

TELEWORKING IN IRELAND: A MULTI-LEVEL SOCIOTECHNICAL TRANSITION PERSPECTIVE

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Abstract

Transport continues to be a significant user of energy and a major source of Greenhouse Gases (GHGs) emissions worldwide. Moreover, the ubiquitous nature and use of technology in contemporary societies continues to transform lives and work environments. Telework occurs when Information Communication Technologies (ICTs) are applied to enable work be performed at a distance from the location where the results are needed, or where work would traditionally have been accomplished in the past. An essential feature of the *Smarter Travel* initiative, telework has been suggested as the means of reducing or eliminating unnecessary travel in the form of the daily commute to and from work, and a positive approach to reducing the overall consumption of distance in Ireland. As an innovative way of working, telework, however, has largely failed to capture management and workers' attention and imagination despite early optimistic predictions and forecasts. It remains a marginal practice and its social and environmental impacts and consequences remain somewhat ambiguous. Using a multi-level perspective (MLP) on sustainability transitions framework, this paper considers telework as a sociotechnical practice and attempts to reveal why it continues to remain a 'niche' practice dominated by specific worker and management profile and industries. What conditions, barriers and pressures impact upon the development and spread of this method of working across various industries and workforces? This study finds that a failure to enrol additional niche-actors, the dominance of traditional ways of working, and a lack of legitimacy in terms of policy, governance and management, have acted negatively to keep telework from emerging from a niche to the regime level, or becoming established as a more mainstream practice and method of working. Telework appears destined to fail even before it has been given a chance to shine as an economic, social and environmental means of sustainability, and transport policy initiative.

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Introduction

There is worldwide acceptance from within the international scientific community that human actions have, and continue to, impact negatively on our planet [1, 2]. Moreover, transportation remains a major user of energy and consumer of the global petroleum stocks, while also creating air and noise pollution and significantly contributing to anthropogenic global warming through carbon dioxide emissions [3-5]. These negative environmental impacts, in addition to (sub)urban sprawl, have developed considerably in Ireland over the past number of decades to a point where current mobility patterns are now deemed unsustainable [6]. Efforts to reconcile the desire for economic growth with aspirations for greater social justice and better environmental protection have shaped international policy agendas in the latter part of the last century, with sustainable development emerging as a fundamental aspiration [7]. Contemporary environmental concerns, such as resource efficiency and climate change, present formidable societal and economic challenges and addressing these may only be realised by deep-structural changes in transport, energy, food, and other systems [8, 9]. Frequently termed 'sociotechnical transitions', these systemic changes involve alterations in the overall configuration of transport, energy and food systems, which entail technology, policy, markets, consumer practices, infrastructural changes, cultural meaning and scientific knowledge [10]. These elements are reproduced, maintained and transformed by actors such as policy designers and politicians, companies and industries, consumers, civil society and researchers, and as such these transitions are complex and long-term processes comprising multiple actors working together [11]. There is, therefore, real need to address the complex issues of affirmative sustainability transitions on multiple levels and dimensions in which it manifests, an approach that seeks to widen participation by encouraging bottom-up approaches that are supported in a top-down manner. The multi-level perspective (MLP) has emerged as a fruitful middle-range framework for analysing sociotechnical transitions to sustainability [11, 12]. Moreover, it is argued that there is a genuine need for transport research to embrace a multi perspective to understand the complexities of modern mobility and transport [13], an approach that takes insights, concepts and methods from other disciplines, particularly social science [14]. MLP is argued as a heuristic framework to analyse interactions between industry, technology, markets, policy, culture and civic society [15].

What is telework, and is it a sustainable practice?

Work takes up a considerable portion of many people's daily lives so transformation in the nature and organisation of work has significant impacts on development, production, and consumption processes. Telework is a flexible working arrangement which enables employees work from home or over-distance through the use of Information Communication Technologies (ICT); a case of moving the work to the workers rather than moving the workers to work [16]. It has been suggested as a strategy to help organisations reduce their infrastructural and utilities costs [17-19], as a way of responding to employees' need for an enhanced work-life balance [20, 21], or as an instrument for the greater inclusion of individuals with various disabilities who have been previously excluded from the workplace [22-24]. Telework has also been proposed as a means of reducing air and noise pollution, and traffic congestion in urban areas through the reduction or elimination of the daily commute to work [25-27] and efforts to oppose climate change should accelerate this trend towards flexible distributed organisations [28]. It is further suggested that teleworking could result in annual savings of over 3 million tonnes of carbon and cut costs of £3 billion for industry, business, and society at large [29]. However, the use of communication technologies do not in themselves invariably lead to travel suppression [30-32] and there are additional environmental consequences from the need to change or update technological equipment, infrastructure, living space, and other such lifestyle adjustments [33, 34]. Our understanding of the environmental impacts and consequences is limited as research has tended to concentrate on the implementation, adoption, and growth of telework programmes [35, 36]. In the absence of further research, the environmental credentials of telework remain somewhat unclear [37]. However, conventional wisdom suggests that telework can suppress or eliminate the daily commute to and from work and thus its potential to diminish the

