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Worlds apart, worlds together: converging and diverging frames in climate and energy governance

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ABSTRACT

This paper argues that past research has overlooked how the way problems and solutions are framed contribute to a prevailing gap in the global governance of climate and energy. Empirically, this paper investigates the frames of energy and climate change as expressed in key documents from the International Panel on Climate Change (IPCC) and International Energy Agency (IEA). Partly in contrast to past research, this paper finds (1) that there is a growing similarity in *how* the IPCC and IEA frame climate and energy; (2) that the IEA has gone from ignoring to acknowledging climate change and the transformation to a low-carbon energy system; and (3) that there is a prevailing difference in *emphasis*, whereas the IPCC only marginally discuss energy, while the IEA is still mainly talking about energy needs and fossil fuels even if climate change and renewables have entered their agenda.

Introduction

Climate change is a major danger that is primarily caused by global energy consumption. Thus, energy and climate change are two closely related domains with strong functional linkages. However, despite clear linkages, many have observed that in terms of global policy and governance, energy and climate change are separate fields (e.g. Gunningham, 2012; Heubaum & Biermann, 2015). For example, there is no single explicit mention of energy in the 2015 Paris Agreement on climate change (UNFCCC, 2015). While implications of climate change on energy security has been acknowledged in some policy contexts, it is generally a new and still underestimated observation on political agendas (Bradshaw, 2014, p. 24; Nyman, 2015, 2018).

Connecting climate and energy governance is essential not only for reversing global warming but also to find solutions for energy poverty and energy supply in a carbon-constrained world. Arguably, the complexity of climate change requires the involvement of many sectors. In practice, however, there is still a tendency among scholars and practitioners to think and act as if climate and energy are separate policy silos and thus fail to grasp interconnectivity and its implications for governance (Van de Graaf & Colgan, 2016, p. 9). Why, then, are energy and climate change managed as separate policy silos at the global level despite their obvious interconnections?

Past research has observed diverging interests and institutional logic in the governance structures of energy and climate change (Amen, Bosman, & Gills, 2008, p. 52). Evidently, energy supply is

intimately connected to issues of sovereignty and national security (Nyman, 2015, 2018). Consequently, '[…] main participants [in energy politics] have largely been focusing on energy supply and demand dynamics rather than the environmental implications of fossil fuel combustion' (Heubaum & Biermann, 2015, p. 230).

In addition, the climate change regime, which was reinforced by the 2015 Paris Agreement, 'is a very explicit regime with an elaborate and increasingly complex normative and institutional framework, [while] the energy domain is more of a "non-regime", lacking both global norms and strong global legitimate actors' (Karlsson-Vinkhuyzen & Kok, 2011, p. 295).

Thus, according to previous research, the policy split between the two areas exists because of state interests and institutions that are not designed to accommodate linkages. Diverging interests and institutional designs do not tell the whole story, however. It remains to be explained why interests and institutions do not change despite the scientific consensus on the use of fossil fuels as the main cause of climate change.

This article highlights a crucial yet overlooked explanation to the divide between energy and climate governance, namely, how issues are *framed*, i.e. how problems are defined, how causes are diagnosed, what moral judgements are made, and what – if any – remedies are promoted. Notably, framing alone can neither explain nor resolve governance gaps, but it is certainly a necessary element (cf. Schön & Rein, 1994), in addition to changing interests and institutional mandates. Diverging 'master frames' help explain policy inertias, path dependencies, and – in this case – the prevailing governance gap between energy and climate change. Focusing on framing is also highly policy relevant because it is much easier for policy actors to change the way that they define problems than it is to change interests and institutions (cf. Bang, 2010; Eising, Rasch, & Rozbicka, 2015; Mörth, 2000; Schön & Rein, 1994).

Framing has indeed been studied in past research on energy policy as well as in studies of climate change (Gifford & Comeau, 2011; Hoffman, 2011; Lakoff, 2010; Morton, Rabinovich, Marshall, & Bretschneider, 2011; Nisbet, 2009; Scrase & Ockwell, 2010; Spence & Pidgeon, 2010; Valenzuela & Qi, 2012). These are crucial contributions, to which we will soon return. Nevertheless, although several studies highlight connections between energy and climate change (Bang, 2010; Birdsall & Subramanian, 2009; Lovell, Bulkeley, & Owens, 2009; Slocum, 2004), not much research has been performed on how diverging frames keep energy and climate *governance* apart. Our call for framing analysis is similar to how David Victor, one of few social scientists within the IPCC, has argued that climate scientists and policy-makers 'should talk more about how disputes are rooted in different values and assumptions' (Victor, 2015).

The remainder of this article is structured as follows. First, past theory and research on framing is reviewed, with a focus on the framing of energy and climate change. Subsequently, our application of framing theory is explained in detail. The empirical analysis deals with master frames of energy and climate change as expressed in key analytic documents from the International Panel on Climate Change (IPCC) and International Energy Agency (IEA), respectively, and focuses on patterns of change and continuity. Then a comparative qualitative and quantitative analysis of framing is performed. Finally, concluding remarks are made regarding the framing of the climate-energy nexus as a precondition for governance.

