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MOBILITY MATTERS:

Technology, Telework, and the (Un)sustainable Consumption of Distance

by

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For Catherine, Brendan, Alan, Liam, & Seán

Abstract

Anthropogenic climate change and its environmental and social consequences are of increasing concern worldwide. Approaches that advocate a 'greening' of current economic and social systems through technological innovation and development tend to dominate policy responses, particularly in resource-intensive sectors such as transport. Technology is perceived in (over)optimistic terms, with limited evidence of challenges to contemporary growth-centric models of development, production, and consumption that cause climate change, a position that can be labelled as a shallow Ecological Modernisation (EM) approach.

Work takes up a considerable portion of people's lives whilst travelling to and from work has become a key feature of everyday mobility in many developed and developing countries. A significant contributor to Greenhouse Gas (GHG) emissions, transport in its current form is deemed to be unsustainable. In a European context, telework – an arrangement that enables employees work from home – has been suggested as a virtual mobility option with the potential to reduce the 'consumption of distance' associated with regular commuting. Given its emphasis on the application of technology to solve environmental problems, the uncritical promotion of telework constitutes a prime example of shallow EM thinking.

Despite the prominence of EM rhetoric in climate policy and practice, theoretically informed empirical explorations of its implementation and impacts remain incomplete. Drawing on a multi-method investigation of telework in the Republic of Ireland, this research finds current policy thinking and practice amongst decision-makers to be largely reflective of neo-liberal environmentalism, contributing little to curbing the consumerist impulses of contemporary economic models and lifestyles. The environmental benefits of telework are also questioned, as is the rationale for existing teleworking schemes. This research further asserts that actual and potential environmental gains can conflict with potentially negative implications for fairness, equity and well-being, with teleworkers shouldering a substantial social burden arising from technology-aided changes in work practices.

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To my colleague Barbara whose calm words and friendship was (and is) deeply heartening and appreciated, and to the rest of the ConsEnSus team; it was a pleasure and a privilege to have been part of such a worthwhile project.

Finally, to my family for all their love and support, I am eternally grateful.   To my sons Eoin, Cian, and Evin for continually teaching me that although I'm rich in health and happiness they will always relieve me of the burden of fiscal opulence, forever to remain (just about) economically sustainable, I say; 'it's a good job for you I didn't study Accountancy & Finance'. And to my wife Annette for all her love and unwavering support throughout, this has only been possible because of your resolve, kindness and love.

Statement of Originality

I, Michael Hynes, hereby certify that all the work described within this thesis is the original work of the author. Any published (or unpublished) ideas and/or techniques from work of others are fully acknowledged in accordance with standard referencing practices.

(Michael Hynes, 2013)

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List of Abbreviations

ANT	Actor-Network Theory
CLS	ConsEnSus Lifestyle Survey
CSO	Central Statistics Office
EM	Ecological Modernisation
EPA	Environmental Protection Agency
GDP	Gross Domestic Product
GHG	Greenhouse Gases
HOV	High Occupancy Vehicle
HSA	Health Service Authority
ICT	Information Communications Technologies
NGO	Non-Governmental Organisation
PDA	Personal Digital Assistants
SC	Sustainable Consumption
SCOT	Social Construction of Technology
SD	Sustainable Development
SMS	Small Message Systems
SSK	Sociology of Scientific Knowledge
SST	Social Shaping of Technology
STEI	Society-Technology-Environment-Interactions
TC	Technological Constructivism
TD	Technological Determinism
VM	Virtual Mobility
VoIP	Voice over Internet Protocol
VPN	Virtual Private Networks
WAP	Wireless Application Protocol
WP3	Work Package Three of the ConsEnSus Project

Chapter 1 - Introduction

There is growing worldwide acceptance that human actions continue to impact negatively on our planet's ecosystem (World Health Organization, 2005; IPCC, 2007b; US Global Change Research Program, 2009; IPCC, 2013). Environmental damage, diminishing natural resources, the extinction of plants and animals, and anthropogenic climate change caused by harmful emissions and excess waste; all are signs of unsustainable patterns of development, production, and consumption. Global temperatures have risen over the past century by at least 0.8 degrees Celsius and this trend is likely to continue, primarily the consequence of high levels of Greenhouse Gas (GHG) emissions into the atmosphere (National Research Council of America, 2011). Traditional ways of doing business - of producing and consuming goods and services – continue to exploit earth's resources as if they are limitless and this will inevitably lead to major transformation and upheaval of life in the future, having consequences for current social and economic structures. Humanity cannot remain on this harmful trajectory without putting the planet's future wellbeing at risk. Whilst ecological damage is not a phenomenon of this century, new understanding and consideration of the issues warrant an approach that welcomes interventions, change, divergence, creativity, and a desire to debate, appreciate, and learn from past mistakes.

In societies of the global north, certain environmental debates have become institutionalised in policy design and have shaped particular public discourse. This is in marked contrast to the high degree of polarisation that characterised ecological considerations throughout the 1970s and 1980s. Although there is still some denial and debate in mainstream media, scientific arguments over climate change now focus on mitigation and adaption rather than if it is happening or what is causing it. But concern and action are two separate principles. To have concern often is to simply acknowledge, but to take effective and decisive action has been something, heretofore, largely beyond policy-makers and frequently neglected by our political leaders. There is broad paralysis of contemplation and procrastination on many environmental protection issues, principally the result of an absence of any economic system to compete with the rationale of continuous growth that underpins modern consumer capitalism.

However, is unceasing growth within the limits of a finite planet plausible? Growth is quantitative increase in physical scale while development is qualitative improvement or unfolding of potentialities, that is; an economy can grow without developing, or develop without growing, or do both, or neither (Daly, 1991). Since human economy is a subsystem

of a finite global ecosystem which does not grow, even though it does develop, it is argued that growth of an economy cannot be sustainable over time (Daly, 1991; Jackson, 2009). Indeed, the depletion of natural resources, the proliferation of environmental impacts arising from the extraction and use of these resources (including the burning of fossil fuels), and financial disruptions due to the inability of our existing monetary, banking, and investment systems to adjust to both resource scarcity and soaring environmental costs, have led some observers to pronounce 'the end of growth' (Heinberg, 2011; Rubin, 2012).

Humanity's continued existence depends on a complex set of interconnected relationships between individuals, society, technology and artefacts, the political and economic systems adopted, and the environment. Unprecedented levels of growth in the twentieth and twenty-first centuries have significantly altered these relationships. Economic development has transformed the face of the planet and altered many human lives. Immense wealth has been created for societies of the global north, by-and-large, leaving other regions in conditions of need, inequality, and often abject poverty. The affluence of some nations has placed considerable pressure on the planet's ecosystems to the degree that pollution, environmental degradation, and diminishing natural resources caused by unsustainable levels of production and consumption are now widely apparent. At the same time, the unrestrained exploitation of energy and natural resources make the existing gulf in prosperity and social justice between north and south decidedly challenging (Mimiko, 2012).

Efforts to reconcile the desire for economic growth with aspirations for greater social justice and better environmental protection have shaped the international policy agendas in the latter part of the last century, with Sustainable Development (SD) emerging as a fundamental aspirations (WCED, 1987). It draws together concern for the carrying capacity of natural systems with the social challenges faced by humanity. But SD has been criticised as an ideological and political project that over emphasises economic and environmental concerns while, at the same time, paying limited attention to questions of social justice (Leach, Scoones, & Stirling, 2010; Bonds & Downey, 2012). Yet others have called it an 'oxymoron' which fails to fundamentally challenge prevailing economic and social structures and how and where we place ourselves in the milieu of ecology (Sachs, 1999; Latouche, 2010).

Particular approaches to Ecological Modernisation (EM) dominate the national, European, and global discourses and debates on development and environmental protection (*cf*. UNEP, 2013). EM theory is an optimistic school of thought within the social sciences

asserting that the economy benefits from greater moves towards environmentalism. Environmental productivity, it is argued, can be the source of future growth and development which increases energy and resource efficiency (Mol, Sonnenfeld, & Spaargaren, 2009). But EM discourses are diverse and broad, and debates vary between 'shallow' and 'deep' thinking where the role of the state, capitalism, and indeed technology varies significantly. Critics, however, argue that in general EM fails to adequately protect the environment, doing nothing to alter the impulses within the capitalist economic mode of production that inevitably lead to environmental degradation (Foster, 2002; Baker, 2007; Jackson, 2009; Barry, 2012). The focus of concern is principally on the economy and growth, with less attention on issues of actual environmental and social harm.

Attempts to create a dialogue on how to link consumption with the environment have often been confused due to difficulties in pinning down core concepts and drawing boundaries around the discussion (Murphy & Cohen, 2001: 5). Consumption involves the attainment of material goods such as fuel, food, clothing, and so forth. This behaviour is tightly bound up with social and cultural practices that define communities, society, and indeed individual identities. Nonetheless, policy-making considerations of the impacts of consumption behaviour has tended to focus attention on appealing to individual consumer's moral and ethical choices when purchasing goods and services, argued to be ineffectual on its own (Davies, Fahy, & Taylor, 2005). For example, the Irish Government's transport policy initiative - *Smarter Travel* (Irish DoT, 2009) - calls for individuals to forego their private car more regularly and shift to more sustainable modes such as walking, cycling, and public transport. However, the absence of any effective public transport network in rural areas, the lack of cycle lanes in urban areas, the spatial development of Irish towns and cities and, indeed, political and public discourses that promote private car use, all vigorously work against environmentally positive individual decision-making.

Work takes up a considerable portion of people's daily lives so a change in the nature of work has significant consequences for SD. A consideration of Society-Technology-Environment-Interactions (STEI) relates to many domains but work involves processes of production and consumption so thus has crucial implications for environmental and social protection policies. Work has often been taken as a symbol of personal value providing status, economic reward, and a means to self-realisation and efficacy (Grint, 1998). It is central to many people's everyday actions, determining their daily activities and rhythms, who they do (or do not) meet, and what relationships they form and maintain. It largely defines a person's position in the social structure and is a shared process linking individuals

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to industrial society, and each other (Feldberg & Glenn, 1979). Whilst much of the research in industrial sociology has been done in the factory, many of today's workers are not employed directly in manufacturing and instead work in administration, financial, commercial, and professional enterprises, and other services which constitute a significant proportion of the global labour workforce (Marsh, 2012).

Travel has also become an indispensable feature of contemporary living and working, and levels of personal mobility have shaped communities and workplaces. Many people travel more often and over longer distances, whether commuting to and from their workplace, school or college, shopping centres, or for work, holidays, or other leisure-related activities. However, the movement of people and goods is also a significant source of GHG emissions, and a major contributor to anthropogenic climate change (Fuglestvedt, Berntsen, Myhre, Rypdal, & Skeie, 2008; WWF, 2008b). The intensification in personal mobility has put humanity on a hazardous collision course with the planet and there is need to reduce harmful emissions, improve the integration of transport infrastructure, land use and planning, and increase the share of less harmful modes of transport (Comhar, 2008). Allied to growing concerns is an awareness that conventional approaches to reducing transport's environmental impacts, mostly reliant on improved technology, are in many respects "doing little more than offsetting the growth in transport activity" (OECD, 2002: 13). Increasingly, 'rebound effects'[1] arising from the increase in the consumption of distance, especially among the rapidly growing middle classes in developing countries such as China and India, wipe out any efficiency gains made through the development of more fuel-efficient vehicles or other such technological fix solutions.

Sociologists have, heretofore, paid limited attention to the social and cultural causes and consequences of increased mobility, including daily commuting to and from work (Rau, 2009, 2012). Traditionally, human spatial practices have been considered the domain of geographers and engineers. But the various forms of spatial mobility are central to many of the interactions between society and the physical environment (Humphreys, 2011). Mobility has become a topic of concern for social theory and research, and this 'mobilities turn' (*cf.* Urry, 2000) has been heightened by the growing interconnectedness brought about by

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[1] The *Jevons Paradox* – also known as the 'rebound effect' - is the proposition that technological progress that increases the efficiency with which a resource is used has a propensity to increase, rather than decrease, the rate of consumption of that particular resource. Such consequences tend to offset the beneficial effects of a new technology or other measures taken. It is based on William Stanley Jevons book *The Coal Question* (1865) and is an often quoted term in economic circles and must surely be a cautious reminder to the limits of technological efficiency in solving ecological problems. In 1992, economist Harry Saunders coined the term 'Khazzoom-Brookes postulate' to describe the idea that energy efficiency gains paradoxically result in increases in energy use (Saunders, 1992).

Information Communication Technologies (ICT) and changes associated with globalisation. The scale of contemporary travel is immense, and this provides the context both for the environmental critique of 'hypermobility'[2] (Adams, 1999) and the belief that mobility has become so central to contemporary society that sociology neglects it at its peril (Urry, 2002: 257). Recent sociological works on mobilities range from road transport (Beckmann, 2004; Urry, 2004) to airports and flying (Adey, 2004) which, in addition to the launch of the journal *Mobilities* in 2006, seeks to debate and develop improved insights relating to mobility. The complexities involved are challenging as "mobility involves a fragile entanglement of physical movement, representations and practices" (Cresswell, 2010b: 18).

Telework is an arrangement which allows an individual work from home for regular payment rather than at a central work location, and is made possible through the use of ICT; a case of moving the work to the workers, rather than moving the workers to work (Nilles, 1998). The *European Framework Agreement* states:

> Telework is a form of organising and/or performing work, using information technology in the context of an employment contract/relationship, where work, which could also be performed at the employer's premise, is carried out away from those premises on a regular basis (Eurofound, 2010b: 3).

Telework offers the potential to suppress, or eliminate, journeys - in particular the daily commute to and from work - and thus can be advantageous in diminishing the negative environmental impacts of avoidable travel, consequently lessening the overall consumption of distance. Telework is advocated by some for technology's ability to support continuing economic development - made possible by new work arrangements and organisation - allied to the environmental benefits of reduced commuting. It thus represents an ideal way to match the rhetoric of EM discourses with the reality of the practice of working from home.

The roots of telework lie in early 1970s technologies linking satellite offices to central locations of employment. The reduction in costs and increase in performance and usability of personal computers and mobile telecommunication devices has enabled the possible decentralisation of work, potentially moving the office to the home. The continuing rollout of broadband infrastructure across Ireland has added to the increasing popularity of telework amongst decision-makers, but a significant gap exists between anticipated figures and the actually number of teleworkers. In Europe, for instance, the average rate of teleworkers

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[2] Hypermobile individuals are highly mobile and take frequent trips, often over greater distances.

throughout the 27 states stands at 7 per cent, with Ireland reporting a figure of just 4.2 per cent (Eurofound, 2010b). One possible explanation put forward for this low level of interest in telework has been that the practice has diffused and been modified over time (Bergum, 2007).

Many of the studies conducted on ICT and its effects on transport fail to move beyond broad statements about its potential for travel reduction and associated business benefits. While there is a growing literature relating to telework, for instance, the primary focus is on its business prowess; on possible efficiency, on Human Resource (HR) management, on property, and on facilities. Comparatively little is known about the social, domestic, and personal upheavals people contend with when working from home. Similarly, little is known about its potential, if any, to be a 'virtual mobility' option that offers an environmentally sustainable way of working. While technology has undoubted potential for environmental good, it does not exist in isolation and must also be considered within the realm of society. Many less noticeable but potentially important environmental, social, cultural, political, psychological and spiritual consequences of technologies and their interactions are regularly overlooked (Sclove, 1995; Huesemann & Huesemann, 2011). Telework epitomises the broad sustainability challenges faced because it illustrates particular tensions between economic interests, social justice related to workers' rights, and overall environmental concerns.

The Research Questions

This research seeks to illuminate the frequently concealed landscape of telework to uncover if this practice can be convincingly used as a virtual mobility option in Ireland (and elsewhere), and what barriers are evident that hamper successful adoption. Telework, as a method of working, is under-researched and ambiguously understood. This study presents arguments for a more critical sociological engagement that tests potential effects of telework on the economy, society, and the environment respectively. Is it possible that many of the benefits that accrue from a reduction in commuting are offset by increased consumption of energy, water, food, and other travel requirements? What are the domestic, social, and cultural implications for people who choose to work from home, and how do policy-makers and key business leaders view telework in relation to EM thinking, if at all?

Interactions between society, technology, and the environment, and how these are conceptualised, form a principal backdrop to this research. Contemporary interpretations of these relationships are often (if not always) dominated by particular approaches that

uncritically endorse technological 'solutions' to environmental problems. Insufficient weight is given to all three pillars of sustainability, including social and structural processes that either help or hinder the adoption and integration of 'sustainability technologies' into everyday life. Whilst it is important to recognise and appreciate the role technology can and does play in environmental protection, it is not adequate simply to develop and deploy technology without due attention and consideration of the societal contexts and circumstances into which it is appropriated. A prime example of such uncritical technological optimistic thinking appears to be that of telework.

This research focuses on telework in Ireland, and also seeks to uncover if key assumptions that underpin deeper aspects of EM thinking are applied in policy design. It centres on telework as an illustrative example of the kinds of sustainability challenges that contemporary society faces. Often complex societal and ecological challenges are reduced to mere technical problems; improving organisational efficiency or producing more for less. There is remarkable confidence that science and technology alone will solve the major problems facing humanity, including those created in the first place by technologies (Huesemann & Huesemann, 2011: 145). But there are crucial limits to the replacement of non-renewable materials and energy by renewable substitutes, for instance. Furthermore, technological benefits are often immediate and obvious while the negative consequences are delayed and less obvious, and this has consequences for long-term societal cohesion and environmental protection.

Telework is promoted on grounds of business efficiency and environmental protection brought about by less commuting through the use of technology for location-independent working, a good illustration of EM rationale. However, while the technology to work from home is widely available, there is an indication of a reluctance and apprehension on the part of many employers, and indeed employees, to embrace the concept of telework. Why is this? Limited attention in telework research is given to work/private dualism and the multifaceted domestic and social concerns of individuals working from home. There are many levels of interconnectivity (and possible conflicts) between the pillars of sustainability for individuals who choose to work in this way. Furthermore, management apprehension about their traditional supervisory roles and the reluctance to empower and trust workers may be hampering telework's development. This thesis, therefore, seeks to answer the following three key research questions:

1. Is Telework a good example of Ecological Modernisation or an illustration of its limits as a paradigm for policy design?
2. How does the environmental rhetoric of telework match the reality of its environmental performance?
3. What are the main issues and concerns that affect the development, implementation, and acceptance of telework in Ireland?

A review of the early literature, scientific and popular alike, (*cf*. Salomon, 1998) suggests that telework forecasts have been over optimistic. Many earlier forecasts were based on a (technological) deterministic viewpoint that assumed people were primitive and unresponsive beings who uncritically adopt technologies as they become available. However, as Salomon (1998: 40) argues "this unidimensional human being does not exist". Instead, people's decision-making processes when adopting technology comprises of numerous highly complex interactions between social, cultural, political, economic, and environmental concerns that need to be better understood. This thesis challenges the frequently optimist interpretations of telework in much of the literature and questions its social and environmental sustainability virtues.

ConsEnSus

Research for this thesis was carried out as part of ConsEnSus, a four year collaborative research project between Trinity College Dublin and the National University of Ireland Galway on consumption, environment, and sustainability. ConsEnSus is funded by the Science, Technology, Research and Innovation for the Environment (STRIVE) Programme 2007-2013, a programme financed by the Irish Government under the National Development Plan 2007-2013. It is administered on behalf of the Department of the Environment, Heritage and Local Government by the Environmental Protection Agency (EPA) of Ireland, which has statutory function for co-ordinating and promoting environmental research.

ConsEnSus examines four key areas of household consumption – transport, energy, water, and food – that impact negatively on the environment and hinder Ireland's efforts to achieve greater sustainability. Seven integrated work packages address three key themes; how consumption could be measured and evaluated, how more sustainable behaviour could be encouraged, developed, and implemented and, what links exist between consumption, quality of life, and well-being? In addition, the project examines how matters of household consumption are governed through institutional practices and participation.

The ConsEnSus project responds to national, cross-border, and international research objectives on sustainable consumption in three main ways. The first generates important baseline data from Ireland in areas of consumption that impact directly on the environment. Efforts to address existing gaps in the literature dealing with sustainable consumption is also included and the research seeks to advance possibilities for measuring consumption through the development and application of innovative social research methods. It also provides international examples of good practice and makes recommendations for a national policy programme in Ireland relating to sustainable consumption, including guidelines for procedures, techniques, and policies for advancing the sustainable consumption agenda at local level.

Work package three (WP3) of ConsEnSus focusses on transport, mobility, and the sustainable consumption of distance in Ireland. It addresses and synthesises all four key themes of the project namely; measurement and evaluation, sustainable behaviour and incentives, health and well-being and, governance, institutions, and participation. A key component of the WP3 is the research undertaken for this PhD dissertation. WP3 is carried out under the leadership of Dr Henrike Rau in the School of Political Science and Sociology at the National University of Ireland Galway.

Methodology

The methodological framework for this research reflects the author's desire to gain novel insights into the concerns, issues, experiences, knowledge, and skills that teleworkers possess[3]. There is little existing or on-going investigation into telework in Ireland, so there is limited scope to build on previous knowledge or bodies of work in this area. Consequently, this research is broadly divided into two distinct but interconnected parts. The first part – Chapters Two and Three – critically examines relevant sociological (and other) contributions to the study of interactions between society, technology, mobility, and the environment, and their relevance to the realm of telework. Part II of the thesis – Chapters Four, Five, and Six – draws on earlier insights to strengthen the analysis of teleworkers' experiences in Ireland, obtained from a desk study of telework, relevant policy considerations in relation to telework, and data gathered in three surveys and sixteen semi-structured interviews.

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[3] Prior to commencement ethical approval for the overall ConsEnSus Project was sought and granted by Dr Saoirse NicGabhainn, Chairperson of the Research Ethics Committee, at the National University of Ireland, Galway.

Part I begins with a wide-ranging examination of STEI and how these interactions are conceptualised and understood. An understanding of the continuing transformation of contemporary society involves not just the introduction of new artefacts but a fundamental transformation in awareness related to technology acceptance and adoption processes. The content of Chapter Two is aided by the inclusion of distinctive and original visual aids that model aspects of STEI. Part I continues in Chapters Three by examining and synthesising key publications and identifies major trends in social science research across key thematic subject areas - notably technology, work, mobility, and the environmental - to provide a comprehensive report on contemporary flexible working environments and arrangements.
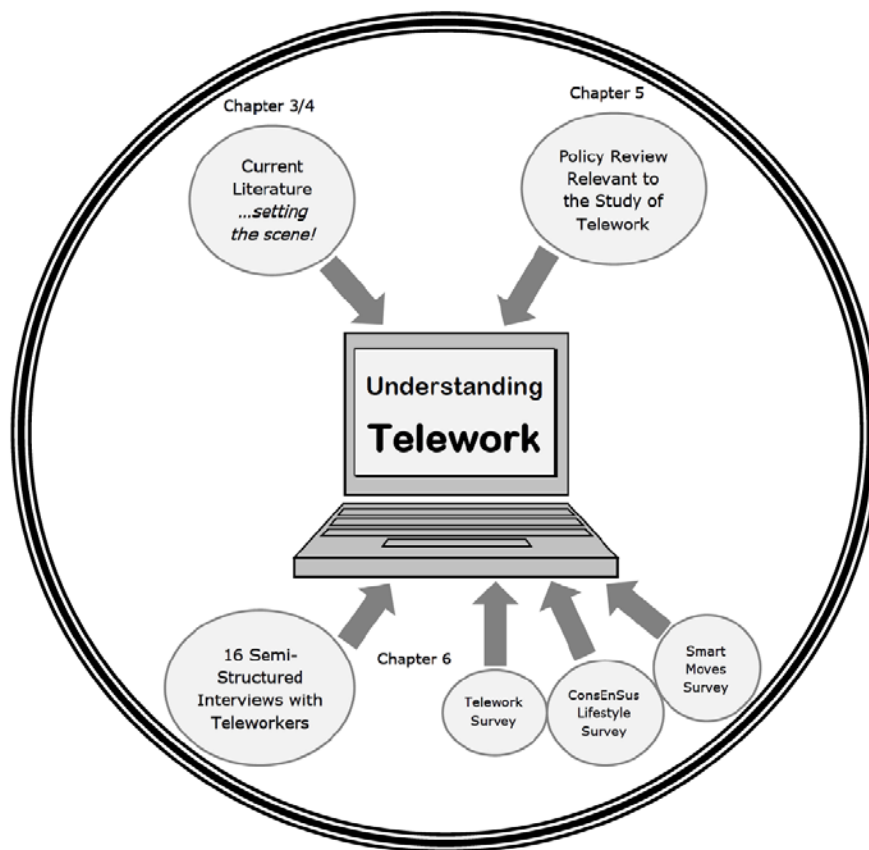
Figure 1 - Theoretical & Methodological Framework

Part II of the thesis commences with a desktop study of telework (Chapter Four) before exploring existing SD, mobility, and flexible working policy issues which has led to an acknowledgment of telework in Chapter Five. This is a comprehensive exploration and is

highly relevant to telework's development and adoption. Telework is promoted on the assumption of reducing the need for commuting in many urban areas as it diminishes the need to travel daily to a single location of employment. However, it appears to fall between the responsibilities of a number of different Irish governmental departments. Where Telework is situated within and amongst these domains is discussed, as are the opportunities and challenges that the adopted policy approaches (if any) brings.

A mixed methodology was used for the fieldwork in Chapter Six, combining both quantitative and qualitative methods of enquiry (*cf*. Bryman, 1988, 2012). As noted by Brewer and Hunter (1989: 22), most areas of research in the social and behavioural sciences now use multiple methods as a matter of course. There is also a view that theory and method must be brought closer together and both must be interpreted from a common perspective if sociologists are to narrow the gap that presently exists between their theories and methods (Denzin, 2009). The literature and theory both inform and shape the empirical elements of research. The interconnectivity between literature and theory and the empirical sections further informs the discussion and conclusion chapters at the end of the thesis.

The *Telework Survey* deployed an online questionnaire targeting teleworkers in a multinational organisation in Ireland. The company is involved in biomedical devices research and manufacturing, and wished to remain anonymous for this research. It has a diverse workforce of management, sales, administration, technology, and manufacturing workers, and its Dublin headquarters actively promotes and encourages telework as a legitimate alternative to office-based work. The number of potential teleworkers at the Dublin site was calculated at 114[4] and a personalised email was send to each of these employees and managers inviting them to participate in the research. Just under half (n=53) took part in the survey - designed using the Limesurvey software – which constitutes a response rate of over 46 per cent. The survey took place from 23rd January to 3rd February 2012. A total of eighteen questions were asked, with a request for further participation in the research made at the conclusion[5].

The questionnaire began with some basic questions; whether or not the respondent currently telework and how many days a week (s)he worked from home. If an individual answered that they were not currently engaged in the practice they were referred to a question about barriers to telework. Questions Four, Five, Six, and Seven used a five-point

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[4] This figure of potential teleworkers is provided by the Human Resources Manager.
[5] The complete questionnaire is available in the Appendix.

Likert scale to allow participants rate statements. The statements in Question Four related to domestic issues such as work/life balance, family, neighbours, and friends. Question Five's statements were focused at the organisational level and dealt with matters such as promotional opportunities for teleworkers, longer working hours, and issues such as gender and personal stress. The necessary skills required for teleworking were addressed in the statements of Question Six.

Question Seven explored matters relating to the overall sustainability of telework. Statements in this question relied on self-reflection and self-assessment to evaluate the impact of telework on a person's carbon footprint across six key areas of household consumption: food, energy, travel, goods[6], water, and waste. The respondents were asked to consider their consumption requirements on days they telework, and contrast these with days when they commuted to their centrally-located office or worksite. Question Eight asked the respondents if they received any formal training and Question Nine enquired if environmental considerations played a role in their decision to telework. Questions Ten, Eleven, and Twelve were questions on their general attitude to environmental issues. Questions Thirteen to Eighteen were requests for demographic information. The questionnaire finished with an appeal for further participation in the research.

Two additional sources of quantitative data were utilised. The *ConsEnSus Lifestyle Survey* (CLS) (*cf.* Lavelle, forthcoming) was conducted over a ten-month period - June 2010 and April 2011 - as part of the ConsEnSus project. Data collection for the CLS took place in Northern Ireland and the Republic of Ireland. A total of 1,500 households - 750 urban and 750 rural - were surveyed in 30 electoral districts across Galway City and County, Derry City, Limavady Council, Dublin City, and Fingal County areas. The aim of the survey was to gain an understanding of people's attitudes and behaviour towards sustainable household consumption and sustainability lifestyles. The questionnaire explored respondents' household behaviour in areas of mobility, food, water, and energy use, and also examined respondents' attitudes towards the environment, environmental responsibility, as well as their attitudes towards their perceived levels of environmental control, their perceptions of quality of life, and their understanding of what constitutes a luxury or a necessity in daily life. The transport questions in the CLS were designed by participants of WP3[7] and were specifically

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[6] Goods, in this instance, refer to equipment, furniture, clothing, or other items that may need to be purchased by a person working from home, other than foodstuffs.
[7] Dr Henrike Rau, Dr Barbara Heisserer, and the author were the researchers in WP3.

aimed at understanding the commuting behaviours of respondents and their attitudes towards other forms of mobility[8].

The third source of quantitative data emanated from the *Smart Moves* project which took place at Thermo King[9] in Galway City (*cf.* Heisserer, 2013). This fieldwork sought to determine how workers actually commute to work, with a view to prompting change in these patterns through a series of incentives and initiatives. The questionnaire was conducted at the beginning of the project and sought the opinions and attitudes of employees and management at the plant to issues relating to local mobility and transport, paying particular attention to individual's daily commuting and general mobility arrangements, and their attitudes towards the environment[10].

The fourth source of data was qualitative consisting of sixteen semi-structured interviews with teleworkers in Ireland. These were conducted between April 2011 and February 2012 with teleworkers from a number of different organisations across the country[11], with the length of interviews ranging from 23 to 48 minutes. The previously mentioned surveys and social broadcast media platforms Facebook and Twitter were utilised to request participation. The interviewees were largely chosen to reflect the broad range of teleworkers currently operating in Ireland. Notwithstanding the limited research in this area, the selection process was shaped by the analysis of telework employees, and their business function, extracted from *e-Working in Ireland: Survey into e-Working Companies* (MRBI, 2002). There were nine male and seven female teleworkers interviewed, a mixture of management, employees, and self-employed, and between the ages of 25 and 65 of age. Seven of the interviews took place face-to-face, with the remainder taking place over-distance using telephone conferencing facilities or/and Skype. Six of the face-to-face interviews were conducted at the individual's place of employment and were arranged using the doodle online scheduling software[12]. The seventh interview was conducted in a public setting. The legitimacy of using over-distance telecommunications is marked by the fact that teleworkers utilise these methods on a daily basis, thus are practiced and comfortable with these means of communication. All the interviews were recorded using both an Olympus digital voice recorder (WS-321M) and a Sony IC recorder (ICD-SX25). Each interviewee was

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[8] The transport section of the CLS is available in the Appendix.
[9] Thermo King is located in Mervue on the east side of Galway city and makes refrigeration units for large vehicles. They employ a staff of approximately 460 workers in manufacturing, administration, and various management positions.
[10] The *Smart Moves Survey* is available in the Appendix.
[11] The table of telework interviewees is provided in the Appendix.
[12] The free doodle scheduling software is available at http://doodle.com/.

requested to read and complete a consent form, in line with suggestions from the Ethics Board[13].

The interviews focused largely on personal, domestic, social, technical, and environmental issues individuals must contend with when working from home[14]. Interviewees were asked to reflect on their experience and knowledge of telework and were invited to broaden any aspect of the discussion if desired. This allowed for the structure of the interview to vary at times, but not to any significant degree. The interviews were conducted in a conversational manner and were preceded by several minutes of informal chat and general discussion. This was a conscious attempt to place the interviewee at ease with the interviewer and process. All the contributors indicated that they enjoyed the experience and were willing to contribute additional information, if required in the future. As the sole interviewer, the author also enjoyed the experience and exchanges with the teleworkers and considered the individuals interviewed to be pleasant, helpful, and knowledgeable in the subject area.

The resulting interview data was transcribed directly from audio files and stored in NVivo. In addition to these transcripts and audio file, NVivo was also used to store observations and comments on the interviewees, the interview process, and other such metadata relating to both the qualitative and quantitative elements of the research[15]. From these transcripts a process of content analysis (*cf.* Krippendorff & Bock, 2008) was employed to identify key topics in the interviews and to classify content in the context of possible EM assumptions and teleworker experiences. Content was identified, highlighted, and categorised into broad themes, which is presented in Chapter Seven.

An important ethical decision was taken prior to commencement; to grant anonymity to the teleworkers and multinational organisation selected for the *Telework Survey*. Building trust between the interviewer and interviewee is of paramount importance and allowing anonymity helped with trust building processes. In addition, individuals working from home often reported that they occasionally felt 'out of touch' or isolated from their office. Separation affects the mutual dependence and shared vulnerability inherent in trust building. Anonymity was granted to participants to reduce any perceived risk of trust decay between teleworkers and those who work at a central office or worksite. Several interviewees referred directly to this issue and indicated that they did not want their contribution misconstrued by

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[13] A copy of the consent form is provided in the Appendix.
[14] A list of potential questions is presented in the Appendix.
[15] NVivo was used to store and categorise data but not in the analysis processes.

employees 'left behind in the office' or managers unable to perform the supervisory functions associated with traditional organisations.

In addition to empirical data gathering, another important element of work focussed on a comprehensive review and desktop study of telework and an extensive exploration of policy, legislation, and public discourse in Ireland and elsewhere. Chapter Four examines and synthesises key publications and research on telework and Chapter Five critically examines any policy decisions made in Ireland and Europe that directly, or indirectly, affect the practice of working from home. Telework has been suggested in *Smarter Travel* - sections four and five (Irish DoT, 2009) - as a virtual mobility option to improve the sustainability performance of the transport section in Ireland by suppressing, or eliminating, commuting to and from work. Therefore, a reflection on issues of SD, transport, flexible working, and telework is deemed essential in formulating the recommendations and conclusions provided later in the thesis.

Contribution to Existing Bodies of Knowledge & Policy Considerations

Reducing traffic can bring many positive effects for society and the environment including energy efficiency, economic gains, personal health and wellbeing, in addition to an improved local environment. However, the absence of viable transport alternatives to the pervasive use of private cars is a major barrier to low-carbon sustainable transport in Ireland. *Smarter Travel* (Irish DoT, 2009) committed the Irish Government to actions to align employment and transport policies - with a particular focus on encouraging e-Working/telework - to transform Ireland's unsustainable patterns of transportation and mobility. But what evidence is available of the widespread promotion or acceptance of telework in Ireland? Are the many domestic, social, political, cultural, and environmental issues acknowledged and clearly understood?   This thesis broadens the debate and critically examines the benefits and weaknesses of telework, from an Irish perspective, paying particular attention to the three pillars of sustainability. As a peripheral European Union country with a relatively low population density, Ireland offers a unique test case for telework. The country's workforce is frequently promoted as highly educated, mobile, and technically savvy (Irish DoJEI, 2012), and with the effects of urban sprawl on spatial fragmentation associated with the 'Celtic Tiger', lengthy commuting times and chronic car-dependency, offers an ideal site for telework to flourish or indeed flounder.

Researching telework offers a unique and novel mechanism to investigate key assumptions and the consequences of STEI. The development, adoption, and use of technologies – a critical element of telework - and how it relate to the environment, affords a valuable context to assess the worth of current policy decisions (if any) in this area. Presented with evidence from this research, policy-makers can reflect on their particular approach to telework and its effectiveness, and employers and employees can make more informed decisions on this significant transformation in work and social practices before committing to working from home. This research also examines the strengths and weaknesses of telework as a sustainability opportunity and seeks to uncover if the approach currently adopted brings the three pillars of sustainability – economic growth, social justice, and environmental protection - into conflict.

Sociological accounts of complex STEI that arise when people chose to telework are rare, particularly in an Irish context. Very shallow forms of EM thinking, which largely incorporate techno-optimistic approaches to environmental protection, frequently dominate discussions and debates and constitute the main attitude in relation to STEI. In addition, much of what is currently known on the subject of telework comes from a technical or organisational perspective. Whilst these factors do require significant attention, applying a sociological lens expands the scope of inquiry to consider many additional socio-economic, political, and cultural elements of concern for teleworkers, issues which are often underreported or ignored. This sociological perspective seeks to appreciate *actual* behaviours, conditions, and experiences of teleworkers, which often contrast with idealistic visions of the practice put forward by some decision and policy-makers, and positions these within some key EM debates.

An improved understanding of teleworkers' experiences will assist the formulation of new approaches to the practice that differ from conventional methods that (over)emphasise the role of technology and management and underestimate the importance of social factors and actual environmental protection. Gaps in existing research have led to the practice of telework being implemented and adopted in an ad-hoc manner within those few organisations that have championed schemes in the past. Realising telework's full potential is also dependent on a deeper understanding and acknowledgement of some of the limitations associated with this method of working, something that has often been overlooked.

Thesis Structure

The thesis is divided into two separate but interrelated parts. The first part critically examines relevant sociological contributions to the study of the interactions between society, technology, mobility, and the environment, and their relevance to telework. Part two draws on the insights from part one to strengthen the analysis of teleworker's experiences, gained from desktop studies, surveys, and interviews. Telework is explored to see how (and indeed if) key assumptions underpinning EM thinking on STEI are applied by key decision-makers and business leaders. The discussion and conclusions – Chapters Seven and Eight - connects the literature and theory sections with the empirical data to better appreciate how (and if) telework is impacted in policy design, whilst also providing recommendations for the promotion, development, adoption, and acceptance of telework in Ireland.

Chapter Two compares and contrasts three conceptual approaches to STEI. The chapter begins with an assessment of two theoretical models used to understand technology, development, and society interconnectivity; Technological Determinism (TD) and Technological Constructivism (TC). The chapter continues with a critical examination of the foremost theoretical model at the intersection between society, development, technology, and environment; Ecological Modernisation (EM). The rhetoric of EM is substantial in environmental policy considerations in Ireland and in the European Union (Wurzel & Connelly, 2010; Barnes, 2011). But are such approaches adequate in the context of more environmentally sustainable practices and for understanding the complex and intertwined issues involved in STEI?

Chapter Three – *Mobility, Technology, & the Transformation of Work* – begins with a brief look at the history and modernisation of work. Much of what telework professes to embody relates to new flexible working arrangements and conditions, and claims of enhanced work/life balance opportunities. A brief reflection is provided of the nature and issues relating to trust, of critical importance to individuals and groups, work and employment, and mobile networked communications. Many of the key aspects of the emerging realities in mobility and work made possible by the introduction, acceptance, and on-going development of ICT are then examined. What potential role can technology play in developing and supporting sustainable transportation options? Several topics at the intersection of technology and mobility are examined before the concept of Virtual Mobility (VM) is considered in detail. This concludes the first part of the thesis, effectively setting the scene and proposing that ICT is facilitating the transformation of work and mobility.

Chapter Four marks the beginning of Part II of the thesis. This chapter presents an extensive examination and desktop study of the principal flexible and virtual working arrangement of concern throughout this research; telework. The chapter explores the key literature and debates underlying the practice of working from home from a number of different perspectives; the individual worker, the organisation, the effects of telework on society and the economy, and environmental considerations. This account of telework, largely in respect of the three pillars of sustainability, will be analysed again in the empirical part of the thesis.

Chapter Five comprises of a desktop study and examination of policy, economy, and mobility matters that impact upon telework in Ireland. Interestingly, it is necessary to consider a range of programmes in this chapter including employment, transport, and working time policies. The chapter begins with a brief summary of international, European, and Irish SD and transport policies before proceeding with an investigation of policy approaches relating to new working arrangements brought about by the widespread use of ICT, and the potential for these arrangements to significantly transform the working environment in Ireland. The chapter concludes with an exploration and search for telework policy and legislation discourses in Ireland.

Chapter Six seeks to illuminate the realities of work and life for teleworkers in Ireland. Whilst some reports of the potential of working from home are available, little in the way of empirical evidence exists. This part of the thesis focuses on the experiences of teleworkers in an attempt to better understand the implications of the policy approach adopted in Ireland. Are flexible working arrangements – including telework - leading to new work environments and realities, or is the notion of working from home a convenience mechanism for increased worker productivity in the face of diminishing social and environmental returns? The second part of the chapter focuses on actual experiences using interviews with teleworkers in Ireland. This qualitative investigation is an effort to provide richer analysis of everyday work and life for people choosing to work from home. Telework is not only to the technologies used to accomplish tasks over-distance, and other significant issues of a social, economic, political, cultural and environmental nature play key roles in teleworkers lives and their decision-making processes.

The discussions and recommendations provided in **Chapter Seven** offer an opportunity to draw the analysis together in a coherent manner. This chapter broadly discusses the validity of EM rhetoric using the test case of telework in Ireland. The empirical

evidence is framed and informed by theoretical considerations presented in Part I of the thesis. Evidence is presented with regards to work/private dualism and questions about the environmental sustainability attributes of telework are central to discussions in this chapter. The environmental failing of telework largely relate to its acceptance as a transport-reduction option without due consideration to its social sustainability consequences and its impacts upon other consumption practices.

Chapter Eight presents final comments and observations in relation to the research process and key findings. This study has implications for policy-making in Ireland (and elsewhere) and an overall understanding of the complexities of telework with regard to environmental and social sustainability. Comments on gaps in the work undertaken and recommendations for further studies and research agendas in these areas will be presented. Addressing these current gaps, this chapter provides final recommendations for policy-makers, organisations, and individuals seeking to telework in the future, in additional to policies relating to overall STEI. The thesis will conclude with both the Bibliography and Appendix.

Chapter Summary

This chapter delivers an overall introduction to the dissertation and suggests that frequently adopted techno-optimistic thinking may inadequately account for contemporary and complex Society-Technology-Environment-Interactions (STEI). In particular, telework in Ireland remains misunderstood by many leading to resistance amongst employers and insufficient interest amongst the general workforce. The chapter begins by outlining one of the prevailing issues of our time; environmental damage caused by excessive Greenhouse Gas (GHG) emissions, much of which emanates from the transport sector. The role sociological accounts of Information Communication Technologies (ICT) can play in understanding these issues and seeking to repair the environmental damage already caused is discussed before the dominant policy rhetoric used for STEI is introduced; Ecological Modernisation (EM). The research questions are presented, followed by arguments as to why telework is a valid test case in the context of STEI and the overall consumption of distance. An overview of the ConsEnSus Project is followed by the research methodologies adopted for this study. The relevance of this body of research and how it will form part of general discussions and debates on sustainability is presented in the latter part of the chapter. In particular, if telework can (or should) be used more effectively as a flexible working option, and if the telework has been, heretofore, adequately conceptualised by existing

interpretations of EM thinking. An outline of the organisation and breakdown of the thesis concludes the chapter. The practice of telework promises a transformation in how work tasks are performed made possible by the introduction of existing and new ICT, with a number of potential additional social and environmental benefits. In the next chapter, a number of ways individuals conceptualise STEI will be presented and discussed; Technical Determinism (TD), Technical Constructivism (TC), and EM theory.

Theory informs and shapes
the data collection & analysis

Thesis
Part One

Thesis
Part Two

Feedback loop from data to test
key concepts & assumptions

Discussions
Recommendations

Conclusions
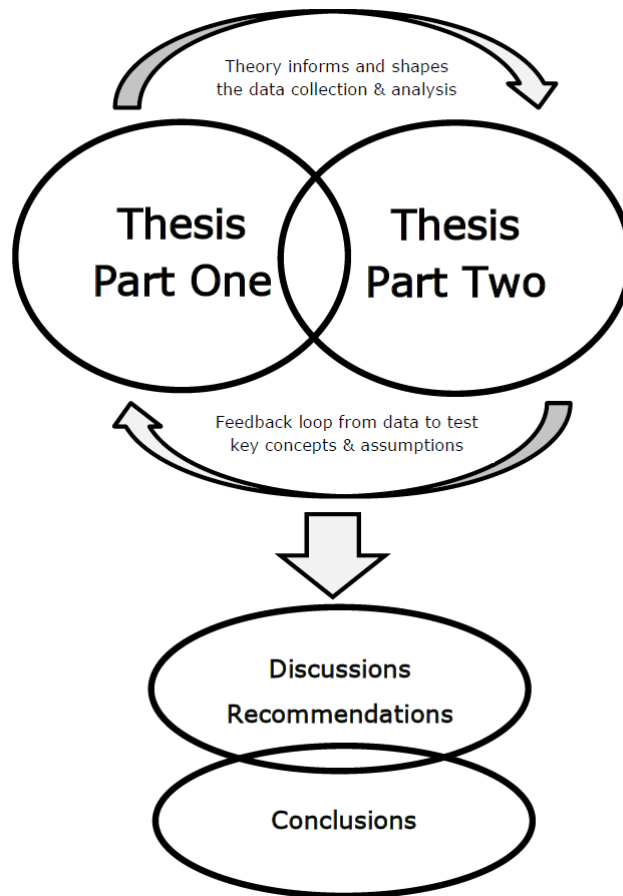
Figure 2 - Thesis Summary

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Chapter 2 - Society, Technology, & Environment Interactions

Technology is all pervasive within industrialised society, transforming people's daily lives and work environments as well as their relationship with the biophysical world. Dominant views of the interactions between society, development, and technology among policy-makers and business leaders are frequently production-focussed, paying limited attention to the end-user, wider issues of consumption in society, and environmental protection concerns. Three prominent strands of Society-Technology-Environment-Interactions (STEI) understanding can be identified; Technological Determinism (TD), Technological Constructivism (TC), and Ecological Modernisation (EM)[16]. Of these three, EM has asserted its dominance particularly in Irish and European environmental protection policy discourses. EM is an overarching component in this thesis as it remains the primary environmental protection policy design instrument worldwide (UNEP, 2013). This chapter seeks to understand the main themes and assumptions underpinning the debates around EM and uncovers an important distinction between deep EM considerations and that of a shallow understanding of the theory. To begin, a clear understanding is needed of the different ways individuals conceptualise technology in the context of its adoption into society and its relationships, impacts, and consequences for environmental protection.

This chapter critically examines these three key models of STEI thinking and the interconnectivity between its elements, and relates this understanding to the study of telework in Ireland in latter chapters. It seeks to demonstration how crucial human and social factors that influence technology development and adoption processes have often been under-conceptualised or overlooked. Furthermore, a strong and culturally prevalent techno-optimist bias exists and advocates afford little attention to the negative consequences of technology assuming that there are only beneficial results and impacts. A critical review of these three main theoretical approaches in relation to technology development and adoption processes will provide a clearer understanding of such interactions and how these are understood in policy design.

EM theory is a multifaceted set of themes and assumptions which have been critically developed over the past number of decades by academics in particular developed nations,

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[16] There are also a number of additionally strong critiques of technology and alternative soft and appropriate technology paths in contemporary environmentalism. One such critique was a major part of the anti-nuclear movement and was related to the early renewables movement. With regards to technology, there has also been a persistent dystopian critique that computers would disempower workers, be responsible for mass unemployment, and lead to new forms of social control, and this can be linked with deep green accounts of technology.

most notably Germany and the Netherlands. However, early assumptions suggests that in policy design telework appears to be somewhat misinterpreted as simply the technological fix of environmental harm against a backdrop of maintaining economic growth made possible by capitalist systems of on-going and persistent production and consumption practices. This appears to represent a form of classic shallow EM thinking, or indeed a neo-liberal environmentalism approach. But will this early assumption match the realty of actual telework practice and implementation in Ireland?

To begin the chapter it is important to position the practice of telework within these three main theories and show how many official accounts of the practice are understood and informed by these traditions. TD represents a robust techno-centric approach which suggests that technology shapes society. In the context of telework, such advocates often make exaggerated claims about the inevitability of telework and the power and influence of technology-aided remote work arrangements within society. TC is agency-focussed and maintains that technological development is largely the result of compromise reached between relevant social groups after episodes of interpretive and design flexibility. Many constructivists believe technological coalitions emerge promoting specific technologies and these options are contested and endorsed by state and market interests. With regards to telework, the main focus of attention is on the use and appropriation of technologies that assist individuals work from home rather than the developmental processes or sponsorship of such technologies. Teleworkers must, therefore, manage and work with the tools they are given under such accounts of STEI.

EM thinking has exerted a strong influence on contemporary debates in the social sciences and has generated important questions and arguments both within and outside the realms of academia. The key features of EM will be outlined and discussed in this chapter, as well as recent considerations, debates, and criticisms. Of importance to this research is how this understanding of EM is applied in policy design, in particular with regards to telework, and how this affects the development (or otherwise) of the practice. At the outset, telework discourses can be positioned within a rather shallow EM or within deeper and more optimistic accounts of the dematerialisation of society by ICT. By carrying information in written, oral, visual and electronic form, telecommunications offer a potential alternative to the transport of goods or persons. But the concept of dematerialisation and the relationship between telecommunications and the environmental debate is much more complex and contradictory than is frequently assumed, and it is argued that it is not possible to make any simple assessment of the environmental role of telecommunications in environmental policy (Marvin,

1997). On the other hand, the evidential discourses within telework policy design that promotes a rather shallow approach to EM appears to be closely allied to TD and neo-liberal environmentalism. Technology or market forces assume a pre-eminent position in a setting where governmental policymakers adopt a hands-off approach and *laissez-faire* attitude to the practice of telework. But is such a non-interventionist approach effective with regards to telework development and implementation? Notwithstanding these debates, the chapter begins with a determinist viewpoint of technology's impacts and consequences.

Theory I - Technological Determinism: *technology will have its way*

Technological Determinism (TD) is a reductionist theory that assumes technologies drive the development of social structures and cultural values. The term was first coined by Thorstein Veblen, an American Sociologist, in his book *The Theory of the Leisure Class* (1899). It is the belief that the characteristics inherent in new technology manage the direction of its development and set the conditions for social transformation, and is argued to be the widely held public and media perception of the relationship between technology and society (Schatzki, Knorr-Cetina, & Von Savigny, 2001; Hirst, 2012). Instead of considering technology as part of a larger spectrum of human activity, determinists view technology as the basis for much of human action[17]. Technology, and technological change, are suggested to be autonomous factors impacting on society from outside, and determinism focuses concern on how to *adapt* to new technology, and not on how to *shape* its development, a basis of criticism for some (MacKenzie & Wajcman, 1999; Davison, 2004) . Improvements in technology drive the development of social and cultural conditions according to technology's own logic (McLuhan, 2003). If this is the case, Winner (1977) maintains, what began more than a million years ago as a human creation has taken on a life of its own, with technology evolving according to its own inner dynamic and unrestrained by social arrangements, culture, and thought.

Smith and Marx (1994) maintain that the sense of technology's power as a crucial agent of change has a prominent place in the culture of modernity. For example, even those individuals who chose not to use computers must still have to accommodate their ways into everyday working and domestic life. Computers are now standard appliances and tools in

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[17] Strongly related to TD, the technocracy movement in the US was a social movement which arose in the early 20th century before becoming overshadowed by other proposals for dealing with the crisis of the Great Depression in the 1930s. The technocrats proposed replacing politicians and businesspeople with scientists and engineers who had the technical expertise to manage the economy, and represented a type of technological elitism.

supermarkets, banks, post offices, libraries, schools, airlines, hospitals, and of course at work; few elements of contemporary life remain unaffected by new or existing ICT. Other technologies also impact on daily life such as the automobile, electricity, antibiotics, contraceptive devices and various types of weaponry, to mention but a few. The structure of such popular accounts conveys a vivid sense of efficacy of technology as the driving force of history and "taken together these narratives give credence to the idea of technology as an independent entity, a virtually autonomous agent of change" (Smith & Marx, 1994: xi).

Some deterministic techno-optimists claim that technology is an autonomous self-correcting system. This is expressed in the faith that technological innovations will automatically, and without human guidance, solve problems, albeit many problems already created by previous technologies (Mesthene, 1969). Such technological optimism and belief in continual progress permeates contemporary industrial societies, it is claimed (Huesemann & Huesemann, 2011). According to Mesthene, technology induces social change in two ways; by creating new opportunities and by generating new problems for individuals and societies. In a direct response to Mesthene, McDermott (1969) takes issue with the notion that technology is a self-correcting system and the idea of 'laissez innover' which had been suggested would benefit all of mankind. McDermott (1969: 643) believed that a small number of elite dictated the direction of technology and the majority of people, when "placed in a position where social behaviour is governed largely by the principle of blind obedience", were led.

Determinism is often referred to in a conventional manner and it is common to find discussions of hard and soft TD (Smith & Marx, 1994). Chandler (2000) viewed hard (or strong) TD as an extreme stance; that a particular technology is either a sufficient condition or sole cause determining social organisation and development and that certain consequences are seen as inevitable, or at least highly probable. Criticism of hard determinism centres on the fact that it invariably puts technology in a position of *absolute power* over society, and the future direction it may take. This led people to a feeling of helpless to changes in the direction technologies were presumed to be driving society. Soft (or weak) TD, more widely accepted, maintains that particular technologies are merely "enabling or facilitating factors leading to potential opportunities which may not be taken up in a particular society or period of time" (Finnegan, 1988: 38). It positions technology in a "more varied and complex social, economic, political and cultural matrix" (Smith & Marx, 1994: xii). Both hard and soft TD, it must be stated, give some limited scope for human input and choice; the disagreement is over how much.