negative environmental consequences of avoidable travel should be acknowledged. Nonetheless, before positive aspects of the practice of telework can be endorsed it is crucial that we have a better understanding of the true social and environmental implications for individuals choosing to work from home.

Understanding the multi-level perspective

The MLP conceptualises overall dynamic patterns in sociotechnical transitions, differentiating three levels to analyse change; the landscape (macro) level, the regime (meso) level, and the niche (micro) level [cf. 12, 38]. Niches are 'protected spaces' such as Research & Development laboratories, subsidised projects, or small markets, where users have special demands and are willing to support emerging innovations [39]. Novelty emerges, over time, from this level as niche-actors work on radical innovations that depart from some of the existing regimes. Niches gain momentum as they become more generally accepted through learning processes of stability configuration or the expansion of social networks resulting in growing legitimacy. The sociotechnical regime forms the 'deep structure' that accounts for the stability of an existing sociotechnical system. The system elements are reproduced, maintained and transformed by various social communities and actors and these become embedded in sociotechnical regimes, which are essential rules that coordinate and guide perceptions and future actions [15]. The notion of sociotechnical regimes encompasses firms, engineers, policy makers, special interest groups, in addition to civil society, thus helping to overcome the tendency to single out one set of actors as pivotal to stability and success. The sociotechnical landscape is the wider context which influences regime dynamics [12]. The landscape level encompasses both the intangible aspects of social values, political beliefs and world views, and the tangible facets of the built environment. These combine within a single landscape category and form an external context with the greatest degree of structuration beyond the control of individuals and sets of actors and as such cannot be influenced in the short-term with change occurring very slowly at this level [11]. These three levels as a nested hierarchy are illustrated in Figure 1 below. The usefulness of the MLP has been demonstrated in case studies of transitions in transport [40, 41], energy [42], water [43], food and sustainable housing [44]. However, it also has been subject to some criticism for minimising the role of agency [45], its bias towards bottom-up change [46], in addition to argument about its epistemological and ontological status [47, 48] and the use of secondary data in case studies [47].

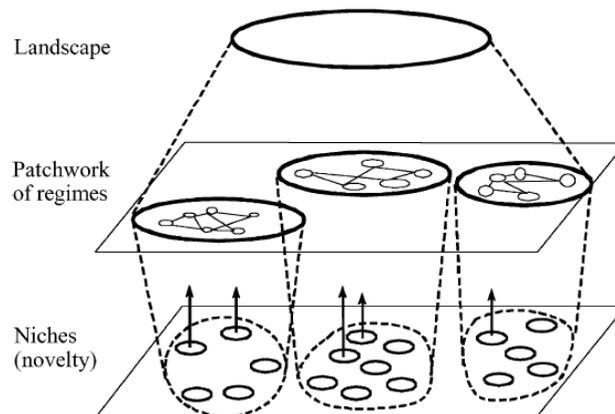


Figure 1 - Multiple levels as a nested hierarchy [39]

Figure 2 (as provided by Geels) offers a representation of how the three levels interact dynamically in the unfolding sociotechnical transitions. Change occurs as result of the outcome of linkages between developments at multi levels. Radical innovations break free from the niche level when ongoing processes at the level of regime and landscape create a possible 'window of opportunity' [39] as a result of different tensions and misalignments. For

instance, climate change is currently putting pressure on transportation systems triggering potential changes in technical heuristics and public policy. When tensions exist radical innovation may take advantage and break through into the mass market, entering competition with existing systems which they may eventually replace. Other opportunities may be created by tensions in the sociotechnical regime itself or, indeed, by shifts at the landscape level which places downward pressures on the regime. There may also be negative externalities in the regime, altering user preferences or imposing stricter regulation, which creates problems for existing systems [49]. Once established, the new system replaces the old regime which is accompanied by changes on broader dimensions of the sociotechnical regime, but this frequently takes some time and happens in a gradual fashion. A newly settled sociotechnical regime may well contribute to changes and influence developments at the landscape level.

