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**Reconceptualising IT? Policy Learning and Paradigms of
Sustainability in the ICT Policy of the European Union**

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MSc in Media and Communications

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Reconceptualising IT?

Policy Learning and Paradigms of Sustainability in the ICT Policy of the European Union

Jussi Nokkala

ABSTRACT

The potential of information and communication technologies (ICT) in delivering an environmentally sustainable society has become an increasingly important area in ICT policy. However, the opinions of non-ICT experts that are guided by paradigms of sustainability rather than ICT paradigms, remain largely neglected in current policy debates. Simultaneously, communication scholars have started to apply a governance approach to media policy, but have yet to assess the influence of actors such as environmental non-governmental organisations (ENGOS) in ICT policy. This paper will aim to fill this gap by comparing contesting paradigms of sustainable ICT policy in the EU. It is argued, that the exclusion of ENGOS from the policy process is likely to lead to incremental and insufficient adjustments, rather than a reconceptualisation of policy objectives. As the multidimensional qualitative data analysis suggests, the dominant ICT paradigm in the EU has started to shift from a techno-economic to a socio-economic definition of knowledge society, but fails to include environmental concerns in a meaningful way. The weak level of commitment to environmental objectives is related to a lack of possibilities to reconceptualise objectives within the new domain of low carbon economy. This is likely a consequence of excluding non-ICT experts, that could have been avoided through a more pluralistic consultation of actors. In order to achieve effective environmental policy integration in ICT policy, this paper recommends more flexible, participatory and decentralised forms of governance that could enable a reconceptualisation of environmental objectives.

INTRODUCTION

It is commonly accepted that the information and communication technologies (ICT) industry accounts for approximately 2% of global green house gas emissions (e.g. Gartner 26.4.2007). With an ecological footprint equivalent to the aviation industry, the environmental regulation of ICT has become a widely debated policy issue. Current developments in China, Japan and the European Union (EU) indicate that national and regional knowledge society strategies are starting to consider the potential of ICT in delivering an environmentally sustainable economy and society. Nevertheless, the effectiveness of current policies is challenged by non-state actors suggesting that incremental changes in the ICT industry will not lead to a low carbon society. More likely, a pluralistic ICT policy that sees the delivery of the knowledge society as a collaborative effort focusing on applications would give rise to a systemic reconceptualisation of policy objectives.

Paradigms of ICT have been used as a justification of the reorganisation of socio-economic relations. Knowledge and technology have been promised to facilitate economic growth and promote social equity. In an age marked by global challenges such as climate change and environmental degradation, current developments suggest that environmental sustainability could be incorporated into the idea of knowledge societies. Academically the interconnection of social, economic and environmental aspects of ICT policy remains largely neglected¹.

Whereas policy content and policy principles are negotiated between a variety of actors, the justification of certain policies is founded on a more theoretical set of norms and values or paradigms. A paradigm shift may change the measures that guide policies as well as the content of policies. Simultaneously, the way in which different voices are included and excluded in policy formulation has an impact on the whole society. Thus, the study of policy paradigms examines the intellectual dimension of policy, the meaning of knowledge and learning in the policy-making process: “[P]olicies cluster around a core set of intellectual commitments that help define the character of the problems they are responsible for and provide paradigmatic solutions to those problems” (Weale et al. 2000: 55).

The EU has committed itself to be an economic, social and environmental leader. Through vast technological change, media convergence and new modes of knowledge production,

¹ E.g. Van Cuilenburg and McQuail (2003) assess media policy paradigm shifts, but do not include environmental aspect as a part of the general objective, the attainment of public interest. Similarly, Heeks (2002) presents a systematic view of ICT and does not include environmental factors as *influencing factors*. Freeman (1996) argues for a “green techno-economic paradigm”, but does not address the wider societal impact of green technology.

knowledge society has become a key concept in the EU that is believed to tackle challenges reaching from economic downturn to climate change and social inequalities.

But how do paradigms guide individual policy measures? In order to understand the possibility of incorporating economic, social and environmental aspects under in ICT policy, we need to look at three levels of policy paradigms (Weale et al. 2000):

Policy content includes adopting individual measures and providing frameworks for individual measures, such as the Environmental Action Programmes (EAPs).

Policy principles are “a set of principles to guide developments and to justify measures that are taken. Together these principles constitute the core of EU policy discourse” (Weale et al. 2000: 62).

Justification of policy can be understood as the underlying rationale of policy-making. Historically, the EU has moved from the exclusive pursuit of economic growth to ecological modernisation, stating that there is no necessary trade-off between economic growth and environmental protection. In other words, the idea of ecological modernisation suggests, that economic growth can take on more environmentally sound forms. This concept can be juxtaposed by the idea of sustainable development that incorporates economic development with the ideas intergenerational equity, social justice and participation (see Weale 2000).

Different actors are guided by different types of policy paradigms, which would lead to different types of policy objectives. Recent policy proposals suggest, that “green ICT” has become a buzzword among ICT companies and policymakers. A common perception of current policy proposals is that “green ICT” could be used to incorporate environmental objectives into the economic system, thus enabling a knowledge-based low carbon economy. However, the opinions of non-ICT experts that are guided by paradigms of sustainability rather than ICT paradigms remain largely neglected in the policy debates. Simultaneously, communication scholars have started to apply a governance approach to media policy, but have yet to assess the influence of actors such as environmental non-governmental organisations (ENGOS) in ICT policy.

This paper will aim to fill this gap by comparing contesting paradigms of sustainable ICT policy in the EU. This paper argues, that the exclusion of ENGOS from the policy process is likely to lead to incremental and insufficient adjustments, rather than a reconceptualisation of policy objectives. In order to incorporate environmental concerns into ICT policy, this

paper proposes more participatory forms of governance. This paper will start by discussing the paradigms of ICT and sustainability and their policy applications in the context of the EU. It will then move on to discuss the shift from state-led policy to new modes of governance that see policy-making as a collaborative effort. Subsequently, it will analyse one key policy proposal for a new digital agenda in the EU and compare it with two alternative policy proposals. Finally, this paper concludes by discussing, why despite all the promising efforts, the European Commission (EC) failed to include sustainability measures in the digital agenda. Furthermore, the concluding chapter will offer recommendations for future research on ICT policy and sustainability.

LITERATURE REVIEW

The idea of scientific paradigms derives from Thomas Kuhn's 1962 book *The Structure of Scientific Revolutions* (1996). Paradigms can be described as a theoretical or philosophical framework, a set of principles, within which theories and rules are being formulated. Freeman (2007:34) argues, that in the 1990s the use of the term "change of paradigm" became commonplace in describing the advance of ICT. In policy analysis the term 'policy paradigm' is linked to the process of social learning, which suggests that a) policy is influenced by previous policy, b) the privileged officials and experts in a given policy area are the key agents advocating social learning and c) policy-making is influenced by "powerful influences from the society and the political arena" (Hall 1993: 288). This chapter will look at paradigms of ICT and sustainability and their applications in the EU context. Furthermore, it will discuss governance as a normative and analytical concept and the inclusion of non-state actors in the policy process.

ICT Paradigms

The rise of the 'Information Age' and 'Information Society' is marked by a change in the technological-economic paradigm as well as a changes in technological, organisational, social, cultural and political systems. ICT policy can be seen as the underlying structure that enables the governance of the ICTs and their applications within a given society. The new form of society, *Information Society*, *Knowledge Society* or *Network Society* can be defined as a society (or societies) that is/are increasingly relying on information, knowledge and networks (see Castells 2000).

Definitions of *Information Society* (IS) can be divided into different groups, based on their criteria of describing the role of information in the modern age. Webster (2002) identifies 5 different types of definitions: technological, economic, occupational, spatial and cultural. In reference to Webster, Servaes (2003) suggests that the most common definition of IS is the technological, which sees ICT as the leading growth sector in advanced industrial economies. Yet, as Servaes observes, there has been a gradual shift towards a more socio-economic and cultural definitions of the IS. However, current definitions neglect environmental aspects of information societies.