Closely linked to TD is the theory of 'cultural lag', a term coined by William F. Ogburn in his book *Social Change with Respect to Culture and Original Nature* (1922). It refers to the notion that culture takes time to catch up with technological innovation, and social problems and conflicts are caused by such a lag or delay. It is predicated on the belief that habits, thoughts, values, and social arrangements often fail to change at the same speed as technological innovation (Volti, 2006). When the material conditions transform these changes are occasioned in the adaptive culture. But changes in the adaptive culture do not synchronize precisely with the change in the material culture and this delay is the culture lag (Woodard, 1934). Ogburn's interest in social change led him to develop his theory and to ask simple questions like; why do cars run off the road? He maintained that when the automobile was first developed, roads had been designed for horses and wagons and were narrow with sharp curves and corners. As the speed of vehicles increased, these roads were unable to handle the power and swiftness of new models of automobiles. The period required for society to adapt - for roads to be developed capable of handling the increased speed of the automobile - was what he described as technologically driven cultural lag (Ogburn & Duncan, 1964).

There are a number of key advocates of TD. One of the more radical technological determinist in the United States in the twentieth century was Clarence Ayres – a principal thinker in the Texas School of Institutional Economics - a follower of Thorstein Veblen and John Dewey. William F. Ogburn was also known for his technological determinism leanings. In his article *Do Machines Make History?* Robert L. Heilbroner (1967) argues that under capitalism (and only capitalism) technology has a unidirectional development due to the autonomous operation of the market. Heilbroner embraces aspects of determinism but does so under carefully stated qualifications.

Karl Marx is frequently understood to have been a technological determinist on the basis of such quotations as; "the windmill gives you society with the feudal lord, the steam-mill society with the industrial capitalist" (Marx, 1992: [1847]). The quote has led to associate the 'basic Marxian paradigm' with a technological determinist perspective (Heilbroner, 1967). Technology and machinery play noticeable roles in his writing and his account of human history is highly structured and nomological (Bimber, 1990). However, this portrayal of Marx as determinist is regarded as inaccurate by some and a position difficult to sustain from his further works, it is argued (MacKenzie, 1984; Adler, 1990). Marx himself identifies three significant factors in the labour process namely; the activity of people, the subject of work, and the instruments of work (Tucker, 1978). Technology does

not appear to hold primacy over any of the other elements. Indeed, the intentional use of technology by human actors in an important theme in Marx's work, one which is contradictory in nature to TD (Bimber, 1990).

Marshall McLuhan's earlier works - such as *Understanding Media: The Extensions of Man* (1964) - is often referred to as a sub-set of determinism, or 'Media Determinism'. McLuhan remarked on the ability of media to 'massage' a message or content and he suggested that "the message of any medium or technology is the change of scale or pace or pattern that it introduces into human affairs" (McLuhan, 1964: 8). Later in life he came to somewhat different conclusions and "where he once saw the human being as a passive responder to media, he came to believe that individuals are active creators of their own environments" (Saettler, 1990: 274). McLuhan's (2003) concept of the *global village* is based on characteristics inherent to electric media including the elimination of time space barriers in the communication process. The ability to eliminate space in the communication process can create a new global sense of communication that is reminiscent of older oral traditions because people become more dependent on and involved with each other, and thus the characteristic of eliminating space constraints drives social change (McLuhan, 2003).

In his book *The World is Flat*, Thomas Friedman (2005) discusses factors that allow the world to become 'flat' or globally interconnected thereby enabling businesses to compete on an equal playing field. Friedman freely admits to being a technological determinist. Kevin Kelly (2010)[18] suggests technology creates itself, using humans to do its bidding, and that it is a global force beyond human control that appears to have no boundaries. Neil Postman is a prominent technological determinist but urges caution in the adoption of new technologies. He maintains that we make a 'Faustian bargain' with every new technology we introduce and use in society (Postman, 1995). Though we may be gaining something (some new ability or convenience) we are inevitably giving something up too, often in the form of healthy relationships or cognitive abilities.

Jaron Lanier (2013: 157), a leading computer scientist and credited with coining the term 'virtual reality', argues that the dominant narrative within the technological development community is largely machine-centric and deterministic. The concept of the 'third wave' is one of a post-industrial society where information can substitute for most of the material resources and becomes the main material for workers, who are loosely affiliated

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[18] Kevin Kelly is the founding executive editor of *Wired* magazine, and a former editor/publisher of the *Whole Earth Catalog*.

(Toffler, 1980). Such information has a limited material density can replace capital and labour, and thus will transform human society. TD is also commonly associated with futuristic commentators[19] and the 'the microelectronic revolution' (*cf.* Large, 1980). TD is also allied to technological optimism and the belief in progress expressed by many influential individuals[20]. As economist Wilfred Beckerman enthusiastically observed "when we ponder on the fantastic technological progress that has been made in the last 20 or 50 years, the mind boggles at the progress that will be made over the next 100 million years" (Beckerman, 1996: 56). Overall, the key claim of TD is that technology represents an independent domain of social power, akin to economics, politics, or military capacity and so some TD proponents are thus interested in the revolutionary potential of such technology.
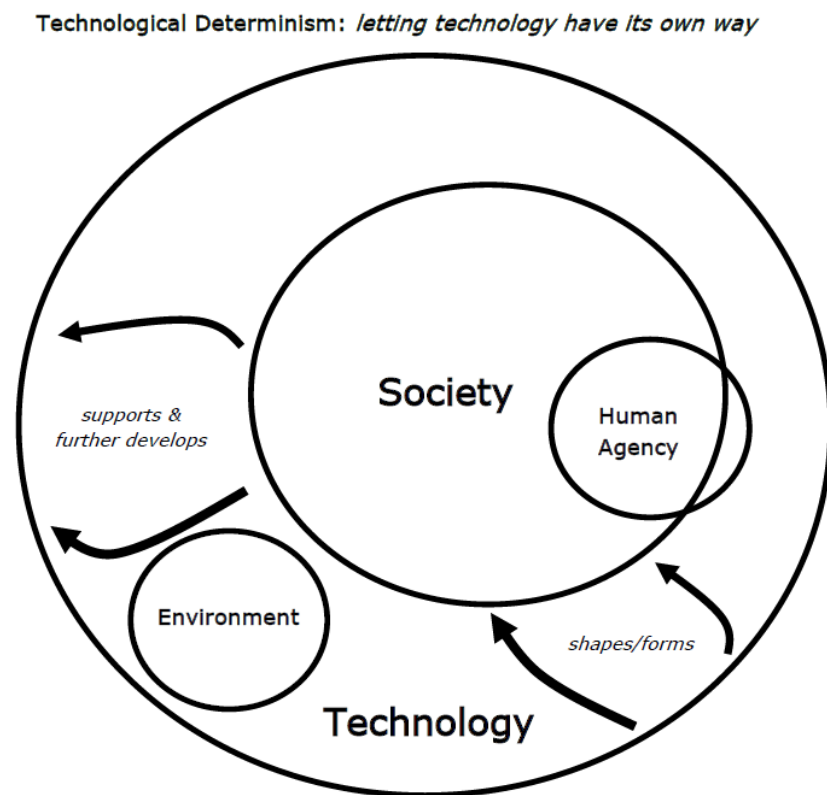
Figure 3 - A Model of Technological Determinism

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[19] Christopher Evans declared that the computer transforms "world society at all levels" (Evans, 1979: cited in Robins & Webster, 1989: 24), while Sir Arthur C. Clark stated "any sufficiently advanced technology is indistinguishable from magic"
[20] Adam Curtis - in his acclaimed 2011 documentary series *All Watched Over by Machines with Loving Grace* - claimed that since the 1970s computer utopians in California believed that humans linked by a web of computers could create their own type of order and establish a self-stabilising society based on the idea of the system or connected computer network (Curtis, 2011).

Criticism of Technological Determinism

TD is a robust reductionist theory that suggests that the direction of social change is set and managed by technology and new technological developments. Although it is the frequently held position for many individuals, and indeed the popular media, its acceptance amongst academics and influential thinkers has waned over the past few decades. Whilst some degree of interaction must be acknowledged and accepted, it is difficult to justify that technology, by itself, is the fundamental feature shaping and transforming society. Humans and not machines make the decision to invent, develop, build, and produce technology (Huesemann & Huesemann, 2011: 243). Nevertheless, any technological change which is great enough is likely to produce some social change, but technology is only one of a number of mediating factors in human behaviour and social change which both acts on and is acted upon by other phenomena. Allocating such governing weight to technology for social change is highly structuralist and an abdication of responsibility in determining technology's true development, adoption, and direction within society. There is a requirement for a level of agency to be acknowledged, and a recognition that people are not simply determined or governed by the artefacts they appropriate and adopt.

Criticisms of the TD viewpoint range from those who take the position that technology is fundamentally good for society (Freeman, 1992; Feenberg, 2001) to those who take a middle ground arguing that TD is an oversimplification of sociological phenomena that can be attributable to many factors including economic, political, cultural, as well as technical (Chandler, 2000). According to Finnegan (1988: 41) "who uses it, who controls it, what it is used for, how it fits into the power structure, how widely it is distributed" are all powerful elements of technological development processes. Further prominent opposition to technologically determinist philosophy emerged from within the domain of the Social Construction of Technology (SCOT), traditionally a prominent constructivist approach to technology development, innovation, and adoption, which will be discussed next in the chapter. This feeling of helplessness to influence change in the direction technologies were driving society inherent in hard TD has received much criticism in the past (Finnegan, 1988; Bijker & Law, 1992; MacKenzie & Wajcman, 1999).

TD is still a significant feature in modern popular media and the power of technology to impose social change appears to be widely accepted. Debates on the significance of social media, and communications technologies more broadly, in generating protest and even violence has continued for a number of years. Interest in 'theories' about how and why new services like Facebook and Twitter might create or enable mass protest was generated by the

revolutionary events in Iran following the June 2009 elections, for instance (Hirst, 2011). However, the question of the influence of TD within journalism needs to be better understood and Mosco (2004) suggests that the idea of a social media revolution is a myth of the 'digital sublime'. TD manifests itself in the working practices of journalists in their reliance on reporting with a 'bias of convenience' and from a perspective of the 'continuous present' (Hirst, 2012). Technology is never just technical but is a combination of what is possible in a time and what is desirable in a certain socio-historic context (Vanesa, 2008).

The accuracy of TD's representations, and the impact of technological development on studies of the social shaping of technology, demonstrate the often complex social nature of development processes (Bijker, Hughes, & Trevor, 1987; Smith & Marx, 1994). Whilst acknowledging the power and influence technology has on the world, research adopting a socially-centred or constructivist approach shows repeated ways in which users not only subvert the uses for which technologies were intended but also reconstitute artefacts in social interaction (Poole & DeSanctis, 1990; Leonardi & Jackson, 2004). Freeberg (2004) suggests that constructivist studies of technology will lead to a realisation that there is no set path by which the development of technologies occur but rather an emergence of similar technologies at the same time leading to a multiple of choices. These choices are made based upon particular social factors and in examining them we will see that they are not deterministic in nature. Much of the criticism of TD centres on the fact that *people* create and *use* technologies, not the other way around. Social constructivist have argued that even lowly users of technology can shape it by co-construction effects, how they use, adapt, hack the technology and how they can ignore, bypass and make technologies obsolete by consumer power.

Despite many years of research, however, deterministic assumptions and language continue to dominate popular discourse in technologically advanced societies (Lievrouw, 2002: 185) much to the displeasure of some observers (MacKenzie & Wajcman, 1999). There is an abundance of new technologies and changes occurring without doubt, but the way we think about technology is not one of these changes. It has been suggested that this kind of futurology or determinist philosophy creates an "invisible world of technologies" (Edgerton, 2008: xi) and an unrealistic expectation of the power and influence it has on society. An approach is needed which will not only acknowledges the important constituents and elements of technological development and adoption processes, but indeed adequately account for these and other social, economic, cultural, political, and contextual perspectives.

The following section focuses on one possible alternative to TD thinking and examines its relevance and impact in relation to STEI debates.

Theory II - Technological Constructivism: *people create technology, but whom does it serve?*

The Social Construction of Technology (SCOT) is a constructivist theory inspired by the Sociology of Scientific Knowledge (SSK), and in particular by SSK's principle of symmetry.   SSK maintains that successful theories are as much a product of their social context as unsuccessful ones. Theories do not succeed because they are *true* but rather because they are socially supported. Similarly, it holds that effective innovations cannot be explained by assuming they *work* better than failed innovations, the analyst must uncover the social context that promotes or fails to promote innovation (Pinch & Bijker, 1984; Bijker & Law, 1992). Research in this area has largely remained committed to an agency approach, although there have been some moves in the direction of a greater emphasis on structure, most notably in Bijker (1995) and Klein and Kleinman (2002). The agency-centred approach views structures as either constraints on, or the products of, individual choices, while the structural approach sees actors as constituted by social structures which are constituted by the actions of these actors (Clark, 1998). SCOT stimulates the observation that technology is a site for social contestation, alternatives, choice, and conflict[21]. The normative assumption of improvement and progress, which TD and some EM advocates have, is displaced with a more sceptical view of the limits and importance of technology. The question becomes not what can technology do, but who does it serve?

Several areas of theory and research co-exist under the umbrella of the Social Shaping of Technology (SST) and most arose in the context of a broad-based scholarly assault on TD (Williams & Edge, 1996; MacKenzie & Wajcman, 1999).   SST emphasises the importance of human choice and action in technology development rather than seeing it as a politically and ethically neutral independent force with its own logic and motivation or; "a mysterious black box that cannot be analysed socially" (Lievrouw, 2002: 185). Central to this approach is the concept that there are choices inherent in both the design and trajectory of innovation programmes, although these choices are not necessarily conscious. Different routes are available leading to different technological outcomes, and these choices can have different implications for society or particular groups within society (Williams & Edge, 1996:

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[21] The key components of a Social Construction of Technology (SCOT) approach are outlined in Table 1.

866). All technologies are value-laden and are consciously directed by specific interests (Huesemann & Huesemann, 2011: 240).

Key Components of the Social Construction of Technology (SCOT)

Component	Definition	Examples/Scenarios
1) interpretive flexibility	each technological artefact has different meanings and interpretations for the various groups	the engineer may view the product differently to the salesperson, who will have to promote and sell the item
2) relevant social groups	the most elementary relevant groups are the users and the producers of the technology, but more often subgroups emerge	the factory owners, management, supervisors, engineers, salespeople, advertisers, customer services personnel, end-users, etc.
3) problems and conflicts	different interpretations often give rise to conflicts and problems	the engineer may want the latest install upgrade, but the marketing department view the end product then as too expensive
4) closure and stabilisation	the interpretative and design flexibility breaks down through closure mechanisms	all relevant groups in the process are satisfied with the product and a consensus has been reached
5) socio-cultural and political context	the wider socio-cultural and political milieu in which technology development takes place	the marketing department may have got their way in using cheap material but does the product conform to recognised standards, public perception, and legislation?

Table 1 - Key Components of the Social Construction of Technology

Another compelling area of research – Actor-Network Theory (ANT) - attempts to overcome the problem of linear causality (Law, 1992; Callon, 1999; Latour, 1999, 2005). It rejects both strong determinism and strong constructivist arguments and considers people, technologies, and institutions alike as *actants* that have equal potential to influence technological development (Callon, Law, & Rip, 1986). "If we abandon the divide between material infrastructure on the one hand and social superstructure on the other a much larger dose of relativism is possible" (Latour, 2000: 51). Technology and people alike are considered as interrelated nodes in constantly changing socio-technical networks which constitute the forms and uses of technology differently in different times and places for diverse groups (Lievrouw, 2002). ANT is valued for its seemingly anti-essentialist or relativist ontology (Lee & Hassard, 1999) and it strives to resist explanations that appeal to the essential characteristics of actors, such as technologies (Harrisson & Laberge, 2002).

However, it is critiqued for 'confusingly' giving technology the status of an independent actor and the myriad web of networks. ACT accounts typically fail to provide explanatory clarity, account for power relationship as opposed to influence, and downplays deeper structural forces or the structural perspective.

Technological Constructivism Model: *it's people that matter most!*
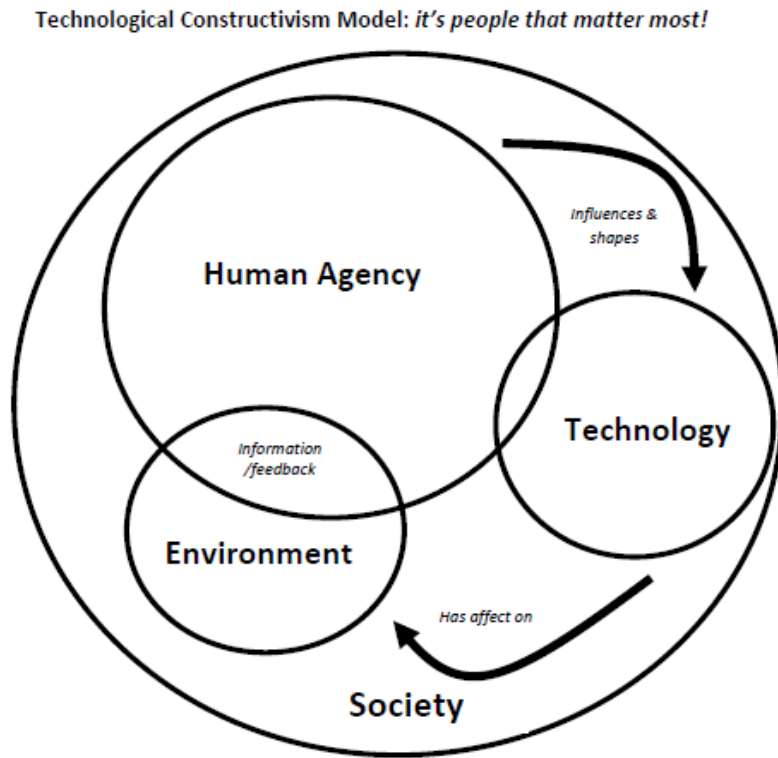
Figure 4 - A Model of Technological Constructivism

There are a number of main advocates in the field of TC. SCOT was first introduced in a seminal article by Wiebe Bijker and Trevor Pinch in 1984 in which they argued that technology does not determine human action but that rather, human action shapes technology (Pinch & Bijker, 1984). Other notable advocates and contributors to early Bijker and Pinch's work include sociologist John Law and historian Thomas P. Hughes. Some practical examination of SCOT can also be found in literature. In his book *The Closed World: Computers and the Politics of Discourse in Cold War America*, Paul Edwards (1996) reflects on the strong relationship between the political discourse of the Cold War and the computer designs of this era. The second prominent theory, ANT, was developed and championed by Bruno Latour and Michel Callon. ANT is known for its controversial insistence on the capacity

of nonhumans to act or participate in systems and networks, and sociologist John Law is again another noted contributor to this area of research.

Criticism of Technological Constructivism

While SCOT makes a genuine attempt to move the debate away from the independent and powerful position technology holds in TD and apportion significant weight to agency, criticism revolves around its narrow scope and its reluctance to address wider issues of context. The inherent structures and meaning of a technology may change once it is appropriated into society, and people use their artefacts differently in different social circumstances and under different conditions. A good case in point is the mobile phone. Text messaging was not considered a key feature in early mobile communications development but as phones became accepted and appropriated differently text messaging took on a new significance and importance. There are also interesting contradictions and interplay between gender, age, and culture in everyday communications and entertainment technology acquisition (Brüschke, 2012). Nonetheless, the constructivist argument is often about revealing choice and inviting a consideration of what technologies are desirable and what are less so, and whether in fact alternatives do exists. Furthermore, hidden power relations tend to show who the technology is meant to serve, and the use of the technology also reveals scope for resistance as consumers as seen as co-constructors in its development.

The main criticism of TC comes from Langdon Winner's (1993) influential critique of SCOT entitled *Upon Opening the Black Box and Finding it Empty: Social Constructivism and the Philosophy of Technology*, where he argues that constructivism is an overly narrow and largely ignores the consequences of the technologies after development. The central emphasis of SCOT research remains the design and development of technology and little is revealed about processes of adoption, adaption, and acceptance, into society. Although the stronger structural focus in later research was an important step, a fundamental problem still exists with the assumption that various social groups are equal and ever-present during the design processes. SCOT continually "fails to adequately attend to power asymmetry between groups" (Klein & Kleinman, 2002: 30), and some groups may even be prevented from participating in the design process altogether (Williams & Edge, 1996). This assumption of a cosy consensus within technology development is excessively agency-centred and the systematic asymmetries of power, and how power differs, are deeply rooted in the structural features of social life (Noble, 1986; Schot & Rip, 1997).

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Other criticism includes the fact that other affected groups, apart from the indicated relevant groups, are ignored and discounted in the process and SCOT fails to adequately account for those options that never make it to the table (Wajcman, 2010). This results, according to Winner (1993), in conservative and elitist sociology. SCOT also disregards any possible deeper cultural, intellectual, or economic origins of social choices concerning technology. In *The Social Construction of Artifacts: A Response to Pinch and Bijker*, Russell (1986) identifies a number of weaknesses in the SCOT model. He argues that it is inappropriate to transfer the approach and concepts of relativistic sociology of science and he suggests another path; "to try and bring technological change as a distinctive dimension into an established, broadly Marxist, form of social analysis" (Russell, 1986: 343). Criticism of ANT relates to its local and contingent focus at the expense of broader social structures which influence the local (Habers, 1995; Reed, 1997) its stance on moral and political issues (Winner, 1993) and anxieties over its insistence on the agency symmetry of non-humans (Laurier & Philo, 1999; Sheppard, 2002).

Theory III - Ecological Modernisation: *can technology be used to save us?*

In the 1960s and 1970s many scholars in the field of environmental sociology were preoccupied with explaining environmental damage. The early environmental debates were dominated by deliberations that could be labelled de-modernisation, de-industrialisation, or counter-productivist[22] (Spaargaren & Mol, 1992; Lash, Szerszynski, & Wynne, 1996). Over time, concerns were expressed about how human behaviour, capitalist institutions, a culture of mass consumption, weakened governments and states, and industrial and technological developments had contributed to the on-going deterioration of the physical environment (Dryzek, Downes, Hunold, Schlosberg, & Hernes, 2003). Enthused by the development of industrial western societies, researchers began to reflect on a new category of research in the 1980s; the changing relationship between nature and society, and the reflection of contemporary society on these changing relations (Mol, 2010). Attention in environmental sociology and politics moved to what is described by Buttel (2003: 306) as; "environment sociology and the explanation of environmental reform". His efforts to focus attention on how societies could find their way out of the "iron cage of environmental despair" (Buttel, 2003: 307) built on previous theoretical work in this area (Dunlap & Van Liere, 1984; Dunlap, 1993; Murphy, 1994). Buttel's main intention is to show that the biophysical world was

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[22] For example, the influential *Blueprint for Survival*, published by the British Branch of Friends of the Earth in 1972, sketched a model of society in which de-industrialisation, community, naturalness, and small-scale production, played key roles.

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relevant to sociology as both a causal factor shaping social change and an outcome of social structures or social processes.

This turn away from merely acknowledging environmental damage was most pronounced in Europe. The practices and institutional developments in some environmental frontrunner European states forced sociologists and political scientists to reorient their focus towards environmental reform (Mol, 2010: 20).   Many of the early studies in the United States were strongly related to neo-Marxist interpretation schemes (Enzensberger, 1974; Pepper, Perkins, & Youngs, 1984) and this, it is maintained, is still evident even today (Mol, 2006). Later, and less forcefully, this turn in environmental social science was adopted by some American academics and other non-European scholars and policy analysts and by the turn of the century environmental reform had become prominent worldwide (Mol, Spaargaren, & Sonnenfeld, 2009). Despite this, Buttel (2003: 306) claimed that the Bush administration's dismissal of the Kyoto Climate Change Treaty in 2001 symbolised that "the United States is among the most recalcitrant in terms of eschewing innovative and effective environmental policies and the extraordinary expansion of raw materials and energy consumption". The international ecological reform movement continues to be viewed with suspicion and apprehension by many decision-makers and business leaders in developed nations across the globe.

One of the more sustained attempts to formulate general assumptions and explanations of contemporary environmental protection policy and thinking is grouped under the term Ecological Modernisation (EM) theory. EM is an optimistic, reform-oriented school of environmental social science and has gained increasing attention among scholars and policy-makers in Europe, North America, Japan, and elsewhere over the past number of decades (Spaargaren, Mol, & Buttel, 2000; Redclift & Woodgate, 2005; Mol, Sonnenfeld, & Spaargaren, 2009). It was first developed in the early 1980s in a number of European countries, most notably Holland and Germany, and is argued to be "a social scientific elaboration and formalisation of the underlying philosophy concerning environmental change articulated in the Brundtland Report" (Mol, Spaargaren, & Sonnenfeld, 2009: 6). It is widely accepted that the German Sociologist Joseph Huber was the founder of EM (Mol & Sonnenfeld, 2000). Huber's early contributions were characterised by a strong focus on the role technological innovation plays in environmental reform processes, in particular at the production stage. In addition, he argued against the bureaucratic state favouring the role of

market forces and dynamics in environmental reform and a structural rather than human agency approach (Huber, 1982, 1985)[23].

An indication of the growing influence of the theory in the 1990s can be found in *The Third Way* (1998) in which Anthony Giddens devotes particular attention to environmental reform. "The importance of ecological politics goes far beyond whatever influence green social movements might muster, or the proportion of the vote green parties might achieve" Giddens (1998: 54) argued, before proceeding to discuss the growing influence of scientific and technological change within environmental reform. However, he also suggested that EM skirts some of the main challenges ecological problems pose for social democratic thought and that, as a result, the theory may be 'too good to be true' (Giddens, 1998: 57). This was in the context of understanding the nature of risk in modern society, particularly environmental risk, and the reflexivity of individuals or groups in the face of such risk.

Of significant importance in this research, two distinct schools of EM thinking have emerged over time. Peter Christoff (1996, 2000) identifies and outlines some important differences between 'weak' and 'strong' EM. Weak, or shallow, EM forms part of mainstream development theory, which views environmental management as the next step in a "unitary evolutionary process of modernisation" (Revell, 2005: 346). It is often narrow in nature and concerns are depicted in terms of monetary value, and the technical fix is recommended as the main solution to environmental damage. Strong, or deep, EM is expressed as a strategy that considers radical change to society with a view to making it more responsive to environmental concerns. It is "ecological rather than economistic, institutional rather than technical, integrated and systemic rather than piecemeal, diversifying rather than hegemonic" (Christoff, 2000: 346-347). Shallow EM merely sustains the dominance of economic considerations over environmental and social protection, whilst the deep approach is more likely to lead to significant and sustained change with regard to tackling negative environmental impacts. In reality, conceptualising political, economic, and ecological developments in diverse and open-ended terms is part of deep thinking, such as no single correct or accepted view of what EM must entail but multiple possibilities to which EM provides an orientation (Berger, Flynn, Hines, & Johns, 2001). Deep EM thinking has broadened over the recent past to encompass such thinking that of transition discourses, transition towns' movement and transitions management literature.

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[23] Huber was one early instigator of EM thinking but since his earlier work there has been a much greater emphasis on the role of the state and steering capitalism more consistent with third way ism or social democracy.

'Weak' Ecological Modernisation	'Strong' Ecological Modernisation
Technological solutions to environmental problems	Broad changes to institutional and economic structure of society incorporating ecological concerns
Technocratic or corporatist styles of policy-making by scientific, economic, and political elites	Open, democratic decision-making with participation and involvement from individuals and groups
Restricted to developed nations who use EM to consolidate their global economic advantages	Concerned with the international dimensions of the environment and global development
Imposes a single, closed-end framework on political and economic development	An open-ended approach with no single view, but numerous possibilities with EM providing orientation

Table 2 - Characteristics of 'Weak' & 'Strong' EM (as based on Christoff, 1996: 490)

The concept of 'dematerialisation' has been linked to deeper EM debates in the recent past and is specifically relevant to the practice of telework. It has been argued that the emergence of ICT and related services should, with the support of other technologies, lead to the dematerialisation of production and to the 'immaterialisation' of consumption (Heinonen, Jokinen, & Kaivo-oja, 2001). Dematerialisation effectively means the translation of information into acoustic, optical, or electric impulses instead of using tangible or material carriers. A telegraph line, for example, is quite tangible. However, once put in place it does not move in order to convey a message but merely provides the pathway along which information travels. In this respect, the telegraph line is to communication what roads or railway tracks are to transport. It is not the message, only the medium. Technically, dematerialisation frees information transmission from a number of physical constraints from which all material movement suffers from. The late eighteenth and early nineteenth century rendered the dematerialisation of complex long-distance communication possible and by detaching communication from transport, a virtual space was created that adhered to a set of alternative physical and psychological rules (Wenzlhuemer, 2007). Approaches to telecommunications and environmental interactions suggest that telecommunications has freed itself from the limits of material transport and thus the practice of telework can be said to facilitate the dematerialisation of certain aspects of work. Some of the major research undertaken on dematerialisation took place in the Netherlands under the direction of the Ministry for Housing, Spatial Planning and Environment (VROM).   VROM's early definition of policy towards dematerialisation "aimed towards influencing the development of economic systems in such a way that the environmental impact of the material flow caused by those

systems is significantly, and in absolute terms, reduced" (te Riele, van Elburg, & Kemna, 2000: 13).

It is important at this time to continue to draw a distinction between the various interpretations of EM. Almost all accounts of EM are reformist, in that that they do not advocate a radical or abrupt rejection of current western societies, patterns of consumption, the role of the state, or capitalism. However, within that position there is considerable variation over the rate, ambition and nature of reform. Some advocates stress the need for a very restrained capitalism and a strong state while others are green neo-liberals. Moreover, some advocates merely adopt EM not in principle but as a strategy of practice most likely to get western states to green themselves. Deep EM advocates may actually share many values with deep greens and other radicals, but believe their accounts lack a credible political strategy, by ignoring the state or calling for the rejection of capitalism. With this in mind, the following section deals in more detail with some of the key themes and characteristics of deeper EM thinking.
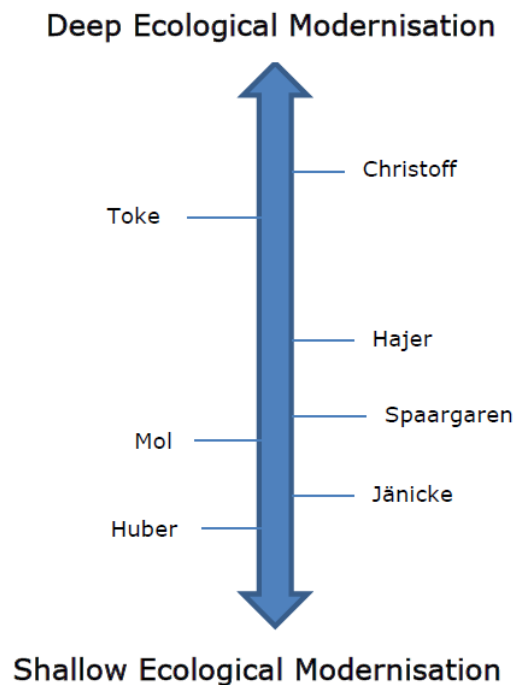
Figure 5 - Contributors to EM Thinking

Some Key Features of Deep Ecological Modernisation Thinking

The emergence of EM deliberations is linked to the energy and employment crisis of the 1970s. At that time, many environmental policies were running into opposition from capitalist and labour interests and seen as destructive of economic growth and job creation. EM promised to bridge this gap as it suggested that states could have ambitious ecological protection allied to job creation and economic growth. Consequently, central to EM philosophy is that contemporary development offers the prospect that economic growth, industrialisation, capitalism, and technological improvements are not only compatible with ecological sustainability but are key drivers of environmental reform (Cohen, 1997; Mol & Sonnenfeld, 2000; Spaargaren, 2000; Mol, 2001). The theory avoids challenging the structures and values of modern society and instead internalises environmental impacts to ensure continued production and output.   Although the frontier of EM theory has broadened theoretically since the 1980s - most notably to include the issue of consumption (*cf.* Spaargaren, 1997) - many studies have similar key features and assumptions. These key themes help shape and influence the debates, discourse, and direction the theory has taken over the last number of years.

EM focuses on the increasing importance and involvement of market dynamics and economic agents such as producers, consumers, credit institutions, utility providers, and other such organisations in environmental management and reform. These are instigators of ecological restructuring and reform, in addition to the more conventional categories of state agencies and environmental social movements that prevail in almost all social theories on the environment (Mol & Sonnenfeld, 2000; Spaargaren, 2000). Furthermore, economic and market institutions and organisations reflect environmental concerns through their pricing, demand, products, and services. On the basis of self-interest, the economy and ecology can be positively aligned by the productive use of natural resources, which may clash and come into conflict with nature conservation in certain circumstances. This is viewed as a form of productive growth similar to labour and capital productivity. Environmental innovations, most often technological in nature, represent 'greening strategies' such as; sustainable resource management, clean technologies, benign substitution of hazardous substances, bionics, product design for environment, product stewardship or extended producer responsibility, recycling, low-emission processes, and add-on purification technology in emissions control and waste processing (Huber, 2008: 361).

Fisher and Freudenburg (2001) identify two main ways in which EM differs from previous environmental protection research. Firstly, EM explicitly describes environmental

improvement as being economically feasible and, in the context of expected continuing economic development, it depicts "political actors as building new and different coalitions to make environmental protection politically feasible" (Fisher & Freudenburg, 2001: 702). Secondly, EM emphasises restricting production processes around ecological principles, which is then a precondition for long-term economic growth (Weale, 1992; Fisher & Freudenburg, 2001). Environmental protection is a potential source of future growth for the economy as it stimulates innovation, provides new market opportunities, and lowers clean-up costs (Mol & Sonnenfeld, 2000; Spaargaren, Mol, & Buttel, 2000).

Another feature of EM thinking is the anticipated transformation of the role of the nation-state and policy-making provisions. More decentralised, flexible, and consensual styles of government should emerge, sometimes referred to as political modernisation (Jänicke & Weidner, 1995). "The traditional central role of the nation-state in environmental reform is shifting, leading to new governance arrangements and new political spaces" (Mol, 2010: 25). These spaces should be filled by non-state actors who assume traditional administrative and regulatory functioning, with the emergent 'sub-political arrangements' (*cf.* Beck, 1997) undermining the nation-state's conventional role in environmental reform. EM is environmental protection that is a "break from top-down, industry-driven solutions to one driven from within social movements" (Toke, 2011b)[24]. Manifestations of this include new actors coming from within the private sector, non-governmental organisations, and other individuals and groupings attempting to shape and influence political opinion and power.

EM studies deliberate on changing discursive practices and the emergence of new ideologies in political and societal arenas (Mol, 2010: 26). Neglect of issues of environmental harm and a lack of ecological concern are no longer accepted as legitimate positions to hold. A juxtaposition of economic and environmental interests emerges as the solid base and an undisputed core principle of EM, although differences remain in interpretations and translation into strategies and approaches. Increasingly, social movements of concerned individuals and groups develop their involvement in public and private organisations and institutions uneasy about general environmental reform. EM reflects an adaptation in the position, role, and ideology of such social movements who, in the past, remained on the periphery and were often (though not always) excluded from processes and institutions of power.

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[24] This is very much his view based on his empirical work with renewable energy advocates. However, wider evidence of EM suggests a heavy presence of industry technical managerialism in pushing technical reform and adaption projects.

The transformation of the environmental movement appears to be a bipolar, or dualistic, strategy of cooperation and conflict, and there are internal debates on the tensions that are a by-product of this duality (Mol, 2000). Furthermore, environmental movements have been surpassed in numbers and influence in some cases by well organised pressure groups of anti-environmentalists. This is particularly evident in the United States with movements such as *Wise Use*[25] (Helvarg, 1994) responding negatively to what is perceived as the institutionalisation of environmental interests. The success of mainstream environmental organisations, coupled with the high visibility of radical environmental activists in some countries, has resulted in a *green backlash* (*cf*. Rowell, 1996), an organised resistance against the environmental movement and its influence on public policy interests (Mol, 2000: 52). In addition, scepticism about climate change now appears a pervasive social phenomenon with different forms evident from outright denial to general uncertainty (Hobson & Niemeyer, 2012).

There is deference given to technology and innovation within EM thinking for repairing environmental damage and having a positive contribution towards future ecological protection. An understanding of this techno-industrial focus within EM is an important consideration for an overall appreciation of the theory. The issue of new technologies is intimately related to the debates between the de-modernisation perspectives and that of EM. Within EM, technology is acknowledged not only for its role in the emergence of environmental problems and issues but also for its potential in preventing and curing many of these issues. The design stage of technological innovation, attentive to incorporating environmental considerations and the conventional model of technology repair and cure, is replaced by one of socio-technical integration:

> The development from (compartmentally organized) end-of-pipe technologies in the early 1970s to ('integrated') preventative technologies in the late 1980s is, in fact, one of the key elements of ecological modernization theory, because the latter technologies are of crucial importance for what Huber (1985: 20) refers to as the 'switch-over' into more sustainable modernity (Spaargaren, 2000: 324).

Growing uncertainties with regard to scientific and expert knowledge and complex technology systems do not lead to the marginalisation of science and technology in environmental

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[25] The Wise Use movement in the United States is a loose-knit coalition of groups promoting the expansion of private property rights and a reduction of government regulation of publicly held property. Wise Use proponents describe human use of the environment as stewardship of the land, water, and air for the benefit of mankind. The Wise Use movement arose from opposition to the environmental movement, and critics widely view it as anti-environmentalist.

reform, instead they are embedded in new environmental and institutional arrangements (Mol, 2010: 25). Huber (2008: 360) maintains that the pivotal component of EM is advanced technology, although there are alternative approaches and accounts of low technology paths within EM. Discussions on wind power within EM, for instance, reveal that this technology was not seen as high tech for some time and can be regarded as a type of intermediate level technology (Toke & Strachan, 2006).

Huber (1985) did argue that production processes from within industrialised nations would be transformed in a manner he described as 'super-industrialisation', involving the invention and distribution of widespread technical innovation. An anticipated conversion from traditional industrial structures, which are often environmentally un-adapted, to an ecologically modernised and consistent 'industrial metabolism' (*cf.* Ayres & Simonis, 1994) is projected. This implies fundamental and major technological innovations, not just incremental efficiency-increasing change and minor or modifications of existing product chains (Huber, 2000: 277). This hypothetically would greatly increase energy and material efficiencies, effectively de-linking economic growth from environmental harm.

> [T]he dirty and ugly industrial caterpillar will transform into a[n] ecological butterfly (1985: 20, as quoted in Mol, 1995: 37).

However, technology innovation and development within EM thinking does not have to be of a high tech nature. It is possible to accommodate and identify alternative, appropriate, and even low technology paths within EM accounts. The discussion of wind powered renewable energy within EM reveals that this technology was not seen as high tech for some time (Toke, 2011a).

This is a significant argument put forward with respect to adopting EM. Proponents of the theory view continuous technological innovation and industrial development as offering the best option for escaping from global ecological disaster and of reclaiming democratic control over technology choices and direction. Spaargaren and Mol (1992) strongly argue that environmental problems and concerns can be addressed and solved through further advancement of technology and industrialisation. Environmental problems in advanced industrial societies, it is argued, are largely caused by wasteful and inefficient production processes and, as a result, new technologies play a significant role in dealing with these concerns (Murphy, 2001b). Technology is no longer viewed as merely contributing to environmental problems, but rather it is valued for its "actual and potential role in bringing about environmental reforms and preventing environmental crises" (Mol, 2010: 25).

The issue of a technological fix of environmental problems, and technology adoption processes in general, also relates to the restructuring and reorganisation of work, and work practices. In the case of telework, technology (and ICT in particular) can be said to be promoted as an EM option on the belief of 'fixing' excessive commuting traffic problems, and its adverse environmental impacts, allied to telework's non-disruptive nature for existing business and work practices and conditions. But what about the overall environmental benefits of telework and in particular the issue of consumption and how it relates to EM? Proponents of dematerialisation viewed their work as an effort to tackle the environmental pressure of specific pollutants and the enormous amounts of energy and material flow inputs in to the economic subsystem and that pose a critical ecological problem (SERI, 2004). Dematerialisation calls for reducing all materials flows in order to avoid potential (and reducing on-going) environmental harm. But while ICT, by itself, in itself does not necessarily lead to a more environmentally-sound future, it does offer new opportunities to develop more sustainable solution (Berkhout & Hertin, 2004). Telework has the potential to be one of these opportunities but some uncertainty exists and our understanding of the application of technologies in environmental protection in general is still somewhat unclear.

Ecological Modernisation Theory Model: *a Business As Usual model?*
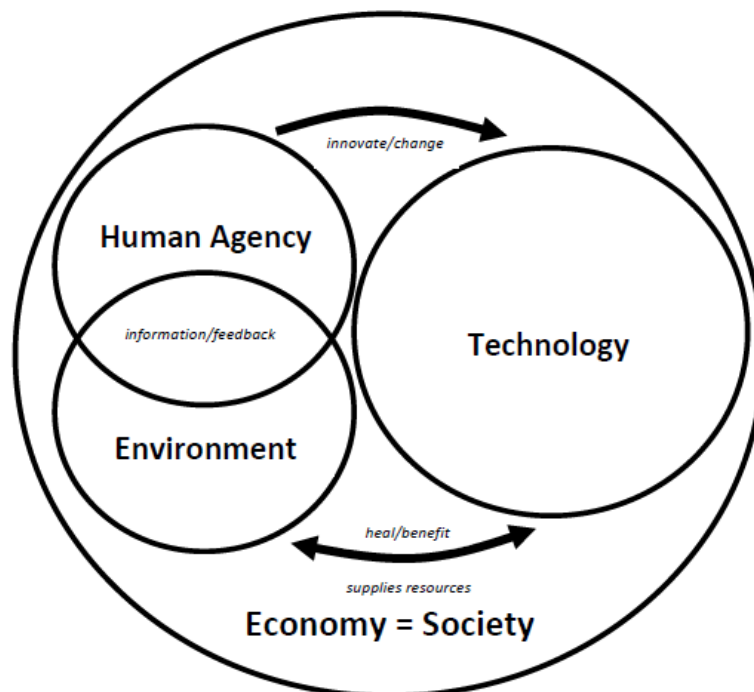
Figure 6 - A Model of Ecological Modernisation

Considering Consumption

The study of consumption has previously received little attention in the context of EM deliberations, even though it is argued to constitute an area of strategic importance (Spaargaren & Van Vliet, 2000). Research in this area had largely been left to economists and social psychologists, and sociologists had long regarded consumption and consumer society as phenomena that mainly deserved criticism, a view also hitherto shared by many environmental social scientists (Winward, 1994). When consumption was given any consideration it was generally regarded as a derivative of production. According to EM advocates, environmental problems in many advanced societies are largely due to wasteful and inefficient production processes and these problems can only be addressed by new technology in a slow and steady incremental reform (Mol, 2002). Such an argument implies that if products were 'sustainable' then consumers will also consume more sustainably.

Murphy (2001b) suggests that, as EM is closed linked to production-related environmental problems, one obvious starting point for consumption recognition is technological development and change.   This change might involve redesigning products based on life-cycle analysis of their environmental impacts, or more fundamental lifestyle changes such as the promotion of telework or online transactions, provided they resulted in reduced environmental impacts. He maintained:

> Such technological changes on their own do not involve or require the integration of environmental concerns into consumption practices themselves. As a result, technological change may be a necessary part of the ecological modernisation of consumption, but there must be more involved (Murphy, 2001b: 47).

Although technology has a significant role to play it is important for consumption to be understood in its own terms and not determined by technology and therefore by producers (Spaargaren, 1997).

In measuring levels of consumption, EM favours the concept of product life-cycle assessment and the analysis of materials and energy flows for measuring resource (in)efficiency. Traditional forms of manufacturing life-cycle assessments were based on the notion of *cradle-to-grave* in which products were created and eventually discarded. Braungart and McDonough (2002) introduced a different concept of *cradle-to-cradle* where waste was integrating it back into the production process. By re-introducing the discarded waste substance into the material flow system it was empowering such materials to maintain their status as resources throughout the entire lifespan of the object or product.

Gert Spaargaren emerged as a major advocate of a new consumption-focus to EM thinking (Spaargaren, 2000; Spaargaren, Mol, & Buttel, 2000; Spaargaren, 2003). Because of the emphasis on production-related environmental problems and solutions in environmental science and policy-making, consumption-related issues received little or no attention until the mid-1990s (*cf.* Spaargaren, 1997). A growing awareness of environmental problems with a strong consumption dimension led to a 'consumerist turn' in environmental practice and research (Cohen, 2001; Shove, 2003; Mol & Spaargaren, 2004). Utilising Giddens' (1984) theory of structuration, Spaargaren (1997) maintains that producer and consumer shaped each other through a production-consumption chain. The EM of domestic consumption centred, he claimed, in developing *information feedback loops* from the consumer to producer to maximise information exchange, thereby increasing efficiency through a process of co-structuration.

European consumers now demand production and processing techniques to be more environmentally benign, sustainable, animal-friendly, and compliant with labour and social standards (Fulponi, 2007). In the context of EM, the notion of ecological citizenship (Dobson, 2003) or the concept of citizen-consumer and political consumerism (Spaargaren & Oosterveer, 2010) suggests that consumers participate in political decision-making processes by putting their environmental and social concerns into practice through purchasing power (Seyfang, 2007). Mol and Sonnenfeld (2000) argue, instead of pursuing a 'command and control' approach and imposing firm regulations from a centralised bureaucracy, that governments steer private actors toward environmentally sound practices. The role of agency has been considered mainly in terms of individual human actors trying to change their individual lifestyles and consumption behaviours through the use of information from government and environmental NGOs. The shortcomings of this particular model have become obvious with the increasing globalisation of consumption (Spaargaren & Oosterveer, 2010).

EM thinking on consumption has developed over the past number of years and interest in the dynamics of the life-world and the everyday life rationalities that govern consumption behaviours are now central to such considerations (Spaargaren, 2008). Consumption as a practice is now the centre of attention for some and this also reflects a change within sociology which moves away from the individual and social structure dichotomy by putting forward social practices as fundamental units for analysis and policy making (Shove, 2003; Warde, 2005). To make consumption more sustainable it needs first to be addressed as practices, as forms of behaviours that represent (and have) a strong

social and symbolic dimensions. Using consumption practices as basic units of analysis helps to avoid individualist and privatised accounts of the role of citizen-consumer in environmental change, while making possible an analysis of the relationship between the personal and the planetary in the process of greening everyday life consumption (Spaargaren & Oosterveer, 2010).

Spaargaren and Mol (2008) suggested three forms of political commitment for individuals; the role citizen-consumers can take in the transnational political realm to articulate environmental rights and responsibilities, the organised forms of political action citizen-consumers might engage with in order to contribute to the greening of globalised production-consumption chains and networks and, the moral engagements of citizen-consumers who in their civic and private sphere of everyday life address global, planetary issues in a direct way bypassing the established political institutions. These they referred to as; *ecological citizenship*, *political consumerism* and, *lifestyle-politics* (Spaargaren & Mol, 2008) and have been the source of further development and analysis (Spaargaren & Oosterveer, 2010).

To summarise, a breakdown of the key themes impacting and shaping deepere aspects of EM thinking is provided in Table 3. It is possible to identify these four key themes from the literature that reflect the essential composition of the theory. The first of these is; EM as the belief that economic growth and environmental protection can be reconciled. In addition, three other themes emerge. EM is regarded as the driver of transformation in policy-making arrangements with traditionally non-state actors assuming regulatory roles and functioning. The third key theme views EM as a technological system transformation which has a positive contribution to future ecological protection. The fourth feature is the belief that (over)consumption can be curbed through consumer choice and pro-environmental decision-making when purchasing goods and services. This facilitates 'feedback loops' to producers, who in turn encourage environmental virtuousness through their decision-making. These four themes make up this unique typology and are designed to represent the major features that frame deep EM thinking but by no means represent the totality of such considerations.

Themes	Assumptions	Definition
Ecological Modernisation as a way to reconcile economic growth and environmental protection	• The economy & environment can be aligned & synergised • High environmental standards is a means of developing market advantage • Economic growth, industrialisation, and capitalism are drivers of environmental reform • Environmental concern is reflected through pricing, product development, and service provision	The belief that a clearer understanding & appreciation of environmental protection is a precondition for sustained economic development and growth
Ecological Modernisation as the driver of transformation in policy-making arrangements	• The nation-state will become more decentralised, flexible, and consensual • Non-state actors & groups will assume new operational roles in policy-making • It will be a break from the 'top-down' approach to one driven by social movements • 'Political Modernisation'	The belief that the nation-state will be transformed leading to former non-state actors assuming regulatory and administrative functioning
Ecological Modernisation as a technological solution to environmental damage and protection	• Technological development can have favourable consequences for the environment • Technology can be used to increase energy & resource efficiency • Product and process innovation will allow clean technologies and substitutes for hazardous substances to materialise	The belief that technology is not just a source of environmental damage but if used judiciously can be a source of efficiency and environment repair and protection
Ecological Modernisation as a means of curbing (over)consumption	• Producer and consumer shape each other through 'information feedback loops' • Market dynamics will transform propagating environmental good, reflected ultimately by product demand • Product life-cycle change – from 'cradle-to-grave' to 'cradle-to-cradle' to take account of product waste	The belief that producers will be shaped by consumer choice and their pro-environmental decision-making, and will in-turn develop ecologically-friendly products & services

Table 3 - Key Themes of Deep Ecological Modernisation

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Criticism of Ecological Modernisation

Advocates of EM maintain that environmental protection is a potential source of future growth for the economy as it stimulates innovation, provides new market opportunities, and lowers clean-up costs (Mol & Sonnenfeld, 2000; Spaargaren, Mol, & Buttel, 2000). It is a way of aligning economic growth with environmental protection. But EM has been subject to criticism and some of its key assumptions have been questioned. Such criticism relates to the assumption of continuous growth, EM's techno optimism and its technocratic nature, and the fact that the theory does not challenge the underlining structures and values of contemporary economic models. EM also advocates innovation and substitution without questioning actual requirements and issues of sustainability. The solution may not necessarily be something new but rather using and consuming less.

The EM assumption relating to the acceptance of economic growth and industrial development has been treated unenthusiastically by some (Hawken, 2001; Richardson, 2002). Hawken (2001) appeared to question the underlying structural difficulties with production growth in a finite resource world when he maintained:

> …if every company on the planet were to adopt the environmental and social practices of the best companies – of say the Body Shop, Patagonia, and Ben and Jerry's – the world would still be moving towards environmental degradation and collapse (Hawken, 2001: 393).

Difficulties with the belief assumption of continuous economic growth also relates to its implementation. A UK study raised a number of concerns with the emissions trading scheme, for instance, including; the voluntary nature of the scheme, the short-term perspective, and the payment of incentives to polluters (Von Malmborg & Strachan, 2005). In attempting to secure industry support and cooperation policy-makers became over reliant on industry guidance, which led to regulatory capture and the extraction of concessions for industry cooperation (Bailey & Rupp, 2004: 238). Choices regarding product development "emerge in an environment where the intentions and relative power of employees, managers, and the owners of enterprises are usually the most important determinants of technological change and its consequences" (Volti, 2006: 178). The anticipated openness for change in institutions of modernity - such as businesses – is naïve in the context of their interests, routines, and perceptions of the world (Berger *et al.*, 2001).

One of the broader criticisms of EM refers to its technological optimism, and the explicit technocratic nature of the theory (Catton, 1982; O'Connor, 1993; Hannigan, 1995; York & Rosa, 2003). It is questionable whether technological solutions alone are sufficient to

guarantee the long-term sustainability of industrialised societies (Hoffren & Korhonen, 2007), although in fairness most EM advocates seek more than just technology fix solutions, they also advocate transformation in governance and economics. Nevertheless, the question of what sustainability actually means in a world where powerful currents of technological change are defining new patterns of excess and scarcity at a bewildering pace is an imposing one (Davison, 2004). It is argued that many technological ecological improvements that are currently available and which are feasible are not yet being considered, fulfilled, or utilised. The more environmentally-friendly products or manufacturing processes, which are sometimes also the most economically efficient, are not always the ones chosen by producers. The asymmetry of power, who are the decision-makers and people of influence, what are the motives for developing technology, what (scarce) materials or resources are needed for production, why indeed is change necessary; all legitimate questions that remain largely under-conceptualised and unexplored within EM deliberations. A good example is the debate over hydrogen or bio-fuels verses (peak) oil. Whilst substitute energy sources are available to replace environmentally damaging fossil fuels such as oil, their widespread adoption and acceptance is not yet evident and impetus in this direction is lacking in policy-making circles, and indeed general public discourse.

It is claimed the global peak of oil production is likely (or has) taken place during the first part of the 21st century (Bardi, 2009; Newman, Beatley, & Boyer, 2009). Energy efficiency and energy savings are key elements to minimise disruptions in provision and allow for long-term sustainable energy supplies, and vectors such as hydrogen are required to fulfil the transition of energy systems (Zerta, Schmidt, Stiller, & Landinger, 2008). A key assumption of EM is that concerns for ecological damage can be frequently narrowed to technological fix solutions. The logic of such an approach must surely rely on infinite material resources being available for new technology production, but unfortunately this is not the case. It is necessary to view technology with a common purpose; the integration of environmental protection with the economic, social, and cultural objectives into a seamless and stable platform for public policy (Dale, 2001). Indeed, criticism of technical-fix solutions maintains that EM lacks the radicalism that characterised de-modernisation and treadmill perspectives on environmental change, and leads to an association that calls for 'green capitalism' (Martell, 1994: 72).