Increasing structuration
of activities in local practices

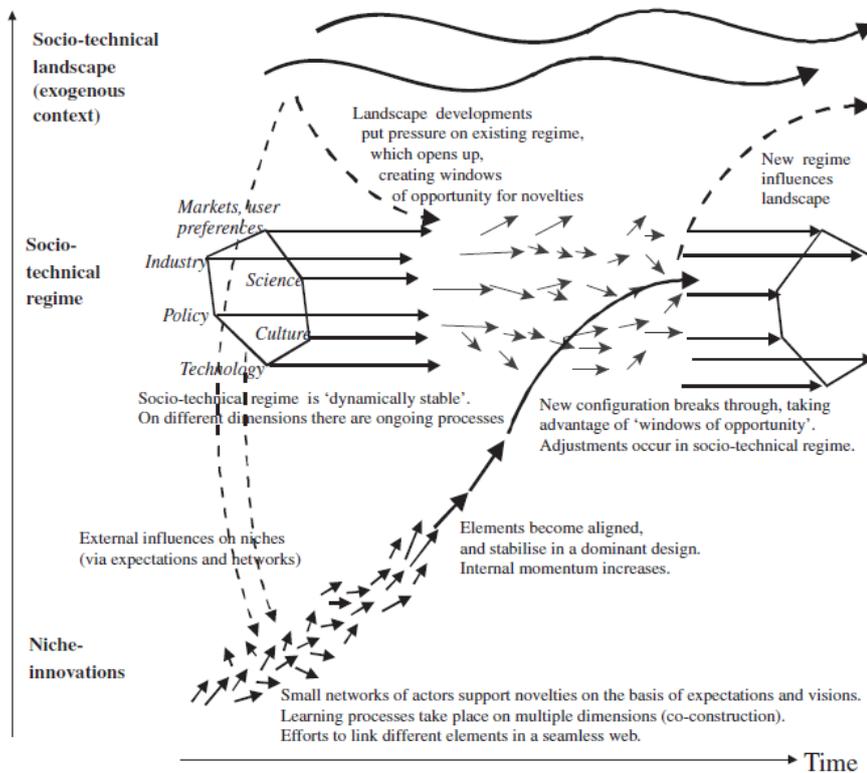


Figure 2 - MLP on transitions [15]

Teleworking in Ireland: The Case Study

To assess the impact of telework, an extensive review of national and international publications, policy, legislation, and evidence of public debates, in addition to primary research in Ireland combining quantitative and qualitative methods of inquiry was undertaken. The quantitative elements combined three separate surveys undertaken as part of the CONSENSUS Project and supplemented by national and European data. The *Telework Survey* [cf. 50] targeted workers in a multinational organisation which has pioneered flexible working arrangements in the past. The *CONSENSUS Lifestyle Survey* [cf. 51] sought an understanding of people's attitudes and behaviours towards sustainable household consumption and sustainability lifestyles, including their transport choices and decisions. The *Smart Moves Survey* [cf. 52] was developed to obtain an understanding of how workers at a selected large factory commute to and from their place of work. It also

sought opinions and attitudes on general issues of mobility and transport, and the environment. Existing national and European statistics complemented the data from these three surveys. The qualitative element of the research, which makes up the bulk of this particular case study, consisted of 16 semi-structured, in-depth interviews with male and female teleworkers. Interviewees were selected to reflect the broad range of teleworkers operating in Ireland [cf. 53]; nine male and seven females, a mixture of management, employees, and self-employed, and between the ages of 25 and 65 years of age. The primary focus of this research was on transport, consumption and sustainability. Such attention has been limited to-date, particularly in an Irish context. Whilst it has been, in the past, promoted merely as an economic instrument; is telework an effective tool for reducing environmentally harmful work-related mobility or does it simply shift environmental and social impacts (and their costs) from the worksite to home?

The foremost national telework data, from an Irish perspective, was published some twelve years ago in the *Quarterly National Household Survey* in which merely 3.5 per cent of the workforce were considered teleworkers [54]. More recently, the *Telework in the European Union* report investigated rates of telework within the European Union, particularly in the context of the *European Framework Agreement on Telework* [55]. This report revealed that the rate of teleworking in Ireland was 4.2 per cent of the workforce, with the European average standing at 7 per cent. Indeed, across Europe the report found a marked difference in regional, national, and even local and organisational terms. The figure for teleworkers within the EU had been expected to triple by 2010 [56] but the actual figure has fallen well short of these optimistic expectations. In fact, more recent announcements by Yahoo CEO Marissa Mayer [57] and Best Buy [58] to discontinue their teleworking arrangements within their respective organisations, in addition to Google's CFO Patrick Pichette counterintuitive anti-telework stance [59], suggests a potential reversal in such trends. Moreover, telework strategy remains underdeveloped in Ireland largely due to an absence of regulation that gives it legitimacy in the eyes of management and workers alike [60].

