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Abstract

The German energy transition – the "Energiewende" – sparks considerable interest around the globe, triggering reactions from admiration and inspiration to skepticism and bewilderment. Gaining followers on the way to a more sustainable energy system has been a main rationale for the country's energy transition and German decision-makers frequently claim leadership in this field. But what does it mean to be an "Energiewende leader" and how can ambitions for Energiewende leadership be put into practice? Since answers to this question remain scattered and vague, our aim in this paper is to conceptualize leadership for the Energiewende case, explore its drivers and instruments empirically, and discuss policy implications. We concentrate on "leadership by diffusion" as an under-researched form of external governance, using a simple analytical framework derived from the literature on leadership and policy diffusion. In a first step, we analyze German parliamentary debates to explore the motivations for international Energiewende leadership and then review measures taken to translate this aim into action. We subsequently discuss Germany's approach to Energiewende leadership against the background of an evolution of the Energiewende itself. From this analysis, we find that while Germany has been a highly active leader facilitating the worldwide diffusion of renewables, a comprehensive leadership strategy in line with the increased ambitions of the Energiewende – towards a comprehensive energy system transformation – has not yet emerged. Such a strategy requires consistency across government, transparent communication, and open dialogue with potential followers. As the main declared motivation for Energiewende leadership is to advance global climate action, this strategy above all needs to be geared towards effective climate leadership. Crucial for this is (a) to safeguard legitimacy of the Energiewende as a policy model by giving priority to climate protection at the domestic level ("sending side"), and (b) to ensure that knowledge created in the implementation process is shared with and adaptable to the local context in other parts of the world ("receiving side").

Keywords: leadership; energy transition; diffusion; transfer; Germany; renewables; climate policy

„*There is no other comparable country in the world that tackles such a radical change of its energy supply (…). But let's not fool ourselves: the world is looking at us with a mix of incomprehension and curiosity to see if it is possible for us to accomplish this energy transition and if so, how. If we succeed, it will become – and I am convinced of this – another prominent German export. And I am also convinced that if this energy transition can be accomplished in a country, it's Germany.* "

German Chancellor Angela Merkel, 29 January 2014[1]

Introduction

The German energy transition – the "Energiewende" – sparks considerable interest around the globe, triggering reactions from admiration and inspiration to skepticism and bewilderment. Gaining followers on the way to a more sustainable energy system has been a main rationale for the country's energy transition and German decision-makers frequently claim leadership in this field: "with the Energiewende, we wanted to gain followers. Of course we did not want to do climate protection in Germany, but convince others to join us." (Vice-Chancellor Sigmar Gabriel, Deutscher Bundestag 2014). Empirical research undertaken by Joas, Pahle, and Flachsland (2014) also shows that generating followers is one of the central goals the Energiewende should achieve in the eyes of key stakeholders in Germany. In the light of these ambitions, experts and scholars have called for Germany to increase actual leadership efforts to encourage the global diffusion of sustainable energy policies and thereby foster global climate protection (Messner, Schellnhuber & Morgan 2014, Messner & Morgan 2013, Tänzler & Wolters 2014, Westphal 2012).

But what does it mean to be an "Energiewende leader" and how can ambitions for Energiewende leadership be put into practice? Since answers to this question remain scattered, our aim in this paper is to thoroughly conceptualize leadership for the Energiewende case, explore its drivers and instruments empirically, and discuss policy implications.

While a major part of the literature on leadership focuses on the strategy and actions of countries or individuals in negotiation settings (i.e. multilateral climate negotiations, EU energy policy-making), we look at the type of leadership "sending countries" can exert to promote the diffusion of policies[2] outside these frameworks. Understanding the role of "leadership by diffusion" (Biedenkopf 2012) is particularly relevant in sustainable energy and climate policy: through decentralized policy coordination (Busch & Jörgens 2007, Busch & Jörgens 2010), diffusion can contribute to the emergence of "de facto regimes" (Busch, Jörgens & Tews 2005, p. 164) in areas where multilateral governance is insufficient or fails.

Assessing Energiewende leadership does not imply that we expect followers to emulate the Energiewende exactly as it is currently implemented in Germany, nor do we presume that Germany aims to export this exact model. Rather, we focus on Germany's ambition and actions to promote the spread of sustainable energy policies abroad, proceeding in five steps:

In section I, we derive a simple analytical framework from the literatures on leadership and diffusion. After discussing the prerequisites for leadership (I.a), we explore how unilateral leadership (I.b) and active leadership (I.c) can promote diffusion and discuss the challenges of assessing the effectiveness of "leadership by diffusion" (I.d). In section II, we introduce the Energiewende as a policy model (II.a) and discuss specific challenges of building leadership on this particular "diffusion item"(II.b). Section III focuses on the drivers for Energiewende leadership present in current parliamentary and political debate. We report the findings of

