**Media and Carbon Literacy: Shaping opportunities for cognitive engagement with Low Carbon Transition in Irish media, 2000-2013.**

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*Abstract*.

*This paper sheds light on the challenges facing communication praxis for transition by reporting on an exploratory, thematic analysis of media reports about reducing carbon emissions. It maps the deployment of ideas about the rationale and multi-faceted processes for moving to a low carbon society in the Irish press. The aim is to show whether and how media reports prioritize or marginalize specific conceptualizations of low carbon transition and decarbonisation. The findings shed light on the socio-cultural factors shaping opportunities for cognitive engagement with transition. In doing so, it contributes to knowledge about how media representations shape carbon literacy or the mainstreaming of routine messages about carbon management and low carbon living. An Irish case study was chosen as it exemplifies the problems of transition for economies dependent on regrowth. It provides an opportunity to investigate the unintended consequences of the now widespread mantra of economic benefits and to highlight potential implications for citizen participation in broader social change.*

*The research identified six media themes about reducing carbon emissions: (Targets and Regulations; Environmental Concern and Climate Change; Protecting Economy and Costs; Sustainability and Technological Innovation; Negative &/or Critical; and Radical Social Change). The study found that the dominant media themes privilege elite interests with policy-driven, economic arguments about the opportunities of transition and decarbonisation. Overtime, the analysis highlighted the marginalization of themes promoting socially-relevant conceptualizations about carbon reduction. As a result, it is argued that Irish media reports mainstream top-down conceptualizations of the multi-dimensional processes of transition and inadequately address the range of viable, alternative understandings of this societal challenge.*

*The findings indicate a need for greater attention to carbon literacy in both media reports and by communication practitioners. In particular, communications strategies to encourage broad public engagement with transition should consider highlighting the socio-cultural and political dimensions of carbon reduction activities.*

*Keywords.*

*Media Representation of Climate Change, Carbon Literacy, Low Carbon Transition, Thematic Analysis, Communication Strategies for Low Carbon Transition.*

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**Media and Carbon Literacy: mainstreaming conceptualizations of low carbon transition.**

Harnessing citizen participation is an essential element of building successful transition pathways, both in terms of generating public support for policy as well as mobilizing citizen involvement in processes of change (Hulme, 2013; Moser, 2010; Moser & Dilling, 2007; Whitmarsh, O'Neill, & Lorenzoni, 2013). As a tangible, local dimension of tackling climate change and energy resource depletion, communication about low carbon transition and decarbonization (LCT/DC)[2] represent an important new approach for increasing public engagement with climate change (Carvalho, 2010; Whitmarsh et al., 2013). However, citizen participation (or public engagement) with environmental change is also a contested activity and there are a range of views about its purpose and practice (Irwin, Jensen, & Jones, 2012; Shove, 2010; Whitmarsh et al., 2013; Whitmarsh, O'Neill, & Lorenzoni, 2011). At a minimum, public engagement with LCT/DC requires raising awareness and knowledge of techno-scientific solutions as well as financial mechanisms to achieve transition. However, transition processes also entail the possibility for radical social transformation (Beck, 2010; Giddens, 2009) which requires public debate about socio-cultural and -political dimensions (Hulme, 2013; Stirling, 2014) such as changes to everyday social practices (Shove & Walker, 2014; Strengers, 2013) as well as imaginaries of the good life. In other words, public engagement with LCT/DC also requires opportunities for citizen participation in debate, decision-making and action aimed at broader social change and requires political as well as psychological or behavioral engagement (Whitmarsh et al., 2013). Additionally, as a multi-dimensional challenge involving a range of choices about how to tackle global environmental change, there are a range of conceptualizations of LCT/DC, each of which involve significantly different outcomes for future environmental sustainability (Nerlich, 2012).

Thus greater knowledge of the influences on public understanding of LCT/DC, such as the socio-cultural factors shaping awareness and knowledge of the rationale for and processes

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of carbon management, are important resources for developing communication strategies to broaden public engagement with LCT/DC.  It is generally agreed that media are powerful agents influencing public awareness, understanding and opinions of social issues. This role is particularly significant in public debates about techno-scientific controversies (Nelkin, 1995) as well as discussion about environmental issues (Carvalho & Burgess, 2005; Corbett & Durfee, 2004; O'Neill, 2013). However, while media analyses of climate change can reference the solutions debate and address questions about 'How to' tackle climate change, to date media studies have focused on the definitional struggle and questions of 'Whether to' and/or 'Why' to tackle climate change which is inherently concerned with understanding and explaining media coverage and construction of climate science. As a result, comprehensive analysis of media coverage of LCT/DC as a multi-dimensional issue involving options for achieving broad social and environmental change is sparse. For example, recent studies have focused on local news and energy transition in Denmark (Horsbøl, 2013) and low carbon housing in UK print media (Cherry et al., 2013). Therefore targeted examination of the deployment of ideas about the multi-faceted concept of LCT/DC in the national press is an important contribution to understanding the wider societal and contextual factors influencing possibilities for citizen participation with transition in the public sphere. In particular, mapping media reports about LCT/DC sheds light on the mainstreaming of ideas about transition (or carbon literacy) and has implications for cognitive engagement with transition.

The study employs the concept of carbon literacy[3] to assess media representations of LCT/DC. The term is often used by community organizations to evaluate public understanding of the social or everyday dimensions of moving to a low carbon future. It is also used in transition studies in research aimed at developing 'effective communication' to improve low carbon consumer behavior (Sharp and Wheeler, 2013) and tourism practice outcomes (Teng et al., 2013). In other words, where the focus is on normative or instrumental communications in which public(s) are primarily understood to be 'consumers' and the purpose of communication is to achieve private sphere engagement

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(Hoppner & Whitmarsh, 2010). Moving beyond such information deficit approaches, Whitmarsh, Seyfang and O'Neill (2011) distinguish between carbon literacy as information provision or knowledge and awareness of scientific facts to propose the more socially-embedded concept of carbon capability which includes situated and contextual understandings of carbon management to facilitate a wider understanding of the possibilities for citizen participation with transition. This study also employs a broader definition of carbon literacy as the situated, contextual and scientific conceptualizations of LCT/DC and knowledge about the multi-faceted approaches for moving to a low carbon future. Thus carbon literacy here incorporates possibilities for wider cultural understandings and well as insights into politics of knowledge about LCT/DC[4]. Related to these definitions, the term cognitive engagement refers to how conceptualizations of LCT/DC promote informed judgements and decision-making about the range of carbon reduction activities (social, technical and financial) and thus facilitates public engagement with transition as a process involving social and environmental change.

In doing so, the study engages with the Cultural Turn in studies of human induced global environmental change (Hulme, 2013) and the increasing focus on societal dimensions of engagement with climate change (Carvalho and Peterson, 2012; Corner, Markowitz, & Pidgeon, 2014; Phillips, Carvalho, & Doyle, 2012). The objective is to understand how Irish media representations shape opportunities for more plural and socially-embedded accounts of LCT/DC and thus the conditions of possibility for action.

As an arena for the production, reproduction and transformation of meanings about complex social issues, the habitual ideas about LCT/DC which are normalized in media reports are highly significant. As Nisbet (citing Etzioni, 2006) notes, '[once assumptions and legitimate authorities are established on a problem like climate change, it becomes "costly in terms of human mental labor to re-examine what has finally come to be taken for granted"' (2013, p.x). Additionally, more people engage with media representations of

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transition than they do with the planning or policy process (Roberts, Upham, Mclachlan, et al., 2013).

Consequently mapping media and carbon literacy can add to the toolkit of strategic communications aimed at broadening possibilities for cognitive engagement with transition by illuminating the social and cultural factors influencing conceptualizations of transition.

Thus the research investigates Irish media reports about reducing carbon emissions in order to examine media representations of LCT/DC and whether these have transformed over time. In addition, because a range of actors compete to define complex, multi-dimensional issues in media reports, the study also investigates the dominant voices of authority on LCT/DC in Irish media.

The study targets Irish print/online media as an important domain to begin mapping media and carbon literacy, because an Irish case study offers an opportunity to examine media reporting in the context of national economic and fiscal crisis following the global banking collapse. Notably, Irish public debate about transition, tied to the need to meet EU 2020 targets, has given rise to more economic arguments for decarbonisation and approaches to carbon management. Consequently, the Irish case can illuminate unintended consequences of the growing economic arguments for transition on cognitive engagement. Thus, while the findings are not generalizable, they have wider relevance as the economic benefits mantra now prevails across EU in news and policy reports about LCT/DC and tackling climate change.