Understanding Telework and Teleworkers

High levels of concern for the environment were identified across all three surveys conducted for the CONSENSUS Project. 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'. 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. 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. A teleworker, for instance, may 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 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 savings. 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.

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 was repeated in different ways in many of the interviews. Teleworkers spoke of occurrences of telework as exceptional and that working from home is not widely discussed within, and indeed outside, their organisations. One of the interviewed teleworkers felt that rates of telework were indeed insignificant:

...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 was 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 a key concern, in addition to mistrust of employees and potential teleworkers. She further 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 interviewees worked for an organisation which had a developed philosophy endorsing flexible working and promoting telework. Whilst acknowledging their own circumstances within a flexible working culture, they felt that not enough was being done on a national level to encourage or promote telework, or 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].

Many interviewees recounted that teleworking conditions and arrangements need to be personally 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:

...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*].

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*].

What is revealed throughout the interviews is that there is no clear narrative about telework and there is a lack of validity and appreciation about its true impacts and the consequences for transport policy. In addition, the environmental connection is largely absent. Telework largely remains an 'invisible' feature of everyday working environments with little interaction between practitioners even from within the same organisation. It is considered a niche practice by teleworkers themselves, a method of working that lacks legitimacy and management understanding. 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 short-term family and domestic reasons. However, there is no policy, or indeed initiative, evident that would promote and support the development of telework in Ireland as a positive instrument of economic, social and environmental sustainability.

Applying the MLP to Telework

With the increasing availability of ICT and rollout of broadband infrastructure, at the turn of the century the Irish Government acknowledged telework as a 'component and facilitator towards introducing and supporting a new paradigm of work, organisation and trade' [61]. It was anticipated that deregulation of the telecommunication market, technology price reductions and performance improvements, would allow telework become a more conventional way of working. The stage was set for telework to emerge from its position as a 'niche' practice and disrupt the established way of working, with the positive externalities of environmental benefits. However, for it to emerge from the niche level it is imperative that the network of actor support increase over time but, to-date, there is no significant evidence of this in an Irish context. Telework, thus, largely remains a working arrangement dominated by a few sectors, most notably technology and sales, and indeed a few individuals from within these professions and industries. There is no evidence of any significant 'snowball' effect with regards to telework over the past two decades and, indeed, some evidence that the practice has retracted somewhat.

The literature on niche innovation distinguishes three social processes; a learning process, the articulation of expectations or vision, and the building of social networks and enrolments of more actors [12]. With regards to learning processes, some best practice guidelines were developed to support teleworking some fifteen years ago. These guidelines predominantly focussed on economic issues at the meso level and largely marginalise social and environmental concerns. No meaningful studies were conducted in the early days of telework's development and these guidelines quickly became outdated as technology, and in particular mobile communications, developed at a rapid pace. Teleworkers were largely 'left to their own devices' and ad hoc and disorganised arrangements ensued. Moreover, practitioners develop unique coping mechanisms and rarely complain about their working arrangements largely due to the practice's lack of official legitimacy and the feeling that to work from home is somewhat of a privilege. However, teleworkers frequently work longer hours without remuneration and feel obliged to be available out-of-office hours. This blurs the lines between work and home and can lead to diminishing levels of satisfaction with their work/life balance. Furthermore, due to the uniqueness of their working arrangements and their desire not to 'rock the boat' very little in the way of community learning is evident amongst teleworkers and ordinarily no training or advice is forthcoming from their respective organisations. This makes the practice somewhat invisible within many companies and firms and, indeed, many teleworkers are reluctant to speak about their working arrangements both in and outside of their organisation.

The traditional way of working, i.e. all travelling to a specific central location to perform tasks as part of an organisation, remains the dominant working practice regime in contemporary society. There is little evidence to suggest that this regime is under threat. Indeed, the termination of teleworking arrangements at Yahoo and Best Buy would suggest that the traditional way of working has been consolidated over the recent past. Working at a central location has been deeply embedded since the beginning of the industrial revolution and remains unchallenged despite the fact that many knowledge workers perform tasks and work in jobs where the resultant output is not necessarily needed at that particular location. More recently, globalisation has facilitated the greater development of globalised distributed teamwork where workers from different countries and region interact and perform tasks as part of a team. In these circumstances centrally-located working is not a prerequisite. Despite these changes there is no evidence to suggest that working at a central location is challenged as the dominant regime and, indeed, is strengthening its position in this regard.