Other scholars prefer the term *knowledge society*, which emphasises the shift from ICTs as drivers of the economy towards an understanding of ICTs as enabling creativity and knowledge. In addition, some definitions suggest a plural definition of *knowledge societies*,

because there are many routes to a future knowledge society depending on historical and contextual circumstances (Mansell & Wehn 1998: 12). Arguably, the paradigm shift from *Information Society* to *Knowledge Societies* indicates a shift from a technocratic understanding of passive information towards more cultural definitions of knowledge-based societies.

The concepts of ‘information economy’ and ‘knowledge economy’ emerged from academic debates on the commodification of communicative processes. First major contributions in this area appeared in the 1960s and 1970s. As Babe (2002: 254) notices, Fritz Machlup’s 1962 book, *The Production and Distribution of Knowledge in the United States* had an important impact on directing economists’ attention to the markets for information. Furthermore, Marc Porat (1976) proclaimed that the information sector of the US economy had increased to 46% of GNP, leading him to suggest that United States had become an Information Economy. These fundamental studies as well as many others (Stigler 1961; Drucker 1969; Bell 1974) lead to various policy responses that emphasised the importance of information in generating wealth and sustaining growth, and thus formed the basis for today’s knowledge-based economies.

However, studies focusing on economic aspects of knowledge-based societies require re-evaluation in the rapidly changing environment. Benkler (2006:2) identifies two simultaneous shifts that point out the limitations of “market-based production places on the pursuit of the political values central to liberal societies”: 1) the shift to an economy based on information and culture, and 2) the interconnected communications environment, the Internet. Whereas the first shift indicates that new patterns of production based on information are at the core of our economic system, the second shift “allows for an increasing role for non-market production in the information and cultural production sector, organised in a radically more decentralised pattern than was true of this sector in the twentieth century” (Benkler 2006: 3). In this new mode of economy, *networked information economy*, social production may have an essential impact, alongside property- and market-based production, that were the two main forms of production in the earlier stage of the information economy, the *industrial information economy*. Whereas the old economy relied on centralised production of communication goods, the new economy is based on decentralised individual action and low technological constraints on information production.

The economic shift as well as the new communications environment poses several questions for current approaches in ICT policy. The new forms of production as well as the cultural definitions of knowledge societies imply a shift towards a more socio-economic paradigm. As

the example of ICT policy of the EU shows, there are signs of a transformation in policy. However, the incorporation of social as well as environmental aspects requires further assessment.

ICT Policy of the European Union

From 1980s onwards, European telecommunications have experienced an extensive shift from state monopolies to a free market system based on private property in both infrastructure and services. Furthermore, as Bauer (2002: 111) describes, the convergence of various ICT sectors (broadcasting, telecommunications, computing etc.) to one unified sector, demanded a more integrated regulatory framework. By the end of 1990s virtually the whole industry operated under a new global, competence driven regime (OECD 2001 as in Jordana 2002: 2).

Since the focus of this paper is on paradigms of ICT and not on media per se, the paper makes use of the term “ICT policy” instead of “media policy”. In this case, ICT policy is understood as a policy area not limited to one industrial sector. As Freedman (2008) notes, media convergence muddles the difference between mass media and telecommunications, necessitating a technology-neutral approach to policy and inviting policy interventions from a variety of political, economic, social and cultural perspectives.

Furthermore, we need to distinguish between *policy*, *regulation* and *governance*. Freedman (2008: 14) describes (media) *policy* as “the development of goals and norms leading to the creation of instruments that are designed to shape the structure and behaviour of media systems”. Freedman (2008) describes *regulation* as the legally binding tools deployed to achieve policy goals and *governance* as the total sum of informal and formal mechanisms that aim to organise media systems according to the resolution of media policy debates. It should however be noted, that this is a rather linear conceptualisation of the three levels, that does not establish a direct link between policy and governance. Instead, this paper assumes that the policy process is cyclical instead of linear, thus suggesting that governance does not only include the organisation according to the resolution of the debates, but contributes to the development of goals and norms.

The idea of the European Information Society emerged in the early 1990s and quickly became the overarching vision in telecommunications policy. The primus motor of this initiative was the European Commission (EC) that observed current developments in the USA and assumed the potential of ICTs to provide economic growth and competitive

advantages (Anttiroiko 2001). The first initiative was the publication of a Green Paper in 1987, which demanded a wide reform of the regulatory framework and a liberalisation of telecommunications services (EC 1987). The idea of the European Information Society was first expressed in the Delors White Paper (EC 1993), that drew links between technology, growth and employment. Another key document is the so called Bangemann report (EC 1994), that brought together a group of experts to make recommendations on enforcing the Information Society in Europe. Recommendations included a range of policy proposals from disseminating ICT applications in all fields of European policy and urged a strong commitment to liberalisation of the sector (Jordana 2002:4).

The European Commission controls the regulation and enforcement of the European Information Society, primarily through Directorate-General for Information Society and Media (DG INFSO), which was formerly known as DG XIII and shared a Commissioner with DG Enterprise. In 2005, DG INFSO was expanded to include media, thus indicating a further step in the convergence of all media to be a part of the same regulatory framework. This reaction was based on the requirements expressed in the new regulatory framework for electronic communications infrastructure and associated services that was adapted in 2003.

In 2000, the European Council of Lisbon expressed its aim to make EU “the most competitive and dynamic knowledge-based economy in the world capable of sustainable economic growth with more and better jobs and greater social cohesion” by 2010. The “Lisbon Strategy” relied heavily on concepts of innovation, learning economy and open method of coordination. Although the initial strategy was constantly updated, most of the strategic targets, including sustainable growth as well as social and environmental goals, were not achieved. The relaunch of the Strategy could not help achieve its goals and the Lisbon Strategy has been widely perceived as a failure (e.g. Euractiv 3.6.2009).

The unsuccessful action plans (eEurope 2002 and 2005) for ICT were followed up by the i2010 programme, that was introduced simultaneously with the expansion of the DG in 2005 and Viviane Reding’s appointment as Commissioner for Information Society and the Media. A High Level Group of Member States’ representatives was appointed to advise the Commission on the development and implementation of the i2010. The High Level Group concluded its work at its tenth meeting, arranged back to back with the high level Conference on Europe’s future ICT policy, in Visby, Sweden.

In search for a new strategy the Commission called for input on a new digital agenda in its Digital Competitiveness Report (EC 2009). In response to this call, the Swedish Presidency

organised the Information Society Conference “Visby Agenda - Creating Impact for an eUnion 2015”. Prior to the conference, a report on the ‘Green Knowledge Society’ was published during the EU Presidency of Sweden in September 2009 (Forge et al. 2009; GKS). The report mapped out the next 5 years of the European information society and served as the central impetus to the Visby Convention on EU ICT policy in November 2009.

The Presidency Conclusions of the Visby Conference stated that ICTs contribute substantially to the European economy, employment as well as cultural and social life. The earlier goal of the Lisbon strategy was modified to the statement, that “[o]ur ambition should be to make Europe the world’s most dynamic and competitive knowledge based economy which employs also ICT to fulfill our environmental responsibilities” (Swedish Presidency of the European Union 10.11.2009). The concepts of *Information Society* and *knowledge based economy* had been replaced by the concept of *green knowledge based society*.

The outcomes of the new agenda remained modest. The Council of the European Union expressed its acceptance for the new strategy by welcoming “ (a) The Commission’s intention to come forward with a follow-up new initiative to succeeding its i2010 strategy; (b) The Visby Declaration Presidency conclusions of 9-10 November 2009 resulting from the conference” (Council of the European Union 2009). In 2010, the Commission outlined a new action plan for digital economy, after appointing Neelie Kroes the Commissioner for the new portfolio of Digital Agenda. Digital Agenda was the first of seven flagship initiatives under the Europe 2020 strategy was introduced in May 2010. Despite the inclusion of social aspects in the new strategy, noticeably the core concept of ‘green’ (i.e. environmental sustainability) was not mentioned in the final strategy².