**Methodological Approach and Research Design.**

The aim of this longitudinal media analysis is to identify the deployment of ideas about transition and to assess the implications of media representations for carbon literacy and

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cognitive engagement with transition. To do so, the study develops an original coding scheme to analyze media articles in terms of broad themes about transition. Media themes were defined as overarching positions on what LCT/DC means and/or how it is to be achieved. The coding scheme was generated using an inductive approach, in other words coding categories and sub-categories were data-driven and based on empirical observation rather than applied a priori. The thematic analysis also drew on media framing studies, specifically the qualitative and quantitative analysis of the primary frame using the entire article as unit of analysis.

As discussed above, this approach is informed by recent scholarship highlighting the significance of the socio-cultural and socio-political dimensions of LCT/DC as well as information and education about socio-technical change in public engagement studies (Corner et al., 2014; Hibberd & Nguyen, 2013; Hulme, 2013; Whitmarsh et al., 2013). While this study is exploratory and partial, it is of value in terms of mapping dominant media themes and highlighting factors influencing carbon literacy. In addition, the coding scheme provides a resource for others who may seek to use a similar approach in future research.

Although the value of print media as an object of analysis has limitations, it offers advantages in terms of:

1.- Ease of access to data, ii)

2.- They are an important site for analysis of claims and public information[5] and

3.- newspapers (print and online) remain a predominant source of information on environmental issues for most people (Antilla, 2010, p.245). While other media are important sources, they have yet to match the coverage of mainstream media (Gavin, 2009) and they are also often dependent on professional news reports (Reese et al., 2007).

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**Data Collection and Pilot Study Sampling.**

The corpus of data used for analysis was composed of all articles from Irish national newspapers and online publications available on Lexis Nexis newspaper database on 3 August 2013 and 12 October 2013 (see Appendix 1). In order to map the wide range of possible articulations and conceptualizations of LCT/DC and to ensure the final corpus provided an accurate account of the balance of technical, economic and social understanding of transition deployed in Irish media reports, keyword searches for both expert and lay articulations of LCT/DC were undertaken. The first keyword search included the terms 'Low Carbon', 'Decarbonisation' and 'Decarbon!' as offering insight into expert and technical discussion. This was followed by a search of the list of Creative Carbon Compounds developed by Koteyko et al., (2010)[6] to shed light on possible lay discussions. As a result, the final dataset provides a reliable reflection of the range of media reports about this multi-dimensional topic and the findings provide a valid account of Irish media representation of LCT/DC and whether and how media representations privilege particular conceptualizations.

The searches covered the period 1 January 2000 – 31 July 2013. This timeframe marks the early stages of Carbon Tax debate in Ireland[7] up to the end of the Irish Presidency of the EU and final discussions of EU policy on LCT/DC. It was hoped that this period would provide sufficient articles for a longitudinal analysis of media reporting and highlight any transformations in representation, especially pre- and post- economic crisis. The news organizations were chosen to provide a good cross section in terms of type of publication and ideological orientation and included broadsheets, tabloids and weekend editions. Likewise, articles selected were from across the spectrum of newspaper sections but excluded articles of less than 150 words and Letters to Editor as these were considered too short for analysis. All articles were screened online and after removing duplicates and articles with peripheral or passing mentions to the topic (eg advertorial or commercial information), this search process yielded a dataset of 347 usable articles (see Appendix 2).[8]

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The 347 articles were then subjected to thematic analysis using the coding scheme developed to identify dominant media themes. This generated six dominant media themes. A pilot study sample of 71 articles (approx. 20% of dataset) was then drawn-up using random stratified sampling. The aim was to generate a representative sample based on the dominant media themes in the broader dataset.

**Thematic Analysis and Development of Coding Schemes.**

Thematic analysis is a particular type of qualitative content analysis that focuses on identifying ideas or themes in texts (rather than words). This analysis drew on Boyatzis' (1998) definition of a theme as a 'recurrent pattern' in data; in particular, '[a] theme is a pattern found in the information that at a minimum describes and organizes possible observation or at the maximum, interprets aspects of the phenomenon' (p.vi-vii). The criterion for what constituted a 'theme' was determined on the basis of its 'prevalence' and 'keyness'. Prevalence refers to the frequency of the theme across the data, whereas 'keyness' describes its meaningfulness or relevance in relation to the research question (Braun and Clarke, 2006).

The coding scheme categories were developed inductively following steps for thematic analysis outlined by Braun and Clarke (2006) and the coding process was carried out using Vivo software.[9] First, all 347 articles were read to develop a sense of the recurring themes about LCT/DC. Categories were further identified by drawing on the concept of framing from media studies. "Framing fundamentally asks how an issue is made meaningful" (Horsbøl, 2013, p.25) and is therefore a useful concept to operationalize thematic analysis of media representations. In this study, it refers to the repetitive use of particular conceptualizations of LCT/DC and are ways of presenting information in line with the media norm of packaging stories (McComas & Shanahan, 1999). This was operationalized

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in the coding process using Entman's definition (1993, p.52) "news frames are 'manifested by the presence or absence of certain keywords, stock phrases, stereotyped images, sources of information and sentences that provide thematically reinforcing clusters of facts or judgements". Thus categories generated by drawing on the concept of framing are essentially dominant themes about what LCT/DC means, involves or requires; or repeating patterns of ideas about the problem LCT/DC solves or the solutions it involves. Additionally, given the multi-dimensional nature of the transition and the possibility of several frames within one article, the idea of a primary frame (ie the most prevalent due to its prominent placement or repetition throughout the article), was also employed to help identify the most relevant thematic category.

Analysis to identify the dominant media themes based on prevalence was then carried out on all 347 articles so that each story was positioned in one category only. As social actors quoted in news media have significant impact on defining debates about multi-dimensional issues such as climate change in society (Carvalho & Pereira, 2008; Horsbøl, 2013), the pilot study analysis also coded the voices of authority on LCT/DC to shed light on which actors make claims about LCT/DC. The study coded claims, assertions, suggestions, recommendations or calls about action on LCT/DC (eg references to what is problem/solution, who is/should be responsible). Voices were defined as references in direct or indirect quotes about LCT/DC in articles and journalists were considered voices when directly/indirectly quoted and/or in references to LCT/DC in opinion columns. The study coded first references to each actor only.

**Findings**.

This research is a first step towards mapping public discussion about LCT/DC in Irish media. The following section outlines key features in media texts relevant to assessing carbon literacy in media representations and possible implications for cognitive

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engagement with transition. First the analysis describes the volume of media coverage over the research timeframe, highlighting trends in media themes and voices of authority. It then evaluates media themes focusing on documenting features that shed light on how media representations inform carbon literacy. In addition, the analysis assesses the impact of economic crisis on trends in media themes, noting changes in the emergence or transformation of particular conceptualizations of LCT/DC.

**Emergence of Irish Media Debate about Transition**.

Debate about LCT/DC is emergent in Irish national press. Results from the Lexis Nexus database suggest that while discussion of 'Carbon' first appeared in the *Irish Times*[10] in 1992,[11] it was not until 2007, following the release of the Stern Report, that LCT/DC became a substantial topic of media discussion across news organizations in Ireland. Analysis of search term frequency reveals that 'Carbon Tax' was the dominant topic of debate over the entire timeframe. Discussion of Carbon Tax was found across all news organizations and was a topic of controversy and contestation, with tabloid coverage often highly critical. The *Irish Times*, which provided over two thirds of the articles in the entire dataset, is the dominant news organization reporting on LCT/DC (see Table 1).