Framing climate change and energy: past theory and research

The way in which people interpret an issue and how they present it to others matter regarding whether and how the issue becomes a focus of policy agendas and how blame and responsibility are allocated. These fundamental social science insights are captured by *framing theory*. Framing

involves interpreting and selectively highlighting parts of reality while neglecting others. In a much-cited review of framing theory, Robert Entman states that

> to frame is to select some aspects of a perceived reality and make them more salient in a communicating text, in such a way as to promote a particular problem definition, causal interpretation, moral evaluation, and/or treatment recommendation for the item described. (1993, p. 52)

More simply, framing refers to 'the process by which people develop a particular conceptualization of an issue or reorient their thinking about an issue' (Chong & Druckman, 2007, p. 104).

The master frame of 'climate change' and the consequential global dangers have been tremendously powerful for mobilizing political and public support for a variety of policy measures, in particular, the reduction of GHG emissions, to reverse global warming (Hoffman, 2011; Lakoff, 2010; Nisbet, 2009; Scrase & Ockwell, 2010; Spence & Pidgeon, 2010; Van de Velde, Verbeke, Popp, & Van Huylenbroeck, 2010). Likewise, framing climate change as a 'hoax' has become a powerful tool for the climate denial movement, which has legitimated positions defending carbon-heavy emissions (Jacquez & Connoly Knox, 2016).

Moreover, past research has shown that in the energy policy domain, there is tremendous resistance to addressing environmental concerns, in general, and climate change, in particular (Bang, 2010; Hoffman, 2011). Hence, frames do not merely identify problems but also allocate blame and responsibility and often legitimate certain courses of action. Framing activities are 'symbolic contests over the social meaning of an issue domain, where meaning implies not only what is at issue, but what is to be done' (Schön & Rein, 1994, p. 29; cf. Entman, 1993; Lakoff, 2010).

Frames can help to 'resolve intractable policy controversies' (Schön & Rein, 1994) and help mobilize support for social movements and political agendas (Lakoff, 2010; Snow & Benford, 1992), as well as legitimize an existing order and prevent structural change (Lantis, 2016, p. 35). When interests clash and institutions defend their policy monopolies, a re-framing of the issue may help to move it out of a deadlock (Eriksson, Karlsson, & Reuter, 2010; Mörth, 2000).

There is some noteworthy past research on the framing of climate change as well as on the framing of energy. We find, for example, James Painter's comparative empirical study of how climate change has been framed in the news media in the English-speaking world. Painter shows that negative framing dominates, as seen from the increasingly dominant language of risk and associated terms, such as disaster, and even in doomsday framing about the end of life on planet Earth (Painter, 2013). Notably, this type of negative framing spans the ideological and intellectual divide, as there are denialists as well as advocates that cultivate the doomsday vision (Angus, 2013; Bellamy Foster, 1998; McKibben, 2005).

Similarly, studies of how climate change is framed in public opinion show that disaster frames dominate there as well, but also that 'motivational frames', i.e. more optimistic frames, suggesting that a positive change is possible (Gifford & Comeau, 2011). When climate mitigation is framed positively – including measures such as moving from low to high energy efficiency – such measures tend to gain more support than if they are framed in negative terms (Nisbet, 2009). By contrast, frames highlighting costs and losses tend to decrease intentions to behave in an environmentally friendly fashion (Morton et al., 2011). Frames that suggest that change is possible tend to be received much more easily than alarmism (Spence & Pidgeon, 2010; Van de Velde et al., 2010, p. 5547).

Surveys of public opinion in Western states indicate that energy security is often prioritized higher than climate change (Nisbet, 2009). This is in accordance with the established view that energy is of central importance for national security, whereas climate change is framed as more of a global environmental challenge (Bang, 2010; Nyman, 2015, 2018). Thus, the policy gap between energy

and climate change is reinforced by an attitudinal gap among the public. As long as energy and climate change are not only governed but also framed as separate domains, the policy gap will likely remain.

Applying framing theory: core elements

Before moving to our empirical analysis, application of framing theory must be clarified. First, our goal is to investigate all of the four core functions of frames, as elaborated by Robert Entman and others: *problem definition* (including whether an issue is seen as a problem to begin with); *diagnosis of causes* (identifying the forces creating the problem); *moral judgements* (blame games); and suggestions of *remedies* (offering and justifying treatments for the problems and predicting their effects) (1993, p. 52). The last point, on remedies, also involves how policy responsibility can become vastly different depending on how an issue is framed. For example, if climate change is framed in terms of 'energy-efficient light bulbs', it becomes a responsibility for every citizen, but if it is framed in abstract terms as a global disaster, it is easier to allocate responsibility mainly to global forums over which individuals have no influence (cf. Slocum, 2004).

Second, a useful analytical distinction can be made between *elaborated* and *restricted* frames. The former type is inclusive and allows for extension and amplification, whereas the latter category provides a constricted range of connotations and articulations (Snow & Benford, 1992, pp. 139–140). The politics of restricted frames is mostly about what issues should be framed and much less about the meaning of the frame itself. Elaborated frames, by contrast, permit not only political struggles about the application but also about the very meaning and connotations of the frame.