Although a gradual shift towards a more inclusive approach to this policy area has occurred, there seems to be little practical change in the focus of policy approaches to *Information Society*, *knowledge based economy*, *green knowledge economy*. Jordana (2002) suggests, that EC has started to address the shortcomings of the first recommendations, commencing with the eEurope project in 1999. Nevertheless, the focus of ICT policy remains on techno-economic aspects. Therefore, it seems to be justified to pose the question, whether social and cultural definitions of knowledge society policy will permeate the ICT policy of the EU. Furthermore, the environmental impact and applications of ICT need to be considered as part of cross-sectoral environmental policy integration. Thus, the three aspects of economic, social and environmental impact of ICTs form an interesting base for the analysis. Especially

² The only environmental objective of the new digital agenda is the 20% overall reduction in energy use on lighting (EC 2010).

the incorporation of environmental aspects and their compatibility with techno-economic and socio-economic approaches to ICT policy will be the focus of this paper.

Paradigms of Sustainability

The scientific evidence and the global awareness on ecological degradation have had a major impact on local, national and international politics. The impact of industry, economy and social life on the biosphere has become a key issue in decision-making. Furthermore, climate change has fundamentally changed the relation between science and politics. In this current situation, where only a healthy biosphere can sustain human life, policies and actions must be judged by the principle of sustainability (Heywood 2007: 267). Nevertheless, different notions of sustainability have been applied in policy-making, which may have different policy implications. The most powerful concepts in the European context are *sustainable development* (SD) and *ecological modernisation* (EM).

SD is the primary approach to environmental sustainability that incorporates environmental, economic and social concerns. As Dryzek (2005) suggests, SD has been the dominant global discourse of ecological concern since the publication of the Brundlandt Commission's report *Our Common Future* (WCED 1987). The key idea of the report is that "[h]umanity has the ability to make development sustainable - to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED 1987: 8). Although Brundtland was not the first to introduce the concept of SD and did not offer any practical steps to achieve SD, it accomplished to bring together a number of isolated and competing issues.

Whereas SD tries to incorporate social aspects with economic growth environmental protection, EM seems to emphasise the economic and environmental aspects of SD (see Weale et al. 2000). In general, EM "refers to a restructuring of the capitalist political economy along more environmentally sound lines" (Dryzek 2005: 167; for an overview Mol & Jänicke 2009). Thus, it includes environmental concerns into the primary concern of governments, the promotion of economic growth, but unlike SD, does not advocate values of social justice.³

However, there are some limitations to this account. Whereas SD can be seen as a form of guiding principles for global responsibility, EM seems to offer more concrete guidelines for a environmentally sound economy in the European context. This does not mean, that the

³ see also Langhelle 2000.

concept of SD should be dismissed. Yet, based on the development in the European context, it is EM that is a more likely principle of environmental policy. Although, SD has been used more often in reference to ICT on a global scale (e.g. Mansell & Wehn 1998), and with a broader scope than before⁴, the same rules may not apply to the European context. As Weale et al. (2000) suggest, the predominance of EM over SD in EU environmental policy measures probably reflects the continuing importance of the origins of European integration in the Monnet method of economic interdependence. Thus, it can be assumed that techno-economic definitions of ICT are more likely to connect with EM, whereas socio-economic and cultural definitions would suggest a link to SD. However, the conceptualisation of EM requires further assessment.

Depending on our definition of EM, it is possible to see it as the promotion of technological solutions to environmental problems or as an extensive institutional restructuring of the economic system. Christoff (1996) characterises weak EM as emphasising technological solutions, technocratic style of policy making monopolised by scientific, economic and political elites and restriction to developed countries that use EM to consolidate economic advantages. On the other hand, *strong EM* is marked by extensive institutional and social change in society, open and democratic decision-making as well as authentic communication about environmental affairs. Hence, it can be argued that a green knowledge society agenda that fulfills the criteria of *strong EM* is more likely to include social and environmental claims, than an agenda based on *weak EM*. Thus, our commitment to a version of EM is also related to our understanding of the society. In accordance with Beck's notion of 'risk society', the 'industrial society' generated environmental risks, that the new society is incapable of dealing with. Since classical institutions of the industrial society, i.e. the dominant actors in weak EM are losing their legitimacy in the eyes of the public⁵, authority could re-emerge from governance networks that cross traditional boundaries between state, economy and society (Dryzek 2005: 175-76). As Christoff (1996) notes, the differences between weak and strong EM are commonly aligned with the different perceptions of the industry and ENGOS respectively. This claim reinforces the initial argument, that the exclusion of ENGOS from the policy process is likely to lead to incremental and insufficient adjustments, rather than a reconceptualisation of policy objectives.

Three key assumptions follow from this. 1) Although there are historical and social incentives for the European Union to follow a SD approach rather, than an EM approach, the strong focus on economy in ICT policy of the EU indicates weak rather than strong EM. 2) Although

⁴ As Servaes & Carpentier (2006: 7) argue, sustainability was initially formulated in terms of environmental sustainability, but has broadened its scope to include social economic and cultural aspects as well.

⁵ see Hajer 2009.

EM does not include principles of social justice, a system based on *strong EM* may still form a base for an open, democratic and environmentally sound knowledge society. 3) Consequently, the strength of EM may reflect the prevailing mode of governance. Thus, we need to explore how the EU has incorporated environmental aspects across policy sectors.

Sustainability and Policy Integration in the European Union

Although the EU has been primarily concerned with establishing a common market and removing barriers, its environmental policy has proved to be quite resistant to political and economic pressure. Nevertheless, as Lenschow (2002) suggests, the European environment remains far from satisfactory. This is mainly due to two facts, 1) many environmental policies are poorly implemented by the member states and 2) progress in environmental policy is often counteracted by action in other policy fields. In order to tackle these problems the Commission has started rethinking its approaches and presenting more flexible, participatory and decentralised forms of governance. In order to achieve environmental policy integration (EPI). As Lenschow (2002) points out, current efforts to establish the environment as a horizontal policy as well as cross-sectoral partnerships reflect lessons learned from earlier policy failure.

Historically, the Commission has dealt with environmental regulation mostly through the Environment DG and the national environment ministries. These are currently being replaced by ‘new governance’ efforts, that emphasise learning across policy fields and across various levels of governance, hence within an open network structure (Kohler-Koch 1999 as in Lenschow 2002:296).

Such new approaches resemble to a large extent from the international discourse on sustainable development (see Lenschow 2002). The concept gained interest on the European agenda because of its attempt to reach a consensus between different policy areas at a low cost. With heated debates about the compatibility of environmental and economic objectives, it was no wonder, that the new ‘no trade-off’ conceptualisation found increasing acceptance. The new approach suggested, that environmental, economic and social objectives may be achieved in a mutually compatible way. In other words, “EPI represents a first-order operational principle to implement and institutionalise the idea of sustainable development, which assumed an increasingly central role in the EU’s *acquis*” (Lenschow 2002: 297, emphasis in original).

EPI is most likely to bring about ‘no trade-off’ solutions when a new governance style is being adopted. Lenschow (2002: 300) suggests, that a general normative principle such as EPI is

dependent on facilitating action on lower levels of governance, that are not a part of the pre-structured policy arena. “For this to work, the application of EPI is dependent on a wider societal dialogue and the inclusion of societal actors in modern governance”. Thus, EPI is closely linked to the reflexive process of policy learning, where behavioural changes follow from reflecting on past experiences, the experience of others and new information, which are included in subsequent policy choices, potentially evoking a new policy paradigm. Arguably, effective EPI in ICT policy would thus require the inclusion of non-ICT actors. This would require a broader understanding of ICT governance, than current research on media governance suggests.