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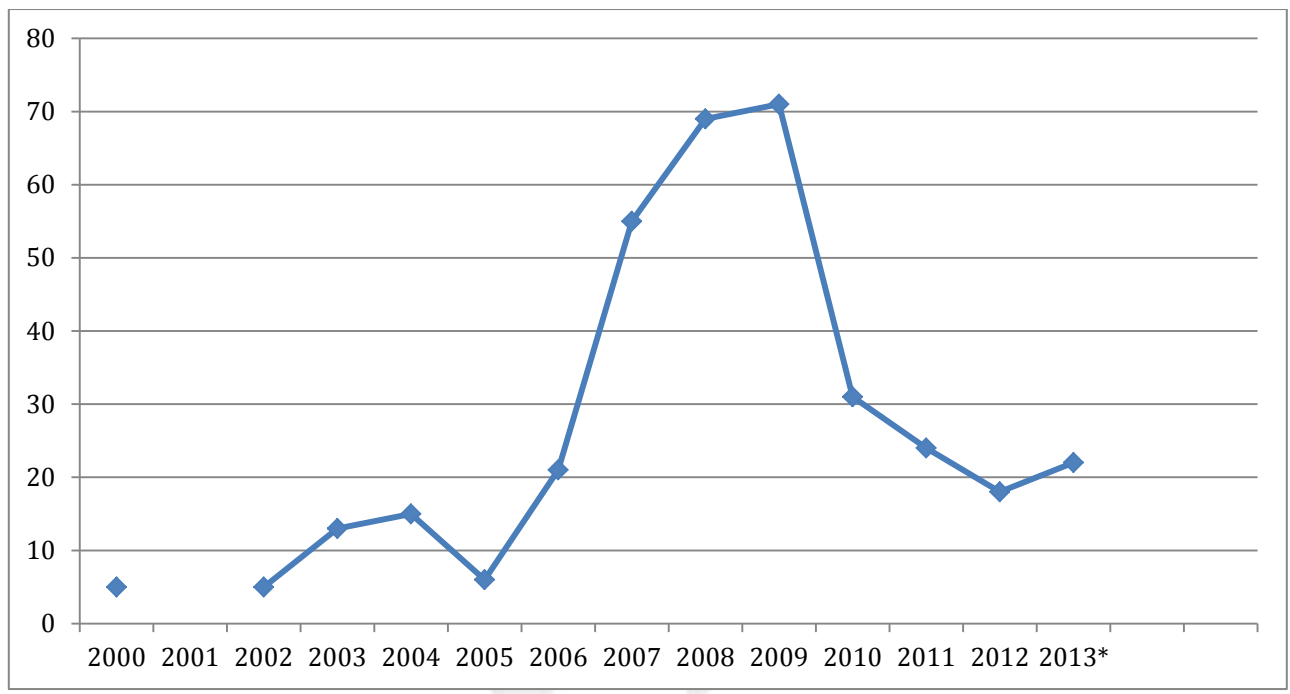Primera Revista Electrónica en Iberoamérica Especializada en Comunicación
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Table 1: Newspaper dataset

|  | Total No of Articles | Type of Publication | Content |
|---|---|---|---|
| *The Irish Times* | 212 | National Broadsheet | Known as Ireland's leading newspaper of opinion/ information |
| *Irish Examiner* | 58 | National Broadsheet | Though a national paper, primary circulation in Cork/Munster region. Aims to challenge conventional choices. Focus on national and international news & current affairs |
| *Irish Independent* | 28 | National Broadsheet (also compact version) | Ireland's largest selling daily newspaper and flagship publication of Independent News & Media |
| *Sunday Business Post* | 21 | National Sunday Paper | Ireland's only financial, political and economic newspaper |
| *The Mirror & Sunday Mirror**** | 11 | Irish Edition of largest UK Tabloid | Traditional left of centre paper covering news, features, sport |
| *The Sunday Tribune** | 10 | National Sunday Paper | National and international news coverage and lifestyle |
| *The Sunday Independent* | 5 | National Sunday Paper | Sister publication to Irish Independent. Covers news, politics and lifestyle over five sections |
| *Irish Daily Mail**** | 2 | Irish Tabloid covering UK politics, economics | 'Hard news', 'social affairs' and 'human interest stories' as well as 'Femail' and 'Money Mail' sections |
| **Total** | **347** |  |  |

\* The Sunday Tribune closed in February 2011.
\*\* Tabloid coverage was markedly low due to large number of stories <150 words and thus not included.

Analysis of the volume of articles about transition during the period 2000 – 2013 indicates a rising trend in coverage among Irish news media (see Table 2).[12] Despite a drop in attention after COP15, there has been a gradual but steady increase in coverage since the onset of economic crisis in 2009. Surprisingly, despite several high-profile policy publications related to LCT/DC in Ireland [13], coverage dropped in 2012.

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Table 2. Volume of Irish media coverage about LCT/DC per year.



*=  1 January – 31 July 2013 (end date of Irish EU presidency).

**Trends in Irish Media Themes about Transition.**

The research identified six overarching media themes about LCT/DC: Targets and Regulations; Environmental Concern and Climate Change; Protecting Economy and Costs; Sustainability and Technological Innovation; Negative &/or Critical, as well as Radical Social Change (see full description of coding scheme in Appendix 3) indicating a variety of conceptualizations about this multi-faceted challenge. However, the findings show that media reports are primarily concerned with policy management across the timeframe and that the Targets and Regulations theme dominates both pre- and post-economic crisis (see Table 3). This is followed by the Environmental Concern and Climate Change theme in which LCT/DC is conceptualized as environmental concern and tackling climate change.

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However, this theme also records the largest fall off post-economic crisis, indicating that it has become marginalized. Together, representation of transition as issues of policy management and environmental concern are the most prevalent media themes accounting for almost two-thirds of media reports.

Table 3: Trends in Irish media themes about LCT/DC: pre- and post-economic crash.

| Dominant Media Themes | Media Coverage (2000 – 2013) | | |
|---|---|---|---|
| | Total | Pre-Econ Crash | Post-Econ Crash |
| **Setting Targets & Regulations** - 'Constructing Policy Goal' *Articles Focused on Setting Carbon Emissions Targets* | 120 | 67 (35%) | 53 (33%) |
| **Environmental Concern & Climate Change** - 'Impending Doom' *Articles Focused on Highlighting Environmental Crisis* | 70 | 52 (27%) | 18 (10%) |
| **Protecting Economy & Costs** - 'Put A Price on Carbon' *Articles Focused on Protecting Irish Competitiveness* | 63 | 33 (17%) | 30 (18%) |
| **Sustainability & Technological Innovation** – 'Green Power & Growth' *Articles Focused on Promoting Benefits of Sustainability* | 51 | 10 (5%) | 41 (25%) |
| **Negative &/or Critical** – 'Folly of Decarbonization' *Articles Focused on Questioning Rationale or Possibility of LCT/DC* | 38 | 22 (12%) | 16 (10%) |
| **Radical Social Change** – 'Post-Carbon Revolution' *Articles Focused on LCT/DC as involving Social Transformation* | 5 | 4 (-) | 1 (-) |

Conceptualization of LCT/DC as Sustainability and Technological Innovation is the main theme to emerge over the timeframe and it is also the second most prevalent theme post-economic crisis. Protecting Economy and Costs, in which transition is conceptualized as involving economic mechanisms and focused on the costs of LCT/DC, is the third largest theme over the timeframe. Significantly, prevalence of this theme has not been influenced by economic crisis. Likewise, skepticism about transition articulated in the Negative and/or Critical theme, is also unaffected by economic crisis. However, both media themes that

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contest the notion of unproblematic change promoted by the sustainability theme (ie such as Negative &/or Critical and Radical Social Change) are marginal, recording the least prevalence over time.

The findings indicate that the dominant Irish media theme of transition promotes an understanding of the challenge as primarily concerned with policy management. Post-economic crisis, this dominant theme is accompanied by a theme of unproblematic progress through Sustainability and Technological Innovation. Additionally, the prevalence of the Targets and Regulations theme, which accounts for one third of the entire dataset, and the focus on Sustainability and Technological Innovation post-economic crisis, indicates a narrow discussion of LCT/DC in media and suggests that the wide range of viable alternatives about transition is being marginalized. This limitation on plurality in Irish print media themes poses the main challenge for carbon literacy and potential cognitive engagement with transition.

**Voices of Authority Across Media Themes.**

Political and business elites are the main voices of authority in this exploratory study while environmental groups and civil society voices are marginalized overtime (see Table 4). The pilot study analysis reveals that political actors account for twice as many quoted references about LCT/DC compared to business and sectoral actors. The least quoted actors are environmental groups and civil society. These findings correspond with the media themes. As would be expected, political voices dominate in both the Targets and Regulations and Protecting Economy and Costs themes, while business and sectoral interests are strong voices in both Targets and Regulations and Sustainability and Technological Innovation. The least referenced actors, environmental organizations and civil society are primarily referenced within the Targets and Regulations theme (ie in articles focused on policy-

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driven dimensions of transition) rather than articles focused on the social or cultural aspects.