In the wider context, there is little evidence that the early rhetoric associated with the emergence of telework as a method of working has produced any significant tangible results with regards to its practical development, implementation and adoption. In an Irish context, telework has largely failed to capture the working public's attention despite early optimistic predictions and forecasts. It remains a marginal practice and its social and environmental impacts and consequences continue to be unclear, with one of the main reasons for this being a lack of practical regulation, direction and research. No new infrastructure or applications specifically designed with teleworkers in mind has been developed over the recent past, and the political will to better understand the main social and environmental issues and regulate with this in mind is lacking. At the landscape level, telework has begun to disappear from the agenda of decision-makers, policy designers, and the mainstream media largely due to a lack of understanding of the real issues involved and a paralysis with regards to the direction to take. Indeed, right across Europe actual teleworker numbers are mixed with adoption rates in some countries better than others. However, there is no clear understanding of why this is so, or any great willingness to investigate.

Conclusions

Work constitutes a human activity that significantly shapes the biophysical environment through the consumption of resources such as fuels, water and clean air, as well as the production of waste. Physical mobility related to paid work outside the home has been

identified as a key source of Greenhouse Gas emissions from the private sector, with car-based commuting causing significant environmental and social damage both in Ireland and elsewhere. While the technology to work from home has been widely available for some time now, there is continuing reluctance and apprehension on the part of many employers, and indeed employees, to embrace telework. What is broadly neglected is the private/work dualism; the multifaceted domestic and social interactions people struggle with when working from home. Simply promoting the economic merits of telework frequently brings the other pillars of sustainability (social and environmental) into conflict. In the case of Ireland, an existing neo-liberal state, chronic car-dependency, and a lack of telework guidelines or schemes reflects classic shallow Ecological Modernisation thinking. An approach suggestive of neo-liberal environmentalism is evident in which individual organisations are given absolute freedom over any such working arrangements leading to a stagnation of the practice overall. The environmental sustainability of telework is also uncritically accepted without due consideration to social and cultural dimensions.

Through the lens of the multi-level perspective of sociotechnical transitions, the practice of telework largely remains anchored at the niche level. In the context of this particular study, there was an absence of any social networking thus diminishing the possibility of enrolling additional niche-actors to the practice. The dominance of the traditional way of working, i.e. employees and management operating from a centrally located office, factory or worksite, severely limits the possibility of 'windows of opportunity' opening at the regime level for telework to exploit. Furthermore, whilst significant unease with regards to the environment was noticeable in the surveys this concern did not translate into positive action with regards to limiting individuals commuting activities. At the landscape level, the lack of any policy or regulation in relation to telework in Ireland is leading to haphazard and confused working approaches, compounding already complicated work and domestic arrangements. Given this legislative and regulatory vacuum, policy-makers and key decision-makers must assume that technology, with respect to its inherent nature, is value-neutral and autonomous bringing about only positive impacts and consequences. Many decision-makers adhere to an (over)optimistic understanding of the power of technology in terms of its social and environmental good, and often hold an uncritical acceptance of innovation and development. Thus, the wider context for telework is severely restrictive in terms of its development and widespread adoption.

There is a real need for more longitudinal research to ensure that any environmental sustainability gains brought about by telework are properly evaluated, in particular in relation to possible consumption changes with regards to transport, energy, water, food, and technology use, and if these are (or can be) offset by diminishing consumption in the workplace. The challenge is to identify the key indicators and conditions that permit the practice to flourish in a way that has positive social and environmental impacts. A greater understanding in this regard will assist good policy design in the future. Furthermore, comprehensive interviews with current policymakers also seem appropriate with regards to their knowledge and position on the practice. However, before we rush headlong into any new telework initiative we must fully understand the consequences and impacts of working from home for individuals, organisations and the environment. In light of the strong economic focus inherent in much of the current rhetoric of continuous growth, a more forceful emphasis on the real issues of social and environmental sustainability of telework will provide a more nuanced perspective. It is only then that a true assessment and the practical benefits of the practice of working from home can be made, and if indeed it is a goal worth pursuing. Moreover, much of the early enthusiasm shown on the subject of telework has long since faded in an atmosphere of ambiguity and uncertainty, along with out-dated web portals and reports. In a world frequently characterised by technological progress, the time may be right to re-visit the subject of telework in a more pragmatic and critical manner.

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