Governance in the European Union

The emergence of the governance approaches has had a major impact on theorising policy-making in the EU. Instead of depending on classic integration theories, governance approaches do not see the EU merely as an international organisation nor as a political system, but rather as an emerging system of “governance without government” (Pollack 2005: 36). The concept of governance has its roots in economics and political science. In recent years, the study of governance has risen to new dimensions and has also attracted a growing interest among communication scholars assessing media policy and regulation (Puppis 2010).

Governance approaches, cannot be seen as a coherent theoretical school, but much more as a set of characteristics as well as normative values that guide the research agenda. A basic definition of governance is offered by Rhodes (1996: 660), who defines governance as “self-organizing, interorganisational networks”. In addition, four characteristics are used to distinguish governance from government: 1) interdependence between organisations (state and non-state) 2) continuing interactions between network members 3) game-like interactions and 4) a significant amount of autonomy from the state. Yet, as Pollack (2005) notes, perhaps the most far-reaching idea established by governance scholars is, that “contemporary governments lack the knowledge and information required to solve complex economic and social problems, and that governance should therefore be conceived more broadly as the negotiated interactions of public and private actors in a given policy arena.” Furthermore, Pollack (2005) suggests, that instead of hypothesis-testing and generalisation, governance scholars tend to focus more on “thick description” and a normative critique of contemporary EU governance.

Given the strong emphasis on interdependence, governance shifts our attention towards a new set of actors. As the main legislative initiator in the European Union, the Commission facilitates debates on policy formulation. In addition, the rotating Presidency of the Council of the European Union was used to provide political continuity, but also to promote new initiatives (e.g. Quaglia & Moxon-Browne 2006). Both actors may use expert reports or open consultations to initiate debate. As Kohler-Koch (1997) suggests, actors most likely to frame policy debates are those, who are interested in doing so and have the necessary resources. In the changing policy environment, actors do not include exclusively industrial actors, but non-profit actors such as non-governmental organisations (NGOs) and think tanks as well. Although NGOs may not have the necessary resources to challenge industrial interest groups on a large scale, they are still relevant to the policy process. As Wallace (1997) suggests, the mapping of relevant actors in the EU is not necessarily a question of “who governs”, but “who participates”. Thus, this paper sees the policy process not only as a question of elitism versus pluralism, but tries to understand the ways in which actors establish policy networks and how they are included in the policy process.

Whereas various scholars have focused on the shift in authority from national governments to supranational and subnational actors, others have focused on horizontal factors of policy-making as well as different forms of policy communities and issue networks. Thus, governance studies have shifted towards specific policy sectors and scholars from various disciplines have started to use the concept of governance. In the field of media policy and regulation, Puppis (2010) suggests a dual conceptualisation of governance, where governance is not only the entirety of rules governing media systems, but also an analytical concept that offers a new way of describing media systems. Furthermore, Puppis (2010) follows a common distinction of governance into horizontal and vertical extensions. Whereas vertical extension focuses on different levels of regulation (supranational-national-local), horizontal dimensions are concerned with statutory regulation as well as self- and co-regulation of social and economic behaviour. In addition, Puppis (2010) supports the idea of normative aspects of governance, suggesting that governance not only describes the regulatory structure, but also points out shortcomings and develops ideas for improvements.

It should be noted, that Puppis (2010) focus is mainly on media and communications sector, thus excluding various non-profit actors from his conceptualisation. Given the necessity of EPI across policy sectors, and the technology-neutral approach to ICT policy inviting policy interventions from a variety of political, economic, social and cultural perspectives (Freedman 2008), the emergence of new actors in ICT policy, such as ENGOs, requires further assessment.

Research Questions

As this chapter has suggested, definitions of knowledge society have shifted from exclusively techno-economic definitions towards more socio-economic and cultural definitions. Simultaneously, there is a growing awareness among policymakers, that environmental concerns need to be integrated among policy sectors. So far, however, there has been little discussion about the environmental aspects of ICT policy. Furthermore, far too little attention has been paid to more pluralistic definitions of media governance that include non-ICT experts, such as ENGOS in the policy process.

This paper will aim to fill this gap by comparing contesting paradigms of sustainable ICT policy in the EU. It is argued, that the exclusion of ENGOS from the policy process is likely to lead to incremental and insufficient adjustments, rather than a reconceptualisation of policy objectives. This paper sets out to understand how the future of the knowledge society is conceptualised, which actors influence the policy creation and which paradigms guide the agendas of different actors. Based on the theoretical framework of the project, three key questions emerge:

RQ1: Which aspects of economic, environmental and social impact of ICTs are included/excluded from the current policy proposal, “A Green Knowledge Society”?

RQ2: Why are certain aspects included/excluded?

RQ3: How does policy content relate to policy paradigms? What are the guiding principles and justifications of policy?

In order to understand how environmental and social aspects are included in the policy debate, the first objective of this paper is to assess the policy proposal on “Green Knowledge Society” (GKS). Second, GKS is compared with two other reports, that address the future of knowledge society in the EU as well as environmental and social impacts of ICTs. Since GKS was based on an expert consultation, that excluded opinions from non-profit actors such as ENGOS, this paper aims to point out the potential limitations of the report. A comparative analysis of alternative reports may not only allow us to point out shortcomings of GKS, but also help develop ideas for improvements. Finally, this paper tries to tackle the question, is environmental policy integration in the European knowledge society, without neglecting the social aspects of ICT.

RESEARCH DESIGN AND METHODOLOGY

This chapter establishes the research design of this paper. Firstly, a methodological framework is established to answer the research questions. Subsequently, this chapter explains the sampling of the data and establishes a design for the research tools of the analysis.

Methodology

This paper will make use of thematic analysis as a main tool of describing the three levels of policy paradigms, *policy content*, *policy principles* and *policy justification* (Weale 2000). Two different levels of coding will be used: the thematic coding and the heuristic coding. The multidimensional analysis follows the principles of the governance approach, “‘thick description’ and a normative critique of contemporary EU governance” (Pollack 2005).

The thematic coding is based on inductive reading of the preliminary data set. The thematic coding is supported by the heuristic coding of data that focuses on unapparent aspects of data, such as social context, intertextuality and possible interpretations. Furthermore, it connects the thematic coding to the paradigms of sustainability (weak EM; strong EM; SD). The dual structure of coding, provides a solution to the main criticisms of the coding approach in qualitative data analysis, which is “the possible problem of losing the context of what is said” (Bryman 2008: 553). Thus, it bridges the gap between *what* is said and *how/why* it is said.

The coding organises the data into basic themes, which can be further grouped into organising and global themes. Following Attride-Stirling’s (2001) categorisation of themes in thematic analysis, basic themes represent the lowest order theme deriving from data, organising themes summarise more abstract principles and global themes are super-ordinate principle metaphors in the text. Whereas basic themes and organising themes emerge in first place from the thematic coding, global themes are “both a summary of the main themes and a revealing interpretation of the texts”. Due to their similar structures, the three dimensions of thematic analysis can be applied in the form of structuring policy paradigms as proposed by Weale et al. (2000). Thus, the three levels of policy content, policy principles and policy justification can be applied to the analytical framework proposed by Attride-Stirling (2001). This categorisation will follow after the initial coding of the data.

Following the thematic and heuristic coding of data, the three proposals can be categorised applying Christoff’s (1996) types of EM. Since the main focus of the analysis is on potential

environmental impact and applications of ICTs, the data is categorised according to Christoff's (1996) types of EM. Furthermore, the more abstract concept of SD can be further assessed through the heuristic coding of data. Applying Christoff's (1996) types of EM, environmental aspects of the proposals are categorised in Table 1.