Third, empirical analysis should identify whether framing has a *positive* or *negative* nature, for example, in terms of gains or losses, opportunities or threats. As noted, the difference between positive and negative framing of climate mitigation matters for the propensity to accept and support climate mitigation (Birdsall & Subramanian, 2009; Gifford & Comeau, 2011; Hoffman, 2011). More generally, positive framing may be more effective for closing policy gaps than negative or fear-based framing, which, in contrast, entrench policy gaps. The impact of positive and negative framing needs to be further studied, however, and will therefore be addressed in the ensuing analysis.

Fourth, frame analysis pays attention to *frame continuity and change*. It is possible to analyse frames at particular points in time, but it is the analysis of continuity and change that truly make a contribution by showing how some frames have tremendous staying power, whereas at other times, reframing can help resolve controversies. This concept corresponds to Kuhn's notions of paradigm and paradigm shifts in scientific thinking (Kuhn, 1962/2012)—that is, the powerful intellectual hegemony and rigidity of established master frames. Thus, the framing process is affected by the degree of consensus or conflict.

The IPCC and IEA as framing organizations

Where are the master frames of climate and energy to be found in the global governance of these issues? An important first observation is that global governance of climate change is more coordinated and integrated than that of global governance of energy. Nevertheless, it is possible to make a systematic comparison between the framing of issues in the two domains, particularly when looking at key assessments provided by dominant expert organizations.

In the climate domain, the IPCC – established in 1988 – is the expert authority that provides the knowledge basis of the global climate convention. As Hulme and Mahony note 'one thing that nearly

all commentators and critics agree on about the IPCC is that it has had significant influence on climate change knowledge, on public discourse about climate change and on climate policy development' (2010, p. 712).

Within global energy governance, there is no similarly undisputed expert authority, yet we suggest that it is relevant to analyse the annual expert analyses provided by the IEA, established in 1974. Both the IPCC and IEA produce regular expert reports, and comparing these reports may reveal interesting differences and similarities between the two domains as well as patterns of continuity and change. It should also be noted that because both organizations act as linking-pins between science and policy, their reports are not immune to political and diplomatic discourse. The IPCC, for example, has been criticized for not being strong enough at advocating precautionary climate mitigation, particularly in its earlier reports (Oosthoek, 2008, p. 64). Others have noted that governments keep control over the IPCC's research agenda and approve reports (Lidskog & Sundqvist, 2015, p. 11).

Importantly, while the IPCC and IEA can be described as 'technocratic', this does not make their framing activities less important than those of more activist and explicitly politicized organizations, such as environmental movements and the fossil fuels lobby. 'Technocratic' organizations generally do not mobilize support or gain influence by framing claims in emotional and explicitly ideological terms. By contrast, technocratic organizations exert 'epistemic power', which is seldom framed in 'activist' language, but gains authority and legitimacy from its dry, scientific prose. While Lakoff and others have claimed that technocratic framing has weakened the impact of environmental movements on public opinion (Lakoff, 2010; see also Brulle & Craig Jenkins, 2006; Shellenberger & Nordhaus, 2005), the IPCC and IEA are not focused on public opinion but rather operate within high-level policy circles, where a technocratic or epistemic logic seems to be more appropriate and effective. More generally, wide bodies of research on both international organizations and the politics of expertise show how technocratic and scientific framing can influence policy agendas (Beck et al., 2014; Eriksson et al., 2010; Littoz-Monnet, 2017; Zald, 1996). This view draws on social constructivism and the inclusion of ideational factors, such as ideas and knowledge. It enables a conceptualizing of international organizations as partly autonomous actors, which goes beyond institutional mandates. International organizations influence outcomes and alter perceptions by transforming information into knowledge. They often decide what kind of data is collected and how it is categorized, often through framing (Barnett & Finnemore, 2004, pp. 30–33).

Furthermore, a caveat is that whereas the IPCC has a stronger global representation, the IEA – emanating from the OECD community – mainly represents liberal democracies, most of which are from the Western world. However, of all of the international energy organizations, the IEA has the most comprehensive scope, covering all types of energy sources and technologies. Moreover, the IPCC and IEA are comparable in that both have authoritative groups of scientific and technological expertise that compile expert assessments.

The ensuing analysis proceeds by analysing and comparing key analytic documents from the IPCC and IEA at two different points in time – before the Copenhagen climate summit in 2009 and the Paris climate summit in 2015, respectively. Specifically, we investigate the IPCC Synthesis Reports of the Assessment Reports (SYR)[1] and IEA World Outlook reports[2] preceding the 2009 and 2015 climate summits. Whereas the IEA produces annual reports, the IPCC publishes its assessments more irregularly. For this reason, we have chosen to compare reports from years when both organizations published assessment reports to enable a comparison in and over time.