Table 4: Trends in Irish media themes about LCT/DC - voices of authority.

| Themes | Total No. Articles | Total in Pilot Sample (% of Pilot) | Voices of Authority (based on pilot study sample) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Pol | Env | Sec | Sci | Civil | Journo | Other | N/P |
| Targets & Regulations | 120 (35%) | 18 (25%) | 19 | 7 | 12 | 1 | 3 | 5 | - | 2 |
| Environmental Concern & Climate Change | 70 (20%) | 12 (16%) | 5 | 1 | 1 | 4 | - | 6 | - | - |
| Protecting Economy & Costs | 63 (18%) | 14 (20%) | 11 | 1 | 5 | - | 1 | 1 | 2 | - |
| Sustainability & Technological Innovation | 51 (14%) | 12 (16%) | 5 | 1 | 7 | 6 | - | 1 | - | 1 |
| Negative &/or Critical | 38 (10%) | 10 14% | 5 | 2 | 1 | 1 | - | 5 | - | - |
| Radical Change | 5 | 5 | 2 | 2 | 1 | 2 | 1 | - | - | - |
| Total | 347 | 71 | 47 | 14 | 27 | 14 | 5 | 18 | 2 | 3 |

**Analysis of Transformations in Irish Media Themes.**

Given space constraints, the following section reports on four of the six media themes, focusing on those that recorded the most significant transformations, ie, marginalisation or emergence of particular themes (see Appendix 4 for full details of all media themes and sample text).

**Targets and Regulations.**

This theme focuses on regulatory mechanisms and setting targets to reduce carbon emissions. While national regulations are featured, particularly in relation to discussion about a Climate Change Bill, it is especially interested in reporting on global discussions about carbon reduction, such as international meetings and political negotiations aimed at

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agreeing 'binding targets'. It promotes political elites and national government as 'responsible agents' of transition. In other words, it promotes the idea of political responsibility and elite action rather than everyday lifestyle change or public involvement in processes of transition.

In a substantial number of articles, the rationale for setting targets is to support market mechanisms (such as carbon trading) as well as underpinning transition to low carbon economies by sending a signal to markets and providing certainty for business investment in low carbon technologies. This top down vision of responsibility for transition corresponds to the top down discourses of Green Governmentality and Administrative Rationalism (Dryzek, 1997). Significantly, emissions targets are commonly discussed in terms of obligations and commitments, which are imposed by outside forces, usually EU-regulations. In addition, achieving imposed targets is often discussed as extremely difficult or impossible for Ireland and in terms of how much it will 'cost' taxpayers. Thus, within the most dominant Irish media theme about LCT/DC, discussion of the rationale for reducing emissions tends to position lay publics as lacking agency and on the receiving end of political decision-making. Such top down perspectives on LCT/DC supports critiques of the power dynamics driving transition as 'authoritarian' (Stirling, 2014). It also suggests that the dominant media theme operates to provide elite flows of information and is primarily concerned with elite persuasion, rather than engaging with wider socio-cultural issues such as everyday expectations or lifestyle change.

In addition, discussions about Irish emissions targets tend to draw on fear appeals to underline urgency and motivate action on Kyoto targets. These are regularly referenced as 'onerous', 'stringent' and likely to get worse in future. However, the use of fear appeals have been critiqued in terms of limiting public engagement (O'Neill & Nicholson-Cole, 2009) and rather than motivating urgent action, research suggests that this is likely to further distance public(s) from engaging with transition.

Articles within this theme also draw on complex scientific reports to highlight the dangers of increasing carbon emissions and support need for action. However, despite the centrality of scientific evidence to support need for action, these reports are primarily discussed as techno-managerial and bureaucratic issues and rarely made socially meaningful information for lay public(s).

As might be expected, many articles within this theme are also critical of political (in) action and mismanagement at both national and global levels, particularly in relation to rowing back on setting meaningful emissions targets. However, such criticism could also generate confusion as on the one hand articles within this theme argue that emissions targets are imposed, impossible to meet and costly but also urgent and absolutely necessary. On the other, it creates the expectation that political elites are responsible for action but by all accounts inept and unlikely to act.

**Sustainability and Technological Innovation.**

Articles in this theme also focus on how to achieve transition, this time through sustainable development and technology. The theme presents an unproblematic view of transition in which technology can help to achieve emissions targets and decarbonisation. However, its primary concern is with promoting the economic benefits of sustainability and significantly the focus is on impacts for business and sectoral interests (ie farming). Thus concern with elite persuasion and information flows also predominate here, as these articles often focus on bureaucratic interests such as energy targets and policy and the main social challenges are represented as reducing energy costs and changing consumer trends. These conceptualizations have come under scrutiny in recent critiques of transition. For example, Sorrell's (2015) review of energy transition highlights the problem with reductive accounts of the simple solutions theme while Webb (2012) queries the credibility of instrumental economic values and the efficacy of individual behavior technologies as drivers of the

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transition to sustainable society, and Young and Dugas (2011) draw attention to how narrow media representation of the viable alternatives for tackling climate change poses a dilemma for radical social transformation.

Notably, within this theme, techno-optimism is predicated on the need for financial incentives and market support to ensure viability of low carbon technologies, rather than the promotion of a 'techno-fix' discourse *per se*. Likewise*,* references about energy transition and moving to 'Green Power' within this theme also focus on economic concerns, such as discussions about 'playing the green card' and the national gains associated with this new 'export industry' rather than critical discussion of technology. Additionally, controversial or contested themes of wider social and local interest such as Risky Technology, Irish Landscape or Greenwashing are hardly referenced within this theme.

Much of the rhetorical force of this theme derives from its promotion and expectation of straight-forward economic benefits of transition. This new green narrative for LCT/DC, which develops post-2009, counters earlier negative views of environmental concern as either being too costly or at odds with national competitiveness. In general, however, representation of economic opportunities in these articles is pragmatic as is their perspective on achieving Kyoto targets. This theme notably reframes the rationale for transition as achieving efficiency (rather than imposing or meeting strict targets) and avoids discussion or critique of consumption. Instead, articles focus on the benefits of technological approaches to efficiency for business and national competitiveness as well as for reducing rising energy costs for consumers – both of which are often referenced as 'win/win' solutions. In other words, in relation to the social dimensions of energy transition, discussion focuses on changing consumer trends through uptake of energy efficiency technology rather than questioning consumption. In doing so, this theme promotes extrinsic motivations for transition based on individualistic and material values (Crompton, 2008; Howell, 2013), rather than conceptualizations of LCT/DC that are

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associated with intrinsic motivations and "engaging values that underpin our decisions as citizens, voters and consumers" (Crompton, 2008, p.5).

**Environmental Concern and Climate Change.**

This theme promotes environmental concern as the rationale for transition and highlights the need to tackle climate change as a matter of grave urgency. As might be expected, a major feature in these articles is the use of fear appeals to promote a sense of urgency about the need for global action. However, as previously discussed, fear appeals such as highlighting the 'irreversible' or apocalyptic nature of the challenge, have been found to be overwhelming and thus distancing in terms of public engagement (O'Neill & Nicholson-Cole, 2009).

In some cases, articles in this theme draw on scientific evidence or reports to lend weight to environmental arguments for tackling climate change and to heighten urgency. However, once again, scientific evidence is typically reproduced without socially (re) contextualizing the technical, abstract language to enhance everyday meaning-making.

Significantly, this theme prioritizes discussion of local environmental dimensions and personal as well as collective responsibility. However these more socially-relevant discussions are often also highly critical, chastising the lack of necessary action and need for future planning on the local level. Thus, as with fear appeals, these overtly negative representations of 'historic' public and collective failure could also be seen as distancing in terms of connecting public(s) with transition and instead could contribute to the 'Hope Gap' (Upton, 2015) on climate change action. Nonetheless, this media theme is also unique in terms of raising and broadening discussion about the social dimensions of transition. For example, articles in this theme highlight moral obligations for citizens and politicians to reduce carbon emissions, and references to the need for changes to everyday social

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practices, such as motoring, flying and food consumption as well as changing expectations about current lifestyles.

**Negative and/or Problematic.**

Articles within this theme draw on a variety of issues to challenge the dominant media representations of transition. In particular, these articles question the notion of simple solutions promoted in the Sustainability and Technological Innovation theme. They are also critical of the need for decarbonisation either because of climate change scepticism, or the minimal contribution Irish emissions reduction could make to global emissions, or because decarbonisation is too costly in the context of austerity and recession. As with Environmental Concern and Climate Change, this media theme is noteworthy because of its attention to social dimensions of transition. Articles here highlight the negative implications of regulatory and financial approaches to transition on ordinary families, motorists, the old and vulnerable sectors of society, in addition to local concerns. Significantly, this sceptical theme is markedly absent from media reports post-economic crisis.