Weak Ecological Modernisation	Strong Ecological Modernisation
Economistic	Ecological
Technological (narrow)	Institutional / systemic (broad)
Instrumental	Communicative
Technocratic / neo-corporatist / closed	Deliberative democratic / open
National	International
Unitary (hegemonic)	Diversifying

Table 1. Types of Ecological Modernisation (Adapted from Christoff 1996).

Individual text segments describing policy measures are understood as *policy content*, subcategories indicate certain *policy principles*, which are linked to *policy principles*. Basic themes (*content*) emerge from the data, e.g. a claim in GKS states that “[a]ll of the EU’s citizens should have the opportunity to participate in an inclusive knowledge society”. The basic theme is coded as “inclusion in KS for all EU citizens”, the organising theme (*principle*) is “deliberative democratic/open” and the global theme is “strong EM” (*justification*). The limitations of the categories are addressed through the heuristic coding, that categorises the content according to the paradigms of sustainability. Not only does the multidimensional coding enable a more transparent analysis, additionally it can be used to point out possible biases of the policy proposals, as well as subjective biases of the researcher’s interpretations.

Sampling of data

In the beginning of the analysis, a selection of potential data was created through a consultation of green ICT experts and inductive reading. After reaching a theoretical saturation, the policy reports were divided into three categories 1) Business development 2) Monitoring and policy review and 3) Policy proposals. Based on the theoretical framework of the paper as well as the research questions, two alternative policy proposals were chosen for the comparative analysis of the GKS report. The alternative proposals were chosen based on the criteria that 1) proposals were not considered in GKS and 2) the proposals represented an

ENGO point of view (or think tanks that focus on sustainable development, in this case Forum for the Future). Therefore, the selection was based on theoretical sampling that “is driven not necessarily by attempts to be ‘representative’ of some social body of population but especially and explicitly by theoretical concerns that have emerged in the provisional analysis. Following a grounded theory approach, such ‘theoretical sampling’ focuses on finding new data sources that can best explicitly address specific theoretically interesting facets of the emergent analysis” (Clarke 2003; Glaser & Strauss 1967). Since the focus of this research project is on emergent ideas in this policy area, the sample for the thematic analysis is as presented in Table 2.

Policy proposal	Content
SCF Associates (2009) Green Knowledge Society: An ICT policy agenda to 2015 for Europe's future knowledge society.	ICT policy agenda to replace i2010 up to 2015. Focus on social impact, economic prosperity and addressing climate change.
Forum for the Future (2008) Connected : ICT and sustainable development.	Potential of the ICT sector to deliver a sustainable future; Shifts focus from production and use to application.
WWF (2009): From “Green IT” to “Greening with IT” in 2009.	Last report of HP-WWF co-operation; Guidelines for IT sector, IT users and governments to move to a low carbon economy.

Table 2. Data sample for the thematic analysis of policy proposals.

Design of Research Tools

The proposals were first coded using three different codes, “economic” (blue), “social” (red) and “environmental” (green). Through the inductive reading combinations of these three codes were added (e.g. economic shift from participant to producer: “economic shift” red+blue; low carbon economy: green+blue). Furthermore, codes for “policy”, “technology/infrastructure” and for “security” were added, the latter being the only category being first coded as “N/A” for “not available”. The three main codes “economic”, “social” and “environmental” as well as their combinations proved to be well-suited for the analysis of general tendencies in the three reports. The heuristic coding was used to explain coding decisions and interpretations. As Seidel (1998) notes, “[i]n a heuristic approach code words more or less represent the things you have noticed... The heuristic approach says that the

coding the data is never enough. It is the beginning of a process that requires you to work deeper and deeper into your data“ (Seidel 1998: 14). Thus, the thematic coding was accompanied by notes, that addressed coding decisions and possible constraints of the coding frames. Using thematic and heuristic coding, each of the three pieces was categorised using Christoff’s (1996) categories. Because of the qualitative nature of the analysis as well as the small sample size, word frequencies were not considered as a part of the analysis.

ANALYSIS

This chapter introduces the multidimensional qualitative data analysis assessing the three policy proposals that were introduced in the previous chapter. The structure of this chapter is threefold, dividing the analysis into individual subchapters, for each policy proposal respectively.

Analysis: *Green Knowledge Society (GKS)*

The objective of the GKS report (2009) was 1) to provide a general focus for the Visby conference 2) assess the progress in i2010 and 3) ‘identify promotional and catalytic actions needed for delivery of the “Information Society”’ (63). Furthermore, the main themes of the report were threefold: 1) Social impacts of ICT 2) economic prosperity and 3) addressing climate change in meaningful ways.

For the thematic analysis, the chapters “Executive summary”, “A vision of a green knowledge society” as well as the Chapters 1-3 were coded using the codes shown in Appendix I. Furthermore, other chapters were considered as a part of the heuristic coding and notes were made that could address shortcomings of the coding frames.

Thematic Coding

Based on the coding of the executive summary, only one out of ten chapters addressed questions of environmental sustainability, ascribing green ICT merely a supporting role in the eco-efficient economy. Other chapters did not establish links to environmental aspects, thus suggesting a form of weak, if any, EM. Four out of ten chapters were coded as being devoted to economic aspects of GKS and three to social aspects. One chapter addressed questions of online security and one policy options for delivering a green knowledge society.

In the chapter “The vision of a Green Knowledge Society” the future society is mostly defined in economic and social terms. Environmental aspects are seen as one of the key aspects of the agenda, but remain absent in the chapter. ICT is seen as “fundamental to the running of EU economies across every sector” (15) and “[t]he social impacts of ICTs are even more profound as relationships within families and organisations are being reshaped”. Whereas economic aspects are linked to current circumstances (e.g. financial crisis), environmental and societal are not discussed in further detail. The report states that “[a]ll of these advances are touched by the principle of supporting a ‘Green New Deal’” (18). However, the focus of the proposal “revolves around the themes of economy, human rights and sustainable development, with the global competitive context in mind”, indicating competitiveness as an overarching principle.

Although, the inclusion of the ‘Green New Deal’ seems to suggest a systemic change (proposing strong EM), links between economy and environment are neglected in *1. The Knowledge Economy*. Economic aspects are mainly linked to social aspects (e.g. improved education and ICT training and an increased user involvement in R&D). However, there are no references linking ICT training, user involvement or a permissive innovation culture to environmental concerns.

Similarly in *2. The Knowledge Society*, social aspects, especially participation in an inclusive knowledge is society, are mostly linked to infrastructure (access to networks), but environmental aspects are excluded. Based on the expert consultations, the report states that there is widespread consensus “that Europe’s goal should be a knowledge society rather than a mere knowledge economy” (23). The coding of this particular chapter pointed out a problem regarding the application of Christoff’s (1996) weak and strong EM: The idea of an open and inclusive knowledge society is a characteristic of strong EM. Nevertheless, the general approach of the proposal is more likely to create weak EM policies. If the knowledge society is inclusive and encourages participation, but does not address environmental concerns, it would certainly take the “green” out of “green knowledge society”.

Since GKS does not incorporate environmental concerns into other policy areas, it is assumed that *3. Green ICT* would ascribe green ICTs merely an incremental role. In opposition to this assumption the report establishes a classification of ICT sustainability impacts addressing production, application and effect on lifestyle practices. Furthermore, the report states that the key question for green ICT policy is, “How can ICT contribute to development of a sustainable world?” (28). As policy goals, the report states a stimulation programme of ICTs in energy saving roles across all relevant industry sectors; ensuring ICT use in more

sustainable behaviour patterns by citizens and business and production of next generation of green ICTs (29).

Whereas the chapters 1-2 were able to combine economic and social aspects, 3. *Green ICT*, combines mostly economic and environmental aspects, most often in terms of energy efficiency. The report focuses mainly on the efficiency of green ICTs (coded environmental+economic). Quoting the Climate Group's 2008 report, it states that "the largest influence of ICT is likely to be in enabling energy efficiencies in *other* sectors. These could deliver CO₂ emissions savings five times greater than the total emissions from the entire ICT sector in 2020" (Climate Group 2008 as in GKS: 27). The combination of environmental aspects with social aspects is merely mentioned as a possible outcome ("ICTs can have substitution effects, eg for physical travel"). In general the report approach to green ICTs is mostly instrumental and technocratic arguing for potential energy savings across key industry sectors.