[1] *Es gibt kein weiteres vergleichbares Land auf dieser Welt, das eine solch radikale Veränderung seiner Energieversorgung anpackt.(…) Doch machen wir uns nichts vor: Die Welt schaut mit einer Mischung aus Unverständnis und Neugier darauf, ob und wie uns diese Energiewende gelingen wird. Wenn sie uns gelingt, dann wird sie – davon bin ich überzeugt – zu einem weiteren deutschen Exportschlager. Und auch davon bin ich überzeugt: Wenn diese Energiewende einem Land gelingen kann, dann ist das Deutschland.*

[2] For an account of German leadership in multilateral negotations, see for example Jänicke (2011) and Fischer and Geden (2011) on the European dimension of the Energiewende.

our analysis of 77 parliamentary debates (III.a) and discuss the role of climate protection as the collective aim pursued through leadership (III.b). Section IV addresses different forms of active Energiewende leadership, from communication (IV.a) to creating channels for transfer (IV.b) to structural incentives for sustainable energy (IV.c). Based on this exploratory assessment of Energiewende leadership, we discuss policy implications for Germany's external Energiewende strategy (V.a) and for the implementation of its domestic policy model (V.b).

I. Conceptualizing leadership by diffusion

Prior to analyzing the Energiewende case, a conceptualization of leadership by diffusion is needed. We draw upon literature on leadership and policy diffusion to explore the (a) nature and prerequisites of leadership, (b) unilateral and (c) active leadership and address the challenges of assessing (d) the effectiveness of leadership by diffusion.

a. Prerequisites for leadership by diffusion

The concept of leadership, "a complex phenomenon, ill-defined, poorly understood, and subject to recurrent controversy" (Young 1991, p. 281) has been employed for a variety of issues, from the mere implementation of an innovative policy to the proactive behavior of countries (or individuals, organizations etc.) in negotiation settings, to a situation where followers effectively implement similar models or adjust their position in reaction to the presence of leaders. Our focus in this paper is on the intermediary step, where leadership on the basis of a pioneering model is targeted at the diffusion of policies outside institutionalized negotiations or legal harmonization. This form of leadership as a "distinct and important mode of external governance through which jurisdictions can contribute to raising the bar of global environmental policy" (Biedenkopf 2012, p.111) is weakly represented in the literature, but relies on similar prerequisites as other types of leadership.

Although other categorizations are possible[3], we clearly distinguish between leadership on the one hand and pioneering on the other hand in this paper. To the difference of pioneers, who are simply first to implement a certain instrument, idea, technology or program, *leaders by diffusion seek to generate followers on the basis of their pioneering policies with a view to reaching a collective goal beyond their strict self-interest* (Underdal 1992, Malnes 1995, Eckersley 2011, Biedenkopf 2012).

This definition encompasses fundamental prerequisites for leadership, namely (1) a pioneering policy model that is visible and available, (2) reputation, resources and legitimacy ("soft power") and (3) the pursuit of a goal beyond self-interest.

Concerning (1), not all pioneering policies are an equally appropriate basis for diffusion and/or leadership by diffusion. Inherent characteristics of the pioneer's policy model, for example its degree of specificity (Klingler-Vidra & Schleifer 2014) or its compatibility with the regulatory culture of potential followers (Kern, Jörgens & Jänicke 2001, pp. 11–13, Tews 2002, Rose 2005), determine the degree to which a policy can diffuse. The diffusion of policies is thus more likely if potential followers see them as replicable, leading to a "normative belief (…) that a rule (…) ought to be obeyed" (Hurd 1999, p. 381). The policy solutions offered by leaders therefore also need to effectively contribute to solving a collective action problem (Underdal 1992, p. 10).

Authors from various strands of the literature agree that visibility, legitimacy and reputation (2), of the country (or organization, individual etc.) and the policy in question are decisive for its leadership potential. The more visible a policy is, the more information on it is available, the greater its reputation of success and

[3] A variety of terms are, sometimes interchangeably, used in the literature to refer to countries introducing or pushing environmental policy innovations. These include "leaders" (e.g. Gallagher 2012, Schreurs & Tiberghien 2007), "pioneers" (Jänicke 2005), "first movers" (in particular in the lead markets literature, e.g. Rennings & Cleff 2011), "front-runners" (Knill, Heichel, & Arndt 2012) or progressive and passive "forerunners" (Liefferink & Andersen 1998).

the higher the legitimacy of the leader country, the more likely it is for a model to diffuse. Elkins and Simmons find reputation and availability to be closely intertwined, since "*the most available policy models, perhaps, are those that are reputed to have been successful*" (Elkins & Simmons 2005, p. 44). The presence of "availability" and "representativeness" biases (Meseguer 2005) renders learning from countries with whom communication takes place, who belong to a common cultural or other reference group or who are generally "prominent states" (Elkins & Simmons 2005, p. 44) more likely. If its exercise is perceived as legitimate by potential followers, leadership can be seen as a specific form of "soft power", defined as "*the ability to get what you want through attraction rather than coercion or payment (…) [arising] from the attractiveness of a country's (…) policies. When (…) policies are seen as legitimate in the eyes of others, (…) soft power is enhanced"* (Nye 2004, p. x). In the case of climate protection, as clearly shown by the outcome of surveys conducted by Karlsson, Hjerpe, Parker, and Linnér (2012), leaders' legitimacy largely depends on whether they are perceived as being committed to a common goal.