The reports from the IPCC and IEA are comparable in that they provide expert analysis of key statistics, scenarios of future developments, causes, effects, and recommended remedies. The analysis

below is organized according to framing theory, with emphases on problem definition, diagnosis of causes, moral judgements, and suggested remedies. The focal point of the analysis is how and to what extent the IPCC takes into account energy-related issues and how the IEA takes into account climate-related issues. Given the amount of text to be scrutinized, the analysis employs both a simple frequency analysis of the entire texts and qualitative analysis of key passages, some of which will be quoted to exemplify framing. The analysis also considers whether frames are elaborated or restricted and are positive or negative as well as what patterns of change and continuity are discerned.

The IPCC framing of climate and energy

Pre-Copenhagen framing

The IPCC Fourth Assessment Synthesis Report (SYR) was published in 2007, two years before the Copenhagen climate summit. In the 2007 report, the main issue was, not surprisingly, climate change and its effects on ecosystems and human society. Thus, the climate change problem is that of the master frame, highlighting the global nature of the problem. In terms of diagnosis, the report centres on the natural and anthropogenic drivers of climate change (IPCC, 2007, pp. 36–41). SYR notes that 'global GHG emissions due to human activities have grown since pre-industrial times, with an increase of 70% between 1970 and 2004' (IPCC, 2007, p. 36). The link to energy is stressed in the report, noting that the largest growth in GHG emissions come from energy supply, transport, and industry. It also states that 'global increases in CO_2 concentrations are due primarily to fossil fuel use, with land-use change providing another significant but smaller contribution' (IPCC, 2007, pp. 36–37; cf. Oosthoek, 2008, p. 63). The report projects that fossil fuels will maintain their dominant position in the global energy mix until 2030 and beyond (IPCC, 2007, p. 44).

The overarching responses to climate change encompass two broad categories: mitigation and adaptation, with international cooperation as an important tool to achieve an adequate response. The report describes the response in the following way: 'societies can respond to climate change by adapting to its impacts and by reducing GHG emissions (mitigation), thereby reducing the rate and magnitude of change' (IPCC, 2007, p. 56). Thus, in a broad sense, mitigation and adaptation are the remedies stressed by the report. The emphasis is clearly strongest on mitigation, which deals with the causes rather than simply learning to live with the consequences of climate change.

Moreover, the report stresses the long-term impact on GHG emissions of decisions on future energy infrastructures investment (IPCC, 2007, p. 58). It notes that 'the widespread diffusion of low-carbon technologies may take many decades, even if early investments in these technologies are made attractive' (IPCC, 2007, p. 58). Overall, energy efficiency, utilization of renewable energy, and changes in lifestyle and behaviour patterns can contribute to climate change mitigation (IPCC, 2007, p. 59). For example, 'climate change policies related to energy efficiency and renewable energy are often economically beneficial, improve energy security, and reduce local pollutant emissions' (IPCC, 2007, p. 61).

To achieve reductions of global GHG emissions and reduce the cost of mitigation, international cooperation is important, but the IPCC is sceptical of relying only on voluntary agreements (IPCC, 2007, p. 62; see also Miller, 2008, p. 54). Instead, concerted governmental action, including taxes and charges on GHG emissions, are considered vital. It is quite clear that the IPCC considers a global response to climate change as crucial. In general, the global aspect is present in the report.

There are few straightforward moral judgements in the technocratic language used in the report. However, the global framing of climate change, emphasis on international – not voluntary –

cooperation, and suggested lifestyle and behavioural changes, together with the warning that climate change could lead to irreversible impacts (IPCC, 2007, pp. 53–54), appear to be prescribing certain courses of action.

The 2007 report clearly connects energy issues to climate change: energy as the main cause as well as the main solution to climate change – with the burning of fossil fuels being the cause and the transformation to low-carbon energy and energy efficiency viewed as the main remedy. The report also states that this much-needed transformation will not be easy because fossil fuels are predicted to dominate the global energy mix beyond 2030.

Pre-Paris framing

The IPCC Synthesis Report from 2014 was published one year before the Paris climate summit. Not surprisingly, the pre-Paris report reiterates the IPCC's concern with climate change as an existential problem of the highest magnitude for planet Earth. The 2014 report differs from the 2007 report in one important respect, however: it is based on a considerably stronger conviction that global warming is mainly caused by human activity, particularly the use of fossil fuels. Whereas the concept that global warming is mainly caused by human activity was framed as highly likely in 2007, the 2014 report frames this as an undisputable fact (IPCC, 2014, p. 47).

Clearly, the 2014 report includes stronger evidence of the many ways that the planet is already experiencing the effects of human-caused climate change – sea level rise, shrinking glaciers, decreasing snow and ice cover, warmer oceans, and more frequent and intense extreme weather events. 'Human influence on the climate system is clear, and recent anthropogenic emissions of greenhouse gases are the highest in history. Recent climate changes have had widespread impacts on human and natural systems' (IPCC, 2014, p. 40).