While there does appear to be some such impacts of dematerialisation in the production of manufactured goods there are contradictory trends around demands for increased levels of mobility and movement (Marvin, 1997). Marvin (1997: 63) maintains

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that while telecommunications have the potential to substitute and monitor physical flows, it also has a powerful role in generating new physical problems through the dispersal of land-use patterns, the generation of new trips, and the enhancement of the attractiveness of travel. In an early thematic exploration for VROM, several areas of concern were raised in considerations of dematerialisation (te Riele, van Elburg, & Kemna, 2000). This included the rebound effect, which the report made clear was reasonable to assume would occur with material reduction or material substitution. The report also acknowledged that dematerialisation was often measured merely in relation to ecological and economic terms and the social consequences were often overlooked (te Riele, van Elburg, & Kemna, 2000: 30). The Sustainable Europe Research Institute recommended that a suitable blend of instruments need to be developed, the result of a transparent political process taking into account ecological, economic, and social objectives in order to ensure the sustainability of Europe's development in the future (SERI, 2004). Yi and Thomas (2007) concluded that traditional assessment approaches are insufficient to accommodate the digital technology revolution and cannot accommodate the challenge of measuring the impacts of ICT on environmental sustainability.

The suggestion that EM offers a feasible strategy for solutions to current ecological crisis remained problematic for those who point to the expansionist nature of capitalism as the main course of environmental degradation (Hajer, 1996). It is argued by some that EM fails to alter, or even challenge, the impulses of the capitalist mode of production, instead internalising the negative features of overproduction and overconsumption, despite the availability of more energy and material efficient technologies (O'Connor, 1993; York & Rosa, 2003; Baker, 2007). Baker (2007) argues that the proposition that EM offers a viable solution to our ecological crisis is problematic for those who point to the expansionist nature of capitalism as the main source of environmental degradation. The objectives and intentions of economic growth and environmental protection are not necessarily allied, and more radical thinkers would argue that they cannot be recoiled. Nonetheless, it must be stated that some deep EM thinkers do advocate a position of heavy regulated and managed capitalism where the state has strong directive power.

This research focusses on exploring existing interactions of society, technology, and environment, and EM is the widely quoted theory within environment and social science and policy-making. However, the theory is preoccupied with issues of production-level ecological solutions and there is a need to lend greater weight to social, domestic, economic, and political issues. The main emphasis of the EM approach is what has been described as the

'treadmill of production' (Pellow, Schnaiberg, & Weinberg, 2000: 132) and the underlying dynamics of capitalist production which seeks to extract natural resources and convert them into profit through market exchange. This often results in "locking organisations into a need for a constant and reliable flow of natural resources to make efficient use of high-cost new technologies" (Pellow, Schnaiberg, & Weinberg, 2000: 132). In EM deliberation, most facets of society and the community are simply seen as related to market activity and are thus reduced to simple market commodities (Zukin, 1995).

This is a key concern with EM particularly when compared with Sustainable Development. There is a lack of concern with issues of social justice, which is supposed to be central to SD thinking, both in its process and its distributional forms, or on society-nature relations (Gouldson & Murphy, 1996; Fisher & Freudenburg, 2001).   Indeed what many EM accounts do is effectively conflate efficiency with social justice. However, the most efficient outcomes are not necessarily the fairest, or serve the most social need just outcomes. A major problem with EM is displacement where clean technology in Europe involves turning or displacing pollution into waste products or services which are often outsourced to developing nations for disposal or processing. With regards to telework, the IT sector has been quite notorious for creating huge amounts of toxic e-waste which is then exported to Africa, India, and China for supposed recycling (Widmer, Oswald-Krapft, Sinha-Khetriwal, Schnellmann, & Böni, 2005; Robinson, 2009). These practices unfortunately fit within mainstream EM rather well.

EM has become the major discourse and strategy by which most industrialised countries structure and tackle their ecological problems (Bluhdorn, 2001)[26]. Within European Union policy-making, EM approaches is in keeping with its key tenet namely; the creation of a neo-liberal, free market economy in support of industrial competitiveness. It is seen as the appropriate political, economic, and cultural mode for addressing ecological problems at this stage of social development underlying ownership relations and organisation of a capitalist economy, the organisation of the nation-state, and consumer culture (Barry, 2003: 210). The pursuit of profit is the embodiment of capitalism and the production of goods for consumption a pivotal aspect of this philosophy. However, this position is the source of some criticism of EM as "it does not address the underlying contradiction in capitalism: a logic of

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[26] Similarly to EM theory, the practice of EM varies as well. In the Netherlands the focus has been at the organisational level and their voluntary action to diminish environmental harm. In China the focus has been on state led planning and on hard wiring major infrastructure projects, such as high speed rail, as mega projects designed to build in EM futures.

ever-increasing consumption in a world characterised by material resource limitations"
(Baker, 2007: 313).

In embracing EM as an environmental policy instrument, there is a tendency to focus
strongly on developing something *new* as opposed to embracing something that is
sustainable or beneficial for the environment. This has led to many cases of 'greenwashing',
a negative term that implies corporate deceit in relation to a company's ecological credentials
and those of its products (Karliner, 1997: 169). Greenwashing occurs when a business or
industry decides that it is easier to convince the public of their environmental stewardship
through the use of public relations tactics than it would be to actually enact meaningful
changes to harmful production processes (Winston, 2009). In her insightful book
Greewashed (2012), Pierre-Louis decries many of the latest 'build it new' and 'build it green'
techniques that focus heavily on high-tech approaches, instead of the conversion of existing
structures. She argues:

> When we focus on these technically oriented solutions, we ignore much simpler traditional
> methods of green building that not only tread lightly on the earth, but are more easily within
> the financial reach of your average aspiring home owner (Pierre-Louis, 2012: 108).

New and novel may not always be better, particularly in terms of sustainability and the
environment. A heavy focus on the promotion of new 'environmentally-friendly' products
may not necessarily be in all our best interests, but rather in the interest of the few. In fact,
Jackson (2009) argues that 'novelty' and the pursuit of new things merely fuels consumption
and leads to ecological crisis.

Despite exceptional global economic growth in the second half of the 20th century
(Worldwatch Institute, 2002) the gap in wealth between the rich and the poor continues to
increase, identified as one of the biggest potential challenges the world is facing (World
Economic Forum, 2013). Technologies continue to remain inaccessible to the majority of the
world's inhabitants and "the colonial history on which many modern technological triumphs
are built, burden the present with a legacy of ecological damage, social inequality and
cultural imperialism" (Davison, 2004: 133). It is, therefore, not hard to imagine that global
conflict over access to natural resources and the distribution of environmental risk will (and
continue to) increase in frequency and intensity as poorer nations seek to emulate the richer
developed world. Individuals who live in abundance and where (over)consumption remains
prevalent do so under very different circumstances than those living in poorer countries and

a *one shoe fits all* approach to environmental policy may not be helpful given obvious economic, social, and cultural differences.

Spaargaren's valuable contributions to the fields of EM and consumption should also be expanded to consider the supply chains of consumption, waste, and the social contemplation inherent in a more holistic understanding of the subject. The EM of domestic consumption centred, he originally claimed, in developing *information feedback loops* from the consumer to producer to maximise information exchange, thereby increasing efficiency. This, however, led to criticism of:

> ..the implicit assumption contained within the conceptual postulates of ecological modernization theory; that the issue of consumption need not be problematized in its own right, for consumption is indirectly implicated through the problemization of production, thereby rendering consumption itself a nonissue (Carolan, 2004: 248).

At the core of the problem of (over)consumption is an inability of environmental governance to alter in any fundamental way the global ecological effects of drivers such as advertising, economic growth, technology, income inequality, corporations, population growth, and globalisation. Together these are causing consumption, much of which is wasteful, to rise steadily worldwide (Dauvergne, 2010). EM envisages a gradual restructuring of global capitalism into a global system of sustainable economic growth but it underestimates considerably the extent of resistance to system change and the problem of (over)consumption. Dauvergne (2010: 3) suggests "perhaps most worrying of all, over time the costs of consumption are drifting into the world's most vulnerable ecosystems and poorest societies as powerful states and corporations externalise the environmental and social costs from the majority of consumers". High living standards in developed countries are maintained in part through the huge unrecognised ecological debts it has built up with developing countries (Millennium Ecosystem Assessment, 2005; The Guardian, 2008).

People do not always act rationally, and many daily and routine decision-making processes are directed by social practices that are developed through our interaction with other individuals, artefacts, institutions, and the social environment. In addition, by concentrating exclusively on improving efficient, energy, and environmental policy - key components of EM – individuals have "lost sight of the cumulative consequences of changing conventions of everyday life" (Shove, 2004: 1062). Moreover:

> …products and services that characterise the ecological modernisation of domestic consumption represent practices and technologies that are based on the idea of individual (rather than social) preferences, due to its grounding within a rationalistic framework of action (Carolan, 2004: 256).

Practices are dynamic by nature and researchers need to focus on the ever-evolving conventions and routines to provide a deeper understanding and a solid foundation for empirical investigation. EM must be viewed as a supply-side environmental governance instrument which fails to consider many of the important social, domestic, cultural, and political issues people grapple with in their daily decision-making.

Returning to the discourse on the shallower aspects of EM thinking, decision-makers often conflate the theory with one of simple technology fix solutions and repair of ecological damage. There is an assumption that technology, left to its own devices, will somehow provide the impetus and direction for necessary change and solve many of existing environment problems that are widely evident. This very shallow EM thinking appears allied to TD rationale but also has strong links to a position of neo-liberal environmentalism. Here also a hands-off approach is embraced, and there is strong reliance on the market for solutions and less so on government for the provision of goods and services associated with ecological good and environmental protection. It is appropriate therefore that we discuss this shallow position and neo-liberalist environmentalism is more detail.

Neoliberal Environmentalism: *the rather shallow approach to EM*

Neoliberalism as a term was first used by European economists in the years preceding World War 2, in an attempt to chart a third or middle way between alternative philosophies of *Laissez-faire* and a statist economy (Mirowski & Plehwe, 2009). What began as a starkly utopian intellectual movement was aggressively politicised by Reagan and Thatcher in the 1980s before acquiring a more technocratic form in the self-styled 'Washington consensus' of the 1990s (Peck & Tickell, 2002). An alternative to Keynesianism was pursued that is more compatible with *laissez-faire*, and this gained increasing prominence in the capitalist nations in the 1980s. Public and political interest began shifting away from the collectivist concerns of Keynes's managed capitalism to a focus on individual choice, called 'remarketized capitalism' (Fulcher, 2004). Neoliberalism has now become the major ideological force shaping contemporary economic development and at its core is a commitment to extending the competitive relations of the market as far as possible, keeping state intervention to a minimum.   It combines a commitment to the extension of markets

and logics of competitiveness with a profound antipathy to all kinds of Keynesian and collectivist strategies. However, neoliberalism is anything but a succinct, clearly defined political philosophy, and Austrian and ordoliberal (German and Swiss) reservoirs of neoliberal though have been clearly at odds with neoclassical orthodoxy, as are more recent variations of rational-choice-based neo-institutionalism (Mirowski & Plehwe, 2009).

The meaning of neoliberalism has changed over time and come to mean different things to different groups of people. Generally however, neoliberalism seeks to transfer control of the economy from public to the private sector and this is done under the confidence that it will produce a more efficient government and improve the economic health of the nation (Prasad, 2006). Castree (2010: 8-9) suggests that the term describes one or more of three related things; a worldview (a body of normative principles, goals, and aspirations amounting to a philosophy of life), a policy discourse (a set of specific values, norms, ambitions, and associated policy proposals professed by those who control, or seek control, the formal apparatuses of government), and a set of policy measures (regulations and procedures that make the worldview and policy discourse evident in some tangible way). If the purpose of neoliberalism of the Reagan and Thatcher era was to raze the Keynesian welfare state, the later neoliberalism approach of Clinton and Blair was designed to build new institutions and to embed the neoliberal project more deeply in civil society (Jessop, 2002). Proponents of the concept often tend to reinforce and celebrate strong private, individual, and exclusive property rights and the notion of liberalism with emphasis on the rights, freedoms, and responsibilities of individuals (Heynen, McCarthy, Prudham, & Robbins, 2007).

The neoliberal era has often been imagined as a period of intense and unrelenting technological innovation and development. Such innovation is often held up as the solution to numerous problems that became apparent in the early 1970s, including the crisis in capital accumulation, the globalization of competition, and the rise of environmental degradation (Reynolds & Szerszynski, 2012). But it has been argued that, save for the internet and mobile telecommunications, the basic technological infrastructure and artefacts have seen little radical transformation since the 1970s (*cf*. Edgerton, 2008). However, at the centre of contemporary and popular discourses on technology is the assertion that network technology ushers in a new phase of capitalism and is a powerful ally in an ideology which has trumpeted the virtues of the free market (Frank, 2001; Aune, 2002). This is not a view shared universally and Fisher (2010) argues that during the Fordist phase of capitalism, technology discourse extolled the capacity of technology to enhance social goals of security, stability, and equality by mitigating the exploitative nature of capitalism. He continues:

> …during the contemporary post-Fordist phase of capitalism, technology discourse extols the
> capacity of technology to enhance individual goals of personal empowerment, authenticity, and
> creativity by mitigating the alienating nature of capitalism. By this move from the mitigation of
> exploitation to the mitigation of alienation, I further suggest, contemporary technology
> discourse legitimates new constellations of power entailed by the new capitalism, at the heart of
> which is the weakening of labor and the state vis-à-vis capital, the liberalization of markets, the
> privatization of work, and the flexibilization of employment (Fisher, 2010: 234).

Neoliberalism, as a political philosophy, promotes a greater reliance on markets and less reliance on government for the provision of nearly all goods and services, including environmental services. But the relationships, impacts, and consequences of neoliberal reforms on environmental governance need to be better understood as neoliberal policies can be varied and unpredictable in their outcomes (Bakker, 2007). Heynen *et al.* (2007: 10), however, maintain that inherent in the relationship between neoliberal reform and environmental politics and governance is the imperative to expand opportunities for capital investment and accumulation by re-working state-market-civil society relations to allow for the stretching and deepening of commodity production, circulation and exchange. This near worship of the market, what is referred to as the 'self-regulating market' (*cf*. Polyani, 1944) is one that is increasing broad and comprehensive as the governing mechanism for allocating all goods and services (McCarthy & Prudham, 2004). This requires the ecologically problematic commodification of everything (Watts, 1994).

The first United Nations Conference on Environment and development, also known as the Earth Summit, held in 1992 was a key event, it is argued, in ensuring that neoliberal ideas were promoted in areas such as social and labour market policy and was effective in disseminating green neoliberalism and green development across the globe (Castree, 2010). The traditional approach to environmental governance and regulation was one of state control and 'command and control' practices such as capping emissions, which relied on establishing limits which were enforced by the state (Mansfield, 2007). In contrast, many policies today contain elements of the neoliberal agenda and what has been called 'freemarket environmentalism' has proliferated in a dialogue between environmentalism and proponents of neoliberalism (McCarthy & Prudham, 2004). The past decade has seen a major expansion in the use of market-based instruments, voluntary agreements, and other such environmental policy instruments, made possible by the growing influence of neoliberal ideas over ecological policy design and natural resource management (Bailey, 2007).

The process of neoliberalisation has had a roll-back period which separated traditional forms of state regulation and welfare provision, devolving much responsibility for regulation and welfare provision downwards, and much authority for regulation upwards to international bodies (Klooster, 2010). Ford (2003) argues that the rhetoric of societal participation introduced by the Brundtland Report did little to change regime politics because it failed to democratise the negotiation process itself. New forms of global environmental governance, and their newly incorporated players, can be viewed simply as reflecting existing distributions of power rather than having changed anything fundamental (Lemos & Agrawal, 2006).

The effectiveness of a neo-liberal approach in environmental protection policy design is broadly under researched and very little work has systematically explored the application of such policies to environmental governance and environmental change (McCarthy & Prudham, 2004; Heynen *et al.*, 2007). However, one 2007 study discussed the emergence and implementation of different systems in relation to renewable energy and associated them to theory on the implementation of neoliberal strategies (Toke & Lauber, 2007). In Britain a renewable electricity certificate trading systems had been established to promote renewable energy and was a form of neoliberal environmental governance introduced to assimilate environmental objectives with neoliberal hegemony. In contract, the Renewable Energy Feed-in Tariff (REFIT) system in Germany is associated with an institutional tradition that places emphasis on giving competitive opportunities to new market entrants in order to break up concentrations of market power by incumbents. The central empirical contrast highlighted was between the so-called 'market-based' 'Renewables Obligation' (RO) in Britain and the more traditional command and control REFIT operating in Germany (Morthorst, 2000). The Toke and Lauber (2007) study, by-and-large, found that neoliberal solutions tend to stunt the deployment of renewable energy in those geographic areas in which they are adopted as public policy and that long term innovation in clean energy technologies is neglected by such instruments when compared to other policy designs, such as REFIT systems. Other studies tend to confirm the argument that to be transformative, certification needs to link to broader social movements questioning current practices of environmentally damaging production and complicit, complacent, consumption (Barnett, Cloke, Clarke, & Malpass, 2005; Guthman, 2007; Klooster, 2010).

Whilst the Toke and Lauber study show that a more neo-liberal style results in weaker renewables outcomes there is a caveat to such findings. The role of the state is crucially limited. A common theme within neo-liberal thinking is that the role of the state becomes minimal and often cannot pick and choose technology winners; therefore it should

not be technology forcing. Neo-liberal environmental policy discourses absolve the state of any strong role, merely co-ordination market actors so that technology can roll out and take affect by itself. In fact, by not backing certain liminal technologies the state *de facto* continues to back more established (and perhaps) unsustainable technologies. The essential argument is that neo-liberal environmental policy backs only a token role for the state with regard to technology selection and promotion, largely leaving it to markets to fail or retreat to an implicit assumption of TD that certain winning technologies will eventually win out. However, when the state does little maybe we should expect little[27]. Whilst the role of the state is a fundamental domain for neo-liberalism, interacts with technology remains less explored. Moreover, the neo-liberal turn towards environmentalism finds a good fit within EM thinking, mostly from shallow forms of the theory and debates. Such approaches are optimist about the role of technology for use in measures to assist environmental protection, and can be largely described as not very ambitious in nature.

Chapter Summary

A critical element of being human is our relationships with each other, the set of relations that we broadly call society. We also have links to the artefacts we create, and our interactions, whether at home and at work, invariably involve relationships with other people and artefacts. Technology seeps and becomes embedded into many aspects of modern life and can be undetectable in accomplishing our daily practices, with much of what we use we do so unconsciously. In many cases "the devices, techniques, and systems we adopt shed their tool-like qualities to become part of our very humanity" (Winner, 1997: 63). But technology does not always fulfil optimistic and positive predictions of success held by technologists and developers; a classic example of such unrealised predictions being the 'paperless office'[28]. This, perhaps, is due to a poor understanding of the complex interconnectivity between society, work, the environment, and the technologies we adopt and use. In the case of telework, we may be making similar mistakes by ceding responsibility for technology's direction, development, and implementation to powerful market forces and indeed the artefacts themselves. Indeed, with regards to Ireland it may be just a further case and continuation of our lacklustre environmental performance (Flynn, 2007).

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[27] Reflections on the state as a major employer would suggest that indeed there is a strong role for it to play in deciding the direction of technology development and implementation, if only for the sake of its own workers and responsibilities.
[28] A paperless office is a work environment in which the use of paper is eliminated or greatly reduced. This is made possible by converting documents and other papers into digital form. In the 20 years since being proposed, paper use has actually increased rather decreased in many offices (Westervelt, 2012).
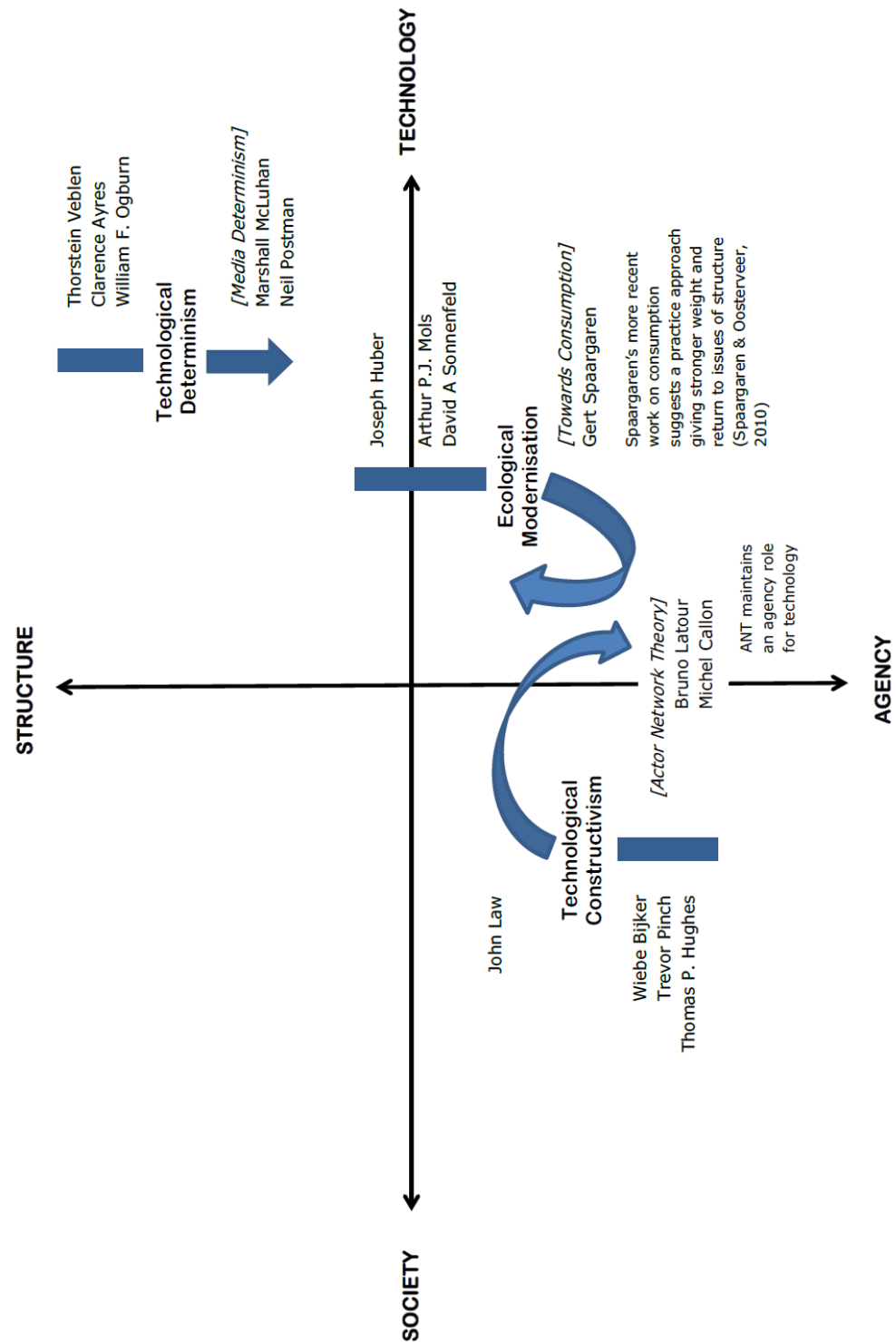
Figure 7 - Mapping Society-Technology-Environment-Interactions

Society impacts on work and technology within the limits of our ecological system. Sociology, therefore, should not be afraid of tackling technology in a manner that has some influence over its future direction and development and there is a need for the discipline to become more involved at all stages of technology development and adoption, a call that resonances with Winner (1977). It also echoes the call from Law and Urry (2004: 404) for social science to "interfere in the realities, to make a difference, to engage in an ontological politics, and to help shape new realities". Bijker and Law (1992: 3) maintained that "our technologies mirror our societies". They reproduce and embody the complicated interplay of professional, technical, economic, and political factors. All technologies are shaped by, and therefore reflect, the complex trade-off that makes up societies.

The backdrop for this research is an exploration of Society-Technology-Environment-Interactions (STEI) and how these interactions can be better understood and conceptualised for effective policy considerations and design. This chapter presented three prominent theoretical approaches to such STEI. The chapter began with a discussion and investigation of Technological Determinism (TD), an often utopian vision of technology as the driver of change in society. This was followed by an exploration of Technological Constructivism (TC) which maintains that successful technological development is a result and product of its social context, and relies heavily on human agency. The chapter continued with the main theoretical framework that underpins many of the environmental policy-making debates in industrialised counties, Ecological Modernisation (EM) theory. EM proposes that economic development and environmental protection can be combined to synergistic effects, creating positive outcomes for the economy and ecology. Key features of EM theory are considered in some detail, including the more recent consumerist turn. A discussion on shallower aspects of EM, in particular neo-liberal environmental thinking, is both necessary and appropriate. Such an approach allows the state to abdicate many of its responsibilities and permit the market dictate the direction, impacts, and consequences of technology development. Telework is promoted on the basis of the introduction of new technology which allows employees work from home. This reconciles with the environmental benefits of reduced commuting traffic and thus telework is ideal for considering how EM is understood in the context of environmental policy design, if at all. The theoretical and conceptual discussions in this chapter, therefore, provide a frame for the case study in part II of the thesis. The next chapter examines and synthesises key publications and identifies key themes in the areas of work, technology, and mobility to provide an overall setting for the empirical investigation of telework in Ireland.

# Chapter 3 – Mobility, Technology, & the Transformation of Work

Work occupies a substantial portion of people's lives. It has often been taken as a symbol of personal value that provides status, economic reward, and a means to self-realisation and efficacy (Grint, 1998). It has become central to people's everyday actions determining their daily activities and rhythms, who they (or do not) meet, and what relationships they form and maintain. Work largely defines a person's position in the social structure. It is a social process linking individuals to industrial society, and to each other (Feldberg & Glenn, 1979). The changing nature of work also has consequences for issues of sustainability and consumption. Telework, and other forms of flexible working, are shifting and transforming patterns of consumption usually associated with traditional work locations and times, and impacting on the other important pillars of sustainability. Such changes in consumption behaviour and disruption to existing domestic and social structures need to be better understood and such working arrangements should not be uncritically endorsed as environmentally and socially sustainable. This chapter sets the scene with regards to the changing nature of work and how technology adoption – in particular Information Communications Technology (ICT) – is leading to transformations in the nature of work and mobility. Consideration of the interconnectivities between work, technology, and mobility is critical to a deeper understanding of the issues affecting individuals who use technology over-distance, as is the case in telework.

The chapter begins with a brief investigation of the history and changing nature of work, and the issue of trust. This is followed by an exploration of the evolving concept of mobilities within sociology and how ICT is enabling the transformation of work and mobility. Technologies support and facilitate Virtual Mobility (VM); the use of ICT to substitute for physical mobility, a means of getting to activities that would, heretofore, have required some form of physical transport or that would have been impossible to do previously. VM can have a lasting and durable effect on activity patterns and socio-spatial structures such as the character of work. Barley and Kunda (2001: 77) suggest that there is a need "to develop images of organisations that are congruent with the realities of work in a new economic order". The spatial (im)mobilisation of work, and workers, represents an under-researched subject of growing importance for industry and indeed sociology. Telework allows employees perform their work over-distance, most notably in their home, spending regular and substantial amounts of time away from a centrally-located office or worksite. This chapter endeavours to set the scene by discussing topics such as work and its changing nature, trust,

mobilities, technology, and the (un)sustainable consumption of distance; all fundamental elements to a richer understanding of the practice of telework.

The (Changing) Nature of Work: *organisations, technology, & the knowledge worker*
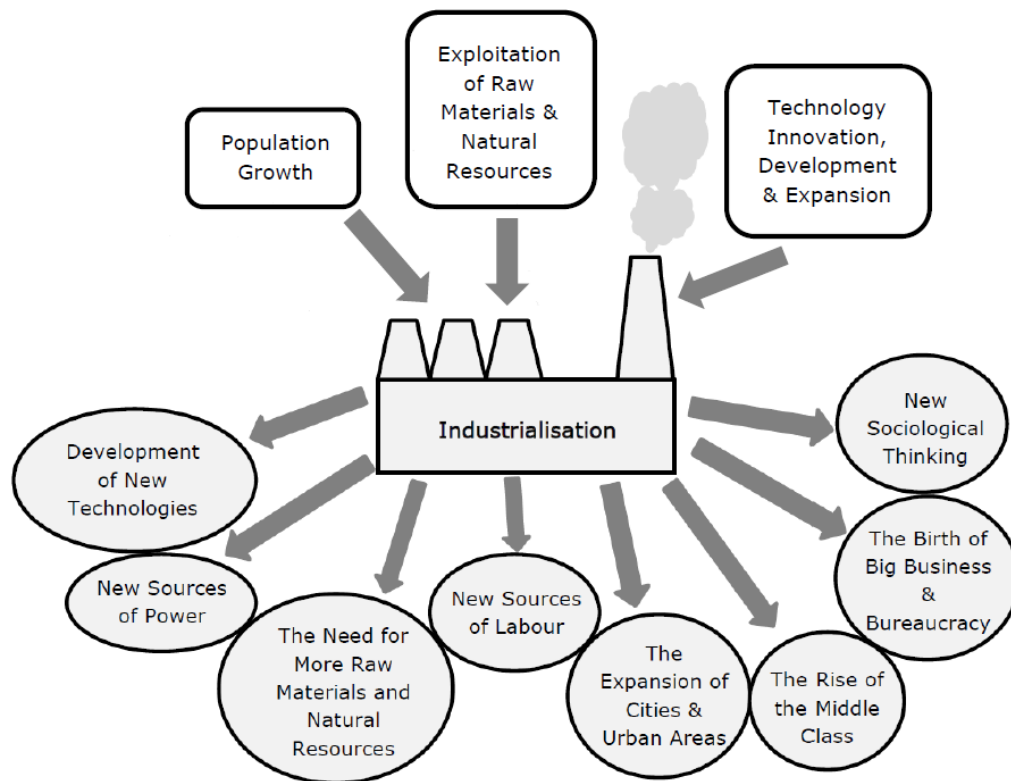
Figure 8 - The Industrial Revolution: Key Causes & Effects

People's experience of work and employment has been shaped by two powerful forces that have transformed the developed world over the last few centuries; capitalism and industrialism (Fulcher & Scott, 2007). The main feature of capitalism is the financing of economic activity through the investment of capital in expectation of making a profit. It was Marx and Engels (1848) who first systematically analysed capitalist production when they argued that the central feature was one of private ownership of the means of production. Industrialism refers to the various methods of organising production that were established

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during the industrial revolution in the eighteenth and nineteenth centuries[29]. The development of technology and the concentration of production led to the *division of labour*[30] into specialised tasks and jobs (Fulcher & Scott, 2007). The core ideas of scientific management were developed by Frederick Taylor in the 1880s and 1890s. A shift away from skilled labour towards unskilled immigrant workers was taking place and this required new forms of coordination, integration and control, and methods of keeping down labour costs (Thompson & McHugh, 2009).

By the 1980s manual work in many western developed countries was in decline and being replaced by computer-assisted technologies and robotics, with the production of goods moving to China, India, and other developing nations. Service occupations largely engaged in the processing of knowledge, such as teachers, financial and marketing personnel, scientists, social workers, and other such professions, rely heavily on different types and grades of data and information. Western economies are no longer driven by the search for more efficient ways of producing goods but by the generation of knowledge and the processing of this data and information (Fulcher & Scott, 2007: 692). Castells (2000: 500) maintains that the concept of the 'information society' in contemporary life suggests dominant functions and processes are increasingly organised around networks that constitute the new social morphology of society. The character of modern 'developed' society, and the roles that mobility, technology, information, communication, and co-operation are playing, are now critically important to contemporary sociology and the changing nature of society.

The transformation from industrial society to an increasingly knowledge-based one affords many opportunities for organisations and individual workers. Multinational organisations increasingly accomplish their work through teams that span local and global boundaries. In the age of the knowledge worker (*cf.* Drucker, 1994) the general nature of work is changing. One new working paradigm happening within the doctrine of organisations and for the role of employees and managers is change indicated by the concept of 'mobile and virtual work' (Andriessen & Vartiainen, 2006a). This type of working is already a reality in many different business areas such as healthcare, consulting, customer services, sales, logistics, and other professional services. But these developments are not confined merely to

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[29] The concentration of production allowed workers to be centrally-located, controlled more easily and monitored more closely, and they were governed by a system of rules which prescribed such things as wages, hiring, layoffs, shifts, retirements, and overall discipline in the workplace.
[30] The division of labour was a concept influential in advancing sociological theories and thought and largely attributed to the work of Émile Durkheim (1893).

the commercial world, they are also taking place in the private and public sectors in Ireland, Europe, and indeed worldwide (Lipnack & Stamps, 2008).

Contemporary economies, reliant and based on knowledge and information, are recognised as the driver of productivity and economic growth leading to a new focus on the role of ICT (Skouby & Windekilde, 2010). The resource implications for individuals, society, and the environment of this are not greatly understood nor accounted for in much of the literature. Historically, technological innovations have not only brought fundamental change to the economic system but also far-reaching environmental and social impacts, for better or worse. Sui and Rejeski (2002) argue that we must balance our pursuit of technological opportunities for ameliorating environmental conditions with a soul-searching re-evaluation of our fundamental cultural values. However, most companies have little interest in exploring the negative environmental and social impacts of technology in spite of the fact that both companies and the environment would benefit from running a more ecologically conscious business (Nattrass & Altomare, 1999; Hawken, Lovins, & Lovins, 2010).

The trend towards mobile and virtual work is pivotal to wider processes in which organisations become less integrated - geographically and in terms of employment - a trend towards less bureaucracy and more peer-to-peer interaction. But with the move towards new working arrangements, new risks and conflicts will inevitably emerge. As individuals become more independent in their work there is a high possibility of isolation, both socially and contractually (Andriessen & Vartiainen, 2006a). Ward and Shabha (2001) found that remote workers lost the ability to 'bounce' ideas and problems, they lacked companionship and social interaction, and felt somewhat isolated and lacked a sense of belonging to the organisation for which they worked. Hobbs and Armstrong (1998: 367) maintained that for socially-isolated remote workers they should be in regular contact with others on a social level and not just through their working environment. Such a view can also lead to a reversal of trends towards mobile and virtual working. Yahoo's new CEO Marissa Mayer decreed that there should be no more working from home for Yahoo staff and was quoted as saying "we need to be one Yahoo!, and that starts with physically being together" (Goudreau, 2013).

Global virtual teams operating across different time zones create issues of protracted workdays, delays, and coordination difficulties. Normal working hours for one member of the

team may be the middle of the night for others[31]. Understanding how individuals differ in their perceptions of time requires awareness of different temporal dimensions, and these dimensions combine to form an individual's time vision (Saunders, Van Slyke, & Vogel, 2004). These can be mapped back to existing management problems experienced around the globe; temporal uncertainty, conflicting temporal interests and requirements, and the inherent scarcity of temporal resources (McGrath & Rotchford, 1983). Scheduling and synchronising reduces temporal uncertainty to the extent that starting and ending points can be specified, but this has obvious consequences for the remote worker. Saunders, Van Slyke, and Vogel (2004: 29) suggests that synergism within a multi-time vision global virtual team can lead to imaginative ways of dealing with schedules and tensions and produce new ways of addressing complex issues that might not emerge in teams with a single time vision.

The agenda for many flexible working arrangements has been stimulated by increasing number of women entering, and re-entering, the workforce (Wood *et al.*, 2010: 20). Changes in employment and family relations have run parallel with the growth of female employment and changes in gender norms (Crompton, 2002). The longer the hours that people currently work the more likely they are to want to reduce their hours, which is particularly pronounced for women (Fagan, 2001). The intensification in married women taking up employment, however, has been suggested as the cause of increased rates of divorce and single parenthood, and family instability (Sander, 1985) as well as a European-wide decline in fertility (Sporton, 1993). But the benefits for organisations offering flexible working opportunities can be substantial[32]. In addition, there is evidence that women are more likely than men to cite flexibility of schedule and other family-related factors as reasons for becoming self-employed (Boden Jr, 1999).

Fevre (2007) maintained that many social theorists associated flexibility within the organisation with an 'age of insecurity'[33]. Doogan (2005: 85), however, argued that employment growth has been rapid in managerial, professional, technical, clerical, and sale occupations, and total job gains have taken place alongside a dramatic increase in long-term

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[31] Issues such as public and national holidays, seasonal difficulties, and the traditional annual holiday period of summertime simply add to these complications.
[32] Results from one study revealed that women who perceived their organisation to offer flexible work hours reported higher levels of organisational commitment and job satisfaction than women who did not (Scandura & Lankau, 1997).
[33] He claimed: social theorists popularized the idea that the affluent societies of the West were entering a new age of insecure employment in which more and more people would be forced to stitch together patchwork careers consisting of short-term spells of work (Fevre, 2007: 517).

employment[34]. However, the popular misconception that people are dissatisfied with their flexible working hours needs to be addressed. Many flexible workers show high levels of satisfaction with their job and working week (Orpen, 1981; Saltzstein, Ting, & Saltzstein, 2001; MacInnes, 2005) and early assumptions relied on the over-simplification of complex data, it was argued (Rose, 2005). Fevre (2003) suggested that the age of insecurity proved to be attractive for social theorists because it was founded on the hypothetical turning point in the history of capitalism, but for which the evidence vanished upon closer scrutiny.

Overall, new technologies create the opportunity for work to take place in any space and time, and working in such a dispersed and mobile manner requires new skills and competences for employees and managers. This trend towards new working practices allows individuals to become more independent but also less integrated within their organisation. Zaccaro and Bader (2003) maintain that the development and maintenance of trust may be the most important factor contributing to dispersed-team success, given the obstacles that impede the establishment of trust in these teams. The importance of reciprocal trust poses new challenges to interpersonal processes such as control and trust, as well as the assumptions regarding their importance.

The meaning of trust can vary between individuals and organisations and there is no intuitive, universal, and well-understood definition. New innovations in technology and organisations has led to less formal and hierarchical modes of control and co-ordination particularly in the workplace (Korsgaard, Pitariu, & Jeong, 2008). Interest in trust has been further stimulated by on-going transformations in society, characterised as late modernity and post-modernity and stimulated, by-and-large, by the development and widespread use of ICT. Trust remains a vital component in telework and when using ICT over distance. However, most research focuses on the evaluation and establishment of trust relationships (Grandison & Sloman, 2000) and less emphasis has been placed on studying the problem from the perspective of the broader technology environment including definitions as well as legal and trust design issues (Song, Korba, & Yee, 2007). Individuals are surrounded by technology; by computers, telecommunications, energy systems, transportation systems, financial networks, and the principles and mechanisms of their operation are often unclear and mysterious for the average user (Sztompka, 1999). It is frequently assumed that we

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[34] Early debates on the impact of flexibility were populated by negative accounts of the re-hiring of redundant steelworkers and other employees under sub-contractors with significant loss of pay, benefits, and health and safety protection (Fevre, 1986; Magdoff & Magdoff, 2004). Studies indicated that deliberate measures to erode employment security and increase the overall number of workers on non-standard contracts were commonplace, with even a growing number of large Japanese corporations practicing this strategy (Kyotani, 1999).

take these technologies and artefacts for granted and do not notice their pervasive presence. Often technology is used unconsciously, leading to the condition that "trust in the multiplicity of abstract systems is a necessary part of everyday life" (Giddens, 1994: 89).

Building, generating, and maintaining trust involves developing strategies to deal with many issues, and handling the questions a person may have. Generating trust over-distance, however, departs radically from traditional business models and practice and can be problematic for some organisations to achieve. Trust is best achieved by allowing the balance of power to shift toward a more cooperative interaction between the organisation and its employees (Hoffman & Novak, 1997). Allowing a shift in power from a centrally controlled organisational structure to one where the employee assumes a level of authority can go against the grain and culture for many companies and organisations, but may lead to greater levels of trust over time. To facilitate this shift many elements of technology and business practices need to be re-examined and re-structured.

The design of telework arrangements places unique burdens on communications and management processes which need to be redesigned for organisations to maximise the benefits (Staples, Hulland, & Higgins, 1998)[35]. Many agree that trust is perhaps the most important element of a harmonious, synergistic, and efficient remote work environment so ways of developing and retaining trust must be an important consideration in organisational design and structure (Crossman & Lee-Kelley, 2004).   Staples, Hulland, and Higgins (1998) concluded that remote employees' self-efficacy assessments can play a critical role in influencing their performance suggesting that it may be possible to enhance employees' work performance through management efforts to improve trust. Often mistrust is misplaced, and there can be a tendency for management concerns to stray into non-work related issues of trust. But trusted employees are just that; they are trusted to do their work. Dauten (2007) maintains; the one who manages least manages best, and often has strong trust in subordinates. Trust is required, therefore, to facilitate remote working, such as telework, play a more significant role in modern organisations. Indeed, the issue of trust is an underlying dynamic and concern for many teleworkers and emerges in different forms in interviews in the empirical chapter later in this thesis.

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[35] A number of studies throughout the 1980s and 1990s found that management issues, including trust, were a significant factor preventing widespread adoption of telework (Huws, 1984; Duxbury, Higgins, & Irving, 1987). A US survey showed 70 per cent of respondents were restricted from teleworking, and the major reason was upper management's lack of trust in employees and concerns over reduced productivity (ID Blog, 2007).

Mobilities, Technology, & the (Un)sustainable Consumption of Distance

In principle, the use of virtual teams and organisations and flexible working arrangements can decrease the need for commuting for many workers. Work can be performed anywhere and at any time by using ICT, with mobility happening virtually. However, there is little evidence that the use of telecommunications increases or decreases the need for physical travel (Lassen, Laugen, & Næss, 2006). In Ireland the total vehicle fleet increased by 137 per cent between the period 1990 to 2008, and total mileage by all private cars increased by 38 per cent between the years 2000 to 2008 (SEI, 2009). At the same time, the availability of telecommunications and related ICT hardware and infrastructure also grew significantly (ComReg, 2010). Despite the potential to be a substitute to physical travel research highlights that mobile telecommunications and ICT has a complementarity or modification effect on travel (Salomon, 1985, 1986; Mokhtarian, 2003). Indeed, Mokhtarian (2003) states:

> At this point, what we can say with confidence is that the empirical evidence for net complementarity is substantial although not definitive, and the empirical evidence for net substitution appears to be virtually non-existent (Mokhtarian, 2003: 54).

Lassen, Laugen, and Næss (2006) argue that there is potential for reducing work-related air travel through the use of ICT - such as videoconferencing and eLearning - in virtual organisations. However, they concluded that in the absence of regulation policy and planning other options should be pursued for stimulating sustainable mobility policies.

Mobility and transportation are essential components of contemporary society where individuals have the desire and feel the need to travel more often. Furthermore, while trading has been a key feature of civilization for millennia, there has never been so much trade, travel, and mobility. The scale of modern travel is immense and has become central to contemporary lifestyles and work practices.   Simultaneously, private motor vehicles have emerged as the greatest contributor to atmospheric warming now and, quite possibly, will be a major contributor well into the future (NASA, 2010).   Cars, buses, and trucks release pollutants and greenhouse gases that accelerate warming, while emitting few aerosols that counteract it. The relevance of the private automobile to this study is significant. The daily commute to work for many individuals involves solo-occupancy car travel and telework seeks to reduce the need for this particular type of travel by allowing people work from home. An individual's regard or affection for car travel will, therefore, have effect on their decision to work from home or not.
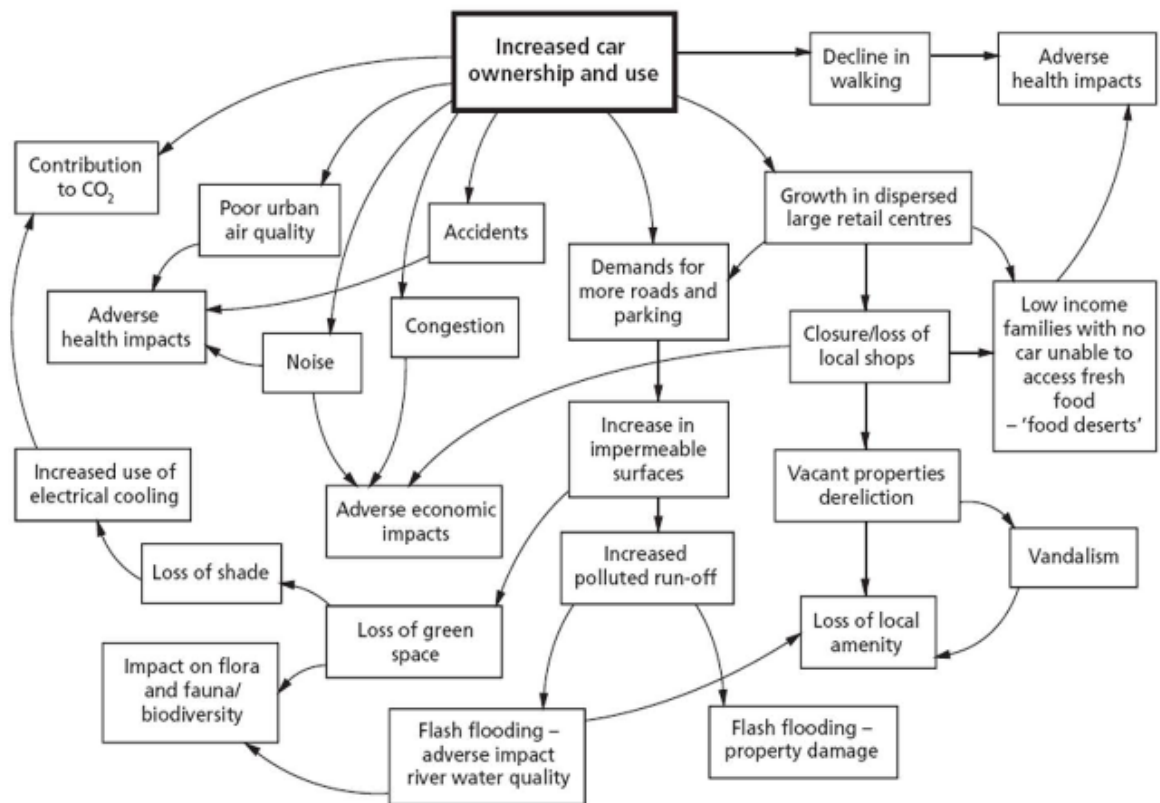
Figure 9 – Implications of Increased Car Ownership & Use (RCEP, 2007: 2)

The car has transformed social life, our environment, and society over the past century in many significant ways (Büscher, 2006; Cahill, 2010a). People spend ever-increasing periods of their lives travelling in cars, and for more and more individuals automobile travel is essential for all their needs (Larsen, Urry, & Axhausen, 2006). Cars have become places we inhabit without necessarily being places specifically designed to be habitable. The diverse social activities that occur during ordinary journeys are, to a monetary way of thinking, of little or no value but research has shown that the time spent in cars is of value in other significant ways (Laurier et al., 2008). It is argued; there are all manner of social phenomena occurring during an automobile journey that are worthy of the attention of those interested in how mobile life happens while in motion (Urry, 2000; Laurier et al., 2008). Given the particularities of cars as small scale architectural spaces "they offer occasions which disrupt and demand the re-assembly of whatever the social relations and the politics of the office and the house are" (Laurier et al., 2008: 26). It is claimed that the automobile is the ultimate expression of consumption to satisfy the need for identity,

autonomy, and individuality and this has become synonymous with the notion of freedom (Gartman, 2004: 193).

For significant numbers of people social life is formed and reformed through recurrent meetings created through physical travel (Urry, 2003). A notable share of people's mobility is by choice rather than necessity, although the distinction between choice and necessity is not always clear (Handy, Weston, & Mokhtarian, 2005). In rich world societies social life is premised on the assumption of mobility; to meet people, to go to/from work, to shop, and to go on leisure and activity breaks (Cahill, 2010a). What is the role technology plays in this new mobile society? The connections between society, technology, and mobility needs to be examined through an understanding of the social implications of the way people adopt and appropriate new technologies, and the social and environmental implications of transport policy and individual travel choices. The environmental and social consequences of travel has real significance for existing ways of life, and technology needs to be applied prudently and intelligently if it is to be used in a constructive manner in weaning people away from the current car-dependent, fossil fuel-addicted, trajectory.

New ICT are openly transforming transportation systems and services, and increasing the mobility patterns of many citizens globally. Numerous challenges in the area of transport and mobility are well established for policy-makers including the need to deal with traffic congestion and pollution, to improve the safety and security of transportation systems, to reduce environmental damage caused by emissions, and to improve an ageing transportation infrastructure (European Commission, 2003). The answer to these issues does not lie simply in creating more roads; existing infrastructure needs to be used more effectively and multi-modal transport options have to be addressed and developed in a sustainable manner.

Mobile telecommunications also facilitate the increased mobility of many people worldwide, and in particular workers (Felstead, Jewson, & Walters, 2005). James (2004a: 204) maintained that mobility represents one of the "crucial affordances of mobile telephones". Electronic media, it is argued, is removing countless social structures, and creating a new social universe with no possibility of withdrawing from the world (Gunther, 2004). People are no longer simply living at a location; they are living in a global communications system. For many, however, they remain fixed locally so their global connectivity appears somewhat superficial.

On the other hand, the ubiquitous use of ICT provides the potential to transform everyday time and space. Research on the construction of everyday space, place, and movement demonstrate that changing geographical/spatial practices affect social regulation and subjective experience of time (Green, 2002: 281). This linkage between space and time has been made in the past with changes in space provoking change in time, and vice versa (Giddens, 1990; Adam, 1994). Time space discussions have been given much attention by Giddens in debates on his structuration theory where he discussed globalisation as a consequence of modernity (Giddens, 1990). He argued:

> In a general way, the concept of globalisation is best understood as expressing fundamental aspects of time-space distanciation. Globalisation concerns the intersection of presence and absence, the interlacing of social events and relations at distance with local contextualities (Giddens, 1991: 21).

David Harvey used the term 'time-space compression' - in his book *The Condition of Postmodernity* (1989) - which he referred to as processes that revolutionised the objective qualities of space and time. Time-space compression often refers to technologies that appeared to accelerate or ignore spatial and temporal distances, including technologies of communication such as the internet and mobile phones, travel using rail, cars, trains, or airplanes, and economics. The latter referred to the need to overcome spatial barriers, open up new markets, speed up production cycles, and reduce the turn-over time of capital.

Recent contributions to the social sciences proposes a new mobilities paradigm in social research (Urry, 2000; Cresswell, 2006; Sheller & Urry, 2006b), with contributions to forming and stabilising this new paradigm coming from anthropology, cultural studies, geography, migration studies, science and technology, tourism and transport, and sociology (Sheller & Urry, 2006b). The social sciences had largely overlooked the importance of mobilities and the movement of people and the introduction of the mobilities challenges the way in which such travel is viewed. For instance, sociology's view of urban life often failed to consider the overwhelming impact of the automobile in transforming the time and space of the modern urban dweller (Sheller & Urry, 2000). But the automobile impacts not only on public space and opportunities for coming together but also on the formation of social networks, spatially segregated urban neighbourhoods, national image and aspiration, and global relations (Sheller, 2004). Mobilities incorporates new ways of theorising this and other mobilities and how this lies "at the center of constellations of power, the creation of identities and the micro-geographies of everyday life" (Cresswell, 2010a: 551).

It has been suggested that places, or locations, are partly consumed and these places are increasingly being restructured as centres for consumption, providing the context within which goods and services are compared, evaluated, purchased, and used (Urry, 1995). The distances travelled between places are likewise consumed. This 'consumption of distance' forms an integral part of everyday life (Heisserer, 2013; Heisserer & Rau, forthcoming). Simultaneously, the internet has grown at an extraordinary rate over the past number of decades, with significant impacts on the social world (Comer, 2007). New forms of imaginative virtual travel have emerged and been combined with physical travel. Mobile technologies, in particular, appear to involve new ways of communicating on the move and the growth of such technologies is allowing new structures of coordination and meetings to surface (Büscher, 2006).

More recently, the concept of sustainable travel has emerged which focuses on individual behaviour and sensible choices rather than on the provision of physical infrastructure or improved transport networks and systems. It ostensibly involves attempts to encourage people to make informed choices about the way they travel and reflect on the consequences of those choices on their health and the environment. The term 'sustainable transport' came into use as a rational follow-on from sustainable development and it is used to describe specific modes of transport, and systems of transport planning, which are consistent with wider concerns of sustainability in society. Many developed and developing countries are confronting difficult issues in selecting and planning for their future transportation systems when there is a need to balance accessibility, mobility, protection of human safety and environment, as well as economic growth and social equity (Rassafi & Vaziri, 2005). The concept of sustainable transportation imply movement of people and goods in ways that are environmentally, socially, and economically sustainable (OECD, 1996).

Some of the negative environmental and economic impacts of transport can be reduced with good design of transport policies, which requires strong political leadership and the ability to recognise the holistic nature of the issues involved. In addition, some positive transformation can be achieved from the use of in-reach technologies. One element of this is the role ICT can play in bringing about a vision for convenient, joined up, multimodal sustainable mobility representativeness. There are many ways in which these technologies have been proposed to make mobility more sustainable from suppressing or eliminating travel to driverless, automated, personal rapid transit systems.