This implies that for soft power to qualify as leadership, its aim (3) needs to be to reach a collective goal (Malnes 1995, Underdal 1992, Eckersley 2011), at least primarily. Leaders can however also benefit from their role and pursue "enlightened, far-sighted self-interest" (Weidner & Mez 2008, p. 374) while contributing to a collectively beneficial goal – a source of tensions that has been critically addressed by Skodvin and Andresen (2006, p. 17). Advantages of leadership for leaders can stem from the legitimization of internal policies through positive international reactions, the reduction of technology cost through diffusion and resulting economies of scale or through first-mover advantages and export opportunities, as shown in the literature on environmental lead markets (Beise & Rennings 2005, Porter & van der Linde 1995).

It should also be mentioned that the objectives pursued through international leadership do not necessarily need to be, and are in fact unlikely to be, fully identical to those pursued with the pioneering policy domestically. To ensure legitimacy, it is however important that the leader's own policy model contributes to solving a collective action problem, in addition to its wish for "others to contribute to solving it, too" (Saul & Seidel 2011, p. 902).

As stated above, we recognize several ways of categorizing the actions of leaders are possible. We propose to look at leadership by diffusion as comprising three consecutive stages, all based on a pioneering policy, from (b) unilateral leadership to (c) active leadership and (d) effective leadership, as outlined in the following sections and summarized in Table 1.

Effective leaders by diffusion	Active leaders	Unilateral leaders	Pioneers	Implement…	a policy innovation ahead of most other countries.
				Provide a policy model that…	contributes to the collective objective
					is visible & available
					is seen as legitimate & feasible
				Show willingness to…	contribute to resolving a collective action problem
					have others contribute to it as well
				Take measures to…	inform about their model
					inform about underlying policy problems & link them to other issues
					create channels through which diffusion can take place
					provide incentives to potential followers (material & non-material)
				Are effective if…	the adoption or implementation of policies in follower countries that contribute to the collective goal is facilitated (does not require copy-pasting nor same policy priorities)

Table 1: Overview of main requirements for pioneering, unilateral, active and effective leadership by diffusion (own compilation).

b. Unilateral leadership: leading by example

Unilateral leadership means "setting the pace" by implementing a pioneering policy and thereby "demonstrating that a certain 'cure' is indeed feasible and does work" (Underdal 1992, p. 4). In our framework, in addition to a pioneering policy model, this "leadership by example" (Underdal 1992, p. 5) requires an expressed willingness by the leader to put a policy model at the service of a collective goal, and clear willingness to engage others on a certain path towards this goal.

The rationality of unilateral action for climate protection has been questioned on the ground that providing such a public good can entail a free-rider dilemma rather than incentivizing others to adopt similar policies in the absence of multilateral agreements (Hoel 1991; on the case of the Energiewende see Weimann 2012). Several arguments can however be brought forward to explain how unilateral leadership can contribute to the solution of collective action problems (see Schwerhoff 2013, Edenhofer, Flachsland, Jakob & Lessmann 2013, Andresen & Agrawala 2002). These mechanisms include the reduction of uncertainty, and of cost and information asymmetries for potential followers, pushing standards of federal and supranational legislation (a prominent example being the California Effect, see Vogel 1997), signaling (Brandt 2004), and by creating normative pressure. The effectiveness of these mechanisms depends on whether they lead to the diffusion of policies that are conducive to reaching a collective goal.

In some cases, unilateral leadership might suffice to trigger diffusion, if the country and model are prominent and reputed successful and/or if followers in search of inspiration or lessons assume that the model addresses policy problems they encounter. Depending on the degree to which all available policy options are assessed by followers, symbolic imitation, emulation, bounded rational learning or learning (Meseguer 2005, p.73) can then lead to the diffusion of the model as a whole or of any element, including negative lessons, derived from it.