In its initial phase, this theme features an anti-environmental agenda and is highly critical of both i) how change associated with transition is 'imposed' on resistant public(s) as well as ii) the rationale for these 'unfair' changes to everyday lifestyles. Some articles also question the simple narrative of technofix and financial fixes.

Post-economic crisis, however, this theme highlights Ireland's unique status within the EU and the challenge of decoupling growth and emissions, to raise questions about top-down regulatory approaches to LCT/DC. Noting that Ireland will have to make the transition to sustainability ahead of the rest of Europe because of its dependence on agricultural food production and the need for economic regrowth, these articles are increasingly critical of

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Ireland's high emissions targets and calls by environmental groups and the Green Party to further increase them.

**Discussion and Implications of Media Representations for Carbon Literacy.**

The research indicates that Irish media reports about transition are emergent and that critiques of LCT/DC in policy and online for as authoritarian, economics-driven (instrumental) and reductive can also be applied to the dominant Irish media representations. Overall, the analysis found that Irish media representations mainstream narrow conceptualizations of the multi-dimensional process and inadequately addresses the range of viable alternatives and potential voices of authority on this societal challenge. In particular, the targeted media analysis of transition, which included lay terms about carbon management, found that techno-managerial, global level discussions dominate media representations. This resonates with critiques of climate change reporting that argue the media fail to address national and local dimensions (Carvalho, 2010; Hulme, 2013). Crucially, although discussion of sustainability presents opportunities for a wide range of lay understandings about moving to a low carbon future, such as community actions, values and responsibility as well as educational dimensions about low carbon lifestyles, these socially-relevant aspects were not featured by Irish media.

The study further demonstrated that media themes were influenced by economic crisis and national economic arguments for transition which is in line with the findings of cross-national media reporting of energy and climate change (Uusi-Rauva & Tienari, 2010). Media themes presenting economic and policy related conceptualizations increased post-economic crisis whereas themes concerned with environmental or critical articulations notably decreased. In other words, increased media representation of economic conceptualizations privileging elite persuasion and information flows appears to be at the expense of a wide range of social articulations about LCT/DC.

Based on this, the study suggests that there is considerable scope for communications strategies to increase possibilities for cognitive engagement by i) focusing on social and local dimensions, for example by broadening carbon literacy and increasing awareness of transition as a socio-cultural and political issue and ii) translating techno-managerial and abstract language to more socially-relevant information. There is also significant capacity for media to develop reporting about carbon management and low carbon lifestyles, particularly in terms of providing more critical and socially (re) contextualized analysis, ie, to provide knowledge-based journalism which interprets, critiques and thus helps clarify choices and challenge reductive accounts of simple linear progress as well as the mainstay of policy-driven, economy focused, data-driven journalism.

The pilot study also examined the plurality of voices in media reports. This partial analysis indicates that while a range of voices compete to define LCT/DC and provide rationales for particular approaches to carbon management, the discussion is relatively one-sided with political and business elites dominating conceptualization and rationale for transition. It also found that critical voices are marginal and, notably, that critical voices (predominantly the voice of journalists) decrease over time. In other words, reflection about potential negative consequences of preferred action and voices promoting alternate rationales or motivations for action are not a feature of Irish media reporting. As will be discussed below, this has implications for the trajectory of transition pathways and the extent to which transition is, indeed, environmentally sustainable. It also has impacts on broader citizen engagement for, as Cherry et al. (2013) argue in their analysis of UK discourses about low carbon housing, the marginalization of social and behavioral dimensions could open the doorway for public backlash and resistance when the realities of radical decarbonisation become more apparent. In addition, critique and contestation in media debates about technoscientific modernization need not be seen negatively. As several scholars have argued, contestation is important feature of democratic public debate (Maeseele, 2010; Mouffe, 2005) and is a critical element for public engagement with

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energy transition, creating opportunities for shared learning and inclusion of different forms of knowledge and values about energy transition (Roberts et al., 2013).

The finding that national economic arguments have had a significant influence on media representations about transition in Ireland corresponds to concerns about the pervasiveness of market capitalism in online discussion of low carbon metals (Nerlich, 2012). Furthermore, researchers have questioned extrinsic motivations and the value of *Homo economicus* or rational self-interest in relation to engaging publics with transition. Strengers' (2013) analysis of smart energy technology and everyday practices found this to be reductive and insufficient conceptualization of the challenges of changing energy consumption in the home. Likewise, analyzing challenges for building a low carbon society, researchers highlight the need for more compelling social visions and the lack of necessary public information and education about low carbon workforce (Carvalho et al., 2011). Related to this, the finding that dominant Irish media themes prioritize government responsibility and agency corresponds to Dryzek's (1997) top-down discourses of Green Governmentality and Adminstrative Rationalism and as Uusi-Rauva & Tienari (2010) note this further detracts attention from the collective and social nature of the problem and wider societal responsibility.

**Conclusion.**

Moving to a low carbon future depends on wide societal engagement with LCT/DC on a range of levels from everyday lifestyle change, to participation in debate and decision-making about approaches to transition and support for public policy (Whitmarsh, Seyfang, et al., 2011). In other words, it incorporates behavioral, cognitive and broader forms of engagement. Zoning in on the idea of cognitive engagement with transition, this exploratory research assessed opportunities for shaping public knowledge and awareness of LCT/DC as well as the situated and contextual meanings in Irish media representations.

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Thus the study adds to knowledge about the societal factors shaping public meanings of LCT/DC and identified several constraints for carbon literacy arising from media representations. Based on this, the following points highlight opportunities for developing communication strategies aimed at promoting broader cognitive engagement with transition.

As an inherently local and social issue, communication about transition presents new opportunities for communications practitioners to inform and educate wider public(s) about processes to achieve transition, low carbon lifestyles and jobs as well as new visions of a low carbon future. Transitions communications therefore stands in contrast to many of the challenges of communicating about global climate change: it offers opportunities for communications about tangible, local actions. Crucially, LCT/DC goes beyond pro-environmental or scientific framings for public engagement with climate change to also incorporate possibilities for conceptualizing social change. However, the findings suggest that media representations and thus a significant contribution to public discussion about transition have yet to capitalize on these possibilities for broadening cognitive engagement. Thus focusing on tangible, local and/or community action(s) represents an important opportunity for future communications strategies.

Another noteworthy finding, in the context of EU goals and the growing mantra of economic benefits, is for communications praxis to consider the balance between economic and environmental perspectives in public discussion about transition. The focus on economic rationales for transition is highly significant in relation to both the trajectory of transition and the choices about transition processes, ie, the outcome of transition pathways. How the problem of transition is framed and the language or stories employed to discuss transition, influence which solutions are seen as possible (Nerlich, 2012). As Nerlich points out in her analysis of the increasing use of market metaphors in online discussion of transition, there is a need for caution in relation to the seductive appeal of economic models

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and metaphors, as the solutions they promote 'may be neither sustainable or just' (2012, p.44). Given the media's role as a platform for public debate and its influence on public knowledge and awareness of environmental and techno-scientific issues, the finding that media representations side-line deeper social and cultural reflection on transition has important implications for building wider public support and involvement with transition pathways. In particular, drawing on the growing literature critiquing absence or marginalization of socio-political discussion about LCT/DC, it suggests that there is a need for communications praxis to consider more critical engagement with a range of viable alternatives in terms of the processes and rationales for transition as well as challenging the reductive, economics-driven, authoritarian approaches for transition promoted by dominant voices of authority. As these findings are based on partial data, however, it is not claimed that they are exhaustive or can be generalized. Nonetheless, they do highlight the need for further research and present resources to do so (see Appendix 3).

The study is limited by the size of the data sample, specifically, its focus on the press and analysis of a single case study. Suggestions for future research include more extensive media analysis, across a range of media (TV, radio, blogs) and locations. There are also avenues for research within journalism practice as the findings suggest tensions between data and knowledge-based journalism around coverage of carbon management. As an issue of social transformation involving choices about techno scientific innovation, LCT/DC is an important area to examine in terms of how communication and media coverage shapes knowledge and values associated with various options for approaching carbon management. It would be fruitful to examine both media organizations and journalism practices in terms of factors shaping media content and production, especially editorial and journalistic decision-making.

## References.

Antilla, L., 2010. Self-censorship and science: a geographical review of media coverage of climate tipping points. *Public Understanding of Science*, 19(2), pp.240–256.

Beck, U., 2010. Climate for change, or how to create a green modernity? *Theory, Culture & Society*, 27(2), pp.254–266.

Boyatzis, R.E., 1998. *Transforming Qualitative Information: Thematic Analysis and Code Development*, Thousand Oaks, CA: Sage.