Heuristic Coding

Based on the thematic analysis of the main chapters mentioned above, all chapters of the report were analysed in a second phase of heuristic coding. Given the marginal presence of environmental aspects in the executive summary and the ten key policy areas, special attention was given to ways in which policy areas are linked to environmental aspects. Based on Christoff's (1996) typology it was assumed, that a proposal reflecting weak EM would make incremental improvements to existing policies, whereas a proposal reflecting strong EM would see ecological aspects as an overarching structuring requiring systemic change.

Environmental aspects are considered in terms of resources throughout the report. The link to a 'Green New Deal' incorporates economic and environmental aspects, but rather in an instrumental than systemic way. Especially, the figure "The Green Knowledge Society: its three main goals and supporting policy areas" (17) points out this problem: An economic boost and the foundation of an inclusive society will enable the ten policy areas will lead to "Green Knowledge Society - an eco-efficient inclusive economy". Yet, ICTs for sustainability are not linked to any other policy area in the table and environmental aspects are not included in chapters regarding other policy areas⁶, indicating an incremental approach to environmental concerns.

⁶ With the exception of large infrastructure projects, that "should have a dimension of sustainability in all that is done in their design and engineering" (45).

This provides strong evidence for the claim, that the GKS report promotes only weak, if any type of ecological modernisation. As Hajer (1995: 261) suggests, the “power of ecological modernisation manifests itself in the degree to which its implicit future scenarios permeate through society and actors reconceptualise their interests and recognise new opportunities and new trouble-spots.” In other words, if the idea of sustainability is not included in other policy areas, it is likely to remain absent. In this case actors such as governments and enterprises define their interests within the existing framework of knowledge society, without incorporating it with environmental sustainability. This could mean, that e.g. SMEs would define their role as innovators in the knowledge society in general, but would not consider environmental concerns an essential part of their work.

GKS succeeds in shifting the attention from an exclusively techno-economic understanding of information economy, towards a socio-economic understanding of knowledge society. However, as the analysis suggests, GKS advocates a weak EM approach, thus failing to include environmental aspects in meaningful ways. Therefore, we need to shift our focus towards actors that define knowledge society and the application of ICTs in terms of environmental sustainability rather than in social and economic terms.

Analysis: Connected - ICT and Sustainable Development (CISD)

The first of the two reports to be compared with GKS was Forum for the Future’s *Connected - ICT and sustainable development*. The report is sponsored by Sun Microsystems and commentators include experts from the ICT sector (BT; Hewlett Packard) as well as think tanks (ICTandclimatechange; The Climate Group).

The main difference between GKS and CISD is the focus of the proposal. Whereas GKS provided an agenda for the European ICT policy, CISD does not restrict itself to a state or region⁷. CISD recommends a more systemic approach to ICT policy. It is based on the idea, that manufacturing ICT, 1) “making IT”, 2) “using IT” for industry purposes and 3) “applying IT” beyond its instrumental functions are all interconnected and key to a more sustainable way of life. The division of ICTs into the three groups of making, using and applying IT is based on WWF’s and European Telecommunications Network Operator’s Association’s (ETNO) campaign⁸, that divided potential effects into direct, indirect and systemic effects.

Thematic Coding

⁷ Nevertheless, most of the examples mentioned in the report are from EU member states.

⁸ ETNO & WWF (s.a.) Saving the Climate @ the Speed of Light.

Whereas GKS incorporated economic aspects with social, environmental and technological aspects, CISD links all aspects of ICT to environmental sustainability. This includes ideas such as the ‘dematerialisation’ of the economy (4), linking improvements in energy efficiency to behavioural change (13) and including individuals and communities of interest in tackling climate change with user-generated content (15).

As already stated in the GKS report, the direct effects of “making IT” remain modest. Furthermore, there is enough information available on efficient manufacturing and it is in the interest of the ICT sector to become more efficient. As for policy reports initially categorised as “Monitoring and Policy Review”, the chapter on “making IT”, discusses toxic chemicals, the lifespan of PCs and e-waste. Furthermore, the problems of hazardous materials in extended supply chains are linked to working conditions in the electronics industry. This shows a comprehensive consideration of several aspects in manufacturing ICTs.

As opportunities for “making IT” CISD states improving production and disposal; reducing demand and re-using PCs. In addition, working conditions in manufacturing ICTs are ought to be improved in a way that covers “labour rights, environmental health and safety, working conditions and business ethics” (11). Thus, even the manufacturing of ICT is linked to environmental and social concerns. CISD connects the idea of reducing demand to “moving away from a business model that is based on products and things and towards business models based on services” (4). Arguably, this illustrates the difference between a technological weak EM and a systemic strong EM.

The chapter on “using IT” addresses the question of consumer electronics and the possibility of behavioural change. Pointing out, that the constant evolution of ICT shortens product lifetimes, it clearly states, that “our technologies are going to have to get more efficient [...] savings must come from more efficient energy use at home, in business and in transport” (13) Thus, there is a stronger emphasis on behavioural change than in GKS, which did not make any such claims. Other opportunities include the use of renewable electricity, cutting energy use of data centres and adopting universal standards, that do not encourage excessive consumption (e.g. “continuous updates of software packages that can’t operate on older PCs is unsustainable”, 14).

Recommendations regarding the application of ICT go beyond the application of ICT in the industry to several areas of life (working; traveling; shopping; meeting), stating that “some of

the biggest wins can arise from applying these technologies to other sectors and issues” (15). As general opportunities CISD suggests improvements in environmental efficiency (e.g. “replacing a material product with a virtual alternative”, p.15); user-generated content and potentially ubiquitous computing. Whereas GKS made reference to more user involvement, CISD links user generated content to social aspects (“End-users sharing knowledge is a democratic process”, p.15) as well as environmental concerns (“Such online applications could help to solve many of our most pressing environmental problems”, 15).

The chapters on different applications further enhances the interrelationship of direct, indirect and systemic impact. The chapter on “Working” refers to energy and time efficiency and tele-working, but also discusses new business models, such as peer-to-peer sharing and freecycle. CISD links business to social and environmental aspects, by stating that “There are sustainability benefits in such initiatives: joining people up, democratising trade, more opportunities to recycle and reuse” (18). The chapter on “Travelling” discusses the substitution of travel through ICTs, controlling traffic and more efficient transport. On “Shopping”, CISD states that online shopping may reduce the environmental impact of retail, but it also predicts an economic shift: “But consumers could also use the internet to do things themselves, by trading peer-to-peer or sourcing directly from suppliers or independent providers” (22). Finally, on “Meeting” CISD projects new forms of knowledge sharing, consultation and collaboration.

As policy options CISD recommends frameworks, market-based policies, regulation, voluntary industry initiatives, monitoring and reporting and government-supported initiatives. All policy tools are accompanied by an explanation, primary focus and policy examples. Following the overall approach of the proposal, CISD sees policy as a collaborative effort stating that “[m]aximising key sustainability characteristics of ICT will depend on the level of co-operation between government, business and NGOs to implement these policies” (28).

Heuristic Coding

The heuristic coding seemed more relevant in analysing CISD than GKS. CISD showed that the coding frame of the thematic analysis might be insufficient in analysing the emergence of new policy ideas. In GKS many segments were coded with one of the primary codes, whereas most segments in CISD were coded with a combination of two or three different codes.