In the report *Smarter Moves*, Kay, Green, and Dibb (2010) outline ways that technology could be used to promote sustainable transportation options. These are grouped into six main areas of concern; reduce the demand for travel, influence travel mode choice, change driver behaviour, change vehicle behaviour, increase vehicle loading factor, and improve the efficiency of the transport network. Although the use of technology can be seen as a large and diverse subject, and covers a much broader focus than improving the sustainability of transport, the industry itself has made some bold prediction claiming it could reduce global transport emissions by as much as 15 per cent by 2020 (RITA, 2011). Some large projects have been running for many years focusing on improving vehicle and driver experience and performance, safety, reducing traffic congestion, and making public transport and cycling more attractive to users. However, there may be a danger that such projects are impulsive and as a result of strong technological optimism evident from some quarters.
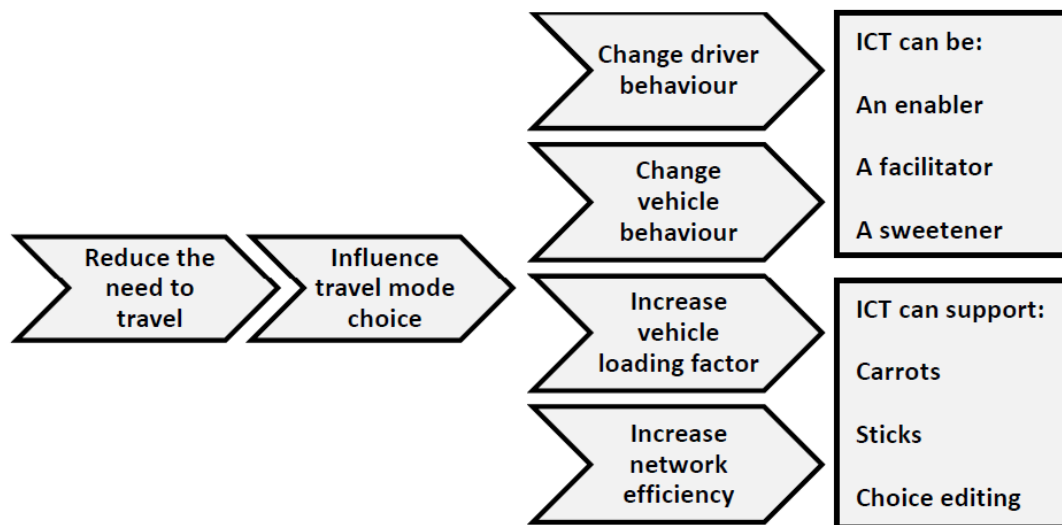
Figure 10 – Technologies for Sustainable Transport (Kay, Green, & Dibb, 2010: 12)

ICT has the potential to support a broad array of ways to make mobility and lifestyles more sustainable. In the context of this particular body of work, enabling home working allows individuals avoid the often unnecessary travel associated with the daily commute to and from work. The convergence of communications and broadcast technologies in the latter part of the twenty century, accelerated by increased processing power and affordability, has led to the emergence of a wide range of new possibilities for carrying out activities virtually,

without the need for physical travel. Technology is now available for individuals to be 'virtually' mobile, to be there but not physically present.

Virtual Mobility: *there but not actually present!*

In the modern world people are frequently expected to have the means to be *present* almost anywhere, to be available to engage in almost anything, and to be able to communicate effectively with anyone using ICT. Ellegård and Vilhelmson (2004) maintain; individuals can use fast means of transportation to reach distance activities and use ICT in their home to obtain information about distant activities and places. They can, likewise, *be present* at events by listening to the radio or watching on television. People can now interact with others regardless of location. This has led to suggestions of the death of geography, the vision of postmodern global nomads, or a new 'frictionless' society (Bates, 1996; Bauman, 2000; Castells, 2000; Lytras & Naeve, 2007). Putnam (2000) however suggested the existence of another networked society with people socially isolated in their homes on front of computer screens, television sets, and video games[36]. Indeed, many people still spend most of their time tied to specific places - their homes and local communities – with limited time spent in physical travel or on the move (Kenyon, Lyons, & Rafferty, 2002; Ellegård & Vilhelmson, 2004).

Virtual Mobility (VM) is frequently referred to in the literature in the context of education where students and teacher, through the use of ICT, experience worldwide exchange of knowledge and expertise whilst remaining at home (Damme, 2001; Bijnens, Boussemaere, Rajagopal, Op de Beeck, & Van Petegem, 2006; Poulová, Černá, & Svobodová, 2009). More recently, it refers to such issues as social exclusion (Kenyon, Rafferty, & Lyons, 2003; Kenyon, 2006) and work-related travel (Lassen, Laugen, & Næss, 2006). New virtual activities can now be performed at home and in the workplace, or elsewhere, and these are transforming people's daily lives while displacing other activities and space. VM allows people obtain the same benefits as one would have with physical mobility but without the need to travel. It is about using technology as the means of *getting to* activities that would previously have required transport, or would have been unrealistic to travel to in the past. It is about transcending, to some degree, the barriers and obstacles put in place by time and space to accomplish a task or take part in activity heretofore deemed impossible or impractical due to distance.

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[36] Putnam's argument is akin to the Marxist concept of alienation.

For a better understanding of VM an awareness of three broad and interrelated categories of personal scalability and accessibility in time and space is needed (Castells, 2000; Adams, 2005). Vilhelmson and Thulin (2008) described these three types of human spatial behaviour as; the physical, the virtual, and media-related worlds. Physical mobility is commonly understood as the interaction between individuals made possible by transportation modes such as the car, train, bus, bicycle, or by foot. VM is the two-way interpersonal interaction made possible by available ICT such as the computer, the internet, and mobile phones. The third - media-related communication - relates to one-way mass communication such as the radio or television. Although these latter two forms of communication somewhat satisfy different needs and obligations they also share basic features:

> …they all make the home more permeable to contact at a distance by enabling individuals to access information, participate in activities, and interact with people in other place. They depend on various space-transcending technologies that speed up human interaction, reduce the friction of distance, and defy the need for geographic proximity in planning and co-ordinating daily activities (Vilhelmson & Thulin, 2008: 604).

These different types of mobility and communication are not alternatives to each other in terms of type of contact, nor do they satisfy the same needs and responsibilities. The relationships are multifaceted and depend on particular situations and reasons for contact. The relationships between the physical, virtual, and media-related worlds increasingly compete when it comes to people's everyday use of time, not least with regards to allocating time to discretionary activities at home and outside the home.

It is now possible to *be there* without being *actually physically present* through technology use. As ICT develops and becomes more widely accepted and established the emergence of 'post-modern' professionals who shape, and are shaped by, new work and social practices emerges (Kakihara & Sørensen, 2002). In this new virtually mobile world, what are the significant issues individuals must content with at work and indeed socially? Will ICT facilitate the elimination of the need for physical travel in the near future and what are the specific needs for individuals to remain connected? For us to remain uniquely human and socially linked is technology all that matters? In the next sub-section a number of key concepts linked to the issue of VM are discussed. For teleworkers their home working days are spent at a distance from their colleagues and customers and frequently isolated from the physical world of conventional work. The concepts of corporeal travel, co-presence, and proximity are critical issues for individuals working from home and who are often mobile only in a virtual sense, thus is of significance to this research.

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Corporeal Travel, Co-Presence & Proximity

In *Mobility and Proximity*, John Urry (2002) set's about exploring the question; why do people continue to physically travel given the many forms of existing and evolving available communication media? He suggests that the explanations for the various forms of travel are centrally located within a reconstituted sociology that takes mobility as its principal concern (Urry, 2000; Sheller & Urry, 2006b). Mobilities explore the movement of people, ideas, and things, as well as broader social implications of those movements for society in general. This mobility turn began in the 1990s in response to the increasing realisation of the historic and contemporary importance of movement for individuals and society. It was driven by increased global levels of travel and new forms of mobility. Whilst mobilities look at movement and the forces that drive, constrain, and are produced by those movements, Urry (2000: 49) maintains we must examine the intersection between the different mobilities such as the physical and virtual rather than treating them each as autonomous.

Travel occurs for many different reasons but one unifying component is defined by the term *corporeal* travel. Corporeal travel defines that:

> Travel is embodied and that as a result people are bodily in the same space as various others, including workmates, business colleagues, friends, partner or family, or they bodily encounter some particular landscape or townscape, or a physically present at a particular live event (Urry, 2002: 258).

Thus, travel results from the need for irregular moments towards physical proximity to particular people, places, or events. This requirement for proximity is felt to be obligatory, appropriate, or often desirable for the individuals involved. In contrast to other forms of travel, corporeal travel enables the person to have encounters which are qualified by the sensual experience of proximity (Gerharz, 2011). Face-to-face contact, facing the place, and facing the moment is what characterises proximate encounters (Urry, 2002: 262). In this way proximity can only be achieved by means of corporeal travel. As close proximity interactions are fundamental to social interconnectivity virtual mobility, it is argued, will not significantly replace physical travel to any large extent anytime soon (Boden & Molotch, 1994).

The circumstance that allows for mutual contact and interaction is expressed as *co-presence*. The term originated in the work of Goffman (1966) who maintained that co-presence existed when people sensed they were able to perceive others, and others were

able to perceive them[37]. Co-presence is primarily a social relationship where people are not only in each other's close proximity but are also reciprocally oriented towards each other, mutually available and accessible to each other, tuned into and in touch with each other (Zhao & Elesh, 2008: 570-571). It is frequently the face-to-face situations people find themselves in with various social gatherings or meetings, furthermore; "co-presence renders persons uniquely accessible, available, and subject to one another" (Goffman, 1966: 22). Ciolek (1982) noted the importance of attention or responsiveness to others in this depiction of co-presence. A definition asserts:

> Co-presence refers to the temporal, virtual, and/or physical co-presence of speaking and listening participants; it addresses concerns with being with others at the same time and place, and being able to give and receive immediate feedback in conversations (Bregman & Haythornthwaite, 2003: 126).

Urry (2002: 259) argues that co-presence affords access to the eyes and eye-contact enables the establishment of intimacy and trust, as well as insincerity and fear, power, and control. Simmel considered the eye as a unique 'sociological achievement' since looking at another individual is what affects the connections and interactions for people (Frisby & Featherstone, 1997: 111). Eye-contact is described as signifying "a wholly new and unique union between two people" and it "represents the most perfect reciprocity in the entire field of human relationship" (Simmel, 1921: 358). During social contact people look each other in the eye repeatedly but for short periods, and without eye-contact people feel that they are not fully in communication.   Argyle and Dean (1965) developed a theoretical framework termed the 'affiliative-conflict' model which they proposed would assist in the identification of the functions of non-verbal behaviour, and in particular eye-contact. They suggested that eye-contact is chiefly used to control the level of intimacy of interactions. Intimacy can be viewed as a joint function of such behaviour as eye-contact, physical proximity, the amount of smiling, and the topic of conversation (Knight, Langmeyer, & Lundgren, 1973: 390). Knight, Langmeyer, and Lundgren (1973) maintained that for any two people the equilibrium for intimacy develops, and deviations from this equilibrium in any one non-verbal channel will produce compensatory changes in other channels.

Zhao and Elesh (2008) make a distinction between co-location, a spatial relationship between individuals, and co-presence, a social relationship. In physical co-location

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[37] Co-presence, in this instance and in line with the Sheller and Urry (2006a) arguments, is meant as a more neutral description of encounters in the physical world, without any implicit assumptions about the ontological difference between the real, the imaginary, the virtual, and the simulated.

individuals are within range of each other's sensory perceptions and can see, hear, and even touch each other without physically re-positioning themselves (Goffman, 1966). However, being within range is not the same as being available to each other so while co-location places people at close proximity co-presence renders people mutually accessible. Social contact, defined as activities of socialising and friendship, "takes place in the realm of co-presence, which is affected by the regionality of space and the power relations that underlie personal affinity and social engagement" (Zhao & Elesh, 2008: 566). The implications of co-presence remain largely under-theorised, Zhao and Elesh (2008) argue, but the emergence of the internet alone cannot bring about the type of ubiquitous connectivity some may have hoped for.

Co-presence is located within time and space since participant's travel somewhere to get together and each commit themselves to remain there for the duration of the interaction. It affords opportunities to show and receive attention, and trust is built over time through conversations, body movement, eye-contact, and other non-verbal means of communication. Misunderstandings can also be detected and rectified. Some sociological arguments have been made for new temporal formations through the use of ICT and the logic of these would suggest a reconfiguration of space and time is taking place (Giddens, 1990; Castells, 1996; Nowotny & Plaice, 1996; Castells, 2000). Certainly changes are occurring with mobile and flexible working arrangements, changes in distances travelled, and the duration and cycle of activities are being constantly altered by mobile and other communication devices. Green (2002: 290) observes; "while the speed of modern urban life and potential fragmentation in social relationships by temporal changes can certainly be noted, mobile technologies also introduce opportunities for new continuities across space and time, previously disjoined through centralisation". New communities are being formed in highly contradictory ways which reflect new coming together – and also new departures - for many people and groups. Thus, social life appears "to involve variously organized 'tight social worlds', of rich, thick co-presence, where trust is an on-going accomplishment and which sometimes permits disembedded relations to straddle the globe" (Urry, 2002: 261).

What roles does (or can) technology play in co-presence? The effectiveness of electronic networks, it is argued, depend on an underlying network of previous social relationships based on face-to-face relationships or co-presence (Nohria & Eccles, 1992). Trust succeeds with face-to-face communication, and groupware technologies turn out to be not fully appropriate when the prerequisite for action is the establishment of trust (Rocco, 1998). An action demonstrates trust if it increases a person's vulnerability to another person

whose behaviour is not under control (Zand, 1972) and there is evidence that people who engage in such trust activities are reluctant to use computer-based ICT due to an absences of face-to-face contact (Olson & Teasley, 1996). There is also evidence that computer-media communication decision-making groups are rarely, if ever, more effective than face-to-face groups (Baltes, Dickson, Sherman, Bauer, & LaGanke, 2002). Online interactions represent a complex blend of human actors and technological systems and it is clear that humans have consciousness and agency, but the same cannot be said of a technological system in and of itself. Technological artefacts have not yet been produced in substance and structure that warrant the attribution of consciousness or agency therefore; "people trust people, not technology" (Friedman, Khan Jr, & Howe, 2000: 36). The task, therefore, should be how to design and use ICT astutely to enhance personal, working, and social lives, and support relationships rather than replace the need for co-presence.

Evidence suggests that the absence of adequate transport is linked to the experience of social exclusion (Kenyon, Lyons, & Rafferty, 2002; Kenyon, Rafferty, & Lyons, 2003; Gray, Shaw, & Farrington, 2006; Kenyon, 2006; Preston & Rajé, 2007). The use of mobile telecommunications and internet-based technologies can complement physical mobility and assist non-mobile means of access to opportunities, social networks, goods and services (Kenyon, Rafferty, & Lyons, 2003). A lack of access to information regarding employment opportunities is a significant barrier to social inclusion, for instance. Access to information online can support the search for work as jobs and employment positions are posted online. In addition, applications forms can be downloaded speedily and individuals can apply for work by e-mail without the need to physically travel to a dedicated location. People can also post their curriculum vitae on dedicated websites which, in turn, can be viewed by numerous employers with access to the internet. VM affords access which clearly has the potential for enriching lives by providing lifestyle and employment options that were once beyond the reach of some individuals. Priya and Uteng (2009), however, maintain that the potential of VM for certain groups like the elderly, uneducated, and low-income populations is still very limited.

Chapter Summary

Individuals typically have a deep-seated desire to accomplish things and to be productive and thus work plays a pivotal role in many people's daily life. At the same time, work arrangements and practices always have environmental impacts and consequences. This chapter was divided into two parts; the first focused on the (changing) nature of work

and trust. Trust is a key constituent of society, work, technology use, and Virtual Mobility (VM), and is deserving of particular attention at the heart of this chapter. The chapter began with a brief look at the nature and development of organised work and how this has contributed to existing working arrangements. Organisational change and how ICT is contributing to, and facilitating, new working arrangements and innovative forms of organisation was also explored. The second part of the chapter began with a sociological examination of mobilities, technology, and the (un)sustainable consumption of distance. Of overarching importance throughout this research, the concept of mobilities and issues such as proximity, corporeal travel and co-presence were investigated and discussed in some detail in the latter part of the chapter. This chapter lays the foundation for a comprehensive exploration of telework dealing with significant topics of debate with regards to work, society, and technology interactions. It effectively sets the scene for determining current work arrangements and environments, and the realities of modern employment including telework. An extensive investigation of telework thus follows in Chapter Four, exploring this method of work in the context of the three pillars of sustainability (economic, social, and environmental).

Chapter 4 – Telework

In many western developed societies over the last number of decades there is a requirement for a new type of work, one that depends more on intellectual processing of information than on the physical labour of the past. Much of the traditional manufacturing and labour intensive work has shifted to developing countries such as India and Bangladesh (Blinder, 2006). Knowledge workers (*cf*. Kling & Scacchi, 1982; Drucker, 2000), in general, do not require access to industrial equipment or raw materials to carry out their tasks, but they do need access to the continuous flow of data to create information. Once these workers have ready access to data, and the necessary technology infrastructure and competencies, they are not tied to a physical worksite or location in accomplishing their tasks. This chapter critically examines the origins of telework before investigating key impacts and conventions associated with this work method. The consequences of telework for the individual, in addition to organisational impacts and the potential benefits and drawbacks for society and the economy, receive particular attention. The effects of telework on the environment are also examined in some detail.   An important feature of this chapter is a thorough evaluation of the benefits and limitations of telework from the perspective of the three pillars on sustainability. This will provide a better understanding of the practice and the practical day-to-day experience of this form of contemporary working from the perspective of practitioners, employers, society, as well as its environmental consequences.

Telework occurs whenever ICT enables work to be accomplished at a geographical distance from the location where the work results are needed, or where it would traditionally have been performed in the past. It is most often associated with homeworking, but telework also includes other arrangements such as satellite offices, telework centres, or mobile telework[38]. The practice of telework has been heralded as a cure for a variety of organisational and social problems. It has been suggested as a strategy to help organisations reduce their infrastructural and on-going utilities costs (Egan, 1997; Van Horn & Storen, 2000), as a way of responding to employees' need for a more enhanced work-life balance (Shamir & Salomon, 1985; Hilbrecht, Shaw, Johnson, & Andrey, 2008) or as a tool for greater inclusion of people with various disabilities who have been previously excluded from the workplace (Hesse, 1995; Anderson, Bricout, & West, 2001).

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[38] For the purpose of this research we will concentrate on telework as the means to allow an individual work from home for part or all of the week.

Telework has also been proposed as a means of reducing air and noise pollution, and traffic congestion in urban areas (Irwin, 2004; Dwelly & Lake, 2008) and efforts to oppose climate change should accelerate this trend towards flexible distributed organisations (WWF, 2009). However, telecommunication technologies used for telework do not in themselves invariably lead to overall travel suppression (Mokhtarian, 1990, 1991, 2003) and there are additional environmental consequences from the need to change or update technological equipment, infrastructure, living space, and other such lifestyle adjustments (Arnfalk, 2002). So, can telework be used to reduce the need for travel and its associated negative environmental impacts, what issues are significant to consider and, how can the adoption and implementation of telework be more socially accepted and environmentally affirmative?

Although it has been many years since Nilles (1975) first coined the term 'telecommuting', the concept still remains problematic today. This is due to (over)attention to the remote location of workers rather than the important organisational dynamics made possible by advanced technology, and the networking aspects of commuter-mediated work (Quortrup, 1998). The United States Government telework website states:

> The terms 'telework', 'telecommuting', 'flexible workplace', 'remote work', 'virtual work', and 'mobile work' are all used to refer to work done outside of the traditional on-site work environment. These terms are defined in different ways and used in different contexts to refer to anything from jobs that are completely virtual or mobile, to arrangements that enable employees to work from home a few days per week or per month (Telework, 2010).

From an Irish perspective, telework is often referred to as e-Work:

> e-Working (also known as teleworking, home working, mobile working and telecommuting) is defined as any business function that is conducted away from the office using modern communications and information technologies (E-Working Ireland, 2008).

Given that it is a way of working utilising technology to allow tasks be carried out independent of location or worksite, it is essential to view telework as the *method of working* and not the job or task performed. In addition, this research focuses on telework as the means to allow individuals work from home as opposed to the various other definitions of the term.

Growth projections for telework are based mainly on past surveys and work analyses which suggest that between 25 and 65 per cent of jobs in America and Europe are at least

partly telecommutable (Weijers, Meijer, & Spoelman, 1992; Gareis & Kordey, 2000; Pratt, 2000). Some research suggests telework and other forms of distributed collaboration are on the increase (Andriessen & Vartiainen, 2006b; Brodt & Verburg, 2007). Others argue that telework has stagnated and remains a marginal phenomenon (Brynin, 2004; Bergum, 2006). However, it is clear that telework has failed to live up to its initial promise and early predictions (see Huws, 1991: for an overview). Although the statistics tend to suggest telework has increased "the reality remains far removed from the early forecasts in the late 1970s and early 1980s" (Pyöriä, 2011: 2). The actual extent of teleworking "may be much less than often imagined" (White *et al.*, 2010: 142) and telework as a concept may have even experienced a demise in interest over the recent past (Bergum, 2007).

Work, over the coming years, is expected to become subject to even greater transformation than in the past, with individual careers changing and being re-engineered more frequently than ever before. In addition, lifelong learning will become the norm as people live longer and continue to be active well into their careers and after. This concept has become topical in recent times (Irish DoETI, 2002). New ways of working and learning are challenging the conventional ways of how we once thought of work and new organisation and business models are emerging requiring new kinds of effort and skills, often carried out remotely. The employment opportunities for people with relevant skills in remote areas are growing and increasingly individuals can choose where and when to work within a global framework where time and space are less relevant. An increasing number of people also aspire to sustainable self-employment and telework is playing a significant role in all these new working environments (Bailey & Kurland, 2002; Mason, 2008). Technology facilitates the creation of new kinds of businesses and Friebe and Lobo (2006) claim more and more people are getting bored by office politics and an oversaturated employment market leading to self-employment and the emergence of the 'digital Boheme'[39].

This chapter sets about comprehensively exploring the available literature on telework to determine its strengths and weaknesses as a form of working in the contemporary age. The structure of the investigation comprises of an inquiry into four main sub-themes; telework's effects for the individual, its impacts on the organisation, social and economic effects and, environmental considerations. The discussion section pulls together the main arguments and considerations involved. Telework offers increased flexibility and autonomy to individual workers but there is also debate as to the impacts for these workers,

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[39] Successful 'Digital Bohemians', it is maintained, set up online business cheaply and trade right away. They work from coffee shops without the intention of ever building a larger company. People works on their own and only builds ad-hoc teams as needed for larger projects.

their families, society, and the environment. Nevertheless, home-based working "seems to be offering policy-makers a win-win for both the economy and the environment" (Dwelly & Lake, 2008: 10). It is this potential, in terms of the economic and environmental benefits, that makes telework an ideal instrument to seek a better understanding of any EM thinking in policy design. It is important, therefore, to get a clear understanding of the effects and impact of telework on the individual, the organisation, society, and the environment. We begin with a comprehensive environmental reflection on the practice of telework.

Environmental Considerations

Telework has frequently been suggested as a way of offering environmental protection benefits by reducing, or eliminating, the commute to work leading to less fuel consumption and less emissions, fewer traffic congestion problems and, savings in energy use in urban office spaces and buildings (Verbeke, Schulz, Greidanus, & Hambley, 2008; Nidumolu, Prahalad, & Rangaswami, 2009). But our understanding of the environmental implications of telework is limited as most research to-date has tended to concentrate on the implementation, adoption, and growth of telework programmes (Bailey & Kurland, 2002; Kitou & Horvath, 2003). Conventional wisdom suggests that telework will reduce traffic congestion, CO^2 emissions, alongside providing other non-transport environmental benefits. Although these benefits are, to a certain extent, achievable with the correct understanding and strategies, interactions between telework and travel continues to remain poorly understood (Glaister, 2008).

The potential for telework to replace some physical travel continues to be debated in the literature. Early research identified the relationship between telecommunications and travel substitution (Salomon, 1986; Mokhtarian, 1990) but these studies "tended to be conceptual, suggestive, and speculative without empirical analysis" (Choo & Mokhtarian, 2007: 5). As ICT increased in power, portability, and usability - together with a reduction in costs - the collective ability of telework to significantly replace travel should have become more noticeable. However, little evidence of this exists. In Ireland, the total mileage by private cars increased by 38 per cent over the period 2000 to 2008, with total mileage by petrol cars increasing by 22 per cent and diesel cars by 106 per cent (SEI, 2009). Some studies did demonstrate the substitution impact of telecommunications (Nilles, 1988; Mokhtarian, Handy, & Salomon, 1995). However, it has been strongly argued that these studies were short-term and small-scale and underestimate complementary effects by failing to consider the more indirect and longer-term relationships, such as an increase in induced

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travel demand and the relocation of residential homes (Mokhtarian & Meenakshisundaram, 1999; Mokhtarian, 2003). Complementarity, also referred to as stimulation or generation, is the use of one mode to increase the use of another mode. In particular, Mokhtarian and Meenakshisundaram (1999) indicated that stimulation of demand for telecommunications leads directly and indirectly to the generation of more travel. The challenge, therefore, will be to "identify the substitutionary applications/services and to promote them without promoting the complementary ones" (Mokhtarian & Meenakshisundaram, 1999: 17).

There is evidence indicating that while the daily commute may be avoided teleworkers make additional journeys during their working day (Fuchs, 2008). Choo, Mokhtarian, and Salomon (2002) indicated that there are potential consequential impacts on travel behaviour from telework; increasing travel by generating new trips. The possible impacts of telework on individual's travel behaviour include; changes in frequency, time of day or day of the week, destination or length of journey, mode, trip chaining patterns, person(s) making the trip, and vehicle ownership (Mokhtarian, 1991). There a number of reasons why the emissions saved by working from home could be partly offset by new emissions, whether through additional miles driven or other energy use. In terms of mileage, Banister, Newson, and Ledbury (2007) documented three rebound effects that were repeatedly identified in the extensive literature on telework:

1. People who avoid the daily commute by telecommuting may nevertheless make additional car journeys for other purposes
2. People who telecommute may free up a family vehicle enabling other household members to make additional journeys that could not otherwise have been made
3. People who telecommute and are freed from having to travel every day, may choose to live further away from their main place of work, so that when they do make journeys into work their mileage will be higher (Banister, Newson, & Ledbury, 2007: 26-27).

Other evidence indicates a net reduction in travel is likely (Kay, Green, & Dibb, 2010). BT teleworkers, despite making additional trips they may not have made during a normal working day, still managed to reduce their weekly car commute distance by 140 kilometres and rail commute by 124 kilometres (Hills, Hopkinson, & James, 2002). This afforded them an annual financial saving of £1,000 or more. Reductions in travel time, travel costs, and energy was also found in studies in the US (Nidumolu, Prahalad, & Rangaswami, 2009). (Lister & Harnish, 2008) reviewed data from the US Environmental protection Agency (EPA), Department of Transportation, General Services Administration (GSA), and seven other sources and found that if 33 million Americans worked from home, Gulf oil exports

could be reduced by 24 to 48 per cent, greenhouse gases by up to 67 million metric tons per year, and as much as 7.5 trillion gallons of fuel each year, for a total of 100 million dollars in savings a day. Notwithstanding this, whilst there are some encouraging results of positive impacts the degree of benefits tends to vary and additional research and analysis of existing data in this area is required. This is also likely to alter significantly as the professions and business sectors currently adopting telework expands over time.

The SUSTEL UK case studies (Hopkinson & James, 2003) found a decrease in commuting distance of 61 miles a week, on average, for those choosing to telework. Reductions in mileage were also found in research conducted in Denmark (Møller-Jensen, Jensen-Butler, Madsen, Millard, & Schmidt, 2008). Finish research (Helminen & Ristimäki, 2007) claimed home-based telework reduced the total amount of commuting kilometres by 0.7 per cent. Choo, Mokhtarian, and Salomon (2005) found a trip reduction effect of the same magnitude in the United States. For individuals, working fulltime from their home their commuting can fall to zero and may even allow a household to move from a two-car to a one-car or no-car home, with the resultant motoring cost saving and positive consequence of reduced emissions and pollution. There is evidence for a reduction in total distance rather than in total journeys as days worked at home increased beyond two per week (White *et al.*, 2010). Helminen and Ristimäki (2007: 341) suggest that although the potential is evident "the impact of telework on commuting frequency is still marginal".

A cautionary note should also be made on the effects of latent demand. This is an increase in traffic resulting from motorists taking advantage of improved conditions due to some demand substituting activity or capacity enhancement and consequentially, "the positive impacts of telecommuting on delay might be slightly diminished by the increasing demand for travel" (Schintler, 2001: 6). A possible 'rebound effect' may also be evident here. Individual teleworkers quite rightly assume that the lack of commuting is contributing to reducing their overall carbon footprint. However, they may reason that they now have existing scope to make additional trips they ordinarily would not take. In addition, while early studies indicated telework permitted additional trips to be generated by other household members (Gillespie, Richardson, & Cornford, 1995; Lyons, Hickford, & Smith, 1997), more recent evidence suggests that this is not the case (Verbeke *et al.*, 2008).

A teleworker may require additional heat and energy at home if their house would otherwise have been unoccupied when they were at work. Many family homes still have occupants whilst one or more adults go out to work so the difference may not be noticeable

with regards to such consumption. But the environmental consequences of telework on consumption behaviour and waste generation has not, to-date, been comprehensively accounted for. A report from the Transport Studies Unit at the University of Oxford did attempt to quantify this consumption and found that while teleworking eradicates energy used on journeys, the extra heating and lighting needed at home wipes out at least 80 per cent of the savings (Banister, Newson, & Ledbury, 2007). While energy consumption has received some consideration the extent to which home-energy use is offset by decreased workplace-energy consumption has not been determined (Hopkinson & James, 2003; Kitou & Horvath, 2003).   The *Smart2020 Report*, however, calculated that homeworking and other forms of teleworking could reduce global carbon emissions by around 0.5 per cent by 2020 (Smart2020, 2008). In the case of the US, it estimated that if the number of homeworkers rose to 30 million, this could reduce emissions by 75-100 million tonnes of carbon dioxide equivalent (James, 2008).

While energy reductions from telework in smaller countries such as Ireland may be comparatively less than for larger counties, Fu, Kelly, Clinch, and King (2012) found that working from home represents a valuable energy saving policy option. This study suggested that Ireland could make a net saving sum of at least 9.33 kW h on average per working from home day and these, they maintain, remains positive and considerable, particularly in light of manifold constraints in respect of energy, emissions, and efficiency targets introduced by Europe. However, one could question certain assumptions in their methodology in obtaining these results. Ruth (2009: 78) argues that in terms of energy savings telework is the great unknown given the present low take-up of the practice, and "any such savings goals can be achieved only if there is a minor revolution in how managers operate".

Moos, Andrey, and Johnson (2006) used an ecological-footprint approach in assessing the overall sustainability of telework and their research moved beyond single-issue studies and single-data analysis. They provided an exploratory investigation and suggested the assumed benefits of telework for society at large must be more carefully examined to "avoid promoting telework's ostensible tendency to reduce air pollution only to find that other harmful effects offset these gains" (Moos, Andrey, & Johnson, 2006: 12). The single-focused nature – primarily on transport - of many previous environmental sustainability studies of telework has led to an often simplistic consideration of complex social and environmental interactions and there is need to widen the boundaries of investigation (Hynes, 2013).

Where the practice of telework is embraced and implemented by organisations, significant savings in the amount of office space workers occupy can be made by offering hotdesk facilities to be shared between employees. Savings of 30-40 per cent of space has been predicted (Telework Association, 2009). Office energy savings is another significant contributor to environmental sustainability from the practice of teleworking and the implementation of the virtual office. While there is evidence of office real estate cost reductions associated with teleworking (Illegems & Verbeke, 2004), this may be offset by increases in home energy consumption and the provision of equipment and more space in setting up a home office. Nilles (1998) found there were not statistically significant differences between teleworkers and non-teleworkers, regarding the consumption of energy in the home. Matthews and Williams (2005) point out that the elimination of office space due to virtual offices yields energy savings that rival those from reduced commuting. They suggest that future analyses and implementation of telework should thus give greater attention to energy use in buildings and residences.

The practice of telework is reliant on the widespread availability, adoption, and development of ICT, both existing and new. However, it is now widely recognised that the production, use, and disposal of ICT's have become a serious environmental problem (Berkhout & Hertin, 2004). It is therefore apparent that the e-business/ICT revolution may have not only positive but also negative impacts on the environment (Yi & Thomas, 2007). Plepys (2002) suggests that the negative environmental effects of growing consumption of electronic hardware are most visible in the end-of-life stage[40]. During the 1990s, a number of studies looked into end-of-life management of electronic waste, in particularly computers. According to some estimates, there are 14–20 million computers scrapped yearly, around 10–15% of them reused or recycled, 15% end up in landfills and the rest are stockpiled by users (Goldberg, 1998). Waste Electrical and Electronic Equipment (WEEE) is currently considered to be one of the fastest-growing waste streams within the EU and contains a number of hazardous substances and at the same time valuable materials (EEA, 2013). However, knowledge of the final destination of a substantial part of used electrical and electronic equipment and e-waste is very limited and the inability to follow the e-waste streams is a serious problem in the enforcement of the policy prohibiting export of certain hazardous waste to non-OECD countries (EEA, 2009).

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[40] Equipment reaches its end-of-life once it becomes dysfunctional for the owner/user, becoming what many classify as waste for that particular user.

In addition to the frequently harmful consequences with disposal of electrical and electronic equipment, many dematerialisation academics in particular are also concerned by both the manufacture and use of ICT, in terms of their impact on the environment (Berkhout & Hertin, 2004; Linderhof, van der Bergh, & Verbruggen, 2009). Most ICT products consist of a large number of different components such as micro-chips, semiconductors, circuit boards, liquid crystal displays, and batteries[41]. The ecological damage caused by computer manufacture is growing across several different environmental domains, such as water use and energy (Forge, 2007; Williams, 2011), and one earlier study estimated that the production of a single personal computer generated 130 kg of GHG emissions and 30 kg of waste (Atlantic Consulting, 1998). The use of ICT is also environmentally problematic. Such equipment consumes electricity and a typical personal computer with CRT display can consume 150 W of power (Pickavet *et al.*, 2008).

Impact	Mostly Positive	Mostly Negative	Example
The Environment			
Peak traffic congestion reductions	√		reduced peak hour commuting traffic and the associated problem this brings
Decreases associated with private motor car use and the overall consumption of distance	neutral[42]		reductions in harmful emissions associated with private vehicle travel but opportunities for additional journeys
Increased domestic energy consumption		√	an increase in heating, lighting, and general energy consumption linked to working from home
Reduced work location energy consumption	√		with reduced employees on-site at the work location there is potentially reduced energy and general consumption needs
Direct environmental effects of ICT		√	the manufacture, use, and disposal of ICT is environmental problematic and such hardware has a short life span, uses considerable amounts of electricity, and incorporates material that is ecologically harmful

Table 4 - Environmental Considerations

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[41] A typical personal computer can contain between 1500 to 2000 components sourced from around the global. This can mean additional energy usage for the transportation of these items to the manufacturing base.

[42] In this instance, more research is required to determine if indeed teleworkers use their private vehicles less when working from home, or if they use it at different times of the day outside the peak hours commute. In addition, does the increased energy consumption at home offset any decreases in private vehicle emissions?

The overall position of telework in terms of environmental sustainability, it is suggested, appears positive or at worst carbon-neutral (James, 2008: 96), but much more comparative and robust research is required to make more concrete assessments. ICT seems to have broadly positive impacts, especially through structural change in the economy with increased efficiency in production and logistics. Environmentally beneficial telework programs are found to also depend mainly on commuting patterns, induced energy usage, and characteristics of the office and home space and equipment use (Kitou & Horvath, 2003). But there is some difficulty in establishing a direct link between telework and ICT use and environmental protection and such technology use does not necessarily lead to a more environmentally-sound future. They do have the undoubted potential to offer new opportunities to develop sustainable solutions. However, as in many economic development and environmental domains, the role of policy and regulation is crucial if these opportunities are to be captured and enlarged. To know where these opportunities lie and how they can be exploited, "we must improve our knowledge of the specific links between ICT and the environment, both empirically and in terms of understanding paths of causation and interaction" (Berkhout & Hertin, 2004: 916). The chapter continues with an examination and synthesis key publications in the other thematic areas of concern to sustainability, the economic and social.

Telework's Effects for the Individual

Telework has various effects and consequences for the individual worker. An understanding of these will help identify the values and motives that may support the promotion of this way of working in the future. Indeed, it is suggested that only certain individual types are suited to telework and that they have characteristics that are crucial to its successful implementation (Doherty, Andrey, & Johnson, 2000; Madsen, 2003)[43]. The type of tasks that are ideal for teleworkers tend to be individually driven, require minimal instruction and checking, do not need to be performed at set times, and produce measureable results (Gupta, Karimi, & Somers, 2000: 27). Lister and Harnish (2011) provide a good study of the characteristics of people who telework in the US[44]. It has also been argued that higher-income higher-status groups tend to benefit more from telework and lower income groups were more likely to occupy jobs still requiring physical presence at a work place, thus incurring the cost and stress of commuting (White *et al.*, 2010: 149).

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[43] Teleworkers largely are self-starters, motivated, focussed, self-reliant and highly organised, but many of these characteristics are based upon speculation and anecdotal evidence.
[44] Their report - *The State of Telecommuting in the US: How Individuals, Businesses, and Government Benefit* – is enthusiastically pro-telework.

Moreover, not all jobs and not all people have a potential for telework (Shin, El Sawy, Sheng, & Higa, 2000; Bailey & Kurland, 2002). It is reasonable, therefore, to suggest that telework is a middleclass phenomenon confined to mainly white collar workers, and excludes many traditional service sector workers.

A potential benefit of telework is the opportunity for individual workers to establish an arrangement that is very personal and conducive to a superior quality of domestic life[45]. As a result, teleworkers are often more motivated and enjoy better job satisfaction than conventional workers (Spillman & Markham, 1997; Himmelsbach, 1998; James, 2004b). The result of UK case studies - in addition to studies carried out in Denmark, Germany, Italy and the Netherlands - show over 50 per cent of respondents felt telework had "a significant positive effect on their quality of life" (James, 2004b: 27). This positive outcome can be chiefly attributed to giving employees more control and autonomy over their working hours and environment (Shamir & Salomon, 1985)[46]. Nonetheless, for many it is essential to be able to leave the home on a regular basis and enter a different social and physical sphere such as a worksite or location (Topi, 2004).

This does not necessarily mean that the motivation for adopting telework is primarily social. Hjorthol and Nossum (2008) found those who telework indicated that the most common motive for working at home was work-related, followed by family reasons, with travel suppression third as a motivating factor. The results of another study disagreed with the positive perception of an improved work/life balance and concluded that "it may be that when cloistered behind the home office door, virtual office workers have more difficulty separating themselves from work" (Hill, Miller, Weiner, & Colihan, 1998: 679). A study from Iceland suggests the combination of flexibility and internet use made it increasingly difficult for people to disengage themselves from work leading to enhanced work/family conflict and possible burnout (Heijstra & Rafnsdottir, 2010).

Illegems and Verbeke (2004: 324-325) argue that the adoption of telework can negatively affect an individual's promotional opportunities and possibilities, especially if the practice is perceived as creating a 'new class' of workers; "out of sight, and therefore out of mind". This negative effect is particularly acute if an employer uses subjective as opposed to

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[45] Being available to pick up children from school, shop outside peak hours, and take a more active role in the community are all possible with telework, allowing individuals more control over their time.
[46] This feeling of more control and autonomy may not always stand up to scrutiny. Much of the control can be say to have become embedded in the software and applications themselves, which often contains metrics for productivity monitoring.

objective performance evaluation methods. It echoed earlier findings on the issue which suggested that virtual workers often equate being out of sight with being overlooked for promotion and other organisational rewards (Kurland & Egan, 1999). This reduction in professional interaction is significant and Pruchno, Litchfield, Fried, and Wallace (2000) highlighted teleworker's belief that they had more negative relationships with their managers and co-workers which impacted on their overall work/life balance satisfaction. Teleworkers reported a significantly lower quality of work life and higher level of 'professional isolation' than their colleagues (Harrington & Santiago, 2006: 7). Higher levels of hierarchical and rational values are associated with higher levels of quality of work life and less professional isolation among teleworkers, suggesting procedures and objectives-setting add clarity and trust to the telework environments.

In many international studies, results suggest that teleworkers worked longer hours than traditional employees, often without additional payment or remuneration for these extra hours (Huws, Robinson, & Robinson, 1990; Michelson, 2000; Hill, Hawkins, Ferris, & Weitzman, 2001; Duxbury & Higgins, 2002a; Peters, Wetzels, & Tijdens, 2008). The flexibility afforded by people working from home can mean people working more than the traditional or contracted amount of work hours. Individual teleworkers need to be aware of the complex issues of compensation in order to protect themselves from possible exploitation if they choose to work in this way. Factors of compensation need to be balanced with advantages of telework such as greater autonomy, flexibility, and the opportunity to balance work and family needs and responsibilities (Mallia & Ferris, 2000).

Working alone and away from the office or worksite can be socially isolating, and a recent study suggests communications and relationships between colleagues, in addition to organisational commitment and job satisfaction, can be adversely affected (Fay & Kline, 2011). Various degrees of isolation have been recorded closed related to the frequency of telework for the individual (Golden, Veiga, & Dino, 2008). As telework intensifies, the risk of professional and social isolation also increases. Professional isolation[47] negatively impacts job performance and, contrary to expectations, reduces turnover intentions (Golden, Veiga, & Dino, 2008)[48]. However, some of these negative impacts may be offset by lower levels of work/family conflict and better job satisfaction (Fonner & Roloff, 2010).

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[47] It has been argued that a sense of professional isolation is more acute for private sector employees than those in the public sector (Cooper & Kurland, 2002).
[48] Moreover, professional isolation's impact on these work outcomes is increased by the amount of time spent teleworking, whereas more face-to-face interactions and access to communication-enhancing technology tend to decrease its impact.

Some workers report dissatisfaction with telework due to the lack of social integration with their colleagues (Illegems & Verbeke, 2004). Salomon and Salomon (1984) stressed the possible loss of social interaction in the workplace due to individuals working from home. The workplace, they maintained, was an obvious place for people to interact socially[49]. Gainey, Kelley, and Hill (1999) maintained that the advantages attributed to telework could lure management and decision-makers to quickly accept this alternative way of working without adequately considering the long-term implications of isolating workers from the traditional workplace. Extending telework creates an 'autistic society' in which people are detached from each other and suffer communication problems due to extreme isolation from human contact and anxiety for the surrounding physical environment to remain unchanged (Peiperl & Baruch, 1997).

Telework is a viable and realistic option in the event of a company's relocation, and there is some evidence the practice has been adopted effectively in these circumstances (James, 2004b). This may be required in order for a company to retain some of its most cherished employees in the face of having to relocate to cheaper or better office space or accommodation. This is especially true with tasks and jobs where there is a lack of well-trained staff with valuable knowledge and experience[50]. Where an organisation, or indeed employee, relocates, telework provides a realistic alternative to redeployment or indeed redundancy. The individual worker can continue to operate remotely and avoid the frequently traumatic upheaval of moving home or travelling greater distances to pursue employment or promotional opportunities.

For others, telework facilitates a greater personal choice regarding where to live, in the absence of the commute to a set work location (Nilles, 1996). The result of research on residential relocation and preference found teleworkers were not more likely to relocate than regular workers, but residential preference showed a positive association with (sub)urban settings (Ettema, 2010). This research appears to support earlier finding that telework has led to further decentralisation and expansion of major urban centres (Shen, 2000; Safirova, 2002). Mokhtarian, Collantes, and Gertz (2004) maintain that telework is relatively low cost whereas moving to a distant location is an expensive decision usually involving a number of bigger consequences than teleworking. A Californian study indicated that workers who took

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[49] A compilation of 150 earlier studies - between the years 1920 and 1954 - found that the social interaction aspects of work were ranked seventh among nine major job-related factors and contributed strongly to both job satisfaction and dissatisfaction (Herzberg, 1957).
[50] It is regarded valid that many large corporations introduce telework to increase employee satisfaction and for their need to retain or find well-trained staff (Forgács, 2010).

up telework tended to relocate closer to, rather than further away, from their work location (Ory & Mokhtarian, 2006). Overall, the effect of telework on residential relocation appears to be limited and traditional factors, such as lifecycle stages, remain the dominant explanatory factors (Muhammad, Ottens, Ettema, & de Jong, 2007).

Telework allows individuals with mobility impairments and other disabilities to participate in mainstream employment opportunities (Woelders, 1990; Anderson, Bricout, & West, 2001; Schopp, 2004). For people with certain disabilities, this method of working removes some of the barriers to gainful employment, in the traditional sense[51]. Properly implemented, telework offers a platform for participation in work-related social networks and social learning to the benefit of the disabled teleworker's social and human capital, with the caveat that these factors are purposefully integrated into telework design and implementation (Anderson, Bricout, & West, 2001; Baker, Moon, & Ward, 2006). Telework creates positive opportunity for choice and the implementation of a telework model for disabled people can improve quality of employment in comparison with systems of profession rehabilitation and disabled persons employment (Bileviciene & Bileviciene, 2010).

An important trend in modern commerce seeks to increase opportunities for individuals to become self-employed, and Ireland has witnessed a steady rise in self-employment figures since the start of the last decade (CSO, 2007). Self-employment offers more control and personal freedom, high motivation, and increased productivity, making it attractive to many individuals (Spillman & Markham, 1997). However, this is not the whole story as self-employment is also related to additional stress, long hours, and often low income (Douglas & Shepherd, 2002). Nonetheless, telework allows people set-up business with reduced start-up costs - such as the need for office space - and improved communication opportunities with existing and potential customers due to enhanced mobile technologies[52]. However, personal loss and conflict can be associated with such working practices, even for relatively privileged people who have education, experience, skills, and work which is intrinsically satisfying (Baines, 2002; Baines & Gelder, 2003). This leads to the suggestion that "if home-based self-employment becomes more widespread, the results may not only be harsh for many individuals but damaging overall to the quality of working life" (Baines, 2002: 98).

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[51] Telework can also afford novel employment opportunities to the socially marginalised, although little evidence exists at present that this is the case.
[52] Contemporary home-based small enterprises are offered as a key part of the new, entrepreneurial, small business economy, but the negative impacts of telework do not dissipate in this economy.

Impacts	Positive Effects	Negative Effects	Examples
The Individual			
1. Improved Work/Life Balance			
• 1.1 Increased work flexibility & autonomy	√		work on your own time and pace,
• 1.2 Family & domestic commitments	√	√	schedule work around family commitments but possible difficulty in separating work from home-life
• 1.3 Increased well-being from reduction/elimination of the daily commute	√		less stress from the elimination or reduction of daily travel in perk traffic and congestion
2. Reduction or elimination of the daily commute to work	√		cut in the distance travelled, plus the associated motoring costs
3. Promotional opportunities		√	reduction in face-to-face contact can lead to 'out of sight out of mind' mentality
4. Increased working day		√	teleworkers frequently work longer hours in the day, often unpaid
5. Isolation and Loneliness		√	an increased likelihood of social and work related isolated and loneliness
6. Residential/Organisation relocation	neutral[53]		control over where a person lives and can relocate
7. Employment opportunities for the disabled and socially excluded	√		more participation in the marketplace for individuals with disabilities or socially excluded
8. Self-employment opportunities	√		low setup costs and high flexibility

Table 5 – Telework's Effects for the Individual

Telework's Impacts on the Organisation

Telework must not be considered in isolation but rather placed in the overall context of existing and continuous business reorganisation and change management environments. With the rapid development of ICT tools and services, telework *has* the potential to become an integral, rather than an optional, way of working, facilitating human collaboration and interaction over-distance. The impacts for organisations embracing telework are numerous but continuous contact and accessibility to the teleworker is critical, even when they are

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[53] Neutral in this instance refers to distance travelled when commuting to and from work and thus savings in overall motoring costs. Research is mixed as to whether an individual teleworker can reduce their overall level of travel.

working offsite (Brown, 2010). For a positive effect on performance, a variety of communication channels must be available and utilised by all staff so teleworkers can remain linked with, and central to, the communications structure (Arling, 2004). It has been highlighted, however, that "some non-telecommuters experience envy and jealousy, frustration, resentment, anxiety, unfairness and anger towards telework colleagues" (Brown, 2010: 75). This may have a disrupting effect on organisational cohesion and effect teamwork.

Studies have shown telework can result in more employee time devoted to work, thus increasing organisational productivity[54] (Baruch, 2000). In UK studies, 39.9 per cent of British Telecom (BT) and 33.3 per cent of British Airport Authority (BAA) staff felt their work performance had improved considerably, with 47.2 per cent of BT and 20 per cent of BAA staff attributing this improvement to telework (Hopkinson & James, 2003). Similar productivity increases were found in Germany (Empirica, 2003) the Netherlands (de Bruin, 2003) Italy (Avanzi, 2003) and Denmark (Danish Technological Institute, 2003). Telework has led to increased working hours for many who work in this manner (Hopkinson & James, 2003) and the conventional process of economic exchange for time spent at the office is being replaced by a new exchange of commitment and engagement in work for the privilege of teleworking and infrequent time flexibility (Steward, 2000). But there are some inherent pitfalls in measurement of productivity from telework, and these concerns have been expressed (Westfalls, 1997; Westfall, 2004)[55].

Teleworking can reduce absenteeism and increases resilience, especially with decreased stress and anxiety levels and more control over working times and location (Costa *et al.*, 2004; Olsen & Dahl, 2010). In a Canadian government study of 30,000 employees of medium and large size companies, the research examined records collected on the consequences of virtual work and its effects on teleworkers (Russell, 2005). It found a 40 per cent reduction in stress levels for teleworkers, leading to a significant decrease in absenteeism, and staff who teleworked had a better overall job experience than their office-bound counterparts. Similarly positive results were found in a Dutch survey of public sector employees which showed telework reduced sickness absences (Possenriede, 2011). However, access to telework only seemed to have an effect on short-term absences in this

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[54] Improved staff productivity can result from fewer distractions, less non-productive commuting time, and enhanced concentration.
[55] These include the selection process for teleworkers, the task they undertake, the lack of other considerations such as improved technology capabilities and, the increase in cost of setting up the teleworker at home.

research since it reduced the number of absences by almost 6 per cent but not the total annual length of absences. Longitudinal research in the US concluded "no evidence that telecommuting reduces absenteeism" (Butler, Aasheim, & Williams, 2007: 103). This contradicted earlier work on telework and absenteeism which showed positive organisational effects (Pratt, 1999; American Management Association, 2000; Telework America, 2000).

Reduced overall costs are a tangible benefit for organisations adopting the practice of telework. Asset utilisation leads to savings on staff time and the space required to facilitate centralised working (Duxbury & Higgins, 2002a). On an economic level telework provides a possible solution to the on-going concerns of rising office overheads experienced in office expansion, or in situations where a high proportion of office desks are empty at any given time. Large organisations in the US - IBM and AT&T – have learnt that "fewer people who need to be in the office meant less demand for office space; in short, reduced expenses for better output means increased profitability" (Lister & Harnish, 2009: xiv). Providing a 'hotdesking'[56] arrangement, in conjunction with the practice of telework, permits a building to accommodate significantly more than its normal capacity of people (Callanan, 1999). Benefit estimates, such as a 60 per cent reduction in office real estate costs at IBM in Armonk New York, have led to a conclusion that telework programmes return benefits that can far outweigh their set-up and running costs (Illegems & Verbeke, 2004)[57].

Another promising organisational impact of telework is the improvement it offers for services to customers in a variety of ways. It can allow higher personalised responses to customer demands and the provision of customer services outside normal office hours without the need for a conventional base or office. This flexibility can fit into the ethos of how a company or organisation operates and can lead to co-operative work across (inter)national boundaries and different time zones. For example, BT observed the benefits from selling flexible working solutions to customers based on its telework schemes (Waters, 2008). Allowing for customers to be serviced 24 hours a day by teams of appropriately skilled individuals who are organisationally integrated and can work in virtual teams to deliver global services are all advantages to be gained from telework (Callanan, 1999).

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[56] Hotdesking involves one shared office space between several individuals at different times and the primary motivation for hotdesking is cost reduction through office space savings.
[57] However, these home office setup costs are rarely factored into projected organisational overheads and the burden is simply transferred to the teleworker. Further, environmental impacts and consequences are also neglected.

Management in general is not overly optimistic about the success of telework schemes because of perceived control and supervision issues (Flynn, 1995; Baruch, 2000). There remains a strong perception that it would be difficult to trust unsupervised workers. Rather than merely relying on telework as a panacea to more liberating and rewarding ways of workings, attention to ensuring a balance in the benefits for both employers and employees would appear to be an obvious prerequisite for gaining commitment to implementing this method of working (Reilly, 2001). The assumption of skewed benefits advantage has led to problems in at least one case in the past (Harris, 2003). Two key lessons were learnt in Topi (2004) in relation to solutions and obstacles to telework. Managers need to carefully evaluate the feasibility and potential obstacles of telework for *their* organisation and given type of work, and the success of such work arrangements cannot be guaranteed with technological solutions alone. In most cases, strong and visible managerial involvement is necessary.