The diagnosis is once again focused on the drivers of climate change, and manmade emissions are central: 'Anthropogenic greenhouse gas emissions have increased since the pre-industrial era driven largely by economic and population growth' (IPCC, 2014, p. 44). The centrality of fossil fuel in contributing to climate change continues to be emphasized. The complementary response strategies, adaptation and mitigation, are identified as the overarching categories of remedies. In the context of mitigation, there is an extensive discussion on 'sectoral mitigation options' that can reduce GHG emission intensity and improve energy intensity (IPCC, 2014, pp. 98–103). Energy efficiency and decarbonization of the energy supply sector are some of the central measures discussed. The report does not, however, discuss energy policy in any detail but instead keeps the discussion at a general level, focusing on the wider frame of transformation to a low-carbon energy system. The report discusses the impact of behaviour and lifestyle: 'shifts toward more energy-intensive lifestyles can contribute to higher energy […] driving greater energy production and GHG emissions and increasing mitigation costs. In contrast, emissions can be substantially lowered through changes in consumption patterns' (IPCC, 2014, p. 94).

The 2014 report places an even greater emphasis on international cooperation than the previous report. International cooperation stands out as the major remedy to a collective action problem. The 2014 report clearly defines climate change as a global problem: 'climate change has the characteristics of a collective action problem at the global scale, because most GHGs accumulate over time and mix globally, and emissions by any agent […] affect other agents' (IPCC, 2014, p. 76).

The report suggests that improved institutions and enhanced coordination and cooperation in governance can help (IPCC, 2014, p. 94). It is interesting to note that the report places an emphasis on actors at the sub-national level, including an observation that there is an increase in transnational

cooperation among sub-national actors (IPCC, 2014, p. 109). This reflects an on-going change of global climate governance towards a more decentralized nature, with a recognition that local actors and the private sector are vital.

In addition, in the 2014 report, straightforward moral judgements are difficult to identify. By pointing out the improved knowledge of the causes, consequences, and severity of climate risks, in particular, for the least developed countries and vulnerable communities, the report gives a sense of urgency to act. Action is needed now to avoid irreversible damage.

As mentioned above, the 2007 report clearly connects energy and climate change. This is also the case with the 2014 report: energy as the main cause as well as the main solution to climate change.

The IEA framing of energy and climate

Pre-Copenhagen framing

In the 2007 IEA report, the issue framed as the main problem is the rapidly increasing global demand for energy. The diagnosis offered is that the increasing global demand for energy is mainly caused by the economic growth in China and India, which are considered to be two new 'giants' in the global economy. Notably, the report is largely dedicated to internal economic and energy-related developments in these two countries. In 2007, a year before the global financial crisis, the prognosis of future trends was that the global economy would continue to grow, particularly in the Global South and East, implying a rapidly growing demand for energy. A specific section was dedicated to high growth scenario projections.

The 2007 report is written in an analytic-scientific style, with few or no moral judgements. It contains numerous normative statements, however, but more in terms of the need for greater awareness of the increasing gap between the demand and supply of energy. In terms of remedies, the report strongly emphasizes 'energy efficiency', particularly concerning new technology for producing and using fossil fuels (IEA, 2007, pp. 41–42). The report notes that many of the measures needed to boost energy supply might also help mitigate pollution and climate change (IEA, 2007, p. 51), which would be additional benefits but not the main goals of boosting energy supply.

Climate change is not discussed as a main concern in the 2007 report and does not appear to be a core issue for the IEA. Climate change is occasionally mentioned as one of many issues and primarily appears in a separate chapter on 'environmental repercussions' (IEA, 2007, Ch. 5). Although the IEA acknowledges the challenge to 'put in motion a transition to a more secure, lower-carbon energy system', it is emphasized that this transition must not undermine 'economic and social development' (IEA, 2007, p. 41). Fossil fuels are projected to dominate the global energy mix for the next 20–30 years, with a resurgence especially for coal, although an increase in 'low-carbon energy' is also mentioned. The report talks about 'sustainable energy', but it is clear that this primarily means a sustainable energy supply, not sustainable management of the environment. Renewable energy is mentioned to a considerably lesser extent than fossil fuels. It is noted that both China and India are aware of the effects of climate change and pollution, specifically the effects of greenhouse gas emissions, although it is recognized that these countries – like many others – worry that 'environmental measures might constrain their economic development' (IEA, 2007, p. 55).

Whereas the IPCC only publishes pre-summit reports (e.g. 2007 and 2014), the IEA publishes annual reports. Therefore, it is relevant to take a brief look at what the IEA has written in between the climate summits as well as after them. The 2008 report explicitly addresses the then-upcoming 2009 climate summit in Copenhagen, specifically regarding the possible impact on energy markets

from an international agreement on new limits of greenhouse gas emissions. One-third of the report is devoted to 'the role of energy in climate change'. It is noted that 'energy is a big part of the total climate change – over 60% of greenhouse-gas emissions come from energy production and use – but still only a part' (IEA, 2008, p. 3). A notable difference from the 2007 report can be identified in the overarching problem framing: Whereas the former report was mainly concerned with how to meet increasing energy demands, the 2008 report clearly upgrades the problem of climate change:

It is not an exaggeration to claim that the future of human prosperity depends on how successfully we tackle the two central energy challenges facing us today: securing the supply of reliable and affordable energy; and effecting a rapid transformation of low-carbon, efficient and environmentally benign system of energy supply. (IEA, 2008, p. 37)

The report further notes that 'preventing catastrophic and irreversible damage to the global climate ultimately requires a major decarbonization of the world energy sources' (IEA, 2008, p. 37). The major remedy suggested to meet both energy demand and climate change is massive investments in energy infrastructure. The main responsibility is assigned to the largest energy markets and CO2 emitters – the US, China, the European Union, India, and Russia. The 2008 report also stresses the importance of reaching a global agreement in Copenhagen 'to steer the world towards a cleaner, cleverer and more competitive energy system. Time is running out, and the time to act is now' (IEA, 2008, p. 49). The 2008 report also analyses, in depth, how renewable energy sources will increase dramatically and slowly phase out fossil fuels.

Pre-Paris framing

In the 2014 World Outlook Report, published one year before the Paris climate summit, the attention to climate issues did not increase compared to previous reports, with 'climate' mentioned 0.19 times per page (see Table 2). Global warming is indeed mentioned as a key problem in 2014, and the IEA confirms its earlier commitment to the goal of preventing climate change. However, climate is listed as only one of at least five other issues framed as major problems. Overall, most of the problems discussed can be summed up as the growing mismatch between supply and demand of energy. The focus is on the rapidly increasing energy demand, particularly in China, but also in India, other parts of Southeast Asia, the Middle East, Sub-Saharan Africa, and Latin America, while demand in the West is considered to be stable over time (IEA, 2014).

In terms of remedies, the 2014 report reiterates the IEA's earlier focus on energy efficiency, although this time, specifically mentioning the transport sector as particularly suited for targeted efficiency reforms. Advancement in technology is also addressed, emphasizing both the development of natural gas technology and renewable energy technology. It is also argued more generally that 'prices and policies must be right' to manage the gap between supply and demand of energy, as well as to mitigate climate change (IEA, 2014).

Despite the relatively limited presence of climate change in the regular 2014 report, the IEA paid particular attention to climate change in the pre-Paris context. They did so by putting together a separate report on climate change and energy, specifically addressing issues and recommendations for the Paris negotiations. Therefore, it is relevant to take a closer look at climate change in the pre-Paris context to obtain a richer understanding of the IEA's understanding of climate change. Nevertheless, the fact that the regular report pays relatively little attention to climate change can be seen as a corroboration of the IEA's view of energy as an issue that certainly has connections to climate change but concerns much more than only that; in particular, energy is linked to the traditional IEA concerns of energy markets and energy supply.

The special 2015 report on energy and climate change was an effort on the part of the IEA to mobilize, as well as to show commitment and the fact that they had important input for the COP21 climate negotiations in Paris. However, the fact that they wrote a separate report may also indicate awareness that their usual annual reports do not focus on climate change but rather treat climate change as one among many other energy-related problems.

The special 2015 report reinforces the IEA commitment to mitigate climate change, explicitly supporting 'the world's agreed climate goal' of limiting the rise in average global temperature to no more than two degrees Celsius (IEA, 2015, p. 1). In contrast with the IEA's annual World Outlook Reports, the special climate report does not frame the need to satisfy increasing energy demands as the main problem or even as a problem on par with climate change. However, although this report is about climate change, it is noteworthy that the report indirectly hints at other problems by noting that making the global energy system consistent with climate goals 'is *one* of the biggest challenges facing the energy sector today' (IEA, 2015, p. 6, italics added).

In terms of diagnosis, the 2015 climate report acknowledges that the energy sector accounts for two-thirds of greenhouse-gas emissions and that the rapidly increasing energy demands in the Global South are a major challenge for the climate goals. In terms of a remedy, the IEA clearly frames itself as part of the solution by acting as 'a centre of global expertise on the impact of the energy sector on the environment, and the technologies and policies available to mitigate them' (IEA, 2015, p. 6). Moreover, the special report reiterates and expands on the IEA's earlier emphasis on a transition to low-carbon energy. According to the report, there is a need for investing more than 13 trillion USD in low-carbon technology to meet the climate goals. In addition, the report stresses the need for 'clarity of vision and certainty of action', including measurable targets, (some of which are suggested in the report) and specification of national climate pledges.

IPCC and IEA framing compared: converging or diverging?

The frame analysis above resulted in some noteworthy observations, particularly when comparing the IPCC and IEA reports in and over time (see Table 1). First, whereas the IPCC has been remarkably consistent over time (except for the upgraded certainty regarding manmade GHS emissions), the IEA has reframed its problem definition. From originally largely ignoring climate change, the IEA has explicitly acknowledged global warming as a major problem, alongside the IEA's traditional concerns for energy supply.