Braun, V. and & Clarke, V., 2006. Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), pp.77–101.

Carvalho, A., 2010. Media(ted)discourses and climate change: a focus on political subjectivity and (dis)engagement. *Wiley Interdisciplinary Reviews: Climate Change*, 1(2), pp.172–179.

Carvalho, A. & Burgess, J., 2005. Cultural circuits of climate change in U.K. broadsheet newspapers, 1985-2003. *Risk Analysis*, 25(6), pp.1457–69.

Carvalho, A. & Pereira, E., 2008. Communicating climate change in Portugal: A critical analysis of journalism and beyond. In A. Carvalho, ed. *Communicating Climate Change: Discourses, Mediations, Perceptions*. Centro de Estudos de Comunicação e Sociedade, Universidade do Minho, pp. 126–156. E-book available at: http://www.lasics.uminho.pt/ojs/index.php/climate_change.

Carvalho, A. and Peterson, T.A., eds. 2012., *Climate Change Politics: Communication and Public Engagement.* New York: Cambria Press.

Carvalho, M., Bonifacio, M. & Dechamps, P., 2011. Building a low carbon society. *Energy*, 36, pp.1842–1847.

Cherry, C., Hopfe, C., MacGillvray, B. and Pidgeon, N., 2013. Media discourses of low carbon housing: The marginalisation of social and behavioural dimensions within the British broadsheet press. *Public Understanding of Science*, 24(3), pp.302–10.

Corbett, J. and Durfee, J., 2004. Testing public (un)certainty of science: Media representation of global warming. *Science Communication*, 26(2), pp.129–151.

Corner, A., Markowitz, E. & Pidgeon, N., 2014. Public engagement with climate change: the role of human values. *Wiley Interdisciplinary Reviews: Climate Change*, 5(3), pp.411–422.

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Crompton, T., 2008. *Weathercocks & Signposts: The Environmental Movement at a Crossroads*, UK: WWF UK.

Dryzek, J.S., 1997. *The Politics of the Earth: Environmental Discourses*, New York; London: Oxford University Press.

Entman, R.M., 1993. Framing - Toward clarification of a fractured paradigm. *Journal of Communication*, 43(4), pp.51–58.

Etzioni, A., 2006. Are public intellectuals an endangered species? In A. Etzioni and A. Bowditch, eds. *Public Intellectuals: An Endangered Species?* Lanham: Rowman & Littlefield.

Gavin, N., 2009. The web and climate change: Lessons from Britain? In T. Boyce & J. Lewis, J. eds. *Media and Climate Change*. Oxford: Peter Lang, pp. 129–142.

Giddens, A., 2009. *The Politics of Climate Change*, Cambridge: Polity Press.

Hansen, A., 2010. *Environment, Media and Communication*, Oxon: Routledge.

Hibberd, M. & Nguyen, A., 2013. Introduction. *International Journal of Media and Cultural Politics*, 9(1), pp.3–5.

Hoppner, C. & Whitmarsh, L., 2010. Public Engagement in climate action: policy and public expectations. In L. Whitmarsh, S. O'Neill, & I. Lorenzoni, eds. *Engaging the Public with Climate Change: Behaviour Change and Communication*. London: Earthscan.

Horsbøl, A., 2013. Energy transition in and by the local media. *Nordicom Review*, 34(2), pp.19–34.

Howell, R.A., 2013. It's not (just) "the environment, stupid!" Values, motivations, and routes to engagement of people adopting lower-carbon lifestyles. *Global Environmental Change*, 23(1), pp.281–290.

Hulme, M., 2013. *Exploring Climate Change through Science and in Society*, Oxon: Routledge.

Irwin, A., Jensen, T.E. & Jones, K.E., 2012. The good, the bad and the perfect: Criticizing engagement practice. *Social Studies of Science*, 43(1), pp.118–135.

Koteyko, N., Thelwall, M. & Nerlich, B., 2010. From carbon markets to carbon morality: Creative compounds as framing devices in online discourses on climate change mitigation. *Science Communication*, 32(1), pp.25–54.

Maeseele, P., 2010. Science journalism and social debate on modernization risks. *Journal of Science Communication*, 9(4), pp.5–10.

McComas, K. & Shanahan, J., 1999. Telling stories about global climate change: Measuring the impact of narratives on issue cycles. *Communication Research*, 26(1), pp.30–57.

Moser, S. & Dilling, L., eds. 2007. *Creating A Climate For Change: Communicating Climate Change and Facilitating Social Change*, Cambridge: Cambridge University Press.

Moser, S., 2010. Communicating climate change: history, challenges, process and future directions. *Wiley Interdisciplinary Reviews: Climate Change*, 1(1), pp.31–53.

Mouffe, C., 2005. *On the Political*, Abingdon: Routledege.

Nelkin, D., 1995. *Selling Science: How the Press Covers Science and Technology*, New York: W.H. Freeman.

Nerlich, B., 2012. "Low carbon" metals, markets and metaphors: the creation of economic expectations about climate change mitigation. *Climatic Change*, 110(1-2), pp.31–51.

Nisbet, M., 2013. Foreword. *Exploring Climate Change through Science and in Society*, Oxon: Routledge.

O'Neill, S. & Nicholson-Cole, S., 2009. "Fear won't do it": Promoting positive engagement with climate change through visual and iconic representations. *Science Communication*, 30(3), pp.355–379.

O'Neill, S.J., 2013. Image matters: Climate change imagery in US, UK and Australian newspapers. *Geoforum*, 49, pp.10–19.

Phillips, L., Carvalho, A. & Doyle, J., 2012. *Citizen Voices: Performing Public Participation in Science and Environment Communication*, Bristol, UK; Chicago, IL: Intellect.

Phillips, M. & Dickie, J., 2014. Narratives of transition/non-transition towards low carbon futures within English rural communities. *Journal of Rural Studies*, 34, pp.79–95.

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Reese, S., Rutigliano, L., Hyun, K., Jaekwan, J., 2007. Mapping the Blogosphere: Professional and Citizen-Based Media in the Global News Arena. *Journalism*, 8(3), pp.235–61.

Roberts, T., Upham P., Mclachlan, C., Mander S., Gough, C,, Boucher, P., Ghanem, D.A. eds., 2013. *Low Carbon Energy Controversies*, Oxon: Routledge.

Schreier, M., 2012. *Qualitative Content Analysis in Practice*, London: Sage

Sharp, A. and Wheeler, M., 2013. Reducing householders' grocery carbon emissions: Carbon literacy and carbon label preferences. *Australasian Marketing Journal (AMJ)*, 21(4), pp.240 – 249.

Shove, E., 2010. Beyond the ABC: climate change policy and theories of social change. *Environment and Planning A*, 42(6), pp.1273–1285.

Shove, E. & Walker, G., 2014. What is energy for? Social practice and energy demand. *Theory, Culture & Society*, 31(5), pp.41–58.

Sorrell, S., 2015. Reducing energy demand: A review of issues, challenges and approaches. *Renewable and Sustainable Energy Reviews*, 47, pp.74–82.

Stirling, A., 2014. *Emancipating Transformations: From Controlling "Transition" to Culturing Plural Radical Progress*, STEPS Working Paper 64, Brighton: STEPS Centre.

Strengers, Y., 2013. *Smart Energy Technologies in Everyday Life: Smart Utopia?*, Palgrave MacMillan.

Teng, C., Horng, J., Hu, M., Chen, P., 2013. Exploring the energy and carbon literacy structure for hospitality and tourism practitioners: Evidence from hotel employees in Taiwan. *Asia Pacific Journal of Tourism Research*, 19(4), pp.451–468.

The Carbon Literacy Project., 2014. The Carbon Literacy Project: Aims and objectives. [Online]. Available from: http://www.carbonliteracy.com/wp-content/uploads/2014/06/Carbon- Literacy-in-a-single-side-CLP-v1.1-pdf.pdf.

Turner, A. 2013. The case for carbon literacy. *Carbon Visuals Blog* [Online], 23 June. Avaliable from: http://www.carbonvisuals.com/blog/the-case-for-carbon-literacy.
Uusi-Rauva, C. & Tienari, J., 2010. On the relative nature of adequate measures: Media representations of the EU energy and climate package. *Global Environmental Change*, 20 (3), pp.492–501.

Upton, J., 2015. Media contributing to 'Hope Gap' on climate change. *Climate Central* [Online], 28 March. Available from: http://www.climatecentral.org/news/media-hope-gap-on-climate-change-18822.

Webb, J., 2012. Climate change and society: The chimera of behaviour change technologies. *Sociology*, 46(1), pp.109–125.