The interconnectedness of different aspects of ICTs emerged from the notes made for the heuristic coding. The thematic coding indicated that systemic change is most likely linked to a combination of environmental and economic or social aspects. E.g. the idea of reducing demand is linked to a broader idea of a service-based market, which is linked to reusing PCs, which is linked to a overall dematerialisation of economy. By contrary, propositions in GKS were more concerned with incremental changes in different sectors. Given the stress on systemic change and the incorporation of economic and social aspects, the analysis suggests that CSID represents a strong EM or possibly SD.

However, CISD can be accused of being too abstract and not providing any actual policy tools. This assumption would reinforce the idea that proposals incorporating all of the three aspects (economic, social, environmental) are hard to realise in the European context (see Weale 2000). Based on the thematic analysis CISD fulfills the criteria of strong EM or SD, but does not provide any recommendations on how to implement a correlating ICT policy.

Analysis: From “Greening IT” to “Greening with IT” in 2009 (GIT)

In 2007 WWF launched a private sector NGO partnership with Hewlett-Packard (HP) mapping the possibilities of ICTs in reducing CO₂ emissions. The 2009 white paper “From Greening IT to Greening with IT” (GIT) brought to conclusion the joint initiative of WWF and HP suggesting that “dealing with climate change should no longer focus on big CO₂ emitters, but on solution providers who can demonstrate concrete solutions, with examples of where increased productivity and reduced emissions go hand-in-hand” (HP 2009).

Thematic Coding

In many ways the thematic coding of GIT resembles the coding of CSID. Most of the segments are coded using combinations, which most often include the code “environment”. However, there is strong focus on links with “technology” “economic” and “policy”, whereas links with “social” are neglected. GIT starts by pointing out, that “[t]here is no agreed vocabulary that distinguishes between the emissions savings related to IT equipment and the savings that IT solutions can contribute to in society” (2). Primarily, GIT addresses the IT industry and policy makers: “[B]efore the industry can act, policy makers must ensure that new ways of providing the same services can compete on a level playing field for more carbon intense solutions“ (2).

GIT proposes a shift from instrumental changes to a new form of low carbon economy, suggesting that policy makers need to “stop focusing on the emissions caused by IT, the 2%, and on solutions that only deliver incremental improvements to existing systems. Instead policy makers need to understand the systemic effects of changes in policy and practice and focus on the remaining 98% of needed reductions that could be enabled by IT” (2). GIT suggests that instead of seeing emissions reductions as a risk, businesses and governments should see it as an opportunity.

GIT demonstrates the current situation in ICT policy through an asymmetric triangle. The asymmetric triangle illustrates two different kinds of asymmetries that contribute to a log jam - first the gap between rhetoric and implementation and second between different stakeholders (5). The rhetoric of the IT industry is seen as still being biased towards 2% approach, selling it as the most important climate contribution. Thus, the implementation in the industry focuses on green IT / 2% and lacks coherent strategies for greening IT / 98% approach. In order to change the situation, GIT recommends a stronger policy engagement, with concrete suggestions “not only directed at climate policy...but also at economic policies” (5).

GIT argues that users, i.e. public and private sector, see IT as a tool or enabling service rather than “a platform for innovation low carbon economy” (6). For chief information officers (CIOs) in non-it businesses, 2% remains a strong focus and potential solutions are not seen as a part of a climate strategy, which may lead to inefficient implementation: “The fact that the low carbon IT solutions are not implemented in order to reduce CO₂ emissions is not a problem in itself, but without a ‘carbon understanding’, synergies and possibilities to achieve even further reductions are often overlooked” (6).

GIT sees increased interest for 98% solutions among policy makers. Still, regulation tends to focus more on incremental improvements and 2%. Furthermore, GIT observes a lack of consistency in the awareness of key policy makers (7). Nevertheless, GIT sees interesting opportunities, that may indicate a transformation in ICT policy. GIT sees that EC’s communication “on mobilising Information and Communication Technologies to facilitate the transition to an energy-efficient, low carbon economy” indicates interesting policy developments, that would be groundbreaking if implemented, but recognises “territorial” borders between different ministries (and DGs) as a major obstacle. (7).

As a solution, GIT proposes the creation of a dynamic triangle. For IT providers this would mean e.g. CO₂ savings disclosure and the assessment of the business potential in 98% as well

as producing a catalogue of low carbon services that a provider can offer. Furthermore, GIT recommends a close co-operation between providers and policy-makers to move from general statements to detailed and transparent proposals for regulation. In addition providers could support key sectors such as transport, building, retailing and finance to bridge the 2% and 98% agenda. The strong emphasis on moving from incremental changes to a systemic cross-sectoral transformation indicates a strong EM approach. However, criteria of a open/pluralistic system remain absent.

GIT sees the lack of interdepartmental co-operation as a major challenge for low carbon solutions among IT users. GIT sees three different ways to tackle this: either CIOs implement a interdepartmental low carbon strategy, low carbon IT solutions are included as a transformative part in the company's climate strategy or the team responsible for strategic development engages in a low carbon initiative to improve company's performance while reducing GHG emissions (9). As concrete suggestions for both public and private sector organisations, GIT proposes moving from products to services; separating the responsibility between 2% and 98%; initiate a dialogue with a leading IT company and exploring the role of low carbon IT solutions during the strategic planning.

GIT sees policymakers as the most important of the three actors in the report. Furthermore, economic incentives play a key role in the transition: "No significant shifts can occur unless the economic incentives make it profitable to move towards a low carbon business model" (12). For policymakers, GIT recommends a shift from product to service perspective; from big emitters to solution providers; from incremental improvements to transformative support; the removal of high carbon subsidies and clear targets for low carbon solutions (12-13).

GIT states that the dynamic triangle can be used to deliver concrete results, which should be based on three key aspects: "A service perspective where the triangle can help to identify solution providers that are currently overlooked; revenue perspective where the triangle can be used to ensure that all stakeholders have something to gain from new policies and a low-carbon feedback perspective where the triangle can be used to guide decisions so that companies move in a direction where they increasingly supply and use low carbon solutions" (15)

Heuristic Coding

Based on the thematic coding, GIT emphasises a technocratic and economic approach to green ICTs indicating weak EM. However, the main objective of the report is to move from

incremental changes to an extensive shift towards a low carbon economy indicating strong EM.

As stated above, GIT links environmental aspects to technology, economy and business and policy, but neglects social aspects. The absence of social equity norms may not be just a matter of primary recipients (IT providers and ICT policymakers), but could be linked to WWF's notion of "low carbon economy". Alcock (2008) categorises WWF as an environmental NGO operating along the lines of free-market environmentalism, harmonising environmental sustainability and economic efficiency. Common themes of such NGOs include efficient methods for attaining environmental objectives, internalising externalities and eliminating environmentally damaging subsidies. This description fits the characteristics of GIT indicating, that WWF's norms are based rather on the sustainability-efficiency interface than on sustainability and distributive equity. The idea of seeing an environmentally sustainable economy in terms of "low carbon economy" further reinforces the resource based notion of the environment. However, GIT still supports the assumption that ENGOs are more likely to promote a strong EM rather than a weak EM approach (Christoff 1996).

Whereas CISD failed to provide a concrete policy proposal, GIT proposes concrete objectives for relevant actors in the policy process. Furthermore, the fact that the proposal is a joint initiative of an NGO and a company and the proposal tries to involve different actors in the formulation and implementation, suggests a pluralistic form of governance clearly indicating a strong EM approach. Nevertheless, GIT does not include conditions of social equity in the proposal, thus reinforcing the potential incompatibility of the economic, social and environmental aspects in sustainable ICT policy in the EU.

DISCUSSION

This paper set out to assess the social and environmental impact of the GKS report, compare it to other proposals, that were not considered for the proposal and discuss possible reasons for including certain aspects while excluding others. Three policy proposals were analysed using a two-dimensional coding of the data. The findings of the data analysis are presented in Table 3.