Why, then, did IEA adopt the climate change master frame? We suggest that this cannot simply be explained by institutional mandate – that member states were signing the Paris Accord and therefore forced the IEA to include climate change. While the influence of member states cannot be denied, theories on international organizations suggest that even intergovernmental organizations seek to form their own identity and actorness in international negotiations (Barnett & Coleman, 2005; Barnett & Finnemore, 2004). By acknowledging climate change, which IEA did in a special report *before* the Paris Accord, the organization sought to make the climate negotiators become more accommodative towards the IEA and pay attention to their views on energy supply.

Second, with the noteworthy exception of problem definitions, both the IPCC and IEA remain remarkably stable over time in how they frame energy and climate change. There are also considerable similarities in how both organizations frame diagnoses and remedies because both organizations emphasize fossil fuels as the main cause of global warming and both organizations note that energy efficiency and transformation to a low-carbon system are essential. This similarity in framing may

Table 1. Comparing the IPCC and IEA framing of climate and energy.

Frames		Pre-Copenhagen	Pre-Paris
Problem definition	IPCC	Climate change and its effects on ecosystems and society: e.g. sea level rise	Climate change and its effects on ecosystems and society: e.g. sea level rise
	IEA	Energy needs; growing gap between the demand and supply of energy in the Global South	Energy needs; growing gap between the demand and supply of energy in the Global South; *climate change*
Diagnosis	IPCC	Global warming and its 'drivers', which are *probably* caused mainly human activities, especially the use of fossil fuels	Global warming and its 'drivers', which are *certainly* caused mainly human activities, especially the use of fossil fuels
	IEA	Growing economies and energy demand in the Global South	Growing economies and energy demand in the Global South; *global warming*
Moral judgements	IPCC	International cooperation among states is needed to respond to climate change	Urgent action is needed
	IEA	Lack of awareness of the mismatch between energy demand and supply; insufficient national political will	Insufficient national investments in energy infrastructure; insufficient national political will
Remedies	IPCC	Adaptation and mitigation: reduce GHG emissions; energy efficiency; renewable energy; lifestyle changes; international cooperation	Adaptation and mitigation: reduce GHG emissions; energy efficiency; renewable energy; lifestyle changes; international cooperation
	IEA	Energy efficiency; decarbonization; massive investments in energy infrastructure	Energy efficiency; transformation to a low-carbon energy system; natural gas; investments in energy infrastructure

indicate an opportunity for stronger collaboration between climate and energy expertise and, ultimately, coordinated governance of the climate-energy nexus.

Third, in terms of moral judgements, the IPCC and IEA reports are very cautious. The few remarks that can be considered to be moral judgement framing emphasize the insufficient political will at the national level, insufficient cooperation at the international level, and lack of understanding of the enormity of climate change (IPCC) as well as of the mismatch between supply and demand of energy (IEA).

In addition to the qualitative frame analysis, it is of interest how often key terms and phrases are used because this indicates the saliency of various themes. Hence, we conducted a word frequency analysis, the results of which are shown in Table 2.

Table 2. Word frequency analysis of the IPCC and IEA reports.

Word	IPCC reports		IEA reports	
	2007	2014	2007	2014
Climate	5.7 (645)	6.5 (1093)	0.2 (141)	0.19 (148)
Energy	1.51 (170)	2.11 (357)	4.97 (3351)	5.01 (3813)
Fossil fuel	0.25 (28)	0.26 (44)	0.13 (91)	0.41 (309)
Renewable	0.196 (22)	0.17 (29)	0.52 (348)	1.19 (890)
Energy efficiency	0.116 (13)	0.12 (20)	0.18 (120)	0.38 (284)
Energy security	0.026 (3)	0.11 (19)	0.20 (133)	0.07 (51)
Low-carbon	0.063 (7)	0.24 (41)	0.04 (3)	0.09 (66)
Clean energy	0	0	0.04 (3)	0.15 (11)
Energy technology/ies	0.026 (3)	0.018 (3)	0.036 (24)	0.05 (40)
Wind	0.24 (27)	0.107 (18)	0.19 (130)	0.43 (325)
Solar	0.348 (39)	0.22 (37)	0.16 (109)	0.53 (400)
Nuclear	0.053 (6)	0.13 (22)	0.45 (303)	1.91 (1434)
Coal	0.12 (13)	0.10 (17)	2.45 (1654)	2.15 (1607)
Oil	0.08 (9)	0.076 (13)	2.17 (1463)	2.50 (1872)
Gas (excl. greenhouse gases)	0.15 (17)	0.053 (9)	1.87 (1260)	3 (2245)
Number of pages in the report	112	169	674	748

Notes: These numbers are the results of electronic searches of the IPCC and IEA reports from 2007 and 2014, respectively. The first number shows the word frequency per page, and the number in parentheses shows the total word frequency in the entire report.

The word frequency analysis confirms some of the general findings of the qualitative analysis, for example, that both the IPCC and IEA are concerned with a comprehensive understanding of energy sources. However, the word frequency also shows something that the qualitative analysis did not show, namely, that although the IEA has addressed climate change in much stronger terms over time, there is still a very clear difference in emphasis. For the IPCC, the master frame of climate change is still very dominant, whereas the master frame of energy needs is still dominant for the IEA.