Whitmarsh, L., O'Neill, S. & Lorenzoni, I., 2011. Climate change or social change? Debate within, amongst, and beyond disciplines. *Environment and Planning A*, 43(2), pp.258–261.

Whitmarsh, L., O'Neill, S. & Lorenzoni, I., 2013. Public engagement with climate change: what do we know and where do we go from here? *International Journal of Media and Cultural Politics*, 9(1), pp.7–25.

Whitmarsh, L., Seyfang, G. & O'Neill, S., 2011. Public engagement with carbon and climate change: To what extent is the public "carbon capable"? *Global Environmental Change*, 21(1), pp.56–65.

Young, N. & Dugas, E., 2011. Representations of climate change in Canadian national print media: The banalization of global warming. *Canadian Review of Sociology*, 48(1), p.1–22.

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**Appendices.**

**Appendix 1: Lexis Nexis search terms – development of data set corpus.**

| Search Terms: | Total Articles | Screened Corpus* | Final Corpus** |
|---|---|---|---|
| Low Carbon &/or Decarbon + | 729 | 266 | 79 |
| Creative Carbon Compounds ++ | 4,134 | 766 | 268 |
| Total | - | - | 347 |

\* Substantial mentions (ie for Carbon Tax/Footprint/Credit/Budget)
\*\* Relevant articles, minus duplicates (eg Carbon Tax & Credit or Footprint often duplicated)
+ Lexis Nexis search retrieved all variations of the root term (eg decarbonised, decarbonisation, etc).
++ Based on set compiled by Koteyko, Thelwall & Nerlich, 2010

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**Appendix 2: Carbon compounds (Koteyko,Thelwall & Nerlich, 2010).**

| List of Creative Carbon Compounds | | |
|---|---|---|
| 1. Carbon accounting | 13. Carbon deal | 24. Carbon indulgence |
| 2. Carbon addiction | 14. Carbon debit | 25. Carbon lifestyle |
| 3. Carbon allowance | 15. Carbon delusion | 26. Carbon living |
| 4. Carbon bigfoot | 16. Carbon detox | 27. Carbon management |
| 5. Carbon budget | 17. Carbon dictatorship | 28. Carbon market |
| 6. Carbon burden | 18. Carbon diet | 29. Carbon morality |
| 7. Carbon challenge | 19. Carbon footprint | 30. Carbon payment |
| 8. Carbon conscious | 20. Carbon future | 31. Carbon saving |
| 9. Carbon crazy | 21. Carbon friendly | 32. Carbon sinner |
| 10. Carbon credit | 22. Carbon guilt | 33. Carbon spewing |
| 11. Carbon critics | 23. Carbon hero | 34. Carbon tax |
| 12. Carbon crusade | | |

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Appendix 3: Coding scheme for dominant Irish media themes about LCT/DC.

| Theme | Definition of theme |
|---|---|
| *Targets & Regulations* | Discussions about Kyoto obligations/commitments and the impacts/implications of $CO_2$ targets; difficulty of meeting national targets and costs of not meeting targets. Calls for political action and government responsibility on targets.<br><br>Includes references to: setting and meeting International & EU emissions reduction targets, national Irish targets; need to meet scientific measures of 'safe' $CO_2$ emissions. Criticism of political inaction /failure to agree on $CO_2$ targets and rowing back on meaningful climate action. |
| *Environmental Concern & Climate Change* | Discussion of environmental crisis at global and local levels; focusses on tackling climate change as an issue of environmental concern, highlights catastrophic threats of inaction.<br><br>Includes references to: environmental crisis and scientific evidence for climate change; Eco-living, Green Lifestyles and Carbon Footprint; personal & collective responsibility; moral obligation to act; social and cultural change (eg changes to everyday lifestyles). |
| *Protecting Economy & Costs* | Discussion of cost-effective measures to meet targets and reduce emissions. Focuses on financial management of carbon and protecting national competitiveness. Concern about impact of targets and financial measures on Irish economy. Implications of Irish recession and austerity on need for targets/ability to meet targets.<br><br>Includes references to economic mechanisms to meet targets and maintaining competitiveness, especially, Carbon Tax, Budget, Credit, Markets; also references to 'polluter pays', 'sending signals to market' and Irish economic management. |
| *Sustainability & Technological Innovation* | Discussion of local dimensions of transition, especially economic opportunities of reducing emissions. Reports on new technologies to achieve $CO_2$ targets/ decarbonisation, but primarily concerned with promoting economic aspects of sustainability, ie need for financial incentives/market support to ensure viability of LC technology rather than promotion of 'techno fix' discourse. Focuses on energy transition/decarbonisation (eg reports about energy policy, rising energy costs and energy security). Also focuses on importance of |

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| | |
|---|---|
| | validating/measuring emissions reduction to market Ireland's Low Carbon status (promoting Irish business/farming). <br><br> Includes references to: enhancing Ireland's Green Credentials, Irish leadership in Green Development. Benefits of green/renewable technologies for economic regrowth, and business (ie) 'embedding carbon into bottom line', developing climate smart/low carbon approaches to business; 'going green'. |
| *Radical Social Change* | Discussion of transition as involving social change; highlights the radical nature of the social transformation associated with move to low carbon future and need for new visions, changing expectations, lifestyles and social practices. <br><br> Includes references to: tough choices to meet targets; drastic changes including landscape change; revolution in thinking by governments, business and citizens. |
| *Negative &/or Problematic* | Questions rationale for meeting targets/emissions reduction, either because of climate change scepticism, or the contribution that Ireland, as a small country can make or effects of recession on Irish emissions. Critical of simple solutions narrative of transition and highlights problems with techno/financial fixes. <br><br> Includes references to: Irish recession/austerity as most urgent crisis; critiques of environmental taxes and Green Agenda/Lifestyle; Ireland too small to make a difference to global emissions, no alternatives to poor infrastructure |

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Appendix 4: Dominant themes in Irish media coverage of LCT/DC and sample text.

| Theme | Sample Text: |
|---|---|
| Targets & Regulations: | This equals less than 2 per cent of Ireland's target under the Kyoto Protocol, which commits the State to limiting emissions of greenhouse gases to 13 per cent above 1990 levels. <br> *(Energy tax not environmentally of benefit – IBEC, Irish Times, 8.03.2000)* <br><br> Reaction from environmental groups, employers and economists varied from calls for stronger cutbacks to warnings of tough times ahead if Ireland is to meet the EU's demands. <br> *(Republic hit by toughest $CO_2$ emissions target, Irish Examiner, 24.01.2008).* <br><br> If carbon is to become the new global currency then we must put a price on carbon…. Targets are an essential underpinning of the new international carbon market, which will drive consumer and investor behavior towards a low-carbon, sustainable future. <br> *(Gormley demands action, Irish Times, 13.12.2007)* |
| Environmental Concern & Climate Change: | We need a sea-change in how we live, work and travel in Ireland if we are to do our fair share to prevent climate change chaos, according to Oisin Coughlan. <br> *(We must act on climate chaos now, Irish Times, 3.04.2007)* <br><br> This month, the world passed a worrying milestone. The amount of carbon dioxide in the atmosphere exceeded a concentration of 400 parts per million (ppm) by volume for the first time in many millions of years. <br> *(No relief as climate change accelerates, Irish Times, 30.05.2013)* <br><br> As Ireland slips into recession, the fear is that environmental concerns will slip off the agenda. …. The chaos engulfing international finance only adds to the domestic aura of gloom - the temptation will be to stick the tree-hugging nonsense onto the back-burner, because it's cheaper to do so. …. Yet it is now evident that if our species is to continue to thrive on this planet, massive political decision not only need to be made, but also delivered upon. <br> *(Eco worrier: Carbon Tax Crucial, Sunday Business Post, 5.10.2008)* <br><br> There is nowhere else to go and no way to reset the planet's climate system… Collectively, humanity has yawned and decided to let dangers mount. <br> *(Market blinds us to dangers of climate change, Irish Times, 15.05.2013)* |
| Protecting Economy & Costs: | … Irish business and consumers will be facing higher electricity, heating and fuel charges, due to a range of new taxes aimed at dramatically reducing the levels of greenhouse gases produced in Ireland, and finally implementing, in real terms, the policy of the polluter pays….. |