The advantage of telework in times of crisis and emergency can be the organisation's ability to respond and sustain the work environment resulting in continued business, commerce, and service provision (White *et al.*, 2010). Telework decentralises and spreads the workforce over many locations thus reducing the ratio of those impacted by any crisis, disaster, or emergency[58]. This is particularly acute at times when travel is reduced or eliminated, or certain locations become inaccessible. In 2006 US President Bush issued the *Implementation Plan for the National Strategy for Pandemic Influenza*, which outlines that government's approach for dealing with the threat of pandemic influenza (HHS, 2006)[59]. The Chiltern Railway's commuter services into London was severely disrupted for several months in 2005 resulting in some regular travellers shifting to working from home for the duration of the service interruption (Dark, 2007). A simulation of how Britain's financial system could respond to a crisis such as a flu pandemic was carried out (Moore, 2007) and this indicated reduced scale of activity could continue with teleworking (White *et al.*, 2010). Similar emphasis was placed on location-specific preparation and business continuity in the Irish Forfás influenza pandemic planning report but with only vague references to planning "policies on flexible work location" and "providing ICT infrastructure to support teleworking" (Forfás, 2009: 25-26). The potential traffic chaos from the London Olympics prompted O2 in the UK capital to undertake a day-long pilot on the 8th February 2012 which saw over 2,500

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[58] Telework, and other types of broad e-networks, are opening up new possibilities for more effective management of large-scale emergencies and success lies largely in having the capacity for the rapid mobilisation of dispersed resources and efficient coordination of all parties involved (Roberts, 2006).
[59] Many public and private sector workplace policies in the US now contain a telework component in the wake of the New York terrorist attacks of 2001, hurricane Katrina, and potential pandemics or other widespread illnesses.

of its employees work remotely, leaving just 125 workers at their communication headquarters (Business Green, 2012)[60].

An additional benefit for organisations from adopting a telework strategy is better staff retention and lower recruitment overheads.   In the case of Bradford Local Authority the practice of telework helped with the retention of existing staff, created new opportunities for part-time work and, in general, widened the available labour pool for the local authority (Hopkinson & James, 2002). Morgan (2004) argued that as a result of extending flexible working arrangements, such as telework, improved staff retention is possible due to flexibility being valued by employees. Telework programmes have also become a key strategy in the retention of in-demand information technology workers (McGee, 2005). Mello (2007) suggests that telework can facilitate the earlier re-entry to work of an employee on any kind of family or medical related leave such as the birth of a child.

The first decade of the new millennium was characterised as an employees' market and more people who wanted to work did work. As a result, the pool of skilled employees became smaller. Employers had to offer incentives to attract worthy employees and to keep top people from leaving their organisation, and while pay was one of these inducements money wasn't everything to younger workers. These were increasing 'quality-of-life conscious times' and people were looking beyond mere financial reward to other benefits of flexibility and time with family when deciding whether to take or keep a job (Duxbury & Higgins, 2002a: 175). Employers who are interested in recruiting and retaining quality staff need to consider flexible work option, of which telework is a prominent option (McCloskey & Igbaria, 1998).

Telework can facilitate a reduction in time-to-market and decreased developmental costs. Assessing new skills and competences allows faster market entry and acceleration of the introductory phases for new goods and services. Utilising the time gains as a competitive advantage - including shortening product development, distribution, and administrative time - are all possible rewards of telework (Illegems & Verbeke, 2004). Virtual research team, which include teleworkers, provides valuable input for new product development and R&D engineers are often able to leverage practical experience from their participation (Ale Ebrahim, Ahmed, & Taha, 2009a). In the globalised competitive marketplace, virtual teams

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[60] In addition to saving 2,000 commuting hours, the company's water use on the day more than halved, while electricity consumption dropped by12 per cent. Such resource savings point to some obvious environmental benefits, which will be discussed in the next sub-section.

represent a growing response to the need for fasting time-to-market, low-cost, and rapid solutions to complex organisational problems (Ale Ebrahim, Ahmed, & Taha, 2009b).

Impact	Mostly Positive	Mostly Negative	Example
The Organisation			
Increased productivity	√		improved staff productivity results from the reduction or elimination of the commute and less colleague distraction working from home
Reduced absenteeism		neutral	telework may have the potential to reduce instances of absenteeism but more research is needed
Decrease in organisational infrastructural, overheads and assess utilisation costs		neutral	decline in the need for space at a central work location, and freeing up of assesses/equipment. Little account taken of setting up teleworker in their home
Organisational cohesion		√	non-teleworking employees can feel envious, jealousy, and resentment towards teleworkers
Employee isolation		√	teleworkers can feel 'cut off' from the organisation
Better staff retention and flexible & part-time work opportunities	√		retention of existing staff who change their residence or experience life-style changes or new part-time & flexible work opportunities
Time-to-market and global customer-care improvements	√		quicker to market for services and produces with extended service provision and customer care
Emergency planning, response and prevention	√		strategies to respond to crises or emergencies which necessitate a reduction in mobility

Table 6 - Telework's Impacts on the Organisation

Telework's Effect on Society & the Economy

The practice of regular commuting to and from work is regarded as highly wasteful for the economy in terms of costs, infrastructural development and maintenance, and energy consumption. The direct cost of transportation and expenditure on supporting infrastructure are exacerbated by the peak-hour nature of commuting and the traffic congestion and pollution that results. Telework can reduce the demand for travel at peak times, and also diminish the pressure on the transport systems overall (Telework Association, 2009). It

reduces the waste of productive time and the resultant stress and impacts on the health of the individuals involved. White *et al.* (2010) argued however, it does not necessarily follow that teleworking for a proportion of total working days produce directly proportional reductions in distance travelled between home and work. They base this on the assumption both home and work location change frequently, although acknowledge "detailed studies in Britain have yet to be made" (White *et al.*, 2010: 151).

One of the more sufficient potential benefits to the economy is increasing worker productivity that accrues from the practice of telework (Ruth & Chaudhry, 2008). Organisations and businesses that have embraced telework have been able to increase output with the same number of staff, or reduce headcount and still provide the same level of service to their clients and customers. However, some of the claims for telework's potential appear exaggerated. The national telework strategy in the US, for instance, indicated that they would increase GDP, reduce the national debt, and bring about a favourable trade balance (Lister & Harnish, 2009). In a report to congress in the US on the status of telework in the federal government, telework was claimed to successfully balance the responsibilities of work and family, increase the safety of neighbourhoods, and reduce pollution (USOPM, 2009). Such optimist claims were made in the absence of any sufficient research or empirical evidence and indicate an anecdotal and subjective approach to telework. Gettler (2012) suggests that one reason why so many technological predictions - such as the widespread adoption of telework - don't come true is that the technological progress everyone raves about tends to happen only in small areas of the economy.

A major development in the working environment has been the steady increase in self-employment opportunities for both male and female workers over the past number of years (Dobbins, 2009)[61]. Self-employment offers increased control and personal freedom, high motivation and productivity, which makes it attractive for numerous highly motivated individuals. The economy of a country can benefit from the injection of enthused and energetic individuals in the form of the self-employed, and new and small firms have emerged as a major vehicle for entrepreneurship to thrive (Audretsch & Thurik, 2001). Telework remains largely the preferred domain of the self-employed, with 62 per cent of teleworkers in the UK claiming to be self-employed and 41 per cent of self-employed people referring to themselves as teleworkers, as opposed to just four per cent of ordinary employees (Carr, 2005). However, there are also noteworthy issues of increased stress,

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[61] Telework offers the technologies and working method that facilitate the set-up of many micro-enterprises and IT services (Callanan, 1999).

longer working days, and low income for many self-employed individuals to contend with (Shields, 1999; MacDonald, Phipps, & Lethbridge, 2005).

Telework also has the potential to bring about a more equitable distribution of economic activity throughout regions and help redress the aggregation of economic activity in our main urban centres (Callanan, 1999)[62]. In addition, the spread of telework can assist in improving the economic and employment opportunities of underdeveloped regions of Europe (Forgács, 2010). Notwithstanding this, the practical impact of telework technologies on rural areas can be very mixed and research points "to the crucial role for successful rural development played by exogenous factors, supported by suitable endogenous resources" (Millard, 2005: 119). Only one-quarter of households targeted in a scheme to provide broadband to remote areas in Ireland took up the offer (Brennan, 2013). A study of the development of local ICT based services in Europe - which included a case study of Longford - focussed on public-private partnerships and the critical mass of use and argued for a "bottom-up process which exploits the needs, enthusiasm, opportunities and resources of the local area" (Millard, 2005: 121).

From an economic perspective, working from home can increase positive work/life balance effects for individuals resulting in improved health with reduced levels of stress, lessening the burden on a sometimes overstretched public health service (HCP, 2006). Three major components in a Canadian study explained the enthusiasm of teleworkers for this lifestyle; elimination of the inconveniences associated with commuting (time and stress) between home and work, reduction of certain environmental hazards found in the office (dubious air quality, noise problems of open areas inducing concentration difficulties, frequent interruptions by colleagues or supervisors), and the promotion of conditions that make it easier to balance work and family demands (Montreuil & Lippel, 2003). This resulted in most teleworkers involved in the study feeling less fatigued and healthier overall[63].

Telework can offer opportunities for people to integrate their personal and domestic lives with their work responsibilities more so than under traditional work conditions (Duxbury & Higgins, 2002b). Whilst most flexible working patterns can be viewed as being good for

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[62] Telework can allow workers live in a location of their own choosing, which creates opportunities for employment creation and retention in remote, rural, and disadvantaged areas. Rural development authorities, in particular, can profit from telework through its broadening of the economic base and the revitalisation of their communities.
[63] However, this study also pointed to important elements which had the potential to cause negative effects on a person's health; scheduling and absences, layout of the home workspace and equipment, musculoskeletal problems associated with computer use, isolation, and stress.

home and family life, they can also be catalysts for improvements in the lifestyle of others. Stress levels are reduced significantly when people are able to improve their work/life balance and cut back on commuting during the rush hour, and telework is suggested to be an effective solution for reducing stress in women's working lives (Hori & Ohashi, 2004)[64]. Respondents with children, in one study, rated stress reduction and family benefits of telework more highly than did those with no children at home (Madsen, 2003). However, some research indicates that there are risks of increased work-family conflict when individuals frequently work from home (Christensen, 1993; Felstead & Jewson, 2000).

When people work from home, local communities may benefit from the increased presence of these workers in the locality. Neighbours are more likely to communicate regularly and local facilities such as shops, swimming pools, libraries, and other such services can expect to be used more frequently. However, time scarcity remains a contemporary social issue, with or without telework. One of the reasons for non-participation in the community considered by Putnam (2000) was the 'community unfriendly workplace' which, he suggests, contributes to the decline in participatory capital and social capital. Heretofore, there have been two different methods used to explain the societal effects of telework, and in particular participatory capital. Futurism/utopianism assumed increased civil activity due to social isolation at home, and technological determinism assumed decreasing need for face-to-face social interaction due to technology penetration, and thus less civil engagement[65]. One study adopting the utopianism approach indicated teleworkers tended to report an increase in participation in voluntary/charitable activities, and political/trade union activities in excess of what was reported from non-teleworkers (Kamerade & Burchell, 2004).

An understanding of differences, and indeed similarities, between women and men and how they perceive their professional and domestic roles is an important issue when considering the adoption or development of telework. With increasing numbers of women re-entering the workforce, they are assuming greater financial responsibility for the family and home. Yet many women - including those who work full-time - continue to carry the main burden of childcare and housework (Greenstein, 2000; Schwartz & Scott, 2000; Craig, 2006). Many women were socialised to believe that being a wife and raising a family is the first priority in life, and financial independence and career advancement secondary (Chafetz,

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[64] Parents and carers are obvious potential beneficiaries of telework and, consequently, children are more likely to grow up in a supportive environment.
[65] Both methods attributed causality of change in society to technology development and penetration, the first adopting an optimist position while the latter predicted negative social consequences (Graham & Marvin, 1996).

1988; Gilbert, 1993)[66]. Cinamon and Rich (2002) found that although more men than women fit a work role and more women than men fit the family role, there was no difference in the dual position. This indicates a significant deviation from traditional gender-based attitudes towards life's roles and was apparent in other research which found men and women attributed similar importance to their careers (Mencken & Winfield, 2000). Mokhtarian, Bagley, and Salomon (1998) suggested women were less likely to express concern about constraints of supervisor reluctance, or lack of visibility to management. White *et al.* (2010) maintained gender differences associated with frequency of working from home is insignificant, indicating a slightly lower proportion of females working from home at least once a week.

There is a growing debate on whether the trend for telework will challenge, or indeed simply reinforce, work and family roles (Huws, Robinson, & Robinson, 1990; Dooley, 1996; Ng, Das, Ching, & Abdullah, 1998; Gothoskar, 2000). The gender difference in labour market behaviour has resulted from the different social situations in which men and women have tended to find themselves. One report argues that a breakdown of the differences between men and women is occurring, with some men taking on 'feminine' roles within the household whereas some female teleworkers were seen as 'breadwinners' (Huws, 1996). However, many women are opting for part-time work in order to accommodate both family and paid labour responsibilities (Reskin & Padavic, 1994). The domestic division of labour has not been altered as a result of men and women working at home either and women - be they wives, in-laws, or domestic helpers - are still largely responsible for housework (Ng *et al.*, 1998). For telework to enhance the benefits for women serious consideration of the existing socio-economic conditions under which it is implemented must be undertaken so as not to reinforce or reproduce the unequal social and gender relations that exist in society.

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[66] There has been some change in the recent past as more men assume stronger family roles and women stronger work roles (Huws, 1996; Burda, Hamermesh, & Weil, 2012).

Impact	Mostly Positive	Mostly Negative	Example
The Economy			
Reduced peak-time commuting congestion	√		less traffic congestion and the associated 'wasted' time of commuting to and from work on a daily basis
Increased productivity	√		improved staff productivity results from the reduction or elimination of the commute and less distraction working from home
Reduced face-to-face interaction		√	higher outputs are recorded for business done face-to-face
Worker relocation	neutral		telework afford the opportunity for people to live further from work
Rural development & promotion of disadvantaged areas	√		telework can allow for a more equitable distribution of economic activity to rural and disadvantaged areas
Health benefits	neutral		some improved health benefits, lessening of the burden on the health services. Increased stress and anxiety due to isolation
Increased work/life balance benefits	neutral		enhanced domestic harmony and family cohesion but can lead to work-family conflict
Heightened community involvement	unknown		working from home allows the individual to become more involved in community activity and support, but no evidence to-date
Rural community (re)development	√		rural communities can remain, or become, thriving or sustainable communities
Evidence of gender differences or similarities	neutral		is it better for women or men to work from home?

Table 7 - Telework's Effect on Society & the Economy

Discussion

Despite previous overly optimist predictions, telework has not yet become an established or integral part of the contemporary working environment, nor has it become a

key component of any new developing 'Smart Economy'[67]. Indeed, there are differing views in the literature about its reach and impacts, with some arguing that telework continues to grow at a fast pace and others maintaining that it is stagnant and the numbers are stable. In many respects there is less promise and confidence in telework than previously acknowledged, with little in the way of new research or direction evident either from policy designers, key decision-makers, or academics. This is best summed up by the cancellation of this year's TeleWork 2013 conference, when the organisers suggested:

> TeleWork is a fascinating and growing process in the United States. Interest in the "distributed" workplace triggered our interest in starting TeleWork 2013, which was scheduled for June 23 to 25 in Saratoga Springs, NY.
> Unfortunately, even though over 17,000 people visited our website, only a dozen registered for the event; therefore, we made a decision to cancel TeleWork 2013. Why the low registration? As we talked with over a hundred of our colleagues, they gave a range of reasons:
> - The "hot" nature of the issue, after Yahoo's decision to cancel teleworking.
> - The lack of a single leader for TeleWork in their organizations. The topics were interesting, but no one had TeleWork strategy and implementation as their full role.
> - A lack of funds to attend a dedicated TeleWork event (TeleWork2013, 2013).

With the increasing availability of broadband, greater wireless connectivity, and reduced cost of new communications technologies, it is now less complex and costly to set up a home working space than ever before. Coupled with the unsustainable travel behaviour associated with regular commuting, the practice of telework appears more practical and realistic in terms of new work environments and sustainability. The rapid development of technology has freed people to work remotely, choosing to balance their work with their home life, if they so choose. In terms of sustainability, telework has potentially more to offer not only in energy savings and lifestyle costs but also to local communities and society in general. With the development of telework apparently stalled, where does the problem lie?

The potential merits of telework in terms of environmental sustainability appear positive from the literature, but much more examination is required of its actual ecological impacts and consequences. Previous studies have tended to concentrate solely on its environmental prowess to reduce unnecessary travel in the form of the daily commute, but telework environmentally-focussed research should not end there. Much more is going on with the shifting of the individual worker's consumption practices from the workplace to the

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[67] *Building Ireland's Smart Economy: A Framework for Sustainable Economic Recovery* was published by the Irish Government in 2008 [available at www.taoiseach.gov.ie/attached_files/BuildingIrelandsSmartEconomy.pdf].

home, which continues to have both positive and negative impacts and consequences in both domains. Indeed, life-stage changes appear to play a significant role in people's decision to work from home (or not), and such longitudinal studies will provide a deeper understanding of the issues and motivations behind such decision-making.

Environmentally appropriate technology use must maximise the efficiency of all energy and material use. However, in the case of telework this is unclear in the absence of empirical evidence, and the relationship between technologies (and in particular telecommunications) and the environmental protection debates are more complex and contradictory than often assumed. Studies in dematerialisation would appear to be a worthy direction for such research but frequently the emphasis is attentive to the adoption and use of technology whilst many of the social implications and negative environmental consequences of such technology appropriation are neglected. For example, while there does appear to be dematerialisation effects in the production of manufactured goods, there are differing trends around demands for increased levels of mobility (Marvin, 1997) and indeed other forms of consumption. For the moment, the true ecological cost of telework is unknown and an important initial step will be to attempt to assess an individual's carbon footprint when working from home and compare this with when they work in a centrally-located worksite. Such deliberations must consider many additional features of consumption practices rather than simply focussed on mobility. Technology, energy, water and food consumption should all be investigated, in addition to considering waste produced.

Numerous social and environmental impacts of telework are not evidently understood or appreciated by key policy and decision-makers. Many of the grandiose assumptions and benefits of telework are merely subjective and anecdotal, or the result of unsuitable advanced studies of such model building. Some of the weaknesses in the available research relate to limited theory-building, small sample size, and excessive focus on the individual (Shin *et al.*, 2000; Bailey & Kurland, 2002). Indeed, the main emphasis of telework is on the economic benefits of this way of working, with little in the way of attention given to the other two pillars of sustainability; the social and environmental. Additional understanding is necessary to appreciate the overall implications of telework in relation to sustainability. Policy-makers should not rush reckless into promoting telework as an option of economic good only to later discover damaging consequences to other elements of environmental, social, and/or economic sustainability. Such early caution might suggest that telework is somewhat incompatible with the positive coexistence of the three pillars of sustainability (and indeed the aims of Sustainable Development).

In the early part of the last decade, policy-making discourse recognised the role telework could play in economic development and environmental protection but this early impetus waned in the absence of strong practical steps to implement and encourage the practice. Indeed, public interest in telework was higher in the mid and latter part of 1990s than it has been since the year 2000 (Bergum, 2007). A practical appreciation of the day-to-day mechanics, procedures, and techniques required for telework appeared to be beyond many key decision-makers and groups that might benefit from such organisational change. Nevertheless, "alteration, adoption and changes are required in the worlds of social policy, planning and governance, as much as they are needed in the worlds of work and domestic organisation, for the social, search and information efficiencies of the new information communication technologies to be realised" (Grieco, 2003: 91). But where is this change apparent, if indeed at all?

There appears to be a strong role for regulation and legislation to play with regards to telework development, implementation and adoption. A hands-off or neo-liberal approach is evident from some quarters with key decision-makers prepared to let market forces decide the direction and extent of telework schemes and reach. Viewed in the light of chapter two considerations, telework appears (over)reliant on technology innovation, development, and adoption, a position similar to that of a Technological Determinist (or shallow Ecological Modernisation) viewpoint which assumes that the power of technology alone will bring about positive change. But such a *laissez-faire* position appears to have less success than one of positive policy intervention, particularly in the case of environmental good (Szarka, 2012).

The most important constituent required for the widespread acceptance and adoption of telework rests with convincing management and employers of the benefits to their organisation, and impressing upon decision and policy-makers that the practice has a role to play in organisational development, and social and environmental sustainability. Many business leaders close towards telework without supplying an adequate reason for their reticence (Forgács, 2010). But such reluctance often stems from existing organisational practices and behaviour such as supervision of work, time management, and issues of trust. Organisational change is often said to be a fundamental component of modern organisations. The benefits of telework include increased worker satisfaction, reductions in carbon emissions from less travel, less office space requirements and, possibly less overall consumption. But strong leadership, strategies, and policy design and implementation - which acknowledge and cater for all three pillars of sustainability - appear essential.

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Chapter Summary

Chapter Four provides an extensive exploration of telework, an innovative working arrangement made possible by the widespread introduction and acceptance of Information Communication Technology (ICT). Telework is defined as the method of applying ICT to enable workers accomplish their tasks or work geographically separated from where the work results are needed, or would have traditionally been done in the past. The chapter begins with an overview of telework before introducing four key themes of analysis: environmental considerations, telework effects on the individual, organisations, and social and economic structures. That telework has potential - in term of social and environmental sustainability and the economic benefits that can accrue - appears obvious, but with limited research and empirical evidence to substantiate this hypothesis it is important that key decision-makers proceed cautiously and seek to fully understand all the implications before promoting telework as a sustainability option. In the absence of such an understanding, some elements or other key pillars of sustainability may be negatively impacted upon. The realisation of teleworks is largely dependent on ICT, which also makes it ideal in seeking a deeper understanding of how Ecological Modernisation (EM) is understood and applied, if indeed at all. In Chapter two it was outlined how many individuals conceptualise Society-Technology-Environment-Interactions (STEI) and in this chapter a comprehensive review of many of the conditions that enable or constrain telework was undertaken. The next chapter - Chapter Five - continue Part II of the thesis with a desktop investigation and analyse of three different policy arenas; Sustainable Development (SD), transport, and (flexible) work, which impact upon telework's development (or not) in Ireland.

Chapter 5 – Policy, Economy, & Mobility: The Emergence of Telework in Ireland

In previous chapters, aspects of Society-Technology-Environment-Interactions (STEI) were presented and discussed, including how individuals conceptualise and understand such interactions. One way this is achieved is through particular approaches and understandings of Ecological Modernisation (EM). Many Irish and European policy strategies and developments relating to STEI are allied to forms of shallow EM thinking and broadly these approaches appear to be understood in a limited way by key decision-makers who draft and implement policy. Telework appears to epitomise this shallow interpretation of EM thinking, where technology development and adoption is assumed to drive a transformation in working arrangements with the additional environmental protection benefits of diminishing travel requirements. This chapter continues the study of telework and sets out the policy initiatives (if any) and challenges relating to this way of working in Ireland. An investigation and analysis is undertaken in three interconnected areas of relevance. These policy domains - Sustainable Development (SD), transport, and (flexible) working - impact upon telework's development and adoption in a number of different ways. But where is Telework situated within or between these domains? Is it a separate matter of concern for policy-makers, if at all, and where does it fit within the scope of SD, transport and (or) work regulation and legislation? Is telework over or under-regulated and what are the opportunities and challenges that the adopted approach brings? Indeed, does telework *fall between the cracks*, so-to-speak, obscured by three diverse areas of governmental responsibilities receiving limited actual attention from policy-makers?

In discussing the first of these three policy areas, the chapter begins by considering the changes in approaches to development, production, and consumption behaviours both in Ireland and elsewhere. SD is an attempt to acknowledge issues of environmental harm, and consumption now assumes a significant role in much of the debates and critical discourse on SD. The matter of the sustainable consumption of distance focuses on reducing or eliminating environmentally unsustainable travel behaviours, and telework is expected to play a role in this respect. Telework is endorsed for its potential in decreasing levels of commuting in many urban areas as it diminishes the need to travel daily to a single location of work. But the matter of telework's environmental credentials is complex as many such workers are already highly mobile and have increased flexibility both in time and space regarding their work. The consequences and tensions between telework and environmental

protection are largely unknown and pose some interesting questions as to the genuine ecological merits of this way of working.
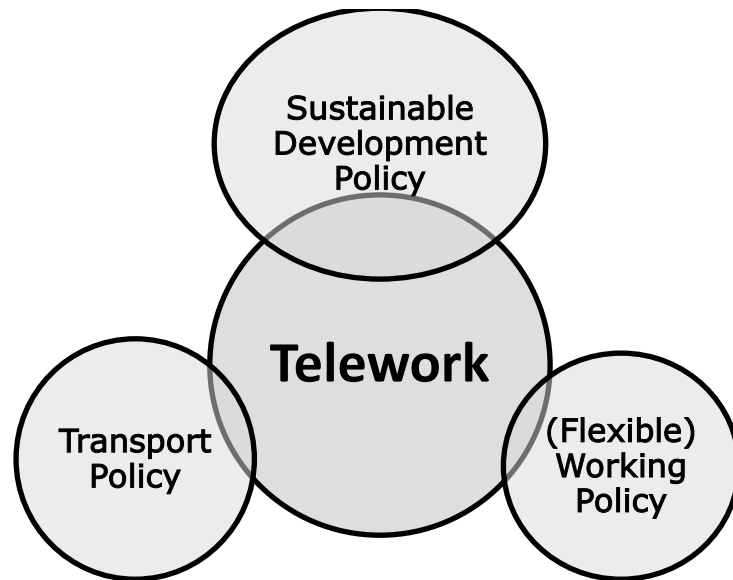
Figure 11 – Telework: The Interconnected Policy Focus in Ireland

Telework is promoted as an economically acceptable option allied to its potential for environmental good and thus is an ideal instrument to evaluate aspects of EM thinking in policy design. This chapter sets out to uncover where telework fits within that spectrum in Ireland and, indeed, if is it understood and implemented in practice by key decision and policy-makers at all. Ireland is a unique and worthy test case to evaluate telework in this regards. The state has embraced the dualistic agendas of neo-liberalism and neo-corporatism which created the economic basis for the multinational led development associated with the boom decade of the 'Celtic Tiger' (Leonard, 2009) and there is little indication that this has changed to any significant degree under the latest coalition government. In addition to trust in neo-liberal capitalism, Ireland remains a site of chronic car dependency (Rau & Vega, 2012). Against this backdrop one might expect to see the broad extent to which a market-friendly EM version of telework develops and grows. In addition, one might also assume that the scope for telework to greatly reduce car travel associated with the daily commute might be much larger than in other countries less dependent on the car. This research seeks to reveal the reality of telework's impacts and consequences in Ireland.

The chapter begins with a review of current policy with regards to SD both in Ireland and within the European Union. The European Union has, and continues to have, a major influence on Ireland's approach to environmental matters (Flynn, 2007; Cahill, 2010b). It also strongly influences the design, development, and implementation of policies on employment rights and working conditions. Nevertheless, Irish enthusiasm for a more proactive type of relationship with EU environmental policy has not grown and Europeanization appears to have limited impact in terms of changing Ireland's cultural mind-sets and general attitudes towards environmental protection (Flynn, 2003). As part of discussions on issues of Sustainable Consumption (SC), telework has been advocated as a potential virtual mobility option to promote the sustainable consumption of distance in Ireland, Europe, and elsewhere across the world. Teleworks' dependence on technology, and indeed often new technology, makes it attractive to many politicians and business leaders seeking environmental policies allied to continuous economic growth.

The chapter continues with an investigation of transport policy in Ireland, paying particular attention to the *Smarter Travel* policy initiative and references to eWorking (telework) as a potential solution to some of the negative environmental consequences of a car-dependent society. In this apparent policy paradigm shift of promoting more sustainable modes of transportation such as walking, cycling, and public transport, telework is regarded as the means to reducing the largely environmentally negative daily commute to and from work. It is also suggested as the means to reducing other forms of work-related travel by allowing individuals communicate and be 'virtually' present with customers and colleagues who are geographically dispersed locally or across the world. In this way, telework has been linked to transport and indeed potential transport policy design.

Whilst there is little evidence of new policy initiatives relating to flexible working in Ireland, the chapter proceeds with an assessment and analysis of the extent of such working arrangements in the country at present. Ideally, much of what flexible working arrangements endorses relates to the flexibility afforded to the individual worker, but the evidence from Ireland would appear to favour a different explanation of what is actually happening. In this realm of soft policy design and in the absence of regulation or legalisation, many organisations are choosing to ignore such working arrangements, instead seeking to retain traditional management and supervision techniques and approaches in centrally located worksites. Where workers do avail of flexible working arrangements it often results in increased productivity and longer working days for these particular individuals.

An understanding of current approaches to telework in Ireland is imperative for this research. This is provided later in the chapter, followed by a reflection of the experience and realities of telework in Ireland and a brief general discussion on the findings. Overall, this chapter provides an in-depth assessment of the structural elements that affect the practice of telework in Ireland. The three main policy areas; SD, transport, and (flexible) working, overlap on the focus of telework and this awareness informs the empirical data analysis in Chapter Six. This is the first time such an approach to investigating telework has been undertaken in Ireland, to this author's knowledge. This review of all the relevant policy areas that relate directly to telework is done in a comprehensive fashion cutting across a number of policy arenas to lay bare many of the issues that have previously remained underreported on the subject of telework. Some early conclusions would hint at the need for SD to move 'beyond policy silos' - as is evident in the case of telework - and that telework itself remains remote and untouched by any concrete policy proposals or decisions in Ireland.

Sustainable Development, Production, & Consumption

The sustainable consumption of distance (part of overall SD considerations) emphases the need to reduce environmentally unsound travel behaviours and telework has an acknowledged role to play in this respect. Telework is frequently promoted on the assumption of decreasing levels of commuting as it weakens the need to travel daily to a single work location. The concept of Sustainable Development (SD) has become a widely held position for national governments, the European Union, and international organisations dedicated to environmental protection within the confines of sustained economic development and growth. The Brundtland Commission (WCED, 1987) definition of SD is based on an ethical imperative of equity within and between generations, and implies sustaining the natural life-support systems of the planet while extending to all the opportunity to improve quality of life (Hediger, 2000).

SD, consequently, encompasses aspects of environmental protection, economic development, and social justice, often referred to as the three pillars of sustainability. But is it possible that these three strands of development strategy can co-exist and prosper simultaneously?   Humanity's demand on the planet has more than doubled over the past forty years as a result of population growth and increasing levels of consumption. The WWF (2008a: 2) reported that in 1961 almost all countries in the world had more than enough capacity to meet their own demands, but by 2005 the situation had changed radically, with many countries only able to meet their needs by importing resources from other nations and

regions. In addition, there is growing evidence of the widening gap between the income of rich and poor, in life expectancy, and in educational performance and literacy rates (Wilkinson & Pickett, 2009). Notwithstanding this, SD remains the prevailing environmental protection and economic growth model for Europe and Ireland.

The most frequently cited definition of SD emerged from the World Commission on Environment and Development's *Brundtland Report* which regards it as:

> development that meets the needs of the present without compromising the ability of future generations to meet their own needs (WCED, 1987: 43).

Although this definition continues to be commonplace, it has attracted criticism for being vague and inherently self-contradictory (Reid, 1995; Huesemann & Huesemann, 2011; Fahy & Rau, 2013), and for suggesting that economic growth, industrial modernisation, and market imperatives should be key drivers for all nations (Lélé, 1991; The Ecologist Magazine, 1993). The report's enthusiasm for economic expansion as the main mechanism for driving global environmental improvements implies that any concerted effort to modify provisioning patterns in affluent nations would impair progress towards this objective (Cohen, 2001: 25). The complex societal challenge of SD is reduced to the purely technical problem of improving industrial eco-efficiency or "producing more with less" (WCED, 1987: 206). Despite these concerns, SD is frequently perceived as encompassing the three pillars of sustainability (Langhelle, 2000; Lehtonen, 2004; Hjorth & Bagheri, 2006).

SD became a fundamental objective of the European Union (EU) when it was included in the Treaty of Amsterdam in 1997 as the overarching objective of future policies. The European Council, meeting in Gothenburg Sweden in 2001, adopted the first SD approach (European Commission, 2001) based on the proceedings of the Lisbon Strategy adopted in 2000, which set new goals for the Union to strengthen employment, economic reform, and social cohesion (European Council, 2000). The EU *Sustainable Development Strategy* is based on the belief that the economic, social, and environmental effects of key SD policies should be examined in a co-ordinated manner, and cognisance taken of this in decision-making. This offered essential means of improving co-ordination at the level of member states. The Gothenburg declaration forms the core of EU's policy towards SD (European Commission, 2010a). The strategy was further strengthened by the European Council Meeting in Barcelona (European Council, 2002) in view of the world summit on SD in Johannesburg that same year. The Commission adopted, in October 2007, the first progress report on the *Sustainable Development Strategy* (European Commission, 2007). According

to this report, there had been significant improvements in some of the seven key priorities identified in the revised strategy of 2006 - including climate and energy - but progress on policy had not yet translated into any substantial concrete action. The European Council, in December 2007, welcomed the progress report and insisted on the need to give priority to implementation measures (European Commission, 2008). In July 2009 the Commission adopted the second *Review of EU Sustainable Development Strategy* (European Commission, 2009). It highlighted that in the intervening years the European Union had mainstreamed SD into a broad range of its policies. A further monitoring review was published two years later (European Commission, 2011). This report provided a relative assessment of whether the EU was moving in the right direction given the stated objectives and targets of previous reports and was not an absolute assessment of whether the EU was sustainable or not. It noted "the disruptive effects of the economic and financial crisis over the period since 2007" and the fact that only two of the eleven headline indicators showed the same evaluation results for the 2009 report (European Commission, 2011: 12). Changes, as presented in the report, are provided in Figure 12.

SDI theme	Headline indicator	2009 report	Revised 2009 evalua-tion	Current report
Socioeconomic development	Real GDP per capita	☀	☀	⛅
Sustainable consumption and production	Resource productivity	☀	☁	☁
Social inclusion	Risk of poverty or social exclusion	⛅	☀	☀
Demographic changes	Employment rate of older workers	⛅	⛅	☁
Public health	Life expectancy and healthy life years	⛅	⛅	⛅
Climate change and energy	Greenhouse gas emissions	☁	☁	☀
	Consumption of renewables	☁	☀	☀
Sustainable transport	Energy consumption of transport relative to GDP	⛅	☁	☁
Natural resources	Abundance of common birds	⛅	⛅	⛅
	Conservation of fish stocks	⛈	☁	☁
Global partnership	Official development assistance	⛈	⛈	☁
Good governance	[No headline indicator]	:	:	:

Figure 12 - Comparison of Headline Indicators (European Commission, 2011)

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In Ireland *Sustainable Development – A Strategy for Ireland* was published in April 1997 by the then Minister for the Environment, Brendan Howlin TD. Although the primary motivation for the strategy was to respond to the UNCED processes and obligations under *Agenda 21* (Mullally, 2004), the aims outlined were broadly in line with European Union policy. A five-year review of the original 1997 strategy was held and published in later years (Irish DoEHLG, 2002). This also served as Ireland's national report on SD to the *Johannesburg World Summit on Sustainable Development* also held in 2002. Comhar[68], the Sustainable Development Council, was established by the Minister for the Environment, Heritage, and Local Government in February 1999 and is the forum for national consultation and dialogue on all issues surrounding Ireland's pursuit of SD (Comhar, 2010). In January 2012, the SD role performed by Comhar was integrated into the work of the National Economic and Social Council (NESC)[69]. Under the terms of *Towards 2016*, the Framework Social Partnership Agreement 2006-2016, the Government committed itself to publishing a renewed National Sustainable Development Strategy by 2008 (Irish DoEHLG, 2007) and a draft for public consultation was made available a number of years later (Irish DoECLG, 2011).

The new National Sustainable Development Strategy, *Our Sustainable Future, a Framework for Sustainable Development for Ireland* was launched in June 2012 with the 'green economy' becoming a central plank in the government's attempts to stimulate an economic recovery (Irish DoELG, 2012). Interestingly, the main focus of attention for this report is on economic recovery but no mention of telework (or e-work) is evident in the document. Promoting telework as an innovative and environmentally-friendly way of working would appear to be a beneficial position or strategy, in terms of encouraging economic growth allied to environmental protection. But the lack of appreciation or understanding of the issues and concerns involved, or indeed a reluctance to encourage (or indeed force) employers to introduce telework schemes, is hampering efforts in this regards. With respect to SD, telework as a policy initiative appears to be parked as an issue of concern. Notwithstanding this, consumption has a significant role to play in environmental protection, and the next subsection deals with the emergence of consumption as a crucial focus in SD policy considerations.

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[68] Comhar is the Irish word for cooperation.
[69] The National Economic and Social Council webpage dedicated to SD is available at www.nesc.ie/en/our-organisation/comhar-sustainable-development-council.

Figure 13 - Sustainable Development Strategies Timeline

The Emergence of Sustainable Consumption as a Policy Focus

Telework is endorsed due to its potential to diminish levels of consumption of distance relating to daily commuting patterns. While consumption had been a long-neglected topic in environmental discourse, there are indications that it has now moved closer to the centre of contemporary policy-making and thinking (Cohen, 2001). This is not unlike EM debates discussed in Chapter Two where the issue of consumption is the subject of increased attention amongst researchers (*cf.* Spaargaren, 1997). Consumption is now regarded as one of the core areas of SD, and there is a growing political and scientific acknowledgement that current levels of public and private consumption in high-income countries needs to change for the sake of environmental sustainability (Hobson, 2002). *Agenda 21* concedes the causal links between wasteful and inefficient consumption patterns and global environmental change (UNCED, 1992; UNDESA, 1998). Consumer behaviour is central to the impact society has on the environment (Jackson, 2005; OECD, 2012). The actions people take and the choices they make to consume particular products and services rather than others, or to live in certain ways, all have direct and indirect impacts on our environment, as well as our personal and collective wellbeing. In the case of telework, choosing to work from home reduces levels of daily commuting thus decreases the consumption of distance. Environmental pressure from household consumption is projected to significantly increase by 2030 (OECD, 2008a), and one of the key determinants of this consumption is economic growth. Other determinants include the growth in world population, the trend towards an aging of the population, urbanisation, and changing lifestyles (OECD, 2008b).

There is an interesting observation to be made regarding the subject and studies of telework. As is the case with EM, there is an attempt in the research to define and understand consumption in its own right and not part of a holistic process of development, production, and consumption. But telework is intractably linked to issues of production as well as consumption and these are intertwined and complex and should not be dealt with separately. Workers employed by organisations produce an end result, albeit often knowledge based, and they are an integral part of development processes. Indeed, it is often found that strong structural issues such as organisational arrangements and management procedures and strategies promote or impede telework development and implementation. The SC agenda appears to be adopting the same type of shallow EM policy thinking, albeit this time the focus is on the individual consumer.

Almost 2 billion new consumers will have joined the global middle class by 2030 and if demands on the planet continues at the same rate two planets will be required to maintain

current lifestyles (WWF, 2008a). Providing for this generation, and the next, presents enormous challenges for governments, and in the search for solutions decision-makers and leaders navigate a complex network of systems, inter-linkages, difficult trade-offs, and powerful feedback loops within the political, business, and natural environments (Krantz, 2010). Sustainability can serve as an innovation platform to aligning improvements in living standards with less reliance on consumption. In Ireland, and elsewhere, working from home has the potential to reduce travel and thus the consumption of distance associated with regular commuting. Sustainable consumption is the use of goods and services that meet people's basic needs and bring a better quality of life while having only minimal impact on the environment (Jackson, 2006). However, this brings valid issues of fairness and equity to the centre of any such debate on sustainability, and in the context of telework who benefits most from such arrangements?

Transport Policy

Telework (eWork) has been suggested in particular transport policy strategies as a suitable means to reduce, or eliminate altogether, the daily commute to and from work for some individuals. Workers who perform their tasks and operate from home for part or all of the week may well diminish the negative impacts of regular commuting transportation in urban and suburban areas at the peak travel periods of early morning and early evening. The structure of the working week varies considerably for different professions and cultures but among many salaried workers in the western world the working week frequently consists of Monday through Friday, with the weekend set aside as a time of personal work and leisure. The traditional business hours of 9:00 am to 5:00 pm represents a workweek of five eight hour days comprising of 40 hours in total. But moving large numbers of workers at these particular times puts enormous stress and strain on transport networks in urban industrial areas. Telework is hence proposed as a viable option in reducing peak time travel pressure on transportation systems.

Transport is a central factor in the economic and social development of a country or region, and the transportation network provides the basis of transit for a variety of transport modes in support of this development. Transport permits production and consumption to occur at different locations while transport planning allows for higher utilisation of infrastructure such as road and railway networks. But transportation is also a major user of energy and consumer of the global petroleum stock, while also creating air and noise pollution and significantly contributing to anthropogenic global warming through carbon

dioxide emissions (Fuglestvedt *et al.*, 2008). In addition, transportation facilitates automobile-oriented urban sprawl in many regions of the world. Due to the role transport plays in economic and social development it is frequently heavily subsidised by governments and good transport planning is often seen as essential to make 'traffic flow freely'. Good transport strategy ensures that supplementary policies are in place to allow governments fulfil their functions and responsibilities with regards to the regulation of transport infrastructure and services. Such supporting measures include the design of national and regional land use and development strategies.

Transport policy within the European Union historically was apportioned to the individual states, with little co-operation or cross-border allegiance between members. However, as part of the Treaty of Rome a commitment was made to the development of cross-border transport networks (Whitelegg, 1997). This was an acknowledgement of the growing frustration of public opinion with chronic delays, poor quality services, environmental concerns, and the greater overall demand for mobility within society (Humphreys, 2011). The European Transport Policy White Paper outlines the need for the transport system to be optimised across the entire European Union to meet the growing demands of enlargement and SD, as set out in the conclusions of the Gothenburg European Council meeting (European Commission, 2010b). It maintained that "a modern transport system must be sustainable from an economic and social, as well as an environmental viewpoint" (European Commission, 2010b: 6).

The dominant policy assumption in much of transport road planning has been 'predict-and-provide' and this instrument has largely remained unchallenged until the 1990s (Vigar, 2002; Cahill, 2010a; Heisserer, Hynes, & Rau, forthcoming). Transport planners devise forecasts of expected increases in the numbers of those who want to drive, and would potentially become drivers, and extrapolated from this the new road space which would be required to meet the expected growth in traffic. This, it has been argued, is transport policy heavily influenced by pressure groups active on behalf of motoring, oil, and road construction interests (Hamer, 1987; Dudley & Richardson, 2000). For most of the twentieth century nations therefore dealt with continued increases in demand for road travel by building roads, largely disconnected from considerations associated with other transport modes and from other forms of spatial development (Vigar, 2002). But what does transport policy consists of in Ireland, how or is it unique, and who are the key actors when it comes to policy design?

As stated, 'predict-and-provide' is a very powerful transport policy paradigm with apparent linkage to the future, and it has also largely dominated Irish transport policy-making. In November 2005 the Irish government announced the most ambitious transport infrastructural plan in the history of the state, which sought to greatly expand Ireland's transport network, at cost estimated to be €34 billion (Transport 21, 2006). The plan included continued investment in Ireland's road network, along with investment in public transport in the form of buses and rail infrastructure. Whilst the strategy was due to run from 2006 to 2015, the *Transport 21* website reported that the capital investment framework concluded in 2010. The growth in the demand for traffic, and in particular the motorcar, showed no sign of abating at that stage but problems posed by vehicle emissions and congestion were beginning to be recognised as challenges on a national and global scale.

In Ireland, people's everyday travel behaviour - such as the daily commute to and from work - largely depends on access to a private car. This has led to the country being classified in the literature as one of the most car-dependent countries in Europe (Wickham & Lohan, 1999; Commins & Nolan, 2010; Rau & Vega, 2012). The disadvantages of a car-dependent systems for society and the environment has been discussed in the past (Vigar, 2002; Wickham, 2006; Cahill, 2010a). The environmental impacts of GHG emissions, air and noise pollution, and urban sprawl, have increased and become problematic for many citizens over the past number of decades in Ireland. Transport-related social exclusion also remains a significant problem for car-less households (Rau & Hennessy, 2009). Ireland's current mobility patterns are now acknowledged as unsustainable, and to continue on this trajectory would mean:

> …congestion will increase, making it more difficult and stressful to make even the most basic journey. For those who have to commute, it will mean longer and longer days, less time with their families, less leisure time and less involvement in their local communities (Irish DoT, 2009: 7).

The onset of the recession and the resulting depletion of public finances in the latter part of the last decade brought about a change in transport policy which was necessary to respond to severe disruptions in the established socio-economic and political system, and to shield individuals and businesses against rising transport costs (Heisserer, Hynes, & Rau, forthcoming). The opportunity to transform and shift transport policy away from prioritising the continuing expansion of the car and related infrastructure is now available.

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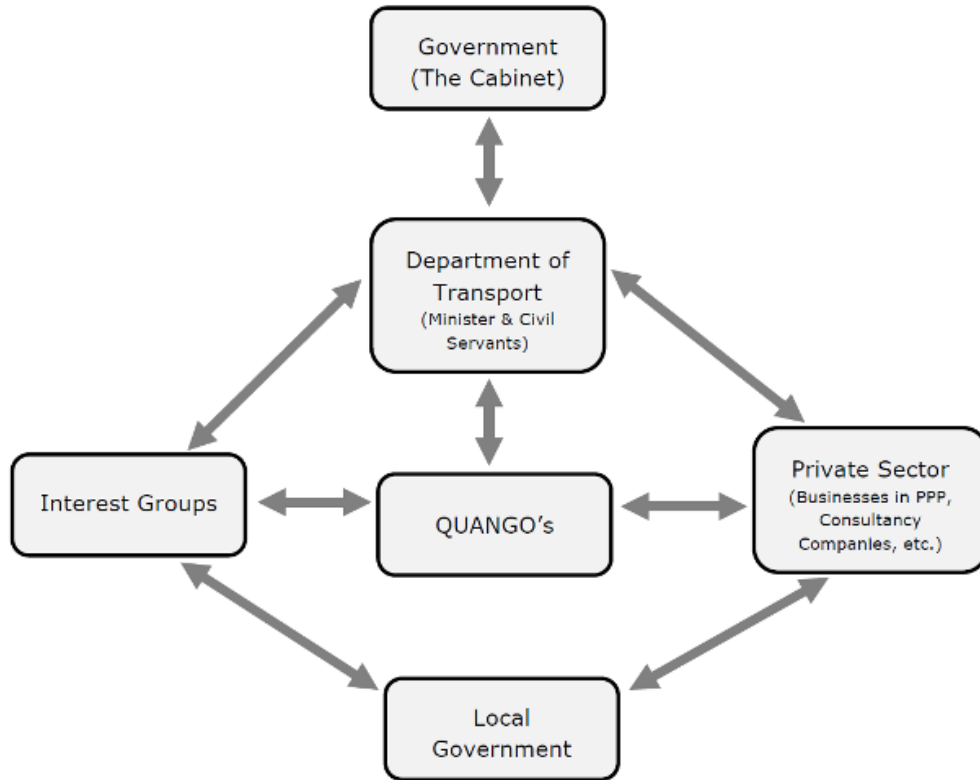
Figure 14 - Key Actors in Irish Transport Policy-Making

At a national level transport policy remains strongly under the remit of central government, but the 'Europeanisation' of key areas of national policy such as infrastructure construction and service provision is becoming evident (Harvey, 2008). The establishment of the social partnership process in the 1980s widened the influence to include the main employer groups and trade unions on policy discussions and direction. The community and voluntary sector in Ireland, which included a group of 26 environmental NGOs, joined the social partnership process under negotiation of the *Partnership 2000* in 1996 (O'Donnell & Thomas, 1998), but their ability to influence governmental policy remained weak (Davies, 2009). Much of transport policy decision-making emanated from the well-documented alliance between politics and business interests, most notably the construction sector, combined with an uncritical 'pro-development' attitude from the trade union movement which prioritised new infrastructure construction. This policy rhetoric is very much associated with EM, an optimistic win–win view of achieving economic development and environmental protection simultaneously (Davies, 2009: 179). Further sources of influence on transport

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policy design came from a number of Quasi-Autonomous Non-Governmental Organisations (QUANGOs) including the National Roads Authority (NRA), the National Transport Authority (NTA), and Córas Imopair Éireann (CIE) which included Bus Átha Cliath (Dublin Bus), Bus Éireann and Iarnrod Éireann (Irish Rail). QUANGOs are controlled by non-elected individuals appointed by government, and although they are purported to be based on expertise and interests they are widely speculated to be no more than payback for political patronage (Clancy & Murphy, 2006).

In an apparent move away from predict-and-provide, a new policy initiative was announced which acknowledged that increased traffic congestion had serious health and environment consequences for present and future generations, and Ireland's "current transport trends [were] unsustainable" (Irish DoT, 2009: 7). Incorporating extensive public consultation in its formational stages the *Smarter Travel* document was a significant policy shift from the previous position of large-scale road construction, emphasising the importance of reducing private car usage in favour of increased model share for sustainable means of transport such as walking, cycling, and public transport. Several years later, and in stagnant Irish economy, *Smarter Travel* appeared to have stalled as a policy initiative, with little evidence of any significant transport model shift (Heisserer, Hynes, & Rau, forthcoming). The current government continues to use the phrase *Smarter Travel* largely for infrastructural construction programmes for cycle lanes, pedestrian walkways, and public transport (Raleigh, 2012), but there is little evidence of any significant change in the transportation paradigm of predict-and-provide. In July 2012 the Minister for Transport, Tourism, and Sport Leo Varadkar announced, on the Departments' website, that the motorway road building budget had been restored (Irish DfTTS, 2012b).

The *Smarter Travel* document outlined actions to reduce travel demand, and pivotal to this was the need to improve the alignment of spatial and transport planning to stop urban sprawl and urban-generated one-off housing in peri-urban areas (Irish DoT, 2009: 11). A particular focus on encouraging telework (eWorking) was part of this action plan to reduce avoidable travel in the form of the daily commute to and from work. The document suggested that:

> ..if even 10 per cent of the working population of 2.1 million were to work from home for 1 day a week, it would result in a reduction of around 10 million car journeys to work per annum (Irish DoT, 2009: 35).

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The government sought to ensure that the public sector would become an exemplar in this area and suggested that organisations in the public sector set targets to encourage telework, which could be followed by private sector organisations on a voluntary basis. Action six of the document specified that research be undertaken to determine if telework centres could be established on a regional basis to facilitate people from rural areas and satellite towns to work from a location closer to home (Irish DoT, 2009: 35), but no evidence of such research is available.

The Minister of State for Public and Commuter Transport Alan Kelly announced the results of the national competition for *Smarter Travel Areas* on the 1st of February 2012, and declared that funding of €23 million over five years would be provided to promote cycling and walking, the use of public transport, and efforts to reducing car travel (Irish DfTTS, 2012a). Provisions for infrastructure delivery - such as cycle and pedestrian paths - were recommended, in addition to eWorking as a key component for reducing congestion and pollution. Nonetheless, little was forthcoming to indicate any measures to promote or enhance telework. The three successful *Smarter Travel Area* bids make little or no reference to telework in their final submissions. The Dungarvan bid declared that eWorking facilities would be provided at the Dungarvan Enterprise Centre, but apart for office space and amenities provision, little in the way of incentives or promotion of telework is provided (Waterford County Local Authorities, 2010: 39). The Limerick City bid sought to encourage eWorking in order to support the Government's drive to have 10 per cent of the workforce working at home for at least one day a week, but no strategy or plan was put forward to achieve this (Limerick City & County Council, 2010: 56). There was no mention of eWorking/telework in the successful Westport submission (Westport Town Council, 2010). In many respects, however, these proved to be token projects with little long-term effects.

Telework has the potential to contribute to transport policy and strategy because of the potential to reduce or eliminate the daily commute to and from work. This can diminish some the negative environmental consequences emanating from the transport sector. But in the case of Ireland, there is little evidence of any real impetus to promote or encourage telework and much of what is apparent in the *Smarter Travel* transport policy document is merely aspirational and lack any forceful measures or guidelines. Indeed, it must be questioned if telework falls under the remit of transport policy and if not what is the correct Department or sector that should be tasked to develop and implement telework in Ireland? Is telework an environmental and sustainability issue, a topic for consideration in transport policy design, or should it be the concern of (flexible) working policy-making?