Moreover, fossil fuels still take up much more space in the IEA reports, even if the need for a transformation to renewable energy is stressed. Hence, how issues are framed does not tell the whole story – it also matters how much attention is given to each issue.

Specifically, the word frequency analysis also indicates the growing saliency of gas in the IEA reports – most likely following the shale gas revolution. Nuclear power also receives more attention in the 2014 reports, mainly because of the 2011 Fukushima disaster and the ensuing German decision to shut down nuclear power completely. In the IPCC reports, it is noteworthy that energy sources (e.g. wind, solar, etc.) do not receive much attention, which may indicate that the IPCC does not go into the details of energy issues.

Conclusion

The main findings of this paper are as follows, some of which contradict past research. First, the IPCC and IEA have become surprisingly similar in how they diagnose problems, assign blame, and suggest remedies, emphasizing growing energy demands, policy uncertainty, and insufficient investments on energy efficiency and low-carbon technology. This growing framing similarity contradicts how many observers generally perceive the gap between the wider climate and energy communities (Bradshaw, 2014; Gunningham, 2012; Heubaum & Biermann, 2015; Nyman, 2015, 2018). While the global climate and energy communities may not have forged any closer ties in terms of governance, they are expressing their concerns and suggesting solutions in increasingly similar terms. That is an insufficient but certainly necessary step toward more effective management of the climate-energy nexus.

Second, IEA has gone from largely ignoring to acknowledging climate change. Moreover, the IEA's reframing of climate change as a major problem has gained salience over time. The IEA is now explicitly committed to the goals of the Paris summit, specifically the need to limit global warming to 2 degrees C or less. This finding stands in stark contrast to observations from past research (Bang, 2010; Hoffman, 2011), which showed tremendously strong resistance in the energy community to addressing environmental concerns, in general, and climate change, in particular. Indeed, given that the IEA has been a stout defender of energy security and quite distanced from renewable energy organizations, such as IRENA (Darby, 2017), the IEA reframing of climate may be a sign of a more fundamental change in the global energy community. Whether this change implies fundamental embracement of environmental concerns or merely a strategic move to make the climate community more receptive towards energy needs can be discussed, but it certainly suggests an opportunity for bridging the gap between global climate and energy governance.

However, the rapprochement of the IEA to the world's climate goals is not met with an equal rapprochement of the IPCC with regard to energy needs. Whereas the IEA has expanded its agenda to include climate change, the IPCC has reinforced its concern for climate change as the main problem for the survival of the planet Earth. For the IPCC, the economic growth and increasing energy demands in the Global South are (only) contributing causes of global warming and not as concerns in their own right.

Third, our word frequency analysis showed that even though the IPCC and IEA frame problems and solutions in increasingly similar ways, there is a prevailing difference in how much ink they spend on each different issue. The IPCC is, as expected, heavily focused on climate change and, which is perhaps less expected, pay only limited attention to energy issues. Likewise, while IEA has explicitly acknowledged climate change and now frame it as major global challenge, they still pay a lot more attention to energy needs than to climate change. Moreover, while IEA certainly has a comprehensive approach to energy sources and emphasizes transition to a low-carbon economy, they pay more attention to fossil fuels than renewables.

Based on the above findings, we are prepared to make some suggestions on how framing can be developed to help coordination of global climate and energy governance. To start with, bridging the governance gap would be helped if both the climate and energy communities appreciate the similarity in how key organizations and experts frame problems and solutions. As negotiation theory tells us, shared understanding is essential for moving up the ladder of cooperation and, possibly, integration. Moreover, if the IPCC and the wider climate community would more explicitly acknowledge global energy needs as well as the short and long-term social and economic implications of transformation to a low-carbon system – just as how IEA has acknowledged climate change – rapprochement and joint solutions would be facilitated.

Finally, technocratic expert organizations as the IPCC and IEA do best by sticking to their dry, scientific prose, i.e. an 'epistemic power' which in a global high-level policy context seems to be more effective than activist and ideological framing. Likewise, our observations corroborate past findings that positive gain frames which take energy needs seriously and emphasize remedies rather than threats have greater potential for converging climate and energy governance (cf. Koteyko, Thelwall, & Nerlich, 2010; Morton et al., 2011; Nisbet 2009; Nyman, 2015, 2018; Spence & Pidgeon, 2010; Van de Velde et al., 2010). The framing moves suggested here may not be sufficient for managing the climate-energy nexus, but they are arguably both necessary and easier to achieve than redesigning institutions and changing national interests.

Notes

1. For the study of IPCC, we selected the IPCC Synthesis Reports (SYR) from 2007 and 2014. The SYRs are condensed versions of the assessments by the IPCC Working Groups. The SYRs synthesize and integrate material contained within IPCC Assessment Reports and Special Reports.
2. The annual IEA World Outlook reports are the main analytic documents produced by the IEA. In addition to this main series of reports, the IEA occasionally publishes reports on special issues. One such special report was published in 2016, on climate and energy, which we included in our analysis in addition to the World Outlook reports.

Disclosure statement

No potential conflict of interest was reported by the authors.

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