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| | While many other European states have introduced green taxes targeting fossil fuels and fossil-fuel generated electricity, Ireland remains one of the only countries to have no such taxes. <u>The Department of the Environment has been pushing for green taxes since 1998, but these have been blocked by the Department of Finance on the basis that the additional energy and fuel costs would make Ireland uncompetitive.</u>" (*We're a gas nation and now we're going to have to pay the price, Sunday Tribune, 15.12.2002*) THE Green Party yesterday vowed to go ahead with plans to <u>impose a carbon tax on Irish families</u>. Energy Minister Eamon Ryan said <u>his party would start the controversial levy before 2010 - and it's expected to cost us EUR250 a year.</u> <u>Many families have already been hit with the EUR200 parking-at-work fee</u>, which is designed to discourage employees from driving to work. (*Green Light for Carbon Tax; Families Will Pay Euro250 Levy, The Mirror, 9.01.2009*) <u>This tax will do little to enhance overall sustainability and risks giving advantage to cheap food imports</u>," he said. …. Farming is a carbon heavy process where there is no alternative to farm machinery and vehicles. By failing to exempt agricultural diesel from this carbon tax the Government are <u>merely taxing farm activity</u>," he said. (*Carbon tax to 'undermine the competitiveness of Irish exporters', Irish Examiner, 12.12.2009*) |
| **Sustainability & Technological Innovation:** | The boldest steps towards this low-carbon future lie in energy efficiency, says the International Energy Agency. …. <u>Consumers too have a key role, but only if they "understand the implications of their consumption and buying choices - they need clear, honest information and the right price signals</u>", says the WEF. (*Big business heading towards a green future, Irish Times, 26.06.2008*) Energy efficiency is a priority for many companies and retrofitting is <u>an investment which yields immediate and substantive savings to the bottom line</u>…. We have found that through staff <u>behavioral changes alone, savings of 20%</u> can be achieved. (*Consultancy firm to create 25 jobs, Irish Examiner, 6.05.2013*) Launched yesterday by Teagasc and the IBEC group Food and Drink Industry Ireland (FDII), the forum has put <u>promoting Ireland's eco-friendly reputation</u> centre stage. The marketing gains could be significant, with Irish agriculture already accounting for 7bn in exports each year. Dr. Rogier Schulte of Teagasc said: "Based on the low carbon footprint of our Irish dairy and meat products, it is possible to turn the threat of reducing greenhouse gas emissions into opportunities for Irish farmers. |

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| | (*The 'green card' could help Irish agricultural sector grow to 30bn, Irish Examiner, 23.06.2010*) <br><br> There is more to it for Ireland than reducing emissions, however important that may be. The country has world class renewable resources in abundance – wind and water being two obvious examples – but has yet to determine how best to develop these assets and potential scale of the investment. <br> (*We have potential to be world leaders in the green economy, Irish Independent, 1.12.201*) |
| **Negative &/or Critical:** | "Energy taxes on industry to meet Irish obligations on the Kyoto Protocol on greenhouse gases would not deliver any significant environmental benefits, a study commissioned by the employer group IBEC has found. <br> Energy tax would be expensive, with big increases in fuel costs, and could adversely affect competitiveness, according to the study by Farrell Grant Sparks Consulting (FGS)." <br> (*Energy tax not environmentally of benefit – IBEC, Irish Times, 8.03.2000*) <br><br> Yesterday's carbon budget was billed as an attempt to save the planet by reducing emissions, which is supposed to make us all feel good. <br><br> In a period where it is increasingly difficult to levy new taxes, carbon is the new gold for the Government. <br> (*Carbon Is Gold For Politicians, The Mirror, 7.12.2007*) <br><br> No matter what the polices, or what Cabinet Ministers say, Ireland cannot achieve its potential growth without emitting more carbon, while a country like Germany can. <br> (*A lot of hot air blowing on the cost/effect of global warming, Irish Independent, 15.02.2007*) <br><br> Friends of the Earth said rules which require a percentage of UK transport fuels to be made up of the "green" fuels could, instead of cutting emissions, have created an extra 1.3 million tones of $CO_2$." <br> (*Biofuels worse than fossil fuels for environment, say activists, Irish Independent, 15.04.2009*) <br><br> For too long debate and target-setting on climate change has been divorced from economic reality. This type of disconnect and wishful thinking has reached a new low with this Bill." <br> (*Milk suppliers criticise Climate Bill as lunacy, Irish Times,12.01.2011*) |
| | Transforming the world's energy economy will require a "fourth technological |

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| **Radical Social Change:** | revolution", changing society as fundamentally as did the harnessing of steam power, the invention of the internal combustion engine and the microprocessor, said Mr. Brown. (*Brown resolves to lead a green revolution, Irish Examiner, 20.11.2007*) <br><br> One Dublin station has taken the initiative to 'rethink' the future of public service premises. Kilbarrack fire station was the first in the world to begin trading carbon with major companies on the stock exchange as part of an effort to reduce emissions. Its sale of carbon savings means that reductions are spread across companies and the profits are reinvested in the service. .. <br> "We should be looked at as leaders of sustainability," explained visionary firefighter and father of two Neil McCabe. … <br> "Basically it started three years ago. The morale wasn't great in another station I worked in because it was so old," said McCabe. "I came up with this idea of the green plan that had everyone becoming involved in the running costs of the station and its carbon footprint." <br> (*'Green' fire station sends carbon footprint up in smoke, Sunday Tribune, 4.07.2010*) |

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[2] The study investigates the twin challenges of low carbon transition and decarbonisation. It understands them as jointly representing the crystallisation or materialisation of climate change action and as core components of the multi-dimensional approaches to carbon emissions reduction. This approach enables assessment of the range of carbon reduction activities (ie social, technical and financial) reported in media. The paper will refer to dual processes of low carbon transition and decarbonisation as 'LCT/DC' or 'transition' throughout.

[3] There are a number of approaches to understanding this concept. According to Anthony Turner (2013) "it is the ability to understand the carbon implications at every scale in the landscape of our lives and lifestyles" thus involving energy consumption; transport; homes and offices. The Carbon Literary Project (2014) defines it as "[a]n awareness of the carbon costs and impacts of everyday activities and the ability and motivation to reduce emissions on an individual, community and organizational basis".

[4] This important concept in the literature on social change examines how ideas are created, used and disseminated and is used here to indicate that scientific facts are interpreted in diverse ways by different actors.

[5] In addition, newspapers remain an important source of information and interpretation on controversial environmental issues (Hansen, 2010).

[6] This list contains the most commonly used words in online discussion about carbon management. See Appendix 2 for full details of all terms.

[7] While mention is made of Low-Carbon & Decarbonisation prior to 2000 and Carbon Tax is often referenced, substantial media discussion commences around 2000. In addition, the range of news print publications on Lexis-Nexis is partial between 1990 – 2000 (predominantly Irish Times). As a result, searches after 2000 produced a more representative corpus.

[8] Both keyword searches produced significant duplication of terms within articles. Reports often referenced both expert and lay terminology within articles (ie, Low Carbon or Decarbonisation and Carbon Tax or Carbon Footprint etc.). In addition, a term (eg Carbon Tax) was often discussed in conjunction with others (eg

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Carbon Markets and/or Carbon Footprint or discussion of Low Carbon Economy). As a result, after careful reading, the dataset reduced considerably. It is also worth noting that, overall, Irish media include more references to Creative Carbon Compounds than expert discussion of LCT/DC and this is reflected in the composition of the final dataset. All relevant articles were included in the final data set, only articles that were either not relevant or duplicates were excluded.

[9] In other words, categories for coding were data-driven based on repeated readings and revisions to coding labels and definitions. This process was facilitated by use of nVivo software which enables easy review and revision of codes in categories. To ensure rigour in the development of the coding schemes, the material was also recoded at regular intervals (after two-weeks) to check for consistency, to identify any problems with definitions as well as the comprehensiveness of the coding schemes ( Boyatzis, 1998; Schreier, 2012).

[10] While not the most widely read paper, it is known as the 'paper of record'. As an elite paper it is influential with policy and decision-makers as well as business and professional communities in Ireland.

[11] Earliest mentions of carbon focussed on discussion of Carbon Tax and this remained the mainstay of media reporting up to 2000.

[12] Figures for 2013 are from January – July only (6 months). Since 2013, increasing community protests over wind farm sites has captured media interest and it is likely that figures for 2014 and 2015 would show further increases in volume of coverage as key social actors begin to raise issues about energy security and low carbon transition in print media.

[13] Noteworthy reports published in 2012: *Our Sustainable Future: National Framework for Sustainable Development in Ireland* (Department of Environment); *Ireland and the Climate Change Challenge* (NESC report); *National Climate Change Adaptation Framework* (Department of Environment).