(Flexible) Working in Ireland & the Role of Telework

Throughout the period of the 'Celtic Tiger' (1995 – 2007), the Irish economy was unique in Europe recording high levels of economic growth averaging at 7.2 per cent per annum (Kelly, 2009). High sustained economic growth led to low inflation, a balance account of payment surplus, falling unemployment, net immigration, and a growing budget surplus, all key positive macroeconomic indicators (Murphy, 2001a). However, after 2007 Ireland's economy declined dramatically and the country went into recession in September 2008. Many analysts blamed the country's over-reliance on the construction industry and property-fuelled economic growth combined with unregulated credit from banks for the resultant crash (Cody, 2009; Ross, 2009; Cooper, 2011). Unemployment rose at a faster rate than anytime over the previous twenty years, and the rate of unemployment recorded in 2012 stood at 14.5 per cent (RTE, 2012). The recession initially had negative effects on employment in the construction industry, which accounted for a large share of early job losses, but rapidly this decline has spread across the economy to manufacturing and services sectors affecting both male and female workers, including a high proportion of migrant workers (Barry & Vasquez del Aguila, 2009).

During the decade of high growth, the gender trend on the Irish labour market had undergone significant changes reflected in a considerable increase in the proportion of women in paid employment. Women's share of total employment increased from 37 per cent in 1993 to 42 per cent in 2004, and represented a continuing trend from the 1980s (Russell, O'Connell, & McGinnity, 2009). This is expected to continue and women are projected to account for about 45 per cent of all employment by the year 2015 (Sexton, Hughes, & Finn, 2002). The European Union target rate for women in employment was 60 per cent by 2010, a target that was met by Ireland in 2007 and 2008 (Irish Congress of Trade Unions, 2010). The labour market profile of immigrants into Ireland during the economic boom years showed them to be a young a highly educated group (Barrett, Bergin, & Duffy, 2006). If it were the case that immigrants and natives were employed in an identical manner in the Irish labour market Barrett, Bergin, and Duffy (2006: 16) suggest that immigrants who arrived in the years between 1993 and 2003 increased GNP by between 3.5 and 3.7 per cent, largely by lowering skilled wages by around 6 per cent and increasing Ireland's competitiveness.

But what does this mean in terms of flexible working arrangements - in particular telework - in Ireland? The changing circumstances and demographic of the working population is highly significant in this regard as many of these 'new workers' are highly mobile and seek flexibility arrangements in improving their work-life balance. Indeed, the

current sacristies of opportunities for some are forcing changes upon the working environment in Ireland. However, while the burden of commuting has levelled off since the recession began the average worker still spends almost nine days each year getting to and from work (Humphreys, 2013). Bill Roche, Professor of Industrial Relations and Human Resources at the UCD School of Business, notes that:

> …there isn't any strong evidence that firms have exploited the recession to fundamentally transform workplaces, or work and employment patterns, to, for example, make them more insecure for employees. What you actually see as the dominant pattern in Ireland, in the recession, is firms battling to sustain pre-recession work and employment practices (Humphreys, 2013).

Statutory provision for leave entitlements, other than maternity leave, is limited in Ireland and could be described as at the lower end of the European Union spectrum. Maternity leave is paid, but paternity leave is not recognised under Irish employment law and thus there is no statutory entitlement so is regarded as unpaid. The *Parental Leave Acts* - 1998 and 2006 - give employees a limited right to leave in times of family crisis, known as 'force majeure leave'. Other leave, such as for normal family or other social purposes, is largely regarded as discretionary and within the gift of employers. Many of the key civil and public service sectors provide for a range of flexible working options and leave arrangements, and individual private sector organisations have also implemented their own work/life balance initiatives. However, developments are slow, and there is evidence that the development of a long-hour culture with excessive commuting times has been undermining quality of life issues for a large section of the Irish workforce (Barry & Vasquez del Aguila, 2009: 4). In addition to leave, childcare provision for pre-school children in Ireland is uncoordinated, variable in quality, and expensive, and there is no state support for after-school childcare and a scarcity of provision (Russell, McGinnity, Callan, & Keane, 2009). As the recession deepens, it is unlikely that any new initiatives with regards to leave entitlements or childcare provision will be introduced over the coming few years.

Work/life balance is the general term used to describe organisational initiatives aimed at improving employee experience of work and non-work domains. Work/life programmes are "employer sponsored benefits or working conditions that help employees balance work and non-work demands" (Cascio, 2000: 166). These arrangements and practices refer to initiatives voluntarily introduced by organisations which facilitate the reconciliation of employees' personal and work lives. Such initiatives, McCarthy, Darcy, and Grady (2010) maintain, include; temporal arrangements that allow individuals reduce the number of hours

they work through job sharing or part-time work, flexible working arrangements such as flexitime where employees are at liberty to choose a start and finish time that matches their personal needs but within the core hours allotted, and telework where employees have location flexibility to complete their tasks or work. In addition, specific work/life balance supports can be put in place. These include employee counselling, employee assistance programmes, time-management skills training, stress management training, childcare facilities or financial support for childcare costs. These initiatives and supports are put in place by organisations to assist staff manage the everyday demands of work and personal life (McCarthy, 2004). In the context of Ireland the public sector tends to offer more programmes that are geared towards reduction of hours compared with the private sector, whilst the private sector offers more work/life balance support initiatives compared with the public sector (McCarthy, 2008: 29).

There is no legal right to work part-time in Ireland, or indeed any other flexible working arrangements such as flexitime working, job sharing, or telework. This is in contrast with several European countries which introduced a legal right to work part-time under the 1997 European Directive on part-time work. Germany, The Netherlands, Finland, and Belgium all guarantee the right to work part-time, whilst France allows such arrangements for parents only. The Irish response – the Protection of Employees (Part-Time Work) Act 2001 – emphasises improving the quality of part-time work rather than granting a right to work this way (O'Connell & Gash, 2003). Part-time working, job sharing, flexitime, and telework are all at the discretion of individual employers, reflecting an overall *laissez-faire* approach to regulation in the area of work in Ireland. O'Reilly (2003) suggests that low statutory working-time regulation and the diminishing role of trade unions allow employers in Ireland more power in shaping working time than is the case in countries such as France, Germany, and the Netherlands. This tends to benefit valuable high-earning employees, and those in the public sector (Russell, O'Connell, & McGinnity, 2009). There is a need for Irish policy-making to legislate, cognisant of deeper aspects of EM thinking, if telework is to be made more environmentally and socially sustainable.

Barry and Vasquez del Aguila (2009) reported that part-time employment and flexible working hours were the most common forms of flexible work arrangements on the Irish labour market. This follows a similar pattern in other European countries, often explained by women's increased involvement in paid employment. Among women, part-time jobs are skewed towards the routine and less skilled occupations such as personal services, sales, clerical and secretarial work. Only 23 per cent are in managerial, professional, and

associated occupations, compared to almost twice that proportion – 45 per cent – among women working full-time (O'Connell & Russell, 2007). This transformation in the composition and size of the workforce in Ireland, which accompanied the surge in the number of women in paid employment outside the home and the growth of inward migration, prompted a significant change in the overall nature of employment in the country. These changes, together with an aging population, have brought the issue of reconciliation between work and family commitments to the fore in Ireland, in a policy climate where state support for care is low and policy is predicated on there being one female carer in the home (McGinnity, Russell, & Smyth, 2007). Russell, O'Connell, and McGinnity (2009: 93) claims that in Ireland part-time work offers the greatest opportunity for work/life balance, followed by flexi-time, but neither telework nor job sharing had such an effect; at least in terms of reducing work/life balance conflict and pressure.

In 2009 the National Centre for Partnership and Performance (NCPP) published a two volume report entitled *The Changing Workplace*, in an attempt to capture the labour market in Ireland (NCPP, 2009).   These surveys sought the views and experiences of both employers and employees, both in the private and public sectors, of existing conditions and work environments in Ireland. The 2009 surveys were the second major national workplace surveys to be conducted in Ireland; the first survey took place in 2003. It was, therefore, possible to track some of the changes in attitudes and experiences of employers and employees over this period. Russell and McGinnity (2011) produced *Workplace Equality in the Recession*, which examines the incidences and impact of equality policies and flexible working arrangements in the workplace, and relies broadly on information from *The Changing Workplace*. It noted in its summary that "the survey data were collected soon after the labour market entered a deep recession, and are compared with those from 2003 survey conducted during the economic boom" (Russell & McGinnity, 2011: xi). No evidence that workplaces had reduced formal equality policies or limited flexible working arrangements or options was found.

The 2009 NCPP studies reported that almost 30 per cent of employees in Ireland worked flexible hours, including flexitime, and over 25 per cent worked part-time. 9.5 per cent were involved in job sharing and 12.8 per cent regularly worked from home in normal working hours[70]. This figure for telework is higher than the European average and appeared to contradict the figure of 4.2 per cent recorded in the *European Telework Report* (Eurofound,

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[70] This was a more restrictive definition of telework than used previously, confining the question of who worked from home *during normal office hours* in order to exclude cases of employees bringing home additional work with them in the evenings and weekends.

2010b). The survey also revealed that women were more likely than men to work part-time and were more likely to job share, even after accounting for other factors. This gender gap was much narrower for telework and working flexible hours. The gap tightened even further when other personal and job characteristics were taken into account. There is evidence in the reports of a rise in working flexible hours, part-time work, and telework between the years 2003 and 2009, and this is particularly notable in the private sector. The modest rise in job sharing was accounted for by the shifting sectorial distribution of employment. The number of flexible working arrangements available to employees in an organisation is associated with some positive organisational outcomes namely; greater job satisfaction and increased output innovation. In addition, participation in these arrangements had no noticeable impact on job satisfaction, organisational commitment, output innovation, and absenteeism.

The results also suggest that telework increased both work/life conflict and work pressure. This is a recurrence of the results found in the 2003 survey. As such, telework should be viewed more as a form of work or task intensification than an arrangement for promoting and encouraging better work/life balance, the report proposed. In addition, the findings indicate that individuals who teleworked tended to have higher earnings, though this was largely accounted for by the type of employment and jobs they performed. Those who worked from home enjoyed greater autonomy in their work, and this effect remained after accounting for both personal and organisational characteristics. Telework was commonly practiced among those working in financial and business services, and particularly those working in professional or managerial jobs (Russell & McGinnity, 2011: 102-103). It was also associated with longer working hours than the average, and this was the only form of flexible working that was more prevalent in the private sector in 2009.

Part-time work has the strongest positive impact on employee well-being (Russell & McGinnity, 2011: xiii). This method of working also tended to reduce work/life conflict and overall work pressure significantly even when personal characteristics, occupation, and organisational characteristics were taken into account. Both part-time working and job sharing were associated with lower job autonomy, even after controlling for other factors, and part-time work was also related to lower earning. Employees who worked for organisations that allowed flexible working hours had less work/life conflict and less work related pressure. Participation in flexible working arrangements was associated with increased job autonomy and a high number of such arrangements were associated with

higher hourly wages, although this was not as evident within the public sector. This may be related, in part, to institutional factors linked to flexitime (Russell & McGinnity, 2011: xiii).

The successful development of more flexible and innovative working arrangements and options is inextricably linked to the development and adoption of ICT. However, research indicates that, with regards to flexible working in Ireland, significant organisational and cultural barriers remain to be overcome before its full potential can be realised (Humphreys, Fleming, & O'Donnell, 1999). Whilst flexible working and increased work/life balance have been key features of many of the partnership agreements between governments and the social partners over the years (see *The Programme for Prosperity and Fairness*: Section 4.3) no legislation to support such positive initiatives has been forthcoming. Such flexible working arrangements remain resolutely the discretion and gift of individual organisations and employers (Russell, O'Connell, & McGinnity, 2009: 75) who often failed to recognise the associated benefits for workers, and their own organisations. The following subsection will delve deeper into one of these flexible working arrangements - telework - to provide a firm foundation and understanding with regards to this method of working in Ireland today.

Moving Work: *(a lack of) telework policy in Ireland*

With the increasing availability of ICT, and the rollout of broadband infrastructure countrywide, the Irish Government acknowledged telework as an important "component and facilitator towards introducing and supporting a new paradigm of work, organisation and trade" (Callanan, 1999: 5). Much of the early momentum and impetus for telework was overseen by the then Minister for Science, Technology, and Commerce at the Department of Enterprise, Trade and Employment, Noel Treacy TD, and was structured within existing social partnership frameworks. It was anticipated that deregulation of telecommunications in Ireland, price reductions and performance improvements, would allow telework to become a conventional method of working into the future. Despite this early enthusiasm no firm policy proposals or initiatives to promote or develop telework in Ireland is evident at this point.

Social partnership was a series of negotiated agreements between Government, the main employer and business groups - Irish Business and Employers' Confederation (IBEC) and the Construction Industry Federation (CIF) - and the trade unions - the Irish Congress of Trades Unions - and at its core was a trade-off of modest wage increases in exchange for a lighter income tax burden. There were also sectorial reforms on pay and conditions, of which

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telework became a potential component particular within the civil service. Commenting on a European award for the National Advisory Council's report entitled *Teleworking's Code of Practice*, Minister Treacy stated that the award was "a major tribute to our social partnership process and will be very helpful in promoting the Code of Practice, and indeed e-work itself" (Irish DoETE, 2000b). Recognition of the need to have a clear framework and way forward for telework led to the inclusion of the practice into the *Programme for Prosperity and Fairness*, which ran from 2000 to 2003 (Department of the Taoiseach, 2000; Irish DoETE, 2000a). The programme outlined a series of measures designed to speed up Ireland's transition to an information society including, "encouraging and supporting teleworking" (Department of the Taoiseach, 2000: 7). Section 4.4 of the programme indicated:

> Ireland will be developed as a "telework friendly" location, including endorsement by the social partners of the Teleworking National Advisory Council's Code of Practice, as well as a review of the relevant fiscal and environmental structures.
>
> Government will introduce teleworking options into mainstream public service employment and, additionally, all publicly-funded organisations will develop a teleworking policy for implementation by 2002 (Department of the Taoiseach, 2000: 124).

The terms 'telework' and 'e-Work' are often used interchangeably in much of the Irish literature (Enterprise Ireland, 2001)[71]. Telework is regarded as encompassing activities such as telesales, businesses operated from home, mobile working in sales or service industries, in addition to other forms of electronic working. It is defined as "a way of working using information and communication technologies in which work is carried out independent of location" (Irish DoETE, 2000c: 7)[72].

Standard employment legislation applies to all telework organisation and arrangements in Ireland. Since 2005 the Safety, Health and Welfare at Work Act require employees and their employers to identify hazards in the workplace and assess the risk to a person's health and safety presented by these hazards (HSA, 2005). All provisions of this act, and the preceding regulations of the 1989 and 1993 Acts, apply to teleworkers and their employers. Section 20 of the 2005 Act requires an organisation to produce a written programme to safeguard employees at work and the health and safety of others who might visit that workplace. An organisation proposing to establish a telework programme must,

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[71] When e-Work is referred to in the chapter the reader can infer it to mean telework.
[72] In the context of this research telework refers to all aspects and occurrence of work where the individuals is not present at a central location, and includes home teleworkers, telecentre teleworkers, telecommuters, and mobile workers.

therefore, first assess the likely health and safety risks to workers and others that may come in contact with the workspace. The organisations Health and Safety Office should assess the suitability of the proposed home office space, but self-certification by the individual themselves, to agreed standards, may also be used.   However, it has been argued that where teleworkers in Ireland are working from home they are rarely inspected by the Health and Safety Authority (HAS) for the following reasons; they are not on the HSA computer register, not readily identifiable when putting new work places on the register, and the authority is unaware of their existence (Eurofound, 2005: 11). In addition, an anomaly in this legislation means that in practice the employer would have to get permission from the teleworker to go into his home so that he (the employer) could comply with his responsibilities.

The Likely Health and Safety Risks for Teleworkers

- Equipment and furniture
- Electrical safety
- Fire safety
- Lighting
- Heating and ventilation
- Ergonomic guidelines on keyboard and VDU use
- Guidelines on carrying heavy items and equipment
- Accident reporting procedures
- Guidelines on avoiding the negative impact of isolated working

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Table 8 - Likely Health & Safety Issues for Teleworkers

There are Irish tax implications for teleworking arrangements which need to be considered before implementation of any programme. The Revenue Commissioners define e-Working as methods of working using ICT in which work is carried out that is not bound to any particular location (Revenue, 2001). These include; working at home on a full or part time basis, working some of the time at home and the remainder in the office or, working while on the move with infrequent visits to the office. In relation to telework the choice of an individual's base may cause an element of difficulty. As outlined by Revenue, in practice if the employee purely works part-time in the office and part-time at home the base is regarded as the office.

An individual's employer may provide equipment - computers, printers, scanners, fax machines and application software - to enable him/her work from home. Where the provision of such items is primarily for business use a benefit-in-kind charge will not be imposed on the employee in respect of incidental private use. The provision of a telephone line for business use will also not give rise to a benefit-in-kind charge. Likewise, the provision of other equipment such as office furniture which enables the person work from home will not attract a benefit-in-kind charge, where the equipment is provided primarily for business use. Teleworkers may incur particular expenditure in the performance of their duties from home, such as additional heating and electricity costs. Revenue allows an employer make payment up to €3.20 per day to employees without deducting PAYE and PRSI. This does not prevent an employee making a specific additional expenses claim where the actual expenditure is in excess of this amount. The tax treatment of motor expenses and subsistence payments, which may be made by an employer without attracting a tax liability, is set out in the Employees' Motoring/Bicycle Expenses (Revenue, 2009a) and the Employees' Subsistence Expenses (Revenue, 2009b) pamphlets respectively. When a telework employee uses any part of the home for work purposes the capital gains tax exemption for Principal Private Residence will not be restricted.

There is an absence of employment legislation dealing specifically with telework, or the status of teleworkers, at present on the statute books in Ireland. The development of strategies to encourage and stimulate telework has, by-and-large, been left to agencies and other organisations such as the National Advisory Council on Teleworking, the e-Work Action Forum, Enterprise Ireland, and Eircom (the once state-owned Irish communications service provider). More importantly, while considerable reference was made to telework, particularly in the early part of the last decade, little action is evident of genuine practical development of policies or approaches to support companies and individuals to implement schemes. In addition, the council and forum setup to support Government policy and decision-making have concluded their work and operations, and the informational website and portal have not been updated for some years now and are no longer available online[73].

The National Advisory Council on Teleworking was established by Minister Treacy in April 1998. It comprised of experts representing diverse areas of concern, expertise, and experience in the areas of telecommunications and information technologies[74], and was charged with the task of advising the Minister on telework and related employment

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[73] The official Irish Governmental telework information portals - www.e-Work.ie and www.telework.ie - are no longer accessible online.
[74] The full membership of the council is provided in the Appendix.

opportunities. The first duty of the council was to produce a report on telework in Ireland and a code of practice, in collaboration with the main stakeholders involved. It was also tasked to provide recommendations for further direction and policy, from an Irish perspective. The council was superseded in November 1999 by the e-Work Action Forum which assumed the role of developing tasks and strategies sets out in the council's earlier report. The e-Work Action Forum concluded its work at the end of 2002, and the last annual report was issued for that particular year (e-Work Action Forum, 2003). In a written reply in 2003 to a Dáil question from Fine Gael's Phil Hogan to the then Tánaiste and Minister for Enterprise, Trade and Employment, Mary Harney, the total cost for the workings of both the National Advisory Council on Teleworking and the e-Work Action Forum was officially stated as €156,856.29 (Houses of the Oireachtas, 2003).

In the context of the European Employment Strategy, the European Council invited members to negotiate agreements to modernise the organisation of work within the community. As a result of these negotiations, on the 16th July 2002 the *European Framework Agreement on Telework* was signed (Europa, 2002). This agreement was not required to be implemented through a European directive, but could be transposed through the autonomous route in accordance with the procedures and practices specific to management and labour in each member state by July 2005. The majority of countries elected to implement the agreement through bipartite collective agreements, many taking place between unions and employers. However, Ireland elected implementation through *soft law*[75] mechanisms. The agreement was thus realised through means such as voluntary agreements, codes of conduct, or guidance. The aim of these instruments, which are non-binding and voluntary in character, was simply to provide information about telework in light of national work regulations in order to facilitate the application of the European Framework Agreement's stipulations (EIRO, 2010). Commenting on Ireland the report noted:

> In Ireland, the government published a code of practice in 2000 that was updated in light of the European Framework Agreement. A number of Irish trade unions have also issued unilateral guidelines based on the European agreement to be used for negotiating telework arrangements with employers. However, company-level collective agreements incorporating telework issues have not yet been reported (EIRO, 2010).

The report of the National Advisory Council on Teleworking - *New Ways of Living and Working: Teleworking in Ireland* - was published at the end of the millennium (Callanan,

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[75] Soft law is the term applied to measures such as guidelines, declarations and opinions which, in contrast to directives, regulations and decisions, are not binding on those to whom they are addressed.

1999). It was aimed at informing those interested in telework of the wide range of issues involved, from the inception of the idea to implications of telework for the self-employed, employers, and employees. It dealt with the subject under a number of different headings including; regional policy, communications infrastructure, awareness, education and training, employment opportunities, legislation and the fiscal environment. The report concluded that in addition to creating an environment for new employment the potential for improving the quality of life of workers was considerable. Telework offered "a better balance between our role as part of the labour force and our other roles as members of society outside work" (Callanan, 1999: 42). Significantly, in the forty eight pages report little attention was paid to environmental issues, with just ten lines set aside for such considerations:

> Motor vehicles are a significant source of greenhouse gases, air pollution, noise, and deterioration of the urban environment and health problems. Both the Department of the Environment and the Environmental Protection Agency have acknowledged the environmental benefits of teleworking, including:
> - reduced commuting, leading to less fuel consumption and less emissions
> - reduced traffic congestion, and
> - possible savings in energy use in urban buildings (Callanan, 1999: 18).

The majority of deliberations were heavily focussed on the economic and social benefits for the country of the widespread adoption of telework.

To accompany the launch of the report, a short three page synopsis was also produced (Irish DoETE, 2000d). In this, seven recommendations to Government were laid out. These began with a call for a precise Government awareness campaign to encourage telework in Ireland. It recommended the formation of a Government telework policy in addition to the implementation of 'telework-friendly' training and education. Furthermore, it argued for the formation of a telework action forum, the establishment of new business models, and a telework-friendly Ireland from a fiscal and environment point of view. It also advocated for EU structural funds to be made available to help finance the upgrading of telecommunications links in rural areas of the country. In particular, it referred to the provision of low-cost broadband telecommunications access as providing the correct environment for increased activity in e-Commerce and a telework-friendly setting throughout the country.

The report *e-Working in Ireland: New Ways of Living and Working: Code of Practice*, was produced by a working group established by the National Advisory Council on

Teleworking, the Irish Business Federation (IBEC) and the Irish Congress of Trade Unions (ICTU), and was based on pre-existing Irish employment legislation (Irish DoETE, 2000c). This report was intended to inform all interested stakeholders of the range of issues involved in telework and sought to lay out the prevailing work-related legislation that applied, in addition to other obligations for employers and employees. It established an outline of terms of employment, data protection, and health and safety legislation, but no new recommendations for policy or legislation was foreseen nor suggested. Interestingly, the report "envisaged that the code would be regularly reviewed and up-dated, as appropriate" (Irish DoETE, 2000c: 7), but no such review or revision was ever undertaken.

In October 2000 the Department of Enterprise, Trade and Employment, the e-Work Action Forum, Enterprise Ireland, and the Information Society Commission provided proposals to Government in a report titled *e-Working in Ireland: Fiscal Barriers and Incentives* (Irish D0ETE, 2000). This was a KPMG evaluation of the principal barriers within the Irish tax system to expanding levels of electronic working in the Irish economy. This report recognised that there were no Irish fiscal incentives that encouraged telework, and recommended certain tax incentives and employer reimbursements be introduced in conjunction with the adoption of the aforementioned code of practice. In addition, it advocated a range of Government measures required to encourage the development of telework in Ireland. In response to this report the Office of the Revenue Commissioners issued a pamphlet dealing with tax implications of telework employees in Ireland (Revenue, 2001), which will be discuss later in this section.

The Irish Government published the Electronic Commerce Act in 2000 providing legal recognition of electronic contracts, electronic writing and signatures, and original information in electronic form for commercial or non-commercial transactions (Irish Statute Book, 2000). The bill also provided for the admissibility of evidence in relation to such matters, the accreditation, supervision, and liability of certification service providers and the registration of domain names. Although no specific mention of telework was made in the bill, it does have obvious implications for individuals who work over-distance and deal mainly in electronic documents. In addition, the Data Protection Act of 1988 was amended to take cognisance of developments in the capabilities of ICT and sought to enshrine into legislation protection for individuals with regards to their personal data (Irish Statute Book, 2003). Although again not specific to telework it does have implications for how all knowledge workers, and their employers, operate and function using ICT.

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The first of three consecutive annual reports from the e-Work Action Forum was released early in 2001 (e-Work Action Forum, 2001). The report discussed some of the key actions that could be adopted to develop telework in Ireland. It outlined a proposal to finance pilot e-Work projects with funding provided by Enterprise Ireland. A total of eleven companies were identified and funding – which on average amounted to €8,787 per organisation – was spent "largely on hardware, software and related infrastructure, and further support (e.g. for training) would be considered, as appropriate" (e-Work Action Forum, 2001: 12). The report carried the results of an MRBI survey which indicated that the profile of teleworkers was; 75 per cent male, 25 per cent female, aged typically between 30-40 years of age, and located primarily in Dublin[76]. The survey also indicated that trust was a major issue of concern for management and catering for the social needs of employees who worked from home was a disincentive to the introduction of telework.

The second annual report from the e-Work Action Forum was released in 2002 by the Forum's Chairman William Burgess, the then Managing Director of IBM Ireland (e-Work Action Forum, 2002). The report again stressed that advancement in ICT was rapidly transforming many aspects of business, but emphasised that "while technological advances have created the infrastructure to enable work to be carried out remotely, the impetus to introduce e-Working is firmly rooted in business and human resources issues" (e-Work Action Forum, 2002: 3). The continuation of e-Work business awareness campaigns was outlined, with branding and promotion assuming a central role. The report discussed the press advertising campaign which relied heavily on the website e-Work.ie, regarding it as an important national information resource and delivery mechanism for actions. In addition, recognition that previous survey results varied widely, in the context of telework, was noted and the e-Work Action Forum sought to engage with the Central Statistics Office (CSO) to include questions on telework in their Quarterly Household Survey for autumn 2002.

The third (and final) annual report of the e-Work Action Forum was made available in 2003 (e-Work Action Forum, 2003). It noted that training courses on the competencies necessary to support telework was now in place at FÁS[77], and these courses was accredited by Further Education and Training Awards Council (FETAC) and available online. The report noted:

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[76] Workers living in Dublin were not exactly the target group of long-distance commuters envisaged by many telework advocates. A more appropriate group would be individuals living in the neighbouring counties - such as Meath, Offaly, and Wexford - and working in Dublin.
[77] FÁS was the National Employment and Training Authority in Ireland. In January 2012 the authority's work and programmes were transferred to the Department of Social Protection.

> …the Forum has achieved very considerable progress in furthering the e-Work agenda. It has raised awareness if the potential for e-Work through remedying information gaps and has addressed other factors such as the lack of certainty with regard to taxation issues, and lack of specific training which previously impacted negatively on the operating environment for e-Work (e-Work Action Forum, 2003: 7).

In October 2002, having reviewed the work of the Forum the Minister for Trade and Commerce considered that, with the completion of the awareness campaign and the launch of the training courses, the Forum had fulfilled its mandate and should not continue beyond the end of 2002. Much of the operational elements to the awareness campaign were thus turned over to Enterprise Ireland who continue to provide information, advice, and direction on the subject (Enterprise Ireland, 2005). Despite this early interest no policy proposals, developments, or initiatives to promote telework in Ireland is evident at this point, nor have been proposed.

Timeline of Governmental Action & Publications on Telework in Ireland

Establishment of the National Advisory Council on Teleworking by Mr Noel Treacy TD, Minister for Science, Technology and Commerce	1998
The Report of the National Advisory Council on Teleworking (NACT) to the Minister for Science, Technology and Commerce - New Ways of Living and Working - Teleworking - in Ireland	1999
A Synopsis of the National Advisory Council on Teleworking Report	1999
Creation of the e-Work Action Forum (formally the National Advisory Council on Teleworking)	1999
E-Working in Ireland: Code of Practice	2000
E-Work in Ireland: Fiscal Barriers and Incentives	2000
Electronic Commerce Bill	2000
The First Annual Report of the E-Work Action Forum	2000
e-Working and Tax – IT69 (Revenue leaflet dealing with tax implications of e-Working employees)	2000
The Second Annual Report of the E-Work Action Forum	2001
The Third Annual Report of the E-Work Action Forum	2002
Central Statistics Office – Quarterly National Household Survey: Module on Teleworking: Third Quarter 2002	2003

Table 9 - Timeline of Action on Telework in Ireland

The Reality of the Irish Telework Experience

Over the last number of decades ICT have *come of age* transforming and influencing the industrial terrain in Ireland and has significant consequences for how people work. Telework is one element of this change. The National Advisory Council on Teleworking's vision of the future was that by 2010 Ireland would be a world leader in e-Organisation and human collaboration:

> …where the talents and culture of the people are empowered to choose where and when to work; where businesses are enabled to sell and trade to the virtual world and an inclusive and geographically balanced economy and nation evolves (Callanan, 1999: 5).

There have been a number of attempts to quantify the people actually teleworking in Ireland, usually as part of larger European research projects. Electronic Commerce and Telework Trends (ECaTT), a project established to generate representative information on the prevalence and spread of electronic commerce and new forms of work in Europe, estimated there were 61,000 teleworkers in Ireland in 2000, approximately 4.4 per cent of the workforce, made up of 27,000 regular teleworkers with the remainder occasional teleworking outside normal office hours (ECaTT, 2000a). Some five years later the figure had fallen to 4.2 per cent who telework at least 'a quarter of the time' or more and a mere 0.5 per cent telework 'almost all of the time' (Eurofound, 2010a). According to these reports these levels were below the European average with Ireland having one of the lowest percentages of regular teleworkers in the European Union[78].

Much of the initial pioneering work in developing telework frameworks and schemes within the European Community took place in the peripheral countries and regions of Europe, including Ireland. The expectation was that more dispersed populations, with significant distance and location barriers to overcome, would benefit more from individual's working from home. Results from early research work were mixed and inconclusive (*cf.* ECaTT, 2000b; SusTel, 2003) but proved somewhat worrying for Ireland:

> While there has been stronger growth in Scandinavian countries, further west development has been slow by European standards. Ireland has been to some extent a puzzle. Despite energetic early work by telework pioneers, and Ireland's developing reputation as a place for high-tech investment, progress has been below the European average (Lake, 2009: 1).

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[78] There are no further comprehensive up-to-date figures for European teleworkers, to this author's knowledge.

Similar results were found in the 2000 Euro barometer survey (European Commission, 2001). This showed regular telework in Ireland at just 2.4 per cent of the adult workforce, and occasional teleworkers at 6.1 per cent. European averages, by contrast, were 5 per cent for regular and 6.6 per cent for occasional teleworkers.

Country	2000 Percentage of Teleworkers	2005 Percentage of teleworkers who work from home 'a quarter of the time'	2005 Percentage of teleworkers who work from home 'almost all of the time'
Austria	10.1 %	8.6 %	3.2 %
Denmark	10.5 %	14.4 %	2.6 %
France	2.9 %	5.7 %	1.6 %
Germany	6.0 %	6.7 %	1.2 %
Ireland	4.4 %	4.2 %	0.5 %
Italy	3.6 %	2.3 %	0.5 %
Spain	2.8 %	6.9 %	1.5 %
Sweden	16.8 %	9.4 %	0.4 %
The Netherlands	14.5 %	12.0 %	1.9 %
United Kingdom	7.6 %	8.1 %	2.5 %

Table 10 - Percentage of Teleworkers in the European Union[79]

Additional data on telework in Ireland was made available from the Central Statistics Office (CSO, 2003). Specific questions were added to the Quarterly National Household Survey (QNHS) to determine levels of home-based workers outside of the large agricultural sector, teleworkers being the most significant constituent. The summarised data established that, using the wider definition[80] there were 59,200 teleworkers in Ireland representing just 3.5 per cent of the workforce. Further analysis indicated 21,800 of these workers were resident in the Dublin area, approximately 38 per cent. Some limitations in the household survey need to be acknowledged: most notably the question *if people worked from home during the previous week*. The study was carried out during the summer holiday period so this may have skewed results to some extent.

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[79] Sources: the ECaTT project (www.ecatt.com) and the European Foundation for the Improvement of Living and Working Conditions (www.eurofound.europa.eu).
[80] The 'wider definition' refers to homeworkers who use a computer with telecommunications link for work.

The modest levels of teleworking in Ireland were examined and acknowledged around the same time and a number of factors identified as the cause for the low levels of participation in the practice (Bates, Bertin, & Huws, 2002). These included; a low penetration of ICT, the structure of the Irish labour force and the low levels of participation of women, the structure of the Irish economy, Irish companies more likely to be subsidiaries than to have subsidiaries, and Irelands geographical separation from the European mainland. Results indicated that compared with the rest of Europe, supply and demand for telework in Ireland was modest with one important exception; Ireland showed strong levels of supply of telework by small firms in the knowledge sector (Bates, Bertin, & Huws, 2002: 3).

Conclusions from Adam and Crossan (2001) indicated that in the majority of cases where telework existed it had been implemented in an ad-hoc manner and was largely employee driven. Telework was not actively encouraged and management commitment was virtually non-existent. As a result, adequate technical and other such support was not forthcoming and the practice of telework was not seen as a priority within the organisations sampled.   Cross and Linehan (2006) maintain that many Irish organisations do not have a culture which embraces the concept of work/life balance and merely pay lip service to the concept. In addition, it appears telework is not the panacea to the employment problems of disabled people, but in instances where the practice was suitable it could have been encouraged and promoted more and to greater effects (Adam & Crossan, 2001). It seems Irish business leaders and managers are not yet convinced of the benefits inherent in the concept of telework, or they are uncertain whether these benefits are worth the risks resulting from the introduction of this new method of (re)organising work environments.

Interestingly, near the end of the decade an O2 Ireland survey - reported on Electronic News Net (ENN) - found that 47 per cent of senior managers in Irish small to medium-sized enterprises (SME's) worked from home at least one day a month, with 29 per cent working from home four days a month or more (O2, 2008). The wider availability of ICT was said to have better aided businesses in meeting their customer needs. "People are getting more used to receiving an immediate response to their queries" Patricia Callan, director of the Small Firms Association, told ENN. "Not having to get to a set office location is a big help in that regard as business people can respond faster" she further stated (Ryan, 2008). In a peculiar way, it appears that the apprehension over supervision and the general unease mangers hold over employees working from home do not extend to their own working practices. If this is the case, then the issue of adoption in Ireland may not be a straight-forward issue of trust between employer and employee. The practice of telework is

not a simple black and white issue, and other significant factors and difficulties need to be recognised and understood.

With the emergence of virtual communities and organisations it is envisaged teleworkers in Ireland could provide critical added value to future human networks. However, such value will only come about from the acquisition of a range of new skills teleworkers will require. It is critical that any potential teleworker acknowledge they are undertaking a new way of working, one where new skills and competencies will play a pivotal role in the success, or otherwise, of this work practice. Some of these skills, as outlined by Callanan (1999) in Table 11, need to be forcefully endorsed and encouraged by all stakeholders in the process, and significantly includes trust as a critical and essential issue of concern:

Skills and Competencies

- Trust
- Collaboration
- Independence
- Information communication technology use
- Focused communication and listening skills
- Time management, and
- Marketing

Table 11 - Required Telework Skills & Competencies

It is difficult to get further up-to-date information on telework in Ireland as many of the associated research and informational websites have been closed or are obsolete since the early part of the last decade. Many of the reports, surveys, questionnaires, and information portals are also outdated and were heavily reliant on EU funding, which appears to have been short-term in nature. There are no longitudinal studies or research on-going in this area, to this author's knowledge. In addition, the subject of telework has received little or no attention from the media, politicians, and business leaders in Ireland for a number of years. This means that a significant gap in information and research now exists that needs to be bridged. With new technological developments and innovations evident since these original studies and reports were commissioned, a fresh new look at the subject of telework in Ireland is necessary. This particular body of research seeks to advance the debate by

providing an understanding of the experiences and knowledge of teleworkers currently operating in Ireland.

Discussion

Three particular areas of concern impact upon telework's development in Ireland. These are SD, transport, and (flexible) working arrangements. Both SD and transport interests view telework as the means to suppress unnecessary travel related to the daily commute to work, albeit that SD seeks the environmental benefits while transport pursues reduced need for the private car and overall reductions in transport infrastructure requirements. It can be argued that telework should solely reside within the domain of (flexible) working arrangements and general employment legislation and conditions, but this is not the case in Ireland. The consequence of this overlapping of responsibility has, heretofore, remained largely unexplored. From the findings presented in this chapter, the result of such imprecise demarcation of responsibility has led telework in Ireland to 'fall between the crack' of the various departments of government and responsibility. This has led to a total absence of policy in this area, ambiguous and imprecise direction, and a vague understanding of the actual realities of telework and teleworkers' lives. There is additional hesitancy in identifying all the issues involved for individuals working from home, although this may also be a consequence of the difficulty in understanding the concerns associated with STEI generally.

Telework has not been developed in Ireland due to the absence of regulation that gives it true legitimacy in the eyes of management and workers alike. The efforts of key decision-makers in Ireland can be characterised as one of bridging the informational gap which existed at the turn of the century, in respect of telework. While some clarification in respect of tax implications was provided, overall strategies to promote and develop telework in Ireland can largely be described as non-existent, and where individual companies have introduced schemes these have been done in an ad-hoc manner. Indeed, the sums of monies provided for agencies, committees, and studies in this area were derisory, and reflect a lack of commitment to the development of any new working arrangements by successive governments. No evidence is available that would indicate a willingness to research or better understand the complex social, personal, and political issues involved when adopting this way of working, or indeed legislate in this area. Responsibility for telework schemes is vested entirely with management who often lack advice, regulation, or indeed general guidelines on

the matter. The result is that telework remains unexplored as a practical environmental tool, as well as a possible economic and social instrument.

Much of the early enthusiasm shown at governmental level has long since faded in an atmosphere of doubt and uncertainty, along with telework's out-of-date web portals and reports. Indeed, the nebulousness of the Irish governmental approach to telework is reflected in the prominence (or lack of prominence) given to the subject in the most recent *Croke Park Public Service Agreement*. The subject was mentioned once where it was proposed:

> …options for e-working or redeployment (in line with the agreed redeployment arrangements) may be considered where feasible (Irish DoPER, 2010).

There is no subsequent reference to telework in the renegotiated *Croke Park II Agreement* or the *Handdington Road Agreement*. However, it has been strongly argued that government has a vital role to play in incentivising and encouraging telework and "needs to revitalise the efforts demonstrated at the turn of the century to encourage telework in Ireland" (Deirdre & Wright, 2012: 11). The time may be right to re-visit the subject of telework in a more pragmatic manner, with a view to promoting this method of working in a more realistic and practical way. A better appreciation of deeper aspects of EM, which acknowledges that radical transformation must also occur in decision-making and emphasis, may prove valuable in this context. However, if the narrow interpretation synonymous with existing shallow EM approaches remains prominent than little progress can or should be expected.

Chapter Summary

This chapter critically investigated the broad implications for telework's development and finds official telework policy in Ireland to be minimal, and that the environmental connections are limited within the context of continuing chronic car dependency. What emerges is little more than soft policy discursive instruments and lower than average up-take of telework perhaps largely due to the fact that car dependency is so culturally normalised within the Irish setting. Whilst discourses on environmental protection, mobility, and economic issues surrounding worker opportunities and rights made possible by Information Communication Technologies (ICT) all have cited telework as part solution to various issues, little practical implementation of such rhetoric is evident to-date. The chapter began with an investigation of Sustainable Development (SD), production, and consumption, both in Ireland and Europe. Telework has been suggested as an option to suppress or eliminate unnecessary

travel and reduce the overall consumption of distance, and has been part of sustainable transport discourses over the past number of decades. Thus, the chapter continued with an exploration of transport policy in Ireland, discussing predict-and-provide and the possible emerging turn towards sustainable transport under the *Smarter Travel* initiative. New ICTs are facilitating the transformation of the contemporary work environment to the extent that new work arrangements and organisation are developing, the implications of which are not yet fully understood or appreciated. The chapter continued with an assessment of flexible working arrangements in Ireland. One of these flexible working arrangements is telework, the subject of the final subsection of the chapter. An investigation of the conditions pertaining to telework in Ireland was undertaken to provide a wider view of how society, and in particular decision-makers, evaluates the importance of this method of working. What was uncovered is a neglect of practical policy direction and legislation in Ireland. The 'hands-off' approach adopted by officials is leading to a lack of legitimacy and appreciation of the potential merits of this way of working. This investigation of the policy landscape sets the stage for our exploration of telework in Ireland and provides a platform for the discussion and recommendations provided in later chapters. Chapter Six presents empirical evidence of the practice of telework and teleworker's experience in Ireland.

Chapter 6 – Exploring (Tele)work: The Views, Experiences, & Practices of Teleworkers in Ireland

Chapter Six is an exploratory study of contemporary teleworker's experiences and practices in Ireland. It sets about uncovering the day-to-day realities that teleworkers experience revealing their understanding of what skills, equipment, and support is required to work from home. Telework was chosen as the test case due to the implicit assumption that the introduction of new and existing technology – in particular Information Communication Technology (ICT) - is transforming working arrangements and practices allowing economic activity to continue unhindered and aligned to environmental protection, a key assumption of EM thinking. Decision-makers, however, frequently cherry-pick aspects of EM that best suit their agenda of promoting economic growth and existing patterns of consumption and choose to ignore deeper aspects such as radical transformation in policy-making arrangements and measures to curb (over)consumption. Interpretations of EM, as emerging in this research, are generally a mere technological fix of environmental problems solution and are stimulated more by the development and production of new technology rather than a genuine approach to ecological protection. This fits comfortably into current neo-liberal thinking prevalent in Ireland and many other developed and developing countries. The value of this particular research, therefore, is that it reveals to what extent EM works (if at all) from a bottom up approach while also uncovering the reality of day-to-day telework practice for individuals that work in this way.

Chapter Six is divided into two separate and distinct parts. Part I presents quantitative data largely obtained from three separate sources. These sources consider general questions and issues of sustainability and technology use and adoption, against a backdrop of EM thinking and in the context of an investigation of telework in Ireland. Whilst quantitative data provides a useful foundation it has a number of weaknesses which need to be acknowledged. It offers a narrower dataset and results are limited to providing numerical descriptions rather than detailed narrative accounts of human insight into the issues explored. Nevertheless, it does enhance the generalisation of the results and allows for greater objectivity in the concluding chapters. Quantitative data provides summaries of data that supports an overview, and in this instance it does deliver an interesting insight into contemporary Society-Technology-Environment-Interactions (STEI). However, the quantitative data provided in Part I cannot be truly representative due to the self-selective sampling nature of the surveys employed, and the information is more explanatory and should not be deemed to be inferential in nature.

To enrich the analysis, the chapter continues in Part II with an investigation of telework in Ireland using data gathered from sixteen semi-structured teleworker interviews. These interviews provide depth and detail by recording attitudes, feelings, and the behaviour of individuals who have experience of working from home over time. The questions were designed to encourage and create openness whilst building a body of knowledge about why people act in certain ways, and their approaches to various decision-making processes and judgements. When viewed with the quantitative data, it provides a clearer explanation why particular choices are made and enlightens the discussion, recommendations, and conclusions later in the thesis. All interviewees had considerable experience of working from home and expressed their views and opinions forthrightly over the course of each interview. Whilst many of the experiences validated an understanding of telework which is revealed in earlier chapters of the thesis, other behaviours and understandings have led to a re-evaluation of telework in the context of the contemporary Irish working environment.

Part I – Revealing Numbers?

The three main sources of data for this initial stage of analysis come from the *Telework Survey*, the *Consensus Lifestyle Survey*, and the *Smart Moves Survey*. All three are defined in the methodology section of Chapter One but a short summary would be beneficial at this point. The *Telework Survey* was conducted at a multinational medical devices manufacturing company located in Dublin, and who have pioneered a flexible working culture in Ireland for a number of years. The *Consensus Lifestyle Survey* took place at various locations across Ireland over a ten-month period between June 2010 and April 2011. The aim of this survey was to gain an understanding of individual's attitudes and behaviours towards sustainable household consumption and sustainable lifestyles. The *Smart Moves Survey* sought the opinions and experiences of employees and management at a Galway manufacturing plant on various issues of mobility, transport, and the environment, paying particular attention to the individual's daily commuting arrangements. All three surveys are valuable in building a broad overview of telework in Ireland. As telework is enabled through the use of ICT, this data also offers a unique approach to understanding possible EM thinking and issues of STEI.

High levels of concern for the environment were identified across all three surveys. All three surveys asked a similar question 'which of the following statements best describes how you feel about the environment' and responses were within five answer options; very concerned, somewhat concerned, not concerned, not at all concerned, and no opinion. In the

ConsEnSus Lifestyle Survey 62.7 per cent of respondents answered they were somewhat concerned, while 23.2 per cent claimed they were very concerned. The *Smart Moves Survey* showed a figure of 62.6 per cent somewhat concerned and 26.4 per cent very concerned. The *Telework Survey* revealed figures of 76.1 per cent somewhat concerned and 17.4 per cent very concerned. Nevertheless, when participants in the *Telework Survey* were asked 'did environmental considerations play a significant part in your decision to telework' 70.6 per cent replied 'no' (see the cross tabulation in Table 12). A bivariate correlation of environmental concern and decision to telework showed a weak relationship ($r = 0.113$). This suggests, environmental concern is not a crucial issue for people choosing to telework.

		Environmental Considerations & Decision to Telework		*Total*
		Yes	No	
How do you feel about Environmental Issues	I'm very concerned	2	4	6
	I'm somewhat concerned	8	18	26
	I'm not concerned	0	2	2
		10	24	34

Table 12 – Crosstab of Environment Concern & Decision to Telework

The *Telework Survey* asked workers if they agreed or disagreed with the statement that they consumed more when working from home. Participants were requested to evaluate their own consumption practices when working from a central office and contrast these with times when they worked from home[81]. 40 per cent (n=22) agreed or strongly agreed that their food consumption in the home increased when teleworking, with 21 per cent (n=10) undecided on this issue. Over 87 per cent (n=41) either agreed or strongly agreed that their domestic energy consumption increased whilst the majority of respondents, over 91 per cent (n=43), felt that their travel requirements did not increase during episodes of telework. Similarly, most of the respondents felt their purchase of goods[82] and other items was unaffected by their telework practice. Figures were somewhat mixed on additional water consumption and waste produced when working from home.

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[81] These are self-reported perceptions of consumption and should not be taken as objective measures of what people actually do.
[82] Goods, in this instance, refer to new equipment, furniture, or other items that may need to be purchased other than foodstuffs.
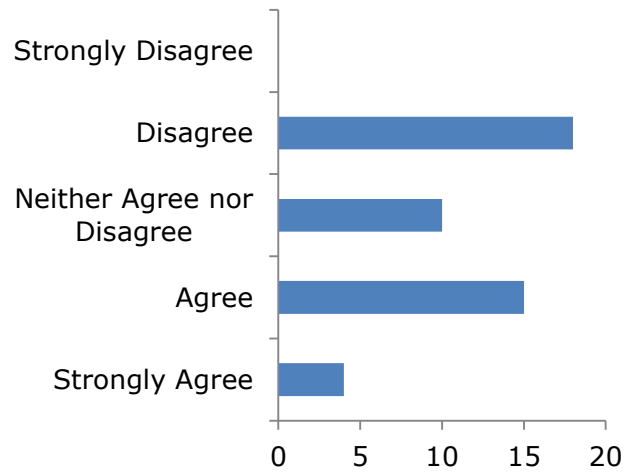
Figure 15 - Food Consumption

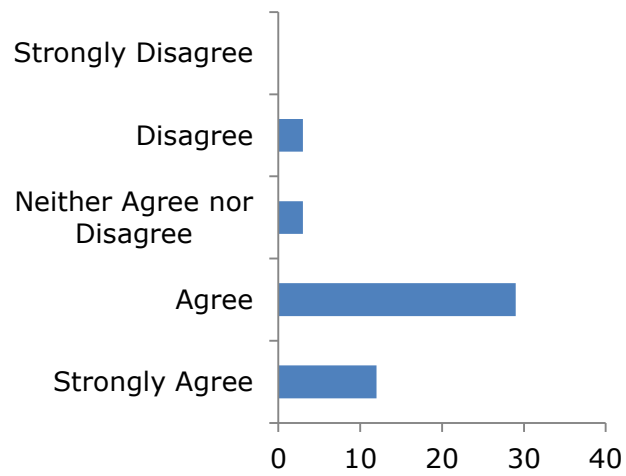**Figure 16 - Energy Consumption**
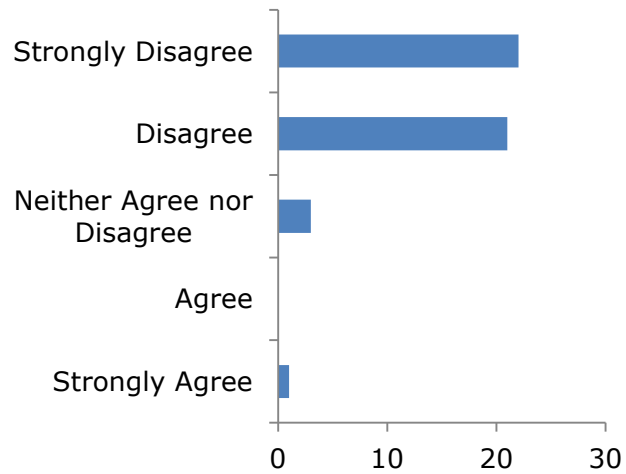
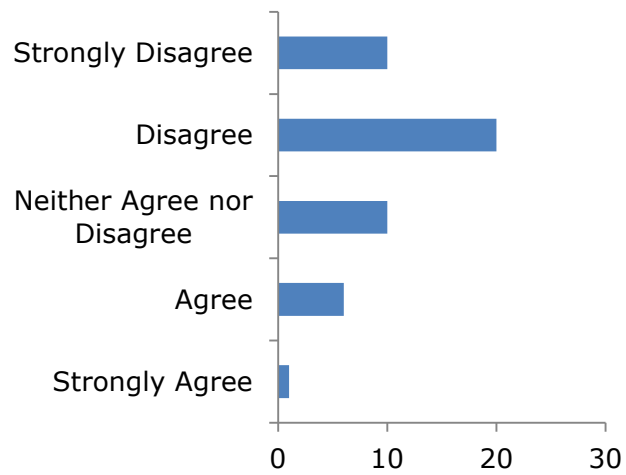Figure 17 - Consumption of Distance
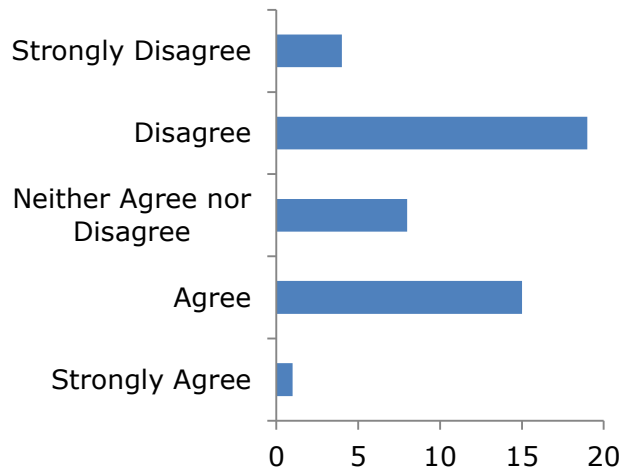

Figure 18 - Goods/Items Consumption
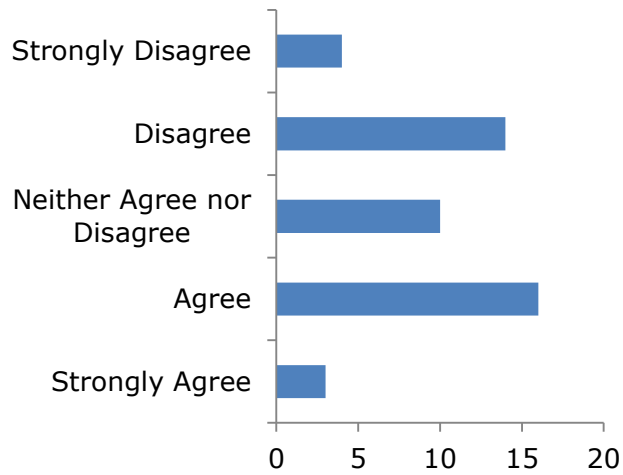
Figure 19 - Water Consumption

Figure 20 - Increased Waste Production

Contrasting the figures for respondents who agree and strongly agree with those who disagreed and strongly disagreed, and eliminating the undecided, the self-reported impacts on consumption are presented in Table 13:

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Category of Domestic Consumption	Reported Increase
Food	Yes
Energy	Yes
Travel	No
Goods & items	No
Water	No
Waste produced	Yes

Table 13 - Self-Reported Changes in Consumption Due to Telework

The environmental consequences and sustainability of telework has mainly concentrated on the potential to reduce private car use in the form of less commuting, and there is no universally accepted method for assessing all the sustainability implications of individuals choosing to telework[83]. A teleworker, for instance, may need to consume more heat and energy at home if their house would otherwise have been unoccupied when they were at work, though the extent to which home energy use is offset by decreased workplace energy consumption has not been sufficiently investigated. Many family homes may still have occupants whilst one or more adults go out to work so the move to telework may not be noticeable with regards to home-based consumption. More importantly, the consequences of telework for general consumption behaviour and waste generation have not, to-date, been comprehensively accounted for. The assumed environmental benefits of telework must be more carefully examined to avoid promoting telework's ostensible tendency to reduce air pollution by reducing the magnitude of daily commuting only to find that other harmful effects offset these gains.