	Green Knowledge Society (GKS)	Connected (CSID)	From “Greening IT” to “Greening with IT” (GIT)
Objective	Proposal for a new digital agenda; “delivery of the information society”.	From direct and indirect effects to systemic effects of applying IT.	From green IT/2% to applications/98%. Points out implementation deficit, bridges gap between rhetoric and implementation.
Thematic Coding	ICT mostly seen in social/economic terms; no links between environmental +economic or environmental+social.	Environmental aspects linked to social, economic, technological and policy aspects.	Environmental aspects linked to economic, technological, and policy aspects.
Heuristic Coding	Incrementalism; technocratic; unifying concrete targets and proposals.	New ideas; general guidelines; collaboration; pluralistic, but abstract (no guidelines for implementation).	Addresses lack of of common definitions; clear objectives and tasks for key actors; absence of social aspects.

Table 3. Results of the analysis.

Applying Weale et al. (2000) three dimensions of policy paradigms, we can finally categorise the findings, to present the *policy content*, *policy principles* and *policy justifications* of the three proposals, as presented in Table 4.

	Green Knowledge Society (GKS)	Connected (CSID)	From “Greening IT” to “Greening with IT” (GIT)
Policy content	Economic prosperity; social impact of ICT; energy efficiency and environmental applications of ICT.	Manufacturing, using and applying IT key to sustainable lifestyle.	Guidelines for improvement (disclosure, co-op), regulation of high carbon subsidies; from incrementalism to low carbon economy.
Policy principles	Competitiveness, sustainable growth.	Dematerialization; systemic change (societal).	Market-based solutions; shifts focus away from polluter pays; Systemic change (economic).
Policy justification	Weak EM; inclusive knowledge society (based on knowledge economy).	Strong EM - SD; Sustainable society through application of ICTs.	Strong EM; low carbon economy enabled through application of ICTs.

Table 4. Results of the analysis applying the policy paradigm framework (Adapted from Weale et al. 2000).

The current research supports the argument, that ICT paradigms are linked to certain paradigms of sustainability. The assessment of links between economic, social and environmental aspects of ICT policy proposals indicates, that there is a strong interdependence between policy content, principles and justification. Furthermore the analysis supports the assumption, that actors in the industry (in this case the ICT experts, that were consulted for GKS) advocate a weak EM approach, whereas ENGOs advocate a strong EM approach.

The GKS proposes a inclusive knowledge society on the one hand and a “strong combination of the Knowledge Economy” and “Green New Deal” (29). It assumes, that a working knowledge economy will lead to a competitive energy efficient knowledge society. GKS recognises possible transformations such as an increase in user involvement and proposes the acknowledgement of digital rights within human rights. Thus, GKS could be seen as a step towards a socio-economic understanding of knowledge society. However, the technocratic approach regarding sustainability, especially the focus on energy efficiency indicates a weak EM approach.

The main reasons for an environmentally weak proposal presented in the GKS report, can be summarised in three points. First, as the literature review already indicates, for EPI to be effective, a wider societal debate and the inclusion of societal actors in governance is needed (Lenschow 2002). Actors, that were consulted for the GKS are mostly experts on ICT, including senior officials, business experts and academics. Thus, ICT experts make use of the

existing definitions of knowledge society, that do not include environmental concerns. Therefore, the exclusion of ENGOs from the consultation, and thus the exclusion of paradigms based on environmental sustainability and strong EM, is likely to offer a partial explanation of the weak EM observed in GKS. Second, the expert consultation also highlights the lack of cross-sectoral understanding of ICT as an enabler of low carbon strategies. GKS proposes ICTs a supporting role in the eco-efficient economy, but does not address the problematic of 2%/98% distinction described in GIT. The lack of common definitions in sustainable ICT is reflected in the weak proposal, which offers an explanation for the environmentally weak outcome of the digital agenda. Thus, *the weak level of commitment to environmental objectives is related to the lack of possibilities to reconceptualise interests and opportunities within the new domain low carbon economy. This could have been enabled by a more pluralistic consultation of actors.* Finally, integration and path dependency help us understand the strong emphasis on competitiveness and economic aspects. As Weale et al. (2000) suggest, the predominance of EM over SD in EU environmental policy measures probably reflects the continuing importance of the origins of European integration in the Monnet method of economic interdependence. Furthermore, the institutional history of DG INFSO, emerging from the DG for Enterprise indicates a possible conflict between different policy areas. Thus, a weak EM outcome is still more likely than a strong EM or SD outcome, despite the high level of environmental regulation in the EU. Nevertheless, more participatory forms of governance may offer a possibility of successful policy integration in ICT policy.

The weak EM approach pointed out in the analysis of GKS was juxtaposed by the analysis of two alternative proposals, CSID and GIT. Both reports offered an account that went beyond the direct and indirect impact of ICTs to propose a systemic change. Whereas CSID linked environmental aspects of ICTs to economic as well as societal change, GIT focused mainly on providers, businesses as users and policymakers. Nevertheless, both proposals shifted the focus towards new applications and a pluralistic approach to governance. CSID was based on the fact that ICT can enable a sustainable society. In order to achieve this, a collaborative effort of businesses, governments and ENGOs is necessary. The strong focus on society and sustainable is apparent in the thematic as well as heuristic coding of CSID. CSID goes beyond the criteria of strong EM to fulfill criteria of SD. However, the lack of concrete policy tools and objectives combined with the dominant view of economic interdependence is unlikely to be implemented in the EU. On the other hand, GIT offers clear objectives for actors, proposes a systemic change towards a service-based low carbon economy. In addition, it fulfills the criteria of open communication and pluralistic governance. However, the idea of low carbon economy is based on the existing system and on an environmental rather than distributive

shift. Furthermore, it fails to include wider societal changes and equity norms, which brings us back to the potential incompatibility of all three aspects in a European policy context. Nevertheless, the analysis of CSID and GIT suggests, that ENGOs advocate a strong EM approach based on paradigms of sustainability

The paper clearly indicates that the incrementalism of EPI in the ICT policy of the EU is related to a policy agenda, that does not propose a systemic change of ICT policy. This is largely due to the fact that actors that would enable a reconceptualisation of environmental objectives are excluded from the policy process. Simultaneously, joint ventures between NGOs and companies are already proposing policies that offer an alternative to the incremental proposals expressed in GKS. In order to deliver a sustainable low carbon economy, it is necessary to establish common definitions for green ICTs, that acknowledge both the 2% green ICT as well as the potential 98% greening with ICTs dimension. This requires a more pluralistic form of governance, that does not see ICT policy merely as an isolated policy domain, but as a cross-sectoral field that requires participatory and decentralised forms of governance. Only through cross-sectoral collaboration and joint ventures between governments, businesses and NGOs, key actors get involved in a social learning process, that enables them to reconceptualise their objectives and opportunities in order to deliver a environmentally sustainable knowledge society.

CONCLUSION

This paper has highlighted a gap in the academic literature as well as policy proposals regarding the potential of ICTs in delivering an environmentally sustainable society. Dominant policy proposals are based on ICT paradigms that do not consider environmental aspects of knowledge society. Simultaneously, ENGOs are excluded from ICT policy and neglected by scholars of media governance. In order to achieve effective environmental policy integration in ICT policy, this paper recommends more flexible, participatory and decentralised forms of governance that could enable a reconceptualisation of environmental objectives.

Because of the lack of common definitions in green ICTs and the shattered nature of ICT policy, a great responsibility lies on future research regarding ICT and sustainability. An apparent starting point for future research is to tackle the question “is it possible to create an ICT policy agenda for the EU, that is guided by the principles of sustainable development?” Scholars of media governance need to acknowledge the emergence of new actors in their field, such as ENGOs. Furthermore, the field requires a set of common definitions that enables a common base for future research and policy. Finally, future research needs to recognise the variety of criteria included in the notion of sustainable development. Although sustainable development has broadened its scope to include social, economic and cultural aspects, it is the normative task of future research to point out any attempt to dilute environmental aspects from the notion of sustainable development.

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