A feature of all three surveys was the topic of responsibility for environmental protection. A similar question was asked in all three; 'in your opinion who is most responsible for protecting the environment?' Six options were provided namely; 'government and their agencies, business and manufacturers, communities (i.e. people working together locally), individuals themselves, all of the above and, other (please specify)'. The *ConsEnSus Lifestyle Survey* showed a split of most options but the largest segment of respondents, 32.2 per cent, opted for 'all of the above'. The figures for the other surveys indicated an increased share for 'all of the above', 44.6 per cent in the *Smart Moves Survey* and 87 per cent in the

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[83] Car mobility and transport is very heavily dependent on fossil fuels. The same is not true for electricity in the home, heat or food, which could be derived from more sustainable and local sources. One could therefore argue that reducing transport fossil fuel dependence is more important.

Telework Survey. This finding suggests that although there is little evidence of increased participation in green politics or pressure groups there is a broad acceptance that all sections of society, including individuals themselves, bear a responsibility for environmental protection. The possibility and conditions for change in policy-making arrangements in accordance with EM assumptions exists, but the opportunities for such transformations appear denied to those willing to progress such change.

Technology has the potential to make a positive contribution to ecological protection and repair existing environmental damage. EM emphasises that environmental productivity - the productive use of natural resources - can be the source of future growth and development through means of technological development and innovation. In the surveys there was limited focus on technology in the context of its development and use as a tool or option of environmental sustainability or protection. Some questions, however, shed light on how individuals' perceive and interact with technology in general, and thus are relevant to this research.

In the *ConsEnSus Lifestyle Survey*, question 18 enquired which option would best encourage people to reduce their journeys by car. Many of the choices provided focussed on improving other more sustainable modes of transport, and incentives and disincentives for motorists. Option five, however, related to technology and suggested that easier online transactions such as banking, shopping, and e-government could help reduce physical travel. A mere 1.1 per cent chose this option. This question was also posed in the *Smart Moves Survey* and not one person, out of a total of 186 individuals, selected this option.

Later in the *ConsEnSus Lifestyle Survey*, in a number of questions relating to energy efficiency, participants were asked about their motivation for choosing particular appliances, their energy suppliers, and their choice of motor vehicle. When questioned if they purchased any appliance in the past five years because it was energy efficient 47 per cent replied 'no'. When asked if they switched to a renewable energy supplier in the past five years 68 per cent responded no and when asked had they purchased an energy efficient car in the past five years 86 per cent of replies were negative. In all three questions a small percentage of individuals replied don't know or that they intended to in the future. Indeed, a later question asked participants if they were well informed about the environmental impact of products they used, to which 54.3 per cent agreed and 4.6 per cent strongly agreed.

In the *Telework Survey* respondents were asked if strong technical knowledge and skills were needed to successful work from home and a Likert scale of options was provided. 28.6 per cent either agreed or strongly agreed, 8.6 neither agreed nor disagreed, while 62.9 per cent disagreed or strongly disagreed. Given the often complex nature portrayed by some of the practice of working in isolation with new technologies it is interesting to note that teleworkers largely view the technologies they use as manageable and incidental to the tasks they are required to accomplish. The participants were also asked if they received any formal training prior to commencing telework, to which over 76 per cent answered 'no'.

New technologies are now widely consumed by many without due attention to environmental damage, or indeed the social consequences of such consumption. Some interesting questions in the *ConsEnSus Lifestyle Survey* expand on this issue and show how some technologies are perceived as necessities and inevitabilities of contemporary living. The question asked people if they considered a range of household items to be luxuries or necessities, and offered 'luxuries, necessity, don't know/neither' options for each item. The results are contained in Table 14:

Would you regard the following household items to be luxuries or necessities?

	Luxury	Necessity	Don't Know/Neither
Car (personal use)	168 (11.2%)	1310 (87.3%)	18 (1.2%)
Bicycle	647 (43.1%)	493 (32.9%)	357 (23.8%)
Dishwasher	1135 (75.7%)	313 (20.9%)	50 (3.3%)
Tumble Dryer	773 (51.5%)	695 (46.3%)	30 (2%)
Electric Shower/Power Shower	374 (24.9%)	1101 (73.4%)	21 (1.4%)
Microwave	738 (49.2%)	701 (46.7%)	57 (3.8%)
Television	264 (17.6%)	1211 (80.7%)	19 (1.2%)
Personal Computer/Laptop	541 (36.1%)	933 (62.2%)	21 (1.4%)
Mobile Phone	192 (12.8%)	1281 (85.4%)	19 (1.3%)

Table 14 - Household Items: Luxuries or Necessities?

Part II – The Teleworker's Experience

This part of the chapter is focused on teleworkers and their actual experiences when working from home and over-distance. This understanding and knowledge can often contrast with the stated aims and objectives of much of existing telework policy, as outlined

previously in Chapter Five. In this section, potential tensions between the three pillars of sustainability as defined in much of SD discourse are revealed. These tensions and the consequences of telework will be further discussed in the discussions chapter. In the case of telework, it has been widely assumed by policy-makers and key business leaders that the change in working organisation brought about by telework benefits both the economy and the environment and as such has been perceived as the means of promoting economic and environmental sustainability. According to some advocates, telework is now embedded in the philosophy of companies and organisations in Ireland, as well as being encouraged and endorsed by local, national, and European policy-makers. But the reality may be somewhat different.

The Lack of Legitimacy

The meagre uptake of telework in Ireland is emblematic of an absence of practical legitimacy for this method of working amongst policy-makers, business leaders, and indeed workers. This position is repeated in different ways in many of the interviews. Teleworkers spoke of instances of telework as exceptional and this matter of working from home is not widely discussed within and outside their organisations. One of the earlier interviewed teleworkers felt that occurrences of telework were indeed unusual:

> …within our organisation locally and nationally I think it's a relatively rare phenomenon [*Teleworker 1, male, aged 25-30, employee*].

Such a view was supported by others who echoed the overall negative sentiment on the validity of telework. One teleworkers reflected on the issue carefully and responded:

> …no I don't think it's promoted at all, I certainly have heard absolutely nothing with regard to teleworking [*Teleworker 12, female, aged 30-35, employee*].

Concern was expressed that telework is frequently implemented in an ad-hoc and unregulated manner within organisations, leading to unpredictable and erratic work administration. The level of unpredictability with structures associated with the practice is summed up by one interviewee:

> I don't think there's any promotion of it ((telework)) I know here it's seen as it's down to your particular manager if you do it and some managers here would say 'oooh no' […] here I would say they don't condone it or they don't condemn it's whatever your manager says and if you are as productive as you need to be, but they probably won't take a stance either way they won't

say 'oooh we want you to work from home' because then they're just afraid of the cost of it 'oooh I might look for expenses' or 'I might look for…' [*Teleworker 7, female, aged 40-45, employee*].

One manager articulated the view that a lack of regulation and adherence to existing legislation was responsible, in addition to mistrust of employees and potential teleworkers. She acknowledged that she herself did not observe existing employment legislation:

> I think people just got so scared when they realised all the implications and they said 'we'll do everything ad-hoc instead because we don't want to acknowledge ((teleworking))' I mean officially I'm not acknowledged as doing this because 1) I'm breaching the amount of hours I do, it breaches the health and safety act if I had to record them all but 2) the real issue was we didn't want to have a precedent that other people in the agency who wouldn't be productive workers would use [*Teleworker 11, female, aged 40-45, management*].

Some of the interviewees worked for an organisation which had a developed philosophy endorsing flexible working and promoting telework. Even from within these established cultures of flexible working arrangements some interesting remarks were noted, with some individuals feeling that particular departments and workers were excluded from telework schemes and programmes:

> It's unfortunate for certain people that they can't do it because they work in customer services or something like that […] people who actually take orders and answer the phones and deal with customer services they can't do that ((telework)) because they have to be at the end of the line in the office you know so some people get a bit aggrieved with the fact that it doesn't apply to them and there's a big *whoha* about it [*Teleworker 16, female, aged 35-40, employee*].

Whilst acknowledging their own circumstances within a flexible working culture, some interviewees felt that not enough was being done on a national level to encourage or promote telework and offered advice and direction in this regards:

> I don't think there's enough done nationally or the government does enough to encourage it to be honest, or encourage companies and give benefits tax breaks or any of that type of thing [*Teleworker 15, male, aged 35-40, management*].

Teleworkers Work Longer

One of the more resilient findings to emerge from the interviews strongly supports the belief that teleworking increases the working day and individuals work longer. Despite

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the lack of legitimacy for telework, this suggests that the benefits for organisations can be positive in terms of increased worker value. Many teleworkers expressed the view that they forgo much of the conventional timekeeping, break times and intervals, associated with working in a traditional office setting. They also expressed the view that they regularly worked the hours reserved for the daily commute to and from their workplace:

> I end up working far more than the hours I'm supposed to work because I'm hooked in from home [*teleworker 2, female, aged 35-40, management*].

> …the best thing is no commute that is the best thing, the flip side is the day is long because you don't finish at five [*Teleworker 6, male, aged 35-40, employee*].

> I'd probably would miss lunch on a Friday whereas when I'm in the office I would always take my lunch […] say for instances I'm in the middle of something I'd work through my lunch and then I might just grab a sandwich and go back and sit at my computer again whereas when I'm in work I tend to go away from my desk and away from the office for an hour [*Teleworker 12, female, aged 30-35, employee*].

> I would work longer hours because I wouldn't be standing at the printer chatting or going for coffee so the hours would be longer in that sense because you'd have less breaks and less social time [*Teleworker 16, female, aged 35-40, employee*].

An opinion was expressed that this additional time worked was closed related to the isolation of working alone from home. Teleworkers felt they concentrated better on their work tasks when there were fewer interruptions from colleagues and managers:

> …you've no one saying let's take a break lets go for a cup of coffee or lunchtime there's no set times I could end up working 'til eight nine o'clock and nobody has come near you all day [*Teleworker 7, female, aged 40-45, employee*].

Indeed, this same teleworker felt obliged to continue working from home even when ill. A sense of frustration and inevitability came through when she stated:

> I mean we work from home even if we're sick we're still expected to work 'just don't come in and give all your germs to everyone' you sit up in your bed and you log on and for as many hours a day as possible, so even when I've been out on certified sick leave I'm still dialled in I'm still working [*Teleworker 7, female, aged 40-45, employee*].

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All interviewees answered negatively when asked if they got paid for the additional hours worked, revealing a possible link between telework and neo-liberal work practices. However, some countered that they were contract workers and didn't necessarily work to rigid conventional working hours. This question indeed took many by surprise:

> No not a penny not a penny, all they told us is that we need to be flexible meaning *you* need to be flexible [*Teleworker 7, female, aged 40-45, employee*].

The questioning continued along this similar line of financial reimbursement for the additional hours worked which allowed teleworkers to reflect deeper on their personal working arrangements and many of the associated feelings. These can be best summed up by the following statement:

> I think anybody who is working from home feels that they have to give that little bit more [*Teleworker 9, female, aged 35-40, contract employee*].

Increased Productivity

Teleworkers spoke of the flexibility telework afforded them and associated this with increased productivity gains for their employers. Whilst welcoming the additional autonomy most felt that they more than compensated for this arrangement by working longer and better for no additional financial remuneration:

> …ok I jump off for ten fifteen minutes in the morning but I know people who spend an hour a day smoking outside so I refuse to feel guilty and I often work through my lunch up 'til about six seven o'clock in the evening [*Teleworker 7, female, aged 40-45, employee*].

This flexibility was appreciated by individuals with demanding additional domestic commitments. An interesting observation in this regards is that all these particular individuals who spoke of their additional domestic needs and obligations were women:

> …if you need to get deliveries or you need to get the washing machine fixed or you need something done in the house or something delivered to the house that sort of thing you can arrange that with the telecommuting option, you know that you can be at home at those times if necessary [*Teleworker 12, female, aged 30-35, employee*].

> I've a flexible arrangement and do the school run so if I ever need to see the teacher she knows I drop the children to school every morning [*Teleworker 16, female, aged 35-40, employee*].

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Employer/Management Suspicion

Despite many obvious benefits for employers and organisations there continues to be an inherent suspicion of telework and teleworkers. Often this is related to issues of supervision and the perceived inability to monitor work and tasks undertaken, in a traditional sense. Much of the apprehension on the part of management relates to the issue of trust:

> I could certainly see problems because as a manager you've no way to monitor the hours people are working or what they're doing [*teleworker 2, female, aged 35-40, management*].

Teleworkers themselves were aware of this unease and are conscious of the issues relating to supervision and monitoring. They tended to overcompensate in this regard and were conscious of this employer discomfort:

> …employees need to justify their reason whereas managers just tell you that they're working from home they don't need to justify as much… we need to justify a little be more [*Teleworker 12, female, aged 30-35, employee*].

One teleworker had temporarily given up the practice of working from home because he felt it was frowned upon by his employer, and he felt he had to justify himself more when working from home:

> …the visibility thing is a big issue and even in a company where they do promote teleworking it was presented to me as it would affect my career it would be a big concern that you're not there and that perception is 'he's not here he's not working' [*Teleworker 4, male, aged 40-45, employee*].

One manager added an additional element related to power within working groups, and she felt that in the absence of a controlling influence workers jockey for a position of authority or strength within the group. She related one story from her own experience about a manager who spent time teleworking and its consequences, but also spoke in a general sense:

> …the problem is when he's not there he doesn't know what they're up to… but the real thing is there's and look it's sociological I suppose it's if you take humans of the pack they need a top dog and if the top dog is absent you know what they say 'if the cats away the mouse will play' somebody starts jockeying for position to be the key person in the group and then all kinds of little games start happening and the manager he doesn't see any of that happening so he doesn't know what's going on and he doesn't know who's killing each other [*Teleworker 11, female, aged 40-45, management*].

Much of the apprehension concerning telework related to the central issue of trust, and in particular the trust managers are required to have when workers are absence from the workplace. This issue of trust became a powerful underlying dynamic throughout many of the interviews. Some workers recognised a certain level of distrust emanating from managers, and others acknowledged that their personal satisfaction with their working arrangements largely relied on trust previously built with managers over time working together with face-to-face contact:

> …it's how responsible the person is and how ethical the person is then it's a question of trust between the manager and the employee the employer and the employee [*Teleworker 6, male, aged 35-40, employee*].

> I think the one other important element of all of this is that there has to be an element of trust on both parties but I think that comes with time because when a company takes you on and they can see at a glance what you're doing and they get results in from what you're doing and they get good feedback about your representation on the phone then I don't think those concerns are a concern anymore [*Teleworker 9, female, aged 35-40, contract employee*].

The question was asked if working from home could harm social mobility and promotional opportunities at work. The responses were somewhat mixed with many saying that it did not matter in their particular circumstance, but others countered that it could have a negative effect on their own promotional prospects:

> The person that puts in the eight to eight and sits in the office five days a week just looks like the harder worker when actually they probably mightn't be at all [*Teleworker 16, female, aged 35-40, employee*].

Others were more positive in their response but much of this optimism was based on their current personal circumstance and existing employer's attitude:

> I don't think so because I just think that for a lot of people working at home the quality of their work is actually of a very very high standard and I think that at the end of the day that's what promotional things would be assessed on and certainly within our own environment I don't think it's seen as an easy option or anything like that [*Teleworker 14, male, aged 35-40, employee*].

The Boundaries between Work and Private Lives

For many interviewees the domestic and social consequences of telework were frequently neglected in favour of the economic benefits for employers. Benefits for an

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organisation can be considerable, in terms of increased working hours and greater productivity gains. However, often personal, family, and community concerns are subordinate to the economic benefits for the organisation once again de-legitimising telework for many people. This is often translated into personal feelings of loneliness and a sense of being cut off from the organisation for some teleworkers:

> I suppose just keeping in touch with what's going on from a work point of view maybe stuff that's not directly affecting you but going on in the background that might be relevant to you [*Teleworker 3, male, aged 35-40, management*].

A requirement for frequent face-to-face human interaction was a common theme for teleworkers and the need, not only for means of communication but also physical proximity afforded by co-presence, became apparent. Teleworkers spoke of this basic human need to remain socially connected and seek out contact with others:

> You do have to ensure that you have a bit of a social life i.e. that you meet people and I would be a very social person but if you're sitting behind that computer all day, which literally I do and I'm busy at work and working very busily, there's no human contact [*Teleworker 10, female, aged 35-40, employee*].

Some interviewees talked about a balance that needs to be met between working from home and working in an office. Some individuals indicated that they would find it extremely difficult to work solely from home. They explained that this was the reason why they telework for just part of the week:

> …you've got to get a balance because I don't think you could do any job like that from home all the time, I think you do need to have a chat with your boss or your colleagues or your peers or whatever so I think if you get the balance right it's ok but I do think if you were exclusively working from home all the time I think you'd find it really difficult [*Teleworker 13, male, aged 55-60, employee*].

The location of where work is performed in many instances of telework allows work to intrude almost effortlessly upon the home and family life of the teleworker. There is an obvious blurring of the boundaries between work and private life in this regards, regularly skewed in favour of work. One female teleworkers spoke of rushing around to meet her domestic and child-minding commitments:

> When I get finished here at quarter past two I'm racing to get to the school I pick them up go home I'm logging straight back in and I'm trying to stay on top of stuff at home they want to be fed they want to be whatever - to go someplace - and I'm trying to do stuff and there's a sense of not being at home when you're at home there's a sense of still being at work [teleworker 2, female, aged 35-40, management].

This same teleworker elaborated further and the following quote illustrates the overlapping of domains and a sense of inevitability and acceptance of this blurring of boundaries, but also a strange sense of gratitude:

> It's fantastic for me personally because one of the key areas where it makes a big difference is the suppliers of the key software that we use are based on the west coast of the United States and we have no working hours in common none so if I send them an e-mail today and they reply tonight and I only get it tomorrow and I reply tomorrow and they reply tomorrow night I don't get it 'til the following day so every question you ask is twenty four hours before there's a response so in my case what I can do is I can log-in at seven or eight o'clock in the evening and I can keep an e-mail conversation going up to eleven or twelve o'clock at night so within that three or four hours you could get what might take two weeks if I couldn't log-in at night you know it could take two weeks to do that work that I could do in a couple of hours and similarly to be able to Skype them or call them from home in the evening makes a huge difference, so from that point of view it's great [*teleworker 2, female, aged 35-40, management*].

Others felt that the disruption caused by work on private life is not a positive thing and expressed a feeling of intrusion at time, the expectation of management concerning the availability of teleworkers being one case in point:

> …some mangers take the view because you're at home your actually available 24/7 as distinct from if I was in an office people would probably say 'your obviously not available 'cause you've got to go home', there's a different expectation almost [*Teleworker 4, male, aged 40-45, employee*].

This clouding of the frontiers between work and the private domains also has consequences for the physical space of the home when workers found themselves working in parts of the domestic realm frequently linked with the private. This led to negotiations and disputes over some spatial and temporal aspects of home-life:

> You have to be cognisant of other people in the family so that you're not disturbing the family because I mean you are working so you're getting phone calls and you're taking over… I'm fortunate that I've got a study but you still end up taking over a part of the house if you know

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what I mean so usually now we plan in advance when my daughter's off or when my wife's off and then I'll look at my calendar and I'll fit it in accordingly [*Teleworker 13, male, aged 55-60, employee*].

One interviewee talked of an extreme case they were aware of where a colleague elected for the option of telework but felt unable to perform his tasks from home:

> We had a director and he couldn't work from home because he had three kids there and he use to work from a hotel up the road when he wanted a break from the office [*Teleworker 15, male, aged 35-40, management*].

Another teleworker talked about the introduction of the blackberry into her unique working arrangements and the effect this had on her domestic and private life:

> …in the very early days I was getting absolutely no sleep, the laptop was in the bed with me and I was getting no sleep what-so-ever because in my particular case we were breaking the Asian market open so you were getting people urgently trying to contact me at three o'clock in the morning looking for answers needing those answers outside Irish hours, you couldn't wait because if you waited you might have been forty eight hours behind by the time you got back to each other so I found that a huge issue… then blackberry came on the scene and it was great you just bring the blackberry to bed instead and if somebody really need you they'd ring it as opposed to you know… and it's so easy to just switch over and it doesn't take the ten minutes to turn on the laptop get the system up-and-running then put in your VPN codes wait for the bloody thing to connect, so that's why you need to have a blackberry I think [*Teleworker 11, female, aged 40-45, management*].

One interviewee found the balance of work and home life particular difficult at times, but this may be down to her particular life stage. She is a mother of young children attempting to balance domestic obligations with that of often demanding work situations:

> …occasionally if the kids are very sick and you're trying to physically be with them but you're trying to also keep on top of what's here and you're trying to do it all in the house then that's not easy [*teleworker 2, female, aged 35-40, management*].

Others relayed concerns where family and friends had difficulties identifying when people were teleworking. Although it appeared obvious to the individual worker themselves this blurring of boundaries may not always be respected or appreciated by others:

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> What really annoys me is if I call my parents and they'd say 'oooh are you at home or are you working' and I'd say 'I am at home working' it's like they think if you're at home you're not actually doing anything you're just watching Dr Phil or something [...] that does annoy me the fact that people think you're actually not working when you're at home [*Teleworker 7, female, aged 40-45, employee*].

The location for people working from home places them firmly within the communities in which they live. Therefore, it would appear obvious that their on-going presence and visibility within the community would increase their involvement. However, all the teleworkers interviewed indicated that they were not more involved in the community with some presenting an almost isolationist approach to the areas in which they reside:

> We don't have any kind of relationship with our neighbours we keep very much to ourselves we're in an estate and we're only there about three years so I mean we know our neighbours to say hello to but not to socialise with [*Teleworker 12, female, aged 30-35, employee*].

An interesting additional element associated with telework and the interviews was the issue of gender. Each interviewee was asked if they felt that telework was more appropriate for men or women. The male interviewees all replied that there was no difference and at issue were the tasks or job to be performed. The female interviewees were much more reflective and circumspect in their responses. Many echoed their actual experience of juggling their working lives and domestic commitments and were cognisant of the obscuring of boundaries from time-to-time:

> …women are the one who see things that need to be done and they'll say they're the ones that'll say 'I just stick on a wash' or 'I've someone coming for dinner I better just take this out of the freezer' or 'I better just…' they will be mentally thinking of stuff that needs to be done whereas men just switch off [*Teleworker 7, female, aged 40-45, employee*].

> I think in Ireland it's assumed that the mother looks after the kids and does the ferrying around so in that respect I would like to think it's probably a woman that would be more keen to succeed at it than a man [*Teleworker 10, female, aged 35-40, employee*].

However, one female manager appeared to take issue with women in this instance and came across antagonistic and almost dismissive of the notion of women working from home:

> I'm working in a division at the moment which is totally gender biased it's nearly all women for some reason we're unlucky, there's two divisions in the agency one is all men and one is all

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women the rest of it is mixed and I would say that for a lot of them ((women)) it would not suit and they would desperately miss the social interaction […] I have a feeling that it wouldn't really suit them in terms of missing the social interaction, they probably wouldn't mind teleworking if it was only one day of the week but they seem to need to get out of the house ((laugh)) [*Teleworker 11, female, aged 40-45, management*].

The overlapping between work and private life was evident throughout many of the interviews. Some of the previous quotes skewed the relationship in favour of the organisation or employer but in some instances teleworkers reported that family Life and commitments can continue unabated while teleworking:

…sometimes I can be doing the dishes or stirring the soup or something and still be on a call to work [*Teleworker 12, female, aged 30-35, employee*].

But for many, telework is considered to be a personally-positive and overall progressive way of working. The issue of improving their work/life balance was often greeted positively and many had affirmative things to say about telework, often evoking personal styles and preferences:

I feel I'm more productive and I feel I'm less tired and it's a better lifestyle and balance for me to work for home [*Teleworker 5, male, aged 30-35, employee*].

…you just have a bit of a slower pace on that one day in the sense that you don't have to get dressed and head out in the car and go to work so you'd actually start at a more leisurely pace and it wouldn't be for the first time that I would still be in my dressing gown at about eleven o'clock or something like that, but I can still work [*Teleworker 13, male, aged 55-60, employee*].

Some movement towards the transformation in policy-making arrangements and processes should be apparent, and considering telework at the organisational level some evidence of its adoption by environmentally conscious individuals or groups should also be noticeable. However, much of what interviewees stated would suggest that telework remains resolutely centrally controlled and at the gift of employers, many of whom do not appreciate or understand the benefits that can accrue or choose simply to ignore the practice.

Negotiating Change: Who is Responsible for Telework Arrangements?

Many interviewees recounted that teleworking conditions and arrangements need to be negotiated and agreed, and the practice continues to be the gift of their employers and

management. This, in many cases, is the consequence of inadequate legislation, regulation and guidelines, and ad hoc arrangements and implementation policies adopted by many organisations. One interviewee told how he:

> I put a proposal to them ((the company)) for two days a week and initially they agreed to one day a week but I just said 'look either two days or it's not going to be practical', so we reached an agreement [*Teleworker 3, male, aged 35-40, management*].

Another teleworker identified an almost indifferent attitude from their employer towards telework. He stated that this indifference may be the consequence of his employer having no support framework or strategy in place for telework or teleworkers:

> I don't know is there even a policy within the company but I know for example in the IT end of things they don't telework in the US generally but they do in Europe but I don't know if that just evolved or whether it's actually a policy and from a HR perspective… I don't know why they regard it as people teleworking or whether it's just something that they turn a blind eye to because there's no support structure in place [*Teleworker 4, male, aged 40-45, employee*].

If telework was becoming more acceptable then it would follow that new developments and practices would also emerge. However, this does not appear to be the case. Individuals had thoughtful opinions on how telework could be developed but little in the way of acceptance of such ideas is evident. Whilst the following statement demonstrates a practical wiliness to explore and progress the notion of new working arrangements it also serve to convey a level of frustration on the issue:

> …when de-centralisation was mentioned - of the state bodies - I actually did say 'look why can't they just have hubs in towns that could be open for twenty four hours' and you could have people booking slots and instead of having to open huge de-centralised offices at enormous costs to the state that if you had these small hubs that could be used by a variety of the different state bodies and say 'ok I'm booking it to work at night-time' or 'it suits me to work certain days' and that people would book them and you'd also have IT backup on hand… but it was thrown out the window [*Teleworker 11, female, aged 40-45, management*].

One interviewee articulated the view that such out-of-town hubs or arrangements could be very beneficial to employers and business communities in general:

> …there's a lot of business parks with empty buildings so you can take the cost of what people have to finance themselves to travel to work and have a local enterprise board set up a room

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for ten people and by accident or by design you could have a technology guy beside marketing people and might have cross company cross technologies cross business sectors in the actual building which could be creating ideas for your company [*Teleworker 3, male, aged 35-40, management*].

The Necessary Teleworking Skills

It is interesting to uncover what teleworkers believe are the necessary skills needed to work from home successfully. These largely relate to personal development and coping skills that would, in any instance, be necessary for competent paid employment. There is little in the way of additional technical skills required, and many interviewees talked about the importance of discipline and self-motivation:

> …a huge amount of self-discipline self-motivation there's no question about that, and when I say self-discipline the need to know when to turn off is just as important as to when to turn on [*Teleworker 11, female, aged 40-45, management*].

The ability to manage time, build a routine, and plan for days working from home is also a suggested skill to acquire for effective teleworking. Teleworkers spoke of carefully planning their work on occasions of teleworking:

> …find an area of the house that is quiet and away from everything and you're able to schedule your week around working from home… there's certain things that might be better done in the office like that you have a better internet connection you have a faster internet connection or whatever so you might arrange to do those things while you're in the office and then leave other stuff ((for home)) so it's a bit more like the management of your work as well [*Teleworker 8, male, aged 25-30, employee*].

There need for strong communication skills amongst teleworkers were again reinforced by interviewees. One teleworker noted:

> …obviously you need to be good at reading e-mails and picking up what people really mean and helping over the phone so I guess good communications can be really vital, and you need to rely on it more when you're not meeting people face-to-face [*Teleworker 5, male, aged 30-35, employee*].

No Input, No Information, No Rules: the Issue of Training in Technology Adoption Processes

Individuals spoke about the lack of information and training prior to commencing working from home, and the continuing absence of such information. The absence of any formal structure and information acts to de-legitimise telework as a way of working in the eyes of the employer and employee:

> …there is no formal training or structure in place, even a reporting structure if something goes wrong [*Teleworker 4, male, aged 40-45, employee*].

Telework is a major change in working organisation but little in the way of training for teleworkers is evident from the interviews. Training and competency in many of the skills and capabilities required have been largely ignored by organisations, management, unions, and indeed individual workers:

> No I wasn't given any formally training, but having said that I didn't request it and don't see the need for it either [*Teleworker 1, male, aged 25-30, employee*].

When asked if training was provided, one person responded that employee health and safety issues were to the fore but little in the way of technical or personal management skills were provided:

> …there isn't any formal training but [*his employer*] has a strong policy on ergonomics so one thing I was told to make sure was that I was set up ergonomically, so they do a lot of things with chairs and desks and monitor positions and that kind of stuff so they did expect that I would be set up ergonomically at home but that was the only kind of training or stuff I needed to get set up [*Teleworker 5, male, aged 30-35, employee*].

Even from within a company with a strong culture of flexible working training and development appeared inadequate. Indeed, this question took most interviewees by surprise as most had not considered the idea of formal telework training:

> …there was no other really training given specifically for working from home I guess [*Teleworker 15, male, aged 35-40, management*].

There is a conspicuous absence of legislation or regulation when it comes to telework in Ireland and much of what is in place relates to existing working environments and is not

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specifically related to working from home. Once again, interviewees had difficulty with this question as most had not reflected upon nor considered legislation in this area:

> I know health and safety comes into it if you're working from home, I presume it does, but that would be about the only thing I could think of I don't really know any legislation that's on the books at the moment for e-working or whatever [*Teleworker 13, male, aged 55-60, employee*].

Telework remains within the gift of employers who retain ultimate authority over decisions to increase, decrease, or indeed end the practice. This suggests that such arrangements are not promoted or driven by environmentally-conscious groups or individuals; they remain firmly centrally controlled within organisations. The benefits continue to strongly favour the employer. One interviewee describes how work has changed for her and how flexibility is now deemed part of her schedule:

> You can end up maybe starting work early in the morning because you've got the Chinese all looking for something or the Indians and then in the evening because you've got the Americans or whatever on so depending on the nature of the issue at the time we need to be more flexible [*Teleworker 7, female, aged 40-45, employee*].

Another testimony is revealing and demonstrates the changing nature of work for teleworkers, often unconsciously established but frequently in favour of the employer. There is intrusion into the private sphere but an acceptance of such inevitability:

> …you're getting e-mails and things coming through all of the time so even times when we have a little bit of downtime you still have e-mails coming through and there's this overwhelming desire to say 'oooh what's on that there now' and that can be a little bit intrusive [*Teleworker 14, male, aged 35-40, employee*].

There is a sense of appreciation and gratitude for being allowed to work from home, and this was common throughout the interviews. Most acknowledged that they worked longer and were more productive but yet remained indebted to their employers and this way of working:

> You get a little more time out of people when you've given them the freedom to work on their own and in their own environment [*Teleworker 15, male, aged 35-40, management*].

The Importance of Communication

When asked what the most important piece of technology was for telework most interviewees responded that it was infrastructural rather than any new personal or technical

devices. The availability of high speed broadband was repeatedly suggested as the main item required for people to work from home effectively:

> …broadband is the key [*Teleworker 1, male, aged 25-30, employee*].

> …without the broadband really it's ((impracticable)) you need that high speed communications [*Teleworker 5, male, aged 30-35, employee*].

> …if I did not have broadband I could not work from home [*Teleworker 10, female, aged 35-40, employee*].

In attempting to uncover the actual technologies that individuals use when teleworking, interviewees were encouraged to talk about the equipment, applications, and devices they used when working from home. For many, what is required can be regarded as typical communication equipment such as the telephone or mobile phone, computer, and a high speed connection, long established within the modern working environment:

> I got broadband I've got a phone I've got my mobile and I've got a landline as well, so I've got all the things that I really need to communicate [*Teleworker 13, male, aged 55-60, employee*].

A number of individuals spoke of new communications software enabling them to work better from home but indeed these were not deemed essential. Many of these applications had the same function in mind; quicker and improved communication between individuals or groups working over-distance:

> …with *Live Meeting* you can take control, I can take control of a presentation someone else could have it projected in the room I can drive it change slides I can point at stuff and obviously talk over the computer to other people in the room who can hear me so it meant… it was almost as good as being there I guess [*Teleworker 5, male, aged 30-35, employee*].

One telework summarised the feelings of many when she stated that it was not so much new technologies that were enabling telework but rather the skill of working these technologies effectively. However, these are often basic technical skills acquired when working in a conventional manner at a central office and are now deemed rudimentary:

> You certainly need to be I suppose computer savvy and also internet savvy [*Teleworker 10, female, aged 35-40, employee*].

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Additional Travel Requirements

It was interesting to note that telework is allowing workers to relocate further away from their work place than may be otherwise practical. Individuals spoke of their long commute to work, something that may not be possible if they travelled to work daily:

> I live quite a distance from here it's in County Clare so it just works out quite well for me but once it comes to five o'clock I've an hour's drive ahead of me [Teleworker 1, male, aged 25-30, employee].

> I lived in Dublin but then once I got married we moved down the country so teleworking was more appealing really, although it was an option whenever I lived in Dublin but because I lived so close I didn't avail of it [*Teleworker 8, male, aged 25-30, employee*].

For some interviewees there was no change in their car use because of their domestic or other such commitments, a classic 'rebound effect' where time saved in commuting is replaced by other car-based activities. When asked if there was a saving in travel due to telework one interviewee indicated:

> …it's not substantial it's not such that I would notice it because I would rarely be at home for an extended period, maybe two or three days if the kids were sick [*teleworker 2, female, aged 35-40, management*].

A typical response from teleworkers with children was that the saving in the commute to and from work was often offset by domestic obligations such as school run, a good example of the rebound effect or *Jevins Paradox*. One teleworker detailed her day as such:

> I start work at eight the kids are in the house playing or maybe watching a bit of television so he's gone and I'm working and then probably around nine o'clock I get the boys in line to get to my car and I drop them off at the school here in Lebane, the school starts at twenty past nine so let's say I would be back at my desk at give-or-take twenty or twenty five past nine and I just continue working 'til twelve and I have my hour lunch break and then I have another break at quarter to three to quarter to four so that I can pick them up from the school [*Teleworker 10, female, aged 35-40, employee*].

Indeed it's not only the daily commute that is at issue with the consumption of distance. Telework has significantly changed the nature of work for many and individuals now operate in globally distributed teams and organisations. This has led to teleworkers travelling more due to the nature of their new working arrangements and connections. It is noticeable that

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many teleworkers now travel greater distances for face-to-face contact with colleagues dispersed across the world, something that would not have been necessary heretofore. Telecommunications, in this regard, is complementary rather than a substitute for co-presence and close proximity interactions. The following quote reflects this understanding:

> I'm going in two weeks' time to the UK and the whole team's coming together from all over the world from America from parts of England there's a good few people from Dublin as well, and we're all coming together in two weeks' time where we're going to do an entire test of the system so for that everyone needs to be onsite [*Teleworker 1, male, aged 25-30, employee*].

Many teleworkers are regarded as mobile workers and the nature of their job necessitates a considerable amount of work travel every year, as suggested by one interviewee:

> Last year I did forty thousand business kilometres and I have to record that for our benefit-in-kind tax on the car and that's savage mileage, and I'll probably hit fifty thousand this year [*Teleworker 14, male, aged 35-40, employee*].

Other interviewees spoke of a reduction in their overall motoring costs due to telework. When asked about his general motoring expenses one teleworker reported:

> …there's a huge cost saving in terms of your fuel, imagine if I was coming up and down to Galway everyday it would be quite a high bill every week so I'm saving on fuel big-time [*Teleworker 1, male, aged 25-30, employee*].

Yet others talked about not saving on transport costs as reductions in commuting was being offset by other occasions of travel. One interviewee laid the blame with the poor available of public transport services. When asked if she used her car less she responded:

> I haven't cut back as such, I would still use it but maybe just go at different times that's all… if I had a way of getting into town at the weekends or going out on a Friday night on a Saturday night rather than hiring taxies if I had a bus service that was efficient then I would certainly consider travelling around by public transport, if it was there [*Teleworker 7, female, aged 40-45, employee*].

The Story of Concealed Consumption

In addition to transport, other issues of consumption were questioned and examined. Teleworkers require additional technology and equipment working from home and these

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extra resources are often neglected when assessing the environmental sustainability merits of telework. Such consumption is described by one interview when he stated:

> I had an inkjet printer but I just found that for the volumes of things I was printing a laser printer would have been a lot quicker a lot more efficient and I just went into the office and I was just told 'look you go out there and buy it and we'll put it through expenses' and I wanted a scanner and they went off and got me a scanner and there's no questions [*Teleworker 14, male, aged 35-40, employee*].

Telework is also facilitating additional shopping opportunities for individuals working from home as they are flexible with their hours and scheduled work breaks. Such opportunities allow for increased opportunities of consumption, in addition to increased travel requirements:

> …during lunchtime we'd say I might pop out and do a quick bit of shopping so the hour that you have at lunch you can get a lot more done [*Teleworker 3, male, aged 35-40, management*].

Interviewees were asked about their energy consumption and needs when working from home, and in many cases they felt that any increase was offset by a reduction in motoring costs:

> …our bills haven't gone up dramatically or anything like that… I did ask my husband about it and I tend not to turn on the lights so there's not much electricity being used, you know the kettle does go on for a cup of tea now and again that's about it but the heating bill probably did go up but ever so slightly, nothing that my husband has really noticed [*Teleworker 12, female, aged 30-35, employee*].

Other interviewees, however, felt that there were more costs and consumption associated with working from home. This view is evident in the statement of one teleworker when he reflected on the impact and personal costs of telework:

> I'm using up electricity I'm using up heat I'm using up say I'm boiling up my kettle I'm using up electricity at home rather than ((at work)) and my internet but I don't know how much it runs into […] I wouldn't say it's significant but if the question is does it cost you less or more working from home the answer is it costs me more working from home [*Teleworker 6, male, aged 35-40, employee*].

Another interesting aspect of ICT is the potential to reduce the use and consumption of paper, with many documents now widely available in digital format. This was treated differently by two separate interviewees. The first stated that she saved significantly on paper:

> I used to get some documentation through on Excel spreadsheets and I had to fill them in manually and send them back but then with online applications that cut that out and I'm quite happy about that because I'm a firm believer that if you don't need paper then don't use it [*Teleworker 9, female, aged 35-40, contract employee*].

However, another teleworker had a different viewpoint and working from home didn't appear to affect her consumption of paper in general:

> I do a lot of my printing in the office because the big printers are much quicker but [*her employer*] obviously provides you with a printer and as much paper and ink that you need but it's one of the deskjets so if I want to print a report off and I know I'm going to be at home during the week and I need it or I want it I tend to do my printing in the office because it's just speedier [*Teleworker 16, female, aged 35-40, employee*].

Chapter Summary

This chapter presents original empirical data on the views, experiences, and practices adopted by teleworkers in Ireland. What is revealed is that there is no clear narrative about telework and there is a lack of understanding about its true impacts and consequences for sustainability. In addition, the environmental connection is largely absent. If anything, it appears to be a work practice that fits with certain public sectors and private firms and is best suited to women employees for family and domestic reasons. The first part of the chapter analyses quantitative data gathered from three main surveys; the *ConsEnSus Lifestyle Survey*, *Smart Moves Survey*, and *Telework Survey*. Little evidence is available to suggest widespread adoption or acceptance of telework schemes in Ireland. Figures for teleworkers remain low which suggest that any merits of telework are not fully known or appreciated. Whilst high levels of environmental concern is apparent in all three surveys this anxiety is not of primary concern for practitioners deciding to telework. There is also a level of inconsistency in peoples concern for the environment and their pro-environmental action, signifying disconnect between the individual and real policy-making, design, and implementation. While substitutes and pro-environmental technology alternatives are available these are not widely purchased, acquired, nor conventional. The intention of this

first part of the chapter was to present a general impression of telework in Ireland, and examine broad Society-Technology-Environment-Interactions (STEI). Part II delivered a richer understanding of the practice. It reflected upon telework as a tool or option of environmental sustainability and set about investigating the extent of telework in Ireland through the experience and understanding of teleworkers. The practice of telework is not widely accepted in Ireland and where it does exist is implemented in an ad hoc and fragmented manner. The availability of Information Communication Technology (ICT) is transforming the nature of work for these particular workers and many individuals now work in globally distributed teams working longer hours and giving greater productivity. However, these workers are not representative of the working population in Ireland. Moreover, concerns remain over the supervision and the monitoring of teleworkers, and this is strongly related to issues of trust. There are also many often neglected social disadvantages for individuals' who telework. Next, Chapter Seven will form the basis of a discussion on telework in Ireland exploring its potential as an option of environmental and social sustainability and lead to some conclusion in the final chapter of the thesis.

Chapter 7 – Discussions & Recommendations

The promise of Ecological Modernisation (EM) thinking on telework is that the introduction of new and existing technologies leads to increased levels of environmental protection in the form of diminishing ecologically harmful commuting practices, aligned to unhindered existing business models and continuing economic growth. But does this rhetoric of EM match the reality of telework in Ireland? Much more is going on in the case of telework than simple reduction of physical travel, for instance. What has been revealed in this research is the often complex intertwining of many elements of Society-Technology-Environment-Interactions (STEI) involving frequently underreported impacts and consequences. Moreover, technology is broadly valued by policy-makers and business leaders who perceive it in an (overly) optimistic manner as the means of confronting issues of environmental harm and anthropogenic climate change, and this fits more into a Technological Determinism (TD) framework rather than one of EM. The economic model adopted in Ireland and Europe continues to be dominated by a growth-centric agenda in relation to development, production, and consumption. But, is it possible to simply develop new technologies that will transport us out of the environmental problems often created in the first instance by earlier technologies?

With the rhetoric of EM now established on the European and global environmental protection policy design landscape, what evidence (if at all) is there of its broad understanding, acceptance, and development as a strategic instrument in Ireland? What role does technology play in the design and the development (or not) of telework initiatives in Ireland? Is the practice of telework an environmentally sustainable option in the first instance? The objective in this chapter is not to simply dwell on the negative aspects of what is revealed but instead seek and discuss appropriate recommendations and solutions to the issues raised. These debates will also help to move the practice of telework from its current impasse with regards to its growth and implementation, and in the context of overall sustainability. The discussions chapter will explore the relevant issues to better assess the EM approach adopted in relation to telework practices, if indeed this is the case, and how it can be better understood and applied in the future.

The assumption inherent in EM is that economic growth can be aligned with environmental protection, but this cannot be upheld nor disproved in this research. As revealed in Chapter Five, there is an absence of any initiative or existing policy in relation to telework in Ireland, making our investigation somewhat problematic. This suggests that telework is not a good example of EM and illustrates its limits as an environmental protection

policy paradigm. It is not possible to determine if EM is appropriately understood due to a lack of policy but it is possible to state that; in the context of telework in Ireland, EM thinking is not applied nor implemented in any way. In addition, it is reasonable to state; in the context of telework, EM is not applied by the majority of influential decision-makers or business organisations in Ireland and there is no evidence of a coherent or ambitious plan to introduce telework to any significant degree using such an approach.

Given the widespread proliferation and use of ICT, and the anticipated environmental benefits of reduced commuter traffic brought about by telework, such working practice should be pervasive and conventional in many organisations, government departments, and other agencies across the country. But evidence in this study would suggest otherwise. Rates of teleworking remain static in Ireland and there is little indication of the promotion or growth of such schemes. The rates of teleworking is just above 4 per cent, below the European average of 7 per cent, and telework interviewees spoke of the practice as a 'rare phenomenon' in Ireland. This suggests that telework is not a legitimate way of working for many and remains an inconsequential working arrangement.

The lack of telework in Ireland contrasts somewhat with evidence of a high level of environmental concern apparent in the surveys and interviews. Having concern for the environment plays little or no part in an individual's decision to telework in many cases. Instead, it is often personal, social, economic, and political factors that take precedence. Current work environments in Ireland do not allow for alternative work practices to easily emerge and thrive, and the majority of individuals still work in jobs that entail traveling to and from a central location and are subject to orthodox management and supervision. There is a lack of practical legitimacy for telework amongst business leaders, management and indeed employees. But how does this lack of validity express itself in the data?

Where telework is implemented in Ireland it is done in an ad hoc and unregulated manner. Some of the interviewees held strong views on why this is the case, with several blaming a lack of regulation and the absence of legislation and official guidelines. There is recognition that government has an important role to play in promoting and developing telework but, at present, were not fulfilling their obligations in this respect. The 'light touch' regulatory approach adopted by politicians and policy-makers in Ireland has allowed a situation develop where a vacuum of legislation or regulation, specifically designed in respect of telework, prevails. Indeed, there is little indication that existing legislation with regards to health and safety (which also applies to teleworkers) is being implemented, and the working

environments for individuals working from home are not inspected or monitored to any significant degree.

What do such decision and policy-makers assume will be the outcome of such a hands-off approach? Given this regulatory vacuum policy-makers must frequently assume that technology has some 'mystical powers' that brings about positive change once its unhindered in its work, a view very much in line with strong Technology Determinism (TD), or at least 'very weak' EM. A key finding of this research thesis is that TD is alive and well and remains prominent with regards to thinking on technology's impacts, and in reality EM gets conflated with such determinist assumptions. There is an unrealistic belief in the power and influence of technology to shape and promote social and environmental change allied to economic growth, resulting in an abdication of responsible by key decision-makers to regulate and legislate. This reliance on the 'myth of autonomous technology' is risky because it diverts attention away from the need for strong social and political control of technological innovation and development. Governments, and other key officials, therefore have a crucial role to play in shaping the direction of technological development and adoption processes.

If policy-makers' (over)optimistic acknowledgement of technology use and direction is not the case then there is confident that employers will embrace telework once the benefits of such organisational change, and its ecological potential, have been made clear; a practical case of neo-liberal environmentalism. This is the only other realistic outcome of light touch regulation. But organisations do not promote telework to any significant degree. There is little indication that employers or management are progressive in this respect, and the absence of telework schemes in Ireland appears to vindicate this position. There is an assumption that the market and technology alone will simply self-execute and drive any such developments. The ad hoc nature of existing schemes suggests a non-committal approach is being adopted by many employers, influenced in no small way by the lack of direction or regulation from governmental departments and agencies. Such indecision and misrepresentation at a structural level merely leads to the de-legitimisation of telework for many organisations, employers, and indeed workers. Firms can appear divided between the attractions of reducing costs and the fit with outsourcing and part-timing, and the risks of lack of control and supervision, and for these reasons middle management frequently dislike telework.

Some middle management spoke about the uncertainty of working over-distance and of being unaware of the true implications of allowing individuals to work from home, including

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the financial costs that may accrue. One interviewee spoke of doing things informally and not acknowledging in any way the practice of telework. Management repeatedly grappled with the issue of how to monitor and supervise workers who were not present at a central location. Such issues appear to be unconsciously placed barriers for management to avoid the changing working environment of new dispersed and globalised workforces made possible by ICT. Work supervision and monitoring are real issues even in a traditional office or worksite, but mangers in these settings do not spend their days 'looking over the shoulders' of employees. Indeed, this would be seen as an unacceptable level of intrusion into people's work, or indeed harassment. Management unease with virtual working appears somewhat irrational given that teleworkers work longer hours.

The successful implementation or adoption of telework is hindered by issues of mistrust. Throughout the interviews individuals' related problems with trust between the parties involved working over-distance. Trust became an underlying theme during the investigation and in the absence of structural guidelines and arrangements the practice of telework will continue to be implemented in a haphazard manner compounding suspicion and mistrust. But are guidelines alone enough to build trust? There is an acknowledgment from many interviewees that trust is established over time with regular face-to-face meetings. Teleworkers spoke of the need to 'get to know each other' before management consented to telework taking place. This supports findings that real and meaningful relationships are built and developed over time by occasions of co-presence and proximity between individuals.

In some instances, individuals felt that in this environment of uncertainty working from home damages promotional opportunities and upward mobility within their respective organisations. In one instance, an interviewee felt he would be overlooked when it came to promotion if he continued teleworking, so much so they he relinquished the opportunity to work from home. Other interviewees had a more positive outlook in this regard, but many of these individuals are employed by organisations with existing positive flexible working cultures. However, visibility remains a challenging concern for teleworkers and as one interview stated: "the person that puts in the eight to eight and sits in the office five days a week just looks like the harder worker". Whilst the social meaning and construction of work remains contested, presence, status and gender remain important issues of concern. Advocates of SCOT may be unsurprised with this finding and there may be a need for EM to move closer to this reality in their deeper considerations.

Interviewees from organisations who embrace flexible working arrangements felt that the manner in which such schemes are implemented is also somewhat improvised. There is inadequate training and direction given to teleworkers and the skills required to work effectively from home are largely trivialised. There are no formal reporting structures and such workers are simply encouraged to 'get on with it'. Interviewees mentioned that the distrustful attitude adopted by many organisations towards telework is diminishing, but much of this is down to personal situations and circumstances and their management's attitude as the practice becomes normalised. Telework is not a new phenomenon as ICT have enabled this way of working for some time now, but in Ireland issues of implementation and adoption are far from straightforward.

The changing nature of work is a significant underlying feature of this study. Contemporary knowledge workers chiefly require the continuous availability of data to perform their work, and ICT has altered the time and place individuals choose to work with this data. Many teleworkers operate in globally dispersed work teams and organisations and this is transforming both the time and space of traditional employment. Workers are fluctuating their hours and increasing their working days in order to remain connected to colleagues across the globe. The conventional nine-to-five is becoming obsolete for these workers, which is having the impact of both increasing productivity and prolonging the working day. Accompanying this change is a positive feeling of increased flexibility and autonomy, with some obvious domestic impacts and consequences. It is worth noting that teleworkers view the flexibility afforded as within the gift of employers and management and see the additional hours worked or increased productivity given as typical and obligatory for them to continue to work from home. As one teleworker stated; "anyone who works from home needs to give that little bit more".

However, is this way of working representative of the working population in Ireland? From our study, this is not the case. There is limited uptake of telework in Ireland so the participants of both the *Telework Survey* and the interviewees can be regarded as exceptional. Many workers continue to work the traditional nine-to-five, five day working week. They also continue to work at central worksites or locations. Teleworking is dominated by managerial, professional, and technical workers, suggesting that telework may reflect social status. It is also a more frequent practice among organisations that have large percentages of knowledge employees. The interviewee profile in this research would concur as most fitted the typical age spread, worked in IT, Sales, and other higher-end jobs, and could broadly be described as knowledge workers.

The social sustainability and consequences of telework rarely receive attention before schemes are implemented. The logic of EM affords little opportunity for a consideration of domestic or social issues instead focussing on the economic and environmental benefits of this method of working. There is neglect of the personal, domestic, community, and social elements in favour of the needs of the organisation, although this is not always obvious to teleworkers themselves. Individuals reported a sense of being 'cut off' from colleagues and the *softer* communication opportunities afforded by centrally-located work, such as casual social meetings and coffee breaks. Largely for this reason, teleworkers stated that they could not work exclusively from home instead opting to telework for just a few days a week.

The interviewees (and participants in the *Telework Survey*) worked longer days, often time which collided with domestic commitments and occasionally generating feelings of work intrusion and loneliness. This mix of emotions of loneliness and intrusion for teleworkers is interesting. People who work from home have an appreciation of the blurring of boundaries between work and private domains and feel a sense of imposition when work interferes with their private lives. At the same time, they desire basic social human interaction from time-to-time. Such a mixture of emotions can complicate teleworking for individuals especially when such issues have not been discussed or explained before adopting the practice.

The need for physical proximity afforded by co-presence became palpable in some interviews as teleworkers sought out particular personal face-to-face contact when working from home. Notwithstanding this, most felt that the flexibility afforded makes a constructive contribution towards a positive work/life balance. However, it must be noted that several of the interviewees spoke of a sense of gratitude towards their employers for allowing them to work from home even when the organisational benefits of such arrangements were apparent. This feeling of gratefulness obscured the obvious intrusion of work upon individual's private home lives, something that is observable to this author. There is evidence that the private domestic lives of many teleworkers are being intentionally disturbed by the practice of telework even thought this is ignored by many who chose to work in this way. EM discussions typically ignore the softer social side of human infrastructure whereas sustainability discourses places a significant importance on such issues.

Another interesting observation is how teleworkers viewed the time spent at coffee breaks with colleagues or 'water cooler moments' as unproductive. Interviewee talked of not 'wasting time' on these work social pursuits instead often having coffee or lunch while they continued to work. Telework appears to instil the need to be always available and at work, in

contract to the traditional work setting. Such a sentiment again benefits the employer. It is curious to contrast this cataloguing of 'non-productive' socialising and the real needs of teleworkers to seek out their own avenues of occasions of co-presence with colleagues, friends, and family. The benefits of coffee breaks and occasions of casual socialising during working hours should not be underestimated as an important work and social cohesive instrument and for building and sustaining relationships within organisations. Organisational power is often a function of social networking in the workplace.

When individual's telework, and thus are not visible to their colleagues or management, there is a default feeling that the individual is well. The obvious signals afforded by eye contact and facial expressions do not apply to the practice of telework. In the interviews, teleworkers declared the need to work even when they were unwell. This again is the result of a sense of gratitude that accompanies the practice of telework and an appreciation for being 'allowed' to work from home, even though these individuals work longer hours offering greater productivity. The benefits accrue to the organisation and telework can be said to be allowing a certain dereliction of duty and due care by these organisations towards their employees. The absence of regulation in this area appears to condone and legitimise this position.

There is no evidence of any new structural or policy-making arrangements emerging with regards to telework. Whilst the majority of teleworkers exhibited a high level of concern for the environment this did not translate into practical action or political activism. What the findings also suggest is that key decision and policy-making in relation to work, mobility, and the environment, remains highly centralised. Ordinary citizens, workers, and interested relevant groups have not yet become empowered to transform, challenge, or indeed contribute to the prevailing decision-making structural status quo. This came across forcefully in the interviews. There is a feeling of powerlessness when it comes to the establishment of collective telework schemes and environmental protection. Many negotiated their own working schedules and arrangements in a very personal manner and were subject to some management and organisational restrictions.

Organisations that permit teleworking are off-loading many of the costs to the employees who work from home. There is no evidence of financial incentives available for those who choose to work from home and indeed these workers often bear the costs of the additional energy and equipment requirements needed to work in this way. There are some tax provisions to assist teleworkers but many interviewees were unaware of these provisions

and these were not applied by organisations to any significant degree. In addition, the organisation benefits from increased productivity gains and teleworkers frequently concede to being available outside scheduled office hours of business. Indeed, the technologies they use also allow workers to be more easily contactable at irregular or unsociable hours. Their lack of visibility to centrally-located offices or worksites means that many colleague and managers do not respect the privacy of the home and assume that teleworkers are always available and working. This increases domestic pressure and conflict as teleworkers can often be seen to 'always be at work'.

Some teleworkers commented on the lack of any innovative developments or new initiatives with regards to telework, particularly the establishment of out-of-town digital hubs to cater for such workers. In addition, teleworkers spoke of the absence of support from government or promotion in this area. As suggested, the real costs of teleworking are absorbed by the individual worker with limited assistance from employers or government. It is therefore reasonable to assume that if such arrangements did not benefit the employers, and in the absence of legislation or regulation to force them, telework would be strongly resisted by many organisations in Ireland. This suggests that telework schemes are centrally controlled within a few organisations, and any transformation in traditional authority and policy-making arrangements with regards to telework is not evident in this research.

The lack of official sources of information, legislation, and guidelines, acts to de-legitimise the practice of telework for many. It exposes a lack of commitment and care to the practice and reflects a position where teleworking is not taken seriously. Many interviewees remarked upon the lack of formal training or information on how to accomplish telework competently. The information portals and websites provided by the Irish government have closed since the early half of the last decade and little has been put in place to fill this information vacuum. This closes off opportunities for participating in telework schemes for many individuals due to the absence of detailed information and direction on how to work effectively from home. It also diminishes opportunities to participate in the design and development of any such schemes. Where existing regulation is applicable – such as the Health & Safety Act – this is implemented in a casual manner and there is little indication that companies or government takes such issues seriously (in respect of teleworking) to any degree.

There is no real evidence of EM policy or discourse in Ireland but what is apparent is a crude and superficial TD approach allied to neo-liberal environmental policy. With regards

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to telework, new ICT is anticipated by policy-makers to promote environmental protection in the form of reduced work travel requirements. Such assumptions are (over)optimistic in nature with little acknowledgment of the powerful underlying forces of capitalism guiding and managing the trajectory of such innovation and development. Taken within the milieu of earlier assumptions, it is uncertain if the economic forces of capitalism can be successfully aligned with environmental protection and much of what is forecast about the assistance of technology in this regards needs to be placed in context. Whilst it is clear there is movement towards greener technologies such developments are merely fuelling the growth of 'green' consumerism in line with capitalist ideology with little regard to resource depletion or environmental protection.

Furthermore, while pro-ecological substitutes are available and accessible, and people are aware of their environmental credentials, there is little momentum to switch and limited official encouragement to change, apart from an obvious drive to product and consume more. This position became apparent in the surveys. New more pro-environmental products are widely available but there is little indication that individuals are switching to these purely on ecological grounds. There is a lack of incentives (or indeed disincentives) for people to choose these products, again an indication of light touch regulation and a shifting of responsibility for environmental protection onto the individual. Moreover, there is no mechanism or process evident that is allowing individuals or groups to participate in promoting pro-ecological substitutes and environmental protection policy design or development in Ireland.

The ubiquitous nature of technology use and adoption in contemporary society is often underestimated, and its effects on society not always truthfully acknowledged or appreciated in some quarters. The use of technology has crept unimpeded into many aspects of our daily lives without due consideration to the consequences of such adoption processes. People now use many technologies in an unconscious almost indifferent manner. This is evident in many of the interviews. Teleworkers talked about the technologies they use when working from home but felt that the key to effective telework remain one of personal development and coping skills, in addition to good communications with customers, colleagues, and between management and employees. The use of available technologies for teleworking has become almost instinctive and involuntarily in nature.

Teleworker's stated that the most essential piece of equipment to telework is a suitable broadband connection, in addition to standardised communication equipment such as

the telephone and computer. Broadband facilitates faster means of communications. When discussing the skills required to telework most spoke of softer skills such as time management, self-discipline, and communications, but the subject of training and development in these skills was greeted with some surprise. Most did not receive training or direction (nor interestingly did not perceive a need) and those who did revealed that it was limited. Whilst teleworkers acknowledge that basic technology equipment is required to enable people to work from home the real skills necessary were individual coping mechanisms and personal development. Nevertheless, the environmental sustainability merits of telework are frequently promoted as technology being used to realise environmental protection.

Some results from the *Consensus Lifestyle Survey* are interesting in terms of how individuals view and conceptualise technology. While household items - such as dishwashers, tumble dryers and microwave ovens - are principally viewed as luxuries, other more recent technologies of mass consumption are widely perceived as necessities. Technologies such as the television, personal computers/laptops, and mobile phones, are implied entities of contemporary living and all have a similar function of supporting means of communications. The items providing certain level of personal comfort in the home, items that can be described as enhancing home life, are viewed as subordinate to objects that enable communications, whether broadcast or for personal use. However, overall technology use does little to fix existing environmental problems, as evident from the growing harm to the planet in line with increased overall technology consumption.

In the context of this research, telework was selected as a test case to measure and explore the assumption (over)consumption can be suppressed and that consumer's pro-environmental decisions leads to changes at the production level. In Chapter Six an analysis of a set of self-reported consumption questions is undertaken. The results were mixed with reported increases in energy and food consumption, in addition to waste produced, but no increase in travel, goods, or water consumption recorded. Such mixed results suggest that the issue of the environmental sustainability of telework is far from conclusive and additional research is needed to provide more assured conclusions.

The question of consumption and the environmental sustainability merits of telework is an interesting one. Our understanding of the overall implications, both in terms of consumption and society, is largely limited to the single-issue focus of transport. Telework is regularly promoted on environmental grounds because of its potential to suppress, or

eliminate, certain automobile use, in particular the daily commute to work. But many studies are merely concerned with this particular issue of travel. Owing to its complex nature, telework needs a wider agenda to provide clearer understandings of the broad implications of its environmental impacts and consequences. The assumed environmental benefits must be carefully examined to avoid promoting telework's ostensible tendency to reduce air pollution by reducing the enormousness of daily commuting only to find that other harmful effects offset these gains.

Environmental sustainability issues were explored in the interviews. The environmental credentials of telework mainly focuses on its potential to reduce, or eliminate, the daily commute to work but additional issues of mobility came to the fore. Some individuals relocated their home further away from their place of work as a consequence of telework. The practice of working from home facilitates the dispersion of workers over greater distances and this unforeseen consequence has, heretofore, not truly been acknowledged. Telework does not appear to challenge commuting practices or such a mind-set per-say but rather reinforces commuting as necessary, as opposed to compact cities and communities which are more sustainable[84]. In addition, the use of ICT is enabling the transformation of work itself with many teleworkers now operating in globally dispersed teams, and these workers felt obliged to travel and meet face-to-face to development and maintain work relationships. This again is an underreported consequence of modern working arrangements and an area that needs additional research. The issue of saving in distance travelled is mixed with some teleworkers reporting reductions due to the absence of the commute but others saying any savings were offset by extra domestic obligations such as school runs.

In addition to issues of consumption of distance, other environmental sustainability concerns were highlighted. Telework in many cases necessitated the consumption of additional technology equipment to allow a person work from home. Individuals indicated that they require extra equipment and resources for their homes, in addition to a broadband connection, and in some instances attempted to recreate their precise work environment in their homes. Working from home permitted workers additional opportunities and occasions to shop for goods and items and this also required additional travel. Increases in energy use, such as lighting, heating and electricity, were all recorded concerns for teleworkers during

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[84] In some ways the telework ideal speaks against the idea of compact walkable cities which intrinsically do away with commuting and sprawl. Telework, like trams and suburban rail, can actually facilitate sprawl, white-flight, and commuting cultures when what would be really sustainable would be walkable work, play, and living communities.

the interviews. These are all further patterns of consumption frequently neglected in analysis of the environmental sustainability of the practice of telework.

Apart from the obvious introduction of new and existing ICT and the (slow) rollout of broadband across the country, there is little or no evidence of training programmes, legislation or regulation, or efforts to promote telework in Ireland. In addition, any environmental consequences, whether good or bad, are purely incidental. There is no noticeable indication that the elements of transforming policy-making arrangements or curbing (over)consumption are receiving any attention or consideration in telework debates. Surprisingly, much of the practical policy approaches to telework currently adopted resembles that of TD, which is often hard to distinguish from shallow neo-liberal EM. Very little in the way of a more statist deeper EM, who might situate telework within a discussion on dematerialisation of energy flows, is evident to any degree.

Recommendations

Over the past number of decades the ambiguous concept of aligning the economy and the environment has been pursued by some advocates of EM, with some limited signs of success. Many environmentally harmful materials and elements previously acceptable are now deemed improper and unsafe and have been replaced with benign alternatives. A case in point is asbestos, now banned within the European Union. In addition, new processes and innovations are helping to reduce the use of scarce natural resources worldwide. However, progress is slow and subject to other considerations, power structures, and competing interests and forces. Alternative energy sources to the harmful burning of fossil fuels have been available for some time but there is little indication that our dependence on oil and coal is abating. Whilst EM thinking does lay the foundation for increased environmental protection, without the necessary resolve and co-operation, and in the absence of binding and obligatory international regulations, progress continues to be at the whim of production and consumer ideologies. Misaligned policy-making needs to be properly understood and accounted for in practical environmental protection strategies.

Telework strategy in Ireland is poorly developed and implemented, if at all. There is an absence of legislation in this area and administration of any such schemes remains organisationally restricted, unregulated, and centrally controlled. There is no evidence of any movement towards transformation in policy-making arrangements in this regard. What is apparent in the case of telework in Ireland is that ultimate authority on scheme

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implementation or establishment rests wholly with management and employers, made possible by government indecision whether by intention or not. Initiatives, where instigated, are often driven from the top-down and any such schemes, in the absence of legislation, rolled out in an ad hoc and unregulated manner. There is no evidence of any significant input from interested or relevant environmental or social groups at any level of the decision-making process with regards to telework.

Before telework is dismissed as an option of sustainability it must be explored in a real and practical sense to fully understand the issues involved so an empirically-informed decision can be made on its validity. Many employers currently fail to appreciate, or indeed choose to ignore, telework and thus remain hostile towards the concept. With decision-making powers so comprehensively skewed in their favour and in the absence of input from significant others, management in Ireland have largely elected to overlook the practice. With regards to telework, Ireland should try a re-formulated and ambitious EM approach to the practice but first must strive to understand many of the real and practical concerns involved. It is recommended - in line with other European countries - that Ireland introduce legislation to allow workers choose telework as a realistic working arrangement under agreed conditions and circumstances. Prior to any legislation, a period of consultation is required to both protect the integrity of the organisation and its work, and to safeguard and respect the private domain of the home. In line with EM thinking, this consultation process must include telework practitioners and interested environmental groups, and their policy-making role must be validated and assured. Expectations should be clearly defined and boundaries made explicit in order to respect the employer and the organisation, and worker's private home life.

In addition to legislation, a robust training programme needs to be designed, developed, and made available widely to participating organisations and employees. This programme should consist of the technological competences needed for individuals' working in isolation and over-distance. Furthermore, the programme must also comprise of personal development skills individuals need for coping when working remotely. Such capabilities have, heretofore, been largely overlooked and underestimated by organisations, key decision-makers, and policy-makers in Ireland to-date. These skills include online communications, personal coping and development, time management, project management, personal discipline, and managing work in isolation.

In the case of telework in Ireland its environmental sustainability credentials are generally unknown. EM as a catalyst and instrument for behavioural change in consumer

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behaviour and practice is also unknown. Whilst there is evidence of a reduction in commuting travel this can often be offset by increased auxiliary mobility needs and the additional consumption of water, food, and energy in the home. Many additional layers of consumption are apparent and a single focus on transportation in this respect is inappropriate. Whilst discourse on the environmental sustainability merits of telework is both warranted and necessary very little in the way of the social sustainability of this way of working is discussed or acknowledged. What is apparent from this research is the significant merging of work and private domains and teleworkers are now working longer and absorbing the costs of telework in terms of their financial commitments and disruption to domestic life. Such developments may be good for the economic wellbeing of the employer organisations but can have negative consequences for family life and personal wellbeing of the individual worker. Social sustainability impacts and consequences must be given greater weigh in the future when deliberating on the subject of telework.

Limitations of this Study

There are a number of limitations to this particular body of research that need to be acknowledged. This study chose the subject of telework in Ireland to obtain a bottom-up understanding of EM thinking, specifically concerns about reconciling economic growth with environmental protection, and if such thinking is prominent in policy design. One of the more fundamental problems experienced is the absence of any coherent description or assessment of EM thinking. What does it mean and to whom? As is revealed in this research, weak EM forms part of mainstream development theory, which views environmental management as the next step in a unitary evolutionary process of modernisation. It is often narrow in nature and concerns are depicted in terms of monetary value, with technical fixes being recommended as the main solution to environmental damage. Deeper approaches to EM promote a more radical change to society with a view to making it more responsive to environmental concerns. Shallow EM merely sustains the dominance of economic considerations over environmental and social protection, whilst deep approaches to EM are more likely to lead to significant and sustained structural changes to tackle negative environmental impacts. Conceptualising political, economic, and ecological developments in diverse and open-ended terms is also a key part of deep EM thinking, which accepts that there is no single correct or accepted view of what EM must entail but multiple possibilities to which EM might provide an orientation. In the absence of a clear and authoritative definition of EM, this research developed a distinctive typology in an attempt to understand its broad assumptions and key debates.

A specific limitation and difficulty emerged during the research. Whilst this study set out to understand if EM is appropriately understood and applied (if at all) in policy design and implementation using telework as a test case, an key concern arose in Chapter Five. In this chapter it was revealed that no policy exists in relation to telework in Ireland and that much of what is evident is expectant rhetoric on the subject and merely aspirational in nature. There is no direction or regulation evident to any significant degree in this regards. Whilst this restricts somewhat the overall findings it is reasonable to make suggestive conclusions based on the evidence at employee and organisational levels, as well as public discourses on the subject. It is also reasonable to assume a particular direction such policy might take based on the knowledge acquired from a reading of reports and information from agencies tasked to develop a strategy for telework in Ireland at the beginning of the last decade.

The absence of existing reliable data on telework in Ireland hindered and limited the study at times. It is not possible to build on previous bodies of knowledge in this area as such information that is available is inadequate, poorly presented, and frequently out-of-date. Many of the studies on telework in Ireland ended over a decade ago and, given the rapid nature of technological innovation and development, often are irrelevant to the research conducted in this thesis. Telework, as a topic of investigation and debate, appears to be disconnected from current policy-making agendas and considerations. This research seeks to reveal and bridge the gaps in this respect. In many ways telework precisely epitomises the problem of shallow neo-liberal EM thinking in policy design, which tends to exaggerate the effect of unconstrained technological fix solutions.

The meagre uptake of telework in Ireland hampered and limited this research, to some extent. Seeking participants for interview took time and in many cases their selection was down to chance encounters or a snowballing effect where teleworkers proposed other possible participants. A number of sources were used to seek contributors, including social media, and the individuals chosen for interview may not be truly reflective of contemporary teleworkers or prevailing telework practice in Ireland. An attempt was made to select participants that broadly fit the profile of teleworkers in Ireland, but this was not always successful. In addition, and given the nature of telework, the planning of interviews was problematic at times and the flexibility afforded teleworkers meant that a number of meetings had to be re-scheduled or postponed. All interviews were conducted in an open and friendly manner and some interviewees were more forthcoming than others. This is a predictable weakness but one which the author is cognisant of and strived to overcome many times over the course of the research.

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In the questionnaires utilised for this research the sample size used was a constraint, particularly in the case of the *Telework Survey*. Once again, the meagre uptake of telework in Ireland played a significant role in this limitation. It is difficult to build trust and gain the confidence of individuals over-distance and in a virtual environment, and many companies were reluctant to take part due to the haphazard nature of their own telework arrangements. The *Telework Survey* attracted only 53 individual participants and not all were teleworkers. In addition, it was not possible to tell if the participants were being truthful in their responses and individuals often read different meanings into each question and therefore replied based on their own interpretation of the question. There is also a level of researcher imposition or bias, meaning that when developing the questionnaire the author was making his own decisions and assumptions as to what is and is not important, therefore these surveys may have omitted or trivialised some issue or topic of importance to teleworkers.

Chapter Summary

This chapter offers an in-depth discussion of data from a number of surveys and interviews with teleworkers, and links the findings to the literature and policy-related considerations provided earlier. It synthetizes the experiences and knowledge individuals have acquired over time in order to make sense of the many facets and practices employees and management have established while working from home. The development of telework is allied to new Information Communications Technologies (ICT) and has been suggested as an option in the growth of more environmentally sustainable mobility behaviours in Ireland. But knowledge of the topic is largely limited to hearsay and untested expectations. What is revealed in this body of work is that many of the important domestic and social aspects of telework have been neglected and this has led to significant blurring of boundaries between work and private lives, not always to the benefit of the workers involved. Much of the impetus for the development and implementation of telework strategies and schemes has been at the discretion of the employer in a *laissez-faire* environment that lacks legislation and governmental guidelines. This has resulted in ad-hoc and unregulated arrangements where the needs of the organisation assume paramount importance over the requirements of the workers and thus have inhibited the growth of telework in Ireland. Much more progressive understanding of the issues involved is required and robust legislation and regulation must lie at the heart of future developments. With teleworking, rather than fit any version of Ecological Modernisation (EM) theory, the reality is closer to Technical Determinism (TD) and neo-liberal light touch environmental regulation. However, the practice exposes problems that even EM advocates need to consider. Telework does not

challenge paradigms of commuting and the consumption of distance/mobility. Working from home does not necessarily reduce mobility as there is scope for displaced mobility and additional consumption. Indeed, the environmental sustainability credentials must be clearly understood in order to avoid promoting the transport saving elements of telework at the expense of increased consumption practices such as heating and eating. In addition, telework suffers serious social costs which EM advocates need to be mindful of. It is only when environmental protection and social sustainability become the central focus of policy attention instead of the forces of development and production that real progress will be made in this respect.

Chapter 8 – Conclusions

The international scientific community's considered opinion is that the earth's surface is incontrovertibly warming and humans are accelerating this through activities such as the excessive burning of fossil fuels that increase concentrations of Greenhouse Gases (GHG) into the atmosphere (IPCC, 2013). This scientific consensus is an uncomfortable dilemma for many of the world's politicians and business leaders and is frequently in conflict with real decision-making and policy implementation in developed and developing countries respectively. But as recent unpredictable weather phenomenon tend to emphasis, mankind may be running out of time to take effective and meaningful action to reverse, stop, or even slow down this trend towards dangerous levels of global warming. Indeed, anthropogenic climate change and rising sea levels may continue for centuries due to the timescales associated with climate processes and feedbacks even if GHG concentrations were to be stabilised, although the likely amount of temperature and sea level rise may vary depending on the fossil intensity of human activity during the next century (IPCC, 2007a). Whilst strong pressure for change on environmental and sustainability issues is necessary, the scientific community must strive to enhance their understanding of the harm and consequences of inaction and communicate these critical messages widely in a clear and concise fashion. This particular body of research was undertaken to add to the substantial existing body of knowledge relating to issues of sustainability and broaden the debates.

Given the absence of any official policy or direction in relation to telework in Ireland, the initial finding of this research is somewhat forthright in nature. Based on the examination of key publications and literature, desktop studies, and quantitative and qualitative research undertaken, telework is not a good example of substantive EM rationale. What is evident from this study is that approaches to telework in Ireland closely resemble neo-liberal environmental policy, or at least a very shallow (non-interventionist) Ecological Modernisation (EM) approach. This suggests that many key decision-makers are merely interested in any non-disruptive value of telework and the benefits that (potentially) accrue to the organisation, made possible by the production and consumption of new and existing Information Communication Technologies (ICT). The environmental impacts and consequences of telework are of secondary concern, with little or no attention given to issues and apprehensions about the social sustainability of the practice. The presumption and 'promise' of technology has largely driven the telework agenda and is a classic example of such shallow EM thinking and neo-liberal environmentalism. Indeed, such an approach could also be labelled as Technological Determinism (TD), given its reliance on technology (unaided) to transform and shape the contemporary work environment.

The grand EM theorising about the promise of telework in practice is revealed to be a rather mixed bag. Based on this initial finding, the Irish test case of telework suggests there are limits to EM as a policy paradigm, particular given the currently adopted neo-liberal position of many politicians and key decision-makers, continuing chronic car-dependency across the country, and a dearth of telework schemes. There appears little appetite for any form of state intervention with regards to telework that would be compatible with much of EM thinking. Within all stands of the EM debates, both shallow and deep, there is endorsement for overall structural change. The dispute is often over the pace and scale of such reform, with deeper EM advocates seeking radical and fundamental transformation and shallow EM promoters pursuing deliberate market-driven reform. Within an Irish context, and through the prism of telework, there is no evidence of any such change occurring, whether incremental or radical, and indeed given the recent attempt to abolish Seanad Éireann centralisation of power appears to be the order of the day. Given that the state was willing to do little we should have expected little in the way of telework's development, and so it has come to pass with its stagnation.

The meagre success of telework in Ireland adds to EM inconsistencies as a policy paradigm, spreading confusion within and outside policy design arenas. This is because EM is often held aloft as the main environmental protection policy framework for developed and developing countries. But there is no evidence of such thinking in telework policy design in Ireland. Indeed, such a lack of success merely heightens the degree of helplessness and apathy amongst individuals it is meant to convince and influence. The economic conditions appear to exist that would welcome change in working arrangements thus lessening the burden of increasing motoring costs on the individual and reducing the environmental impacts of commuting. Involvement in policy creation, development, and implementation often empower and awaken individuals and groups to the potential, possibilities, and opportunities centring on, and around, environmental protection and overall sustainability. In addition, reducing, and indeed in some instances eliminating, consumption is a judicious position to espouse in circumstances of continuing resource depletion and in promoting human and social wellbeing. The overall circumstances exist for deeper aspects EM thinking to develop and flourish, in the context of telework, but no evidence is available of this emerging or occurring to-date in Ireland.

The case for the environmental sustainability merits of telework in Ireland remains unproven. Whilst there is some evidence that teleworkers reduce the frequency of their daily commute to and from work the volume of this reduction is offset, at times, by teleworkers

relocating further away from their workplace and their additional travel requirements, opportunities, and desires. Moreover, the issue of further hidden consumption practices and behaviour - such as eating, washing, and heating - remains inadequately investigated and vague. These consumption practices often increase for individuals working from home, but the extent that this increase is offset by consumption reductions in the workplace is also unclear. Further longitudinal research into teleworker's consumption patterns is required, including an analysis of life-stage changes in practices such as found in parenthood. Until such research is complete the environmental sustainability credentials of telework will remain questionable. Telework, it can be said, is merely a tentative emerging work practice which is only suggestive of an environmental potential, but has many associated unexplored social impacts and consequences. The practice, therefore, should not be promoted as a positive environmental option until its ecological impacts and consequences known.

The evidence from this research suggests that an absence of legislation and guidelines has allowed ad hoc arrangements to become the norm for telework in Ireland. Control and regulation of telework schemes is vested solely with employers who often fail to appreciate, or choose to ignore, the benefits that accrue or the impacts and consequences for the individual worker and ecological harm. Indeed, in many cases suspicion and issues of mistrust have helped to disrupt or halt telework schemes from developing to their full potential. Management in Ireland need to enhance their understanding of all the issues involved or telework will become a missed economic (and possible social and environmental protection) opportunity. The concern of work/private dualism needs to be better appreciated and catered for in any telework scheme design to avoid the economic benefits coming into conflict with social and environmental sustainability. There is a requirement to consider and understand telework inclusively and acknowledge the political, organisational, social, community, domestic, and personal issues of meaning and relevance to people electing to work from home.

The on-going recognition of Ireland's unsustainable patterns of mobility, in terms of ecological harm, and the limited action evident in addressing this issue is of growing concern. Many of the aspirations contained in the *Smarter Travel* initiative have not yet been realised, apart from selected infrastructural construction projects. A considered element of *Smarter Travel* was an emphasis on the use of Information Communication Technologies (ICT) in promoting telework and thus reducing the need for daily commuting. However, no policy (or policy direction) exists in relation to telework in Ireland and *Smarter Travel* has now appeared to have stalled in favour of renewed road construction and continuing *Predict and*

Provide approaches[85]. The subject of telework is rapidly disappearing from economic and environmental discourses in Ireland and this particular research seeks to reignite the debate and provide a greater understanding and appreciation of this method of working in a more pragmatic manner. This study endeavours to broaden the current narrow scope of inquiry on the subject to consider significant issues of personal, social, and political concerns for individuals working from home.

The concept of Sustainable Development (SD) appears to be taking a backseat to the on-going global economic crisis and there is limited debate evident of any shift from current restrictive economic models and concepts espoused in many countries and regions. Whilst consumption became a key component of consideration in SD debates with *Agenda 21* at the Rio Summit, little progress to curb excessive and unnecessary (over)consumption is noticeable. Indeed, measures to recover from current economic difficulties contradict efforts to restrain needless consumption as politicians and business leaders call for citizens to stimulate economies by consuming and buying more (Oliver, 2011; Kirkup, 2012; O'Connell, 2012). Efforts to link consumption and the environment continue to be fraught with difficulty, ambiguity, and resistance, and demands for the individual to curb their own personal consumption behaviours in the absence of significant structural change and contradictory messages from politicians, policy-makers, and business leaders, are proving to be ineffective.

This thesis fits into a wider literature which is sceptical about telework overall. Political leaders in Ireland continue to espouse a *laissez-faire* approach which avoids the necessary intervention required to develop telework and promote moves towards more environmental sustainability behaviours. Indeed, telework 'falls between the cracks' of responsibility for a number of different departments of government and is omitted from all policy considerations. Noninterventionist economics, or market fundamentalism, seeks to liberate markets from political interference and in the case of telework in Ireland such an attitude is indeed apparent. The rise of neo-liberalism in Ireland since the 1980s, with its worship of the magic of the market and its ideological unwillingness to acknowledge what climate change represents, is a major challenge and concern. Yet, as Lord Stern (2007) argues; "climate change is the greatest and widest-ranging market failure ever seen". The ability to address this crisis does not appear to have yet reached the point where new political realities and understanding can be articulated. Many politicians and business leaders

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[85] In January 2012 Minister of Transport Leo Varadkar announced €100 million worth of funding for new road projects across the country, this despite the continuing poor economic climate and a reduction in overall road use in Ireland [see www.transport.ie/pressRelease.aspx?Id=485].

appear unable (or unwilling) to take the necessary action required to tackle anthropogenic climate change. In the modest case of telework in Ireland, this would require regulation, employment legislation, and robust organisational guidelines to ensure that any such scheme has a reasonable chance of success. Environmental protection concerns, however, must be to the fore in any such considerations and debates. Considering the adoption of key political aspects of EM thinking, which consents to the increased participation of relevant and interested groups and individuals into the domain of policy-making, may be a useful beginning.

Throughout the current global economic crisis many individuals continue to speak of growing economies through increased production and consumption. Others are more mindful of the lasting consequences of accumulative damage to a fragile planet, although these voices can be marginalised at times. Short-sightedness in terms of stimulating growth may well lead to increased economic development at the expense of the long-term viability of communities, society, and indeed the environment. What is necessary is decisive action rather than mere expressions of concern for all pillars of sustainability. But such actions largely appear to be beyond the imagination of many influential politicians and key business leaders. In the current economic milieu that is dominated by production-centric consumption-based capitalism, proposals of resource restraint and discourses of sustainability are predominantly greeted in an antagonistic and dismissive manner. Nevertheless, the continuous growth model is inherently unstable resulting in cycles of 'boom and bust' and continuous growth, in the context of a finite resource world and existing environmental damage, is unlikely to support current levels of materialism in developed nations indefinitely. It is no longer plausible to build, produce, or consume our way out of current problems and real innovation and leadership is required in the promotion of genuine and sustainable change. That change is necessary is obvious, but who will champion it?

To summarise; Ecological Modernisation (EM) thinking is not applied in telework policy design by those tasked to undertake such decision-making in Ireland. Telework, therefore, is not an example of EM and largely reflects its limitations as a policy paradigm given the neo-liberal philosophy adopted by influential politicians and business leaders. This is apparent from the absence of any policy initiative or proposal in this area, and by the unsophisticated manner in which telework is advocated as the 'positive' consequence of the adoption of new and existing Information Communication Technologies (ICT). In practice, telework does not live up to its environmental rhetoric and frequently brings the three pillars of sustainability (economic, social, and environment) into conflict. The practice cannot be

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established as an environmentally sustainable option due to incomplete and inadequate research in this area. Often, environmental gains in transport are offset by additional needs and opportunities of consumption in other areas such as eating and energy use. Furthermore, in many instances the consumption costs of telework are off-loaded by organisations to the individual worker and to their homes. The main issues and concerns that affect the acceptance, implementation, and development of telework have been outlined throughout this thesis. These include the need to acknowledge and manage the work/private dualism, the lack of legitimacy for telework, and the absence of legislation and regulation for telework schemes. The development of telework is largely hampered by an indifferent attitude amongst key policy and decision-makers tasked with its promotion and development, and a suspicious approach by organisational leaders.

As the condition of our planet continues to deteriorate and evidence of anthropogenic climate change becomes more apparent, the need for continuing research becomes crucial. A resilient constituent of environmental protection will remain issues of sustainability, and how (over)consumption is increasing levels of depletion of the earth irreplaceable resources and needs to be halted and reversed. One of the central stumbling blocks to such progress remains the short-sighted nature of many politicians, policy-makers and contributors, and business leaders, and their inability to become real innovators in terms of re-engineering our economies. Many are content to continue on a destructive trajectory of environmental damage and resource depletion, a position which future generations will no doubt be critical of. A fresh look is needed to understand, explore and investigate, plan, and progress ideas on how to live within the confines of a finite resource planet, and deeper aspects of EM thinking have the potential to provide a roadmap. Let us begin this transformation armed with the artefacts and technologies that support us, an understanding of the limits within which we exist, within the societies, communities, and families that sustain us, and the hope and optimism of health, wellbeing, and sustainability for all.

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Appendix

Prof. Tom Callanan *Chairman*	University of Limerick
Mr Liam Breslin	Strategic Developments, Telecom Eireann
Ms Maureen Breslin	Irish Wheelchair Association (resigned Dec 1998)
Ms Paula Carey	Research Officer, ICTU
Ms Riona Carroll	Executive Officer, Telework Ireland
Ms Claire Foley	Manager, International Teleservices Course Cavan College of Further Studies
Mr Niall Hayes	Lucent Technologies
Professor Deirdre Hunt	University College., Cork
Mr. Terry Landers	Ericsson Systems Expertise
Ms Mary Leahy	College of Commerce, Cork (resigned May 1998)
Ms Helen Mullins	College of Commerce, Cork
Mr John Lowery	Deputy Chief Executive, Údarás na Gaeltachta
Mr Charles Lynch	Chief Executive Officer, Galway County & City Enterprise Board
Ms Sheila McCaffrey	Managing Director, KITE
Mr Joseph McCormack	Managing Director, McCormack and Associates
Mr Gerry McGovern	Managing Director, Nua Ltd
Mr Declan Murphy	Enterprise Ireland (resigned September 1998)
Mr Tom Maguire	Enterprise Ireland
Ms Una Murphy	TELSI
Ms Maebh O'Connor	Business Development Manager, PKS systems
Dr John O'Flaherty	Managing Director, National Microelectronics Applications Centre Ltd, Limerick
Mr Frank Ryan	Frank Ryan & Associates
Mr Joseph Sweeney	Managing Partner, O'Donnell, Sweeney & Co.
Secretary to the Council:	Mrs Theresa Fitzpatrick, Department of Enterprise, Trade and Employment
Editorial Consultant:	Dr Aedín McLoughlin, Glenwood Research

Figure 21 - The National Advisory Council on Teleworking

Telework Questionnaire

[1] Do you telework at present?
*Please choose **only one** of the following:*

- o Yes
- o No
- o I have teleworked in the past but not at present

Telework refers to working from home for part (or all) of the week, and usually involves the use of Information Communication Technologies such as a computer/laptop, access to the Internet, a telephones, etc.

[2] How many days a week do you usually work from home?
Only answer this question if the following conditions are met:
*Please choose **only one** of the following:*

- o One day a week
- o Two days a week
- o Three days a week
- o Four days a week
- o Five days a week
- o More than five days a week

[3] Which of the following is <u>the most significant barrier</u> to telework, in your case?
Only answer this question if the following conditions are met:
*Please choose **only one** of the following:*

- o My employer/management would not allow it at present
- o It is not possible for me to telework (I need to be present in the building/office to work)
- o I don't have all the necessary equipment at home (broadband/PC/telephone/etc)
- o There would be more pressure on me working from home
- o I have family at home and I would be easily distracted
- o I would have to work longer hours
- o I would miss the camaraderie at work
- o I would miss out on promotional opportunities
- o I never really considered telework as an option/I don't know
- o Other (please specify)

[4] To what extent do you agree or disagree with the following statements:

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Telework offers a better work/life balance overall	○	○	○	○	○
Working from home allows a teleworker more quality time with their family	○	○	○	○	○
Housework and chores increase when a person works from home	○	○	○	○	○
Teleworkers are at their happiest working alone at home, rather than in an office/factory	○	○	○	○	○
Teleworkers are more available to friends and neighbours when they work from home	○	○	○	○	○

[5] To what extent do you agree or disagree with the following statements:

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Telework can affect a person's promotional opportunities	○	○	○	○	○
Teleworkers work longer hours	○	○	○	○	○
Teleworkers are more isolated when working from home	○	○	○	○	○
Telework is more stressful than working from an office/factory	○	○	○	○	○
Telework is better	○	○	○	○	○

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
for women than for men					
Telework is better for managers than for employees	○	○	○	○	○

[6] To what extent do you agree or disagree with the following statements:

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
You need strong technical knowledge and skills to work from home	○	○	○	○	○
Teleworkers are required to be very flexible about the times they work	○	○	○	○	○
You need to be very disciplined to telework effectively	○	○	○	○	○
You need strong time-management skills to work from home	○	○	○	○	○
You must have a dedicated space at home to telework efficiently	○	○	○	○	○
The ability to multitask is a necessity to work well from home	○	○	○	○	○

[7] To what extent do you agree or disagree with the following statements:

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
When working from home consumption of food increases	○	○	○	○	○
When working from home you use more energy (for my computer, heat, cooking, etc)	○	○	○	○	○
When working from home you use the car more often (shopping, school runs, etc)	○	○	○	○	○
When working from home you generally purchase more goods and items	○	○	○	○	○
When working from home you usually use more water	○	○	○	○	○
When working from home you produce more waste for disposal	○	○	○	○	○

[8] Did you receive any formal training or advice before you commenced telework?
Only answer this question if the following conditions are met:
*Please choose **only one** of the following:*

- ○ Yes
- ○ No

In this instance I'm referring specifically to advice on how to set up a home office, time-management, self-discipline, and such related telework skill issues.

[9] Did environmental considerations <u>play a significant part</u> in your decision to telework?
Only answer this question if the following conditions are met:
*Please choose **only one** of the following:*

- o   Yes
- o   No

By environmental considerations we mean the need to reduce travel and thus congestion, pollution and energy use associated with personal transport.

[10] Which one of the following statements best describes how you feel about the environment?
*Please choose **only one** of the following:*

- o   I'm very concerned
- o   I'm somewhat concerned
- o   I'm not concerned
- o   I'm not at all concerned
- o   I've no opinion/Don't know

[11] In your opinion who is most responsible for protecting the environment?
*Please choose **only one** of the following:*

- o   Government and their agencies
- o   Businesses & manufacturers
- o   Communities (i.e. people working together locally)
- o   Individuals themselves
- o   All of the above
- o   Other (please specify)

[12] What level of Government is most responsible for protecting the environment?
Only answer this question if the following conditions are met:
*Please choose **only one** of the following:*

- o   The European Union
- o   National Government
- o   Local Government (i.e. Local Authorities/City & County Councils)
- o   The Environmental Protection Agency (EPA)
- o   Other (please specify)

[13] Are you...
*Please choose **only one** of the following:*

- o   Female
- o   Male

[14] What is your age?
Please write your answer here:

[15] What is your marital status?
*Please choose **only one** of the following:*

- o Single
- o Married
- o Widowed
- o Separated
- o Divorced
- o Long-term relationship
- o Other (please specify)

[16] Are there children under 18 years of age living as part of your household?
*Please choose **only one** of the following:*

- o Yes
- o No

Children can be sons, daughters, brothers, sisters, nephews or nieces, etc.

[17] How many of these children are pre-school age?
*Please choose **only one** of the following:*

- o None
- o One
- o Two
- o Three
- o Four
- o Over four

This figure includes children who are currently going to pre-school facilities, or a crèche.

[18] What category best describes your current occupation or job?
*Please choose **only one** of the following:*

- o Professional
- o Service industry
- o Looking after the home
- o Managerial/Supervisory
- o Technical
- o Manual
- o Farmer
- o Government/Civil Service
- o Self employed
- o Other (please specify)

ConsEnSus Lifestyle Survey – (Part B) - Transport Questions

Q15. How far do you have to travel (one way) to work/college/school on a daily basis? *(Please tick one option)*

1. Less than 1 mile
2. Less than 2 miles
3. Less than 3 miles
4. Less than 5 miles
5. Less than 10 miles
6. Less than 20 miles
7. Over 20 miles
8. Not applicable
9. Don't know/Not applicable

Q16. Which method of transport do you most frequently use to travel to work/school/college?
(Please tick one option)

1. Walk
2. Cycle
3. Bus/train
4. Taxi
5. Car (*driver*)
6. Car (*passenger*)
7. Motorbike
8. Not applicable

Q17A. Is there public transport (or a private bus service) available for this commute to work/college/school?
(Please tick one option)

1. Yes

2. No

3. I don't know

Q17B. If yes, what is the main reason for not using this public transport?
(Please tick one option)

1. It's too expensive
2. It's unreliable
3. It's very restrictive (can't go when and where I want)
4. It's unsafe
5. Buses can be very unhygienic
6. I need to carry heavy/bulky things
7. I need to give lifts to others
8. I need the car for work
9. Never considered it/I don't know
10. Other (*please specify*)

Q18. In your opinion, which one of the following would encourage people most to reduce their journeys by car? *(Please tick one option)*

1. An increase in the cost of fuel/parking/toll charges
2. Improved/more affordable public transport
3. Improved bike lanes, footpaths and pedestrian crossings
4. More financial incentives to encourage people to walk/cycle
5. Easier online transactions such as banking, shopping, e-government
6. I don't believe there is any encouragement that would make people leave their car at home
7. Never considered it/I don't know
8. Other (*please specify*)

Q19A.In your opinion, what is the <u>biggest benefit</u> of driving a car?
(Please tick one option)

1. It's very flexible (the freedom to travel)
2. I can carry heavy/bulky things
3. I can give lifts to others
4. I'm protected from bad weather
5. It's safer (*less risk of an accident*)
6. Never considered it/I don't know
7. Other (*please specify*)

Q19B. In your opinion what is the <u>biggest obstacle</u> to driving a car?
(Please tick one option)

1. It's too expensive (cost of fuel/parking)
2. There are too many traffic jams and congestion
3. It's bad for the environment
4. I don't get physical exercise
5. I'm physical unable to drive
6. Never considered it/I don't know
7. Other (*please specify*)

Q20A. In your opinion, what is the <u>biggest benefit</u> of cycling?
(Please tick one option)

1. It's a cheaper option
2. It's good for the environment
3. It's good for my health
4. No trouble with parking or traffic jams
5. It's very flexible & convenient
6. Never considered it/I don't know
7. Other (*please specify*)

Q20B. In your opinion what is the <u>biggest obstacle</u> to cycling?
(*Please tick one option*)

1. I have to travel some distance
2. It is costly to buy bike/ equipment/ gear
3. I have to carry heavy/bulky items
4. I need to give lifts to others
5. Cycling is dangerous
6. Lack of secure cycle paths
7. I'm not protected from the weather
8. I'm physically unable to cycle
9. Never considered it/I don't know
10. Other (*please specify*)

Q21A.In your opinion, what is the <u>biggest benefit</u> of walking?
(*Please tick one option*)

1. It's a cheaper option
2. It's good for the environment
3. It's good for my health
4. No trouble with parking or traffic jams
5. It's very flexible & convenient
6. Never considered it/I don't know
7. Other (*please specify*)

Q21B. In your opinion what is the <u>biggest obstacle</u> to walking?
(*Please tick one option*)

1. I have to travel some distance
2. I have to carry heavy/bulky items
3. I need to give lifts to others
4. Increased risk of accident/injury
5. I'm not protected from the weather
6. I'm physically unable to walk
7. Never considered it/I don't know
8. Other (*please specify*)_____

Q21C. Please state whether or not you could walk to the following places without too much trouble
(*Please say yes or no to each of the following*)

A. A local corner shop/newsagent
B. A church
C. A park or playing pitch
D. A local school
E. A community or recreation centre
F. A crèche (or a childcare facilitate)
G. A pharmacy
H. A pub
I. The place I work

The Smart Moves Project Questionnaire

1. **How far do you have to travel (one way) to work on a daily basis?**

1. Less than 1 mile
2. Less than 2 miles
3. Less than 3 miles
4. Less than 5 miles
5. Less than 10 miles
6. Less than 20 miles
7. Over 20 miles
8. Not Applicable/Don't know

2. **Which method of transport do you most frequently use to travel to work?**

1. Walk
2. Cycle
3. Bus/Train
4. Taxi
5. Car (driver)
6. Car (passenger)
7. Motorbike
8. Not Applicable

3. **Which method of transport do you most frequently use for recreation & leisure?**
   (For going to sports/cinema/pub/theatre/visiting friends/etc)

1. Walk
2. Cycle
3. Bus/Train
4. Taxi
5. Car (driver)
6. Car (passenger)
7. Motorbike
8. Not Applicable

4. **Is there public transport (or a private bus service) available for your commute to work?**

1. Yes
2. No
3. I don't know

5. **What, in your opinion, would be the main reason for not using public transport?**

1. It's too expensive
2. It's unreliable
3. It's very restrictive (I can't go when and
where I want)
4. It's unsafe
5. Buses are very dirty & unhygienic
6. I need to carry heavy/bulky items
7. I need to give others a lift
8. I need my car for work
9. I never really considered this/I don't know
10. Other (please specify)

6. **In your opinion, which one of the following would encourage people to reduce their journeys by car?**

1. An increase in the cost of fuel/parking/toll
charges/etc
2. Improved/more affordable public transport
3. Improved cycle lanes, footpaths & pedestrian
crossing
4. More financial incentives to encourage people
to walk & cycle
5. Easier online transactions such as banking,
shopping, e-government, etc
6. I don't believe there is any encouragement
that will make people leave their car at home
7. I never really considered this/I don't know
8. Other (please specify)

7. **In your opinion, what is the <u>biggest benefit</u> of driving a car?**

1. It's very flexible (the freedom to travel)
2. I can carry heavy/bulky items
3. I can give other people a lift
4. I'm protected from bad weather
5. It's safer (less chance of an accident or injury)
6. I never really considered this/I don't know
7. Other (please specify)

8. **In your opinion, what is the <u>biggest obstacle</u> to driving a car?**

1. It's too expensive (cost of fuel/insurance/parking/etc)
2. There is too many traffic jams & congestion
3. It's bad for the environment
4. I don't get enough physical exercise
5. I never really considered this/I don't know
6. Other (please specify)

9. Do you own a car at present?

1. Yes
2. No

10. In your opinion, what is the <u>biggest benefit</u> of cycling?

1. It's a cheaper option
2. It's good for the environment
3. It's good for my health
4. No trouble with parking or traffic jams
5. It's very flexible & convenient
6. I never really considered this/I don't know
7. Other (please specify)

11. In your opinion, what is the <u>biggest obstacle</u> to cycling?

1. I have to travel some distance
2. It's costly to buy a bike/equipment/gear/etc
3. I have to carry heavy/bulky items
4. I have to give others a lift
5. Cycling is dangerous
6. There's a lack of secure cycle paths
7. I'm not protected from bad weather
8. I'm physically unable to cycle
9. I never really considered this/I don't know
10. Other (please specify)

12. Do you own a bicycle at present?

1. Yes
2. No

13. In your opinion, what is the <u>biggest benefit</u> of walking?

1. It's a cheaper option
2. It's good for the environment
3. It's good for my health
4. No trouble with parking or traffic jams
5. It's very flexible & convenient
6. I never really considered this/I don't know
7. Other (please specify)

14. In your opinion, what is the <u>biggest obstacle</u> to walking?

1. I have to travel some distance
2. I have to carry heavy/bulky items
3. I have to give others a lift
4. There is an increased risk of accident/injury
5. I'm not protected from bad weather
6. I'm physically unable to walk
7. I never really considered this/I don't know
8. Other (please specify)

15. Have you ever considered a carpooling or car sharing arrangement to get to work?

1. Yes
2. No
3. I can't remember

15a. If you have answered yes, are you currently in a carpooling or car sharing arrangement?

1. Yes
2. No

16. Have you made any change to your travel-to-work routine in the past year?

1. Yes
2. No

17. If so, what prompted the change to your travel-to-work routine?

1. Earth Day/The Smart Moves Competition
2. Economic reasons (the downturn)
3. I moved house/residence
4. Circumstances changed for me at home
5. Other (please specify)

18. Which one of the following statements best describes how you feel about environmental issues?

1. I'm very concerned
2. I'm somewhat concerned
3. I'm not concerned
4. I'm not at all concerned
5. I've no opinion/Don't know

19. In your opinion, who is most responsible for protecting the environment?

1. Government agencies (*if you answer yes here then go to question 19a*)
2. Businesses & manufacturers
3. Communities (i.e. people working together in communities)
4. Individuals themselves
5. All of the above
6. I don't know
7. Other (please specify)

19a. In your opinion, what level of government is most responsible for protecting the environment?

1. European Government
2. National Government
3. Local government (*i.e. Local Authorities/City
&County Councils*)
4. Environmental Protection Agency (EPA)

20. Are you….

1. Female
2. Male

21. What category below best describes your occupation?

1. Professional
2. Service Industry
3. Managerial
4. Technical
5. Manual/Factory worker
6. Government/Civil Service
7. Self-employed
8. Other (please specify)

22. What year were you born?

23. Do you work for Thermo King?

1. Yes
2. No

24. If you would like to participate further in the project or require any additional information, please enter your email address or phone number below:

The Telework Interviewees, Consent Form, & Semi-Structured Questions

Code	Interview Date	Gender	Management or Employee	Age	Married or Single	Children	School Age
Teleworker 1	07 April '11	Male	Employee	25-30	Partner	No	
Teleworker 2	08 April '11	Female	Management	35-40	Married	3	Yes
Teleworker 3	12 April '11	Male	Management	35-40	Partner	No	
Teleworker 4	14 April '11	Male	Employee	40-45	Married	Yes	Yes
Teleworker 5	17 April '11	Male	Employee	30-35	Married	No	
Teleworker 6	21 April '11	Male	Employee	35-40	Married	Yes	Yes
Teleworker 7	27 April '11	Female	Employee	40-45	Single	No	
Teleworker 8	02 Sept '11	Male	Employee	25-30	Married	3	Yes
Teleworker 9	27 Oct '11	Female	Self-Employed	35-40	Married	No	
Teleworker 10	07 Nov '11	Female	Employee	35-40	Married	2	Yes
Teleworker 11	30 Nov '11	Female	Management	40-45	Single	No	
Teleworker 12	14 Feb '12	Female	Employee	30-35	Married	Yes	Yes
Teleworker 13	15 Feb '12	Male	Employee	55-60	Married	Yes	No
Teleworker 14	15 Feb '12	Male	Employee	35-40	Married	2	Yes
Teleworker 15	17 Feb '12	Male	Management	35-40	Married	No	
Teleworker 16	23 Feb '12	Female	Employee	35-40	Married	3	Yes

Table 15 - Table of Telework Interviewees

Possible Telework Questions for Semi-Structured Interviews

- Could you outline how you came to telework or work from home; just give me a little history behind it...
- What's the best thing about working from home...
- And the worst thing about working from home...
- Have you family in the home and are they school/working age...
- Can you give me a reason why you decided to telework...
- Do you work from home for the full week, or part of the week...
- Was there any pressure from your employer/colleagues to telework or did you actively seek it out ...
- Did you receive/ask for any formal training before you began teleworking...
- What types of skills are really necessary to work from home...
- What technologies do you use...
- Do you use these technologies differently (do you have a wireless phone so you can move about)...
- Are you aware of any Irish legislation that covers teleworking arrangements...
- Did environmental concern (the need to reduce travel) have an impact on your decision...
- Do you feel isolated working from home...
- How do you feel communications with the office/organisation is; is it good, do you think it could be better...
- Can you outline you're morning; do you begin at 8am/9am in the morning and keep the structure and time of working at the office...
- Do you dress up for working at home...
- Does family life impinge on your work; do you find you need to give lifts or make lunch, things like that...
- Do the neighbours call around more often now that you're at home...
- Do you feel you work longer hours now that you work from home...
- Are you paid for these extra hours...
- Have you cut back on the use of your car or do you feel you just use it at different times now...
- Do you think you've saved money on travel by working from home...
- Is there a greater deal of flexibility or a better work/life balance from working at home...
- Can teleworking affect a person's promotional opportunities...
- Does teleworking affect the professional interaction between people...
- Have you heating, electricity or other bills increased since you began teleworking...
- Do you feel less or more stressed working from home...
- Working from home, are you more involved in the community...
- Given a choice, would you change anything about your teleworking arrangements...
- Do you think teleworking is better for men or women (& why)...
- Where would you go to get information on teleworking...
- Is it better for managers or employees to work from home...
- Do you think teleworking is promoted well, either locally or at a national level...

Consent Form: Telework Interviews

The ConsEnSus Project (www.consensus.ie)
Mike Hynes
School of Political Science & Sociology, National University of Ireland Galway

I am Mike Hynes in the School of Political Science at the National University of Ireland Galway. As part of my PhD project I am conducting research under the supervision of Dr. Henrike Rau and I am inviting you to participate in my study. The purpose of the study is to examine mobility and travel patterns in Ireland with a view to making these more sustainable in the future.

This study involves reflecting on sustainable modes of transport such as walking, cycling, public transport, carpooling and teleworking with a view to getting a better understanding of the practices involved in people's choice of travel option.

Your participation is completely voluntary and you may withdraw from this study at any time without penalty.

All information obtained in this study will be kept strictly **confidential.** All participants will be asked not to disclose anything said within the context of the discussion. All identifying information will be removed from the collected materials, and all materials will be securely stored.

I also understand that my words may be quoted directly. With regards to being quoted, please initial next to any of the statements that you agree with:

√	I wish to review the notes, transcripts, or other data collected during the research pertaining to my participation.
√	I agree to be quoted directly.
√	I agree to be quoted directly if my name is not published (I remain anonymous).
√	I agree to be quoted directly if a made-up name (pseudonym) is used.
√	I agree that the researchers may publish documents that contain quotations by me.

By signing this consent form, you are indicating that you fully understand the above information and agree to participate in this study.

Participant's signature: _____

Print name: _____

Researcher's signature: _____

Date: _____

If you have any questions about this project please contact Mike Hynes at 087-9170437, m.hynes5@nuigalway.ie or the project supervisor, Dr Henrike Rau, at 091-495104, henrike.rau@nuigalway.ie. This research has been reviewed and approved by the National University of Ireland Galway Research Ethics Board. If you have any questions or concerns about this study you may contact the Research Board at NUIG, University Road, Galway, Ireland. Phone: 091-495312 Fax: 091 494591, E-mail vpresearch@nuigalway.ie