Rather than relying on the hope that "by virtue of a policy's employment in one locality, other policymakers may hear of (…) a policy innovation" (Klingler-Vidra 2014, p.60) and emulate it or draw lessons, interaction between followers and leaders can facilitate diffusion. Active leadership, through the mechanisms outlined in the next section can increase the likelihood and quality of lesson-drawing and learning from pioneering policies.

c. Active leadership: communication, institutions, incentives

Active leadership, the second stage of leadership by diffusion in our framework, turns willingness to lead into practice with a view to attract followers. Numerous drivers pushing potential follower countries to look at the policy experience of others, resulting in learning, imitation, positive or negative lesson-drawing and other outcomes, have been identified in the literature on policy transfer and diffusion[4] (e.g. Dolowitz & Marsh 2000, p. 9, Holzinger, Jörgens & Knill 2007). Among them, active policy promotion by leaders has been somewhat neglected as a facilitating factor. This is striking since overlaps between determinants for diffusion, such as availability of information, incentives and reputation, and key aspects of leadership are substantial.
Active leadership covers outreach to potential followers in a number of ways (Young 1991, p. 287), from actively contributing to making the policy model and evidence on the collective action problem available through communication (i.e. "intellectual leadership"), to framing the debate in a direction that favors the pioneering model as the preferred way to reach the collective goal ("issue-framing", Saul & Seidel 2011, p. 907), to linking the model to other issues of relevance to potential followers ("issue-linking", Flachsland, Lessmann, & Edenhofer 2012, p. 263), to creating spheres in which leadership can be exerted (Eckersley 2011, p. 9), to incentivizing followers through material means ("structural leadership", Young 1991, p. 288, Saul & Seidel, 2011, p. 903).

[4] There is a debate in the literature on the use of the terms "policy transfer", "policy diffusion" and sub-mechanisms (learning, emulation, lesson-drawing, mimicry, coercion, conditionality to name but a few, see also (Dolowitz & Marsh 2000) with overlaps between the concepts. Given its use in the concept of "leadership by diffusion", we employ the term "diffusion" for any spread of policies, programmes and ideas due to interdependent policy-making in this paper.

To exert active leadership, a pioneering model needs to be communicated, explained and evidence provided in an attempt to shape the way potential followers "understand the issues at stake and to orient their thinking about options available to come to terms with these issues" (Young 1991, p. 288). The importance of actively transmitting information on a policy model if it is to find followers is also recognized in the policy diffusion literature: Busch and Jörgens (2005, p. 865) even define diffusion as an „international spread of policy innovations driven by information flows".

A considerable part of the literature on leadership relates to international negotiations and bargaining, such as climate negotiations. Leadership concepts have been less used in areas of environmental and energy policy where the "sphere of leadership" (Eckersley 2011) is not as clearly defined, where no strict rules of procedure define a terrain for analysis and where measuring the success of leadership against the outcome/results of negotiations is not possible. An important aspect of leadership by diffusion is thus the creation of "spheres of leadership" or transfer channels, through which information can be exchanged. This may include the establishment or a refocusing of international fora, clubs, organizations, bilateral partnerships or initiatives through "institutional leadership" (Saul & Seidel 2011, p. 907).

Beyond communication and creating spheres of leadership, leaders can bring material resources into play and change the cost structure of adopting a certain policy or model through "structural leadership" (Young 1991, p. 288). Opposing the very idea of structural leadership, Malnes (1995, p. 98) suggests "*that we reserve the concept of leadership for influence which springs from other things than threats and offers (…)*". We adopt an intermediary position in this paper. Threats and coercion remain excluded from the concept, given that leadership by diffusion is based on legitimization and voluntary policy choices by followers. However, it appears justified to include potential monetary and non-monetary incentives to the "toolbox" of leaders in this field. The risk of conditionality for developing countries, although existing, needs to be put into perspective given that important international donors promote different energy concepts.

d. Effective leadership: gaining followers

We follow Saul and Seidel (2011, pp. 902–903) in their view that leadership is not *per se* conditioned upon the existence of followers: countries can, by their willingness and actions, show (unilateral and active) leadership independently of their immediate success in finding followers. Leadership then appears as a dynamic process in which generating followers is a desired outcome. Only effective leadership, as the third stage of our framework, is characterized by success in convincing others to follow and in thereby facilitating the achievement of a certain collective goal. The effectiveness of leadership and the challenges of measuring it have been subject to discussions in the literature (Saul & Seidel 2011, Skodvin & Andresen 2006).

With regard to diffusion, quantitative studies have predominantly been used to assess the number of followers to a pioneering policy and were highly useful in identifying diffusion patterns (Liefferink, Arts, Kamstra & Ooijevaar 2009, Knill, Heichel & Arndt 2012, Sommerer 2011). However, this type of assessment does not allow to measure the effectiveness of particular leadership efforts. Policies can also diffuse in the absence of leadership and, in the case of independent problem solving, without followers even knowing a policy was implemented elsewhere. The role and impact of leaders on actively triggering processes of diffusion has, as we already mentioned, received comparatively little attention so far and requires more in-depth qualitative studies.

It also needs to be stressed at this point that "effective" leadership does not require the leader's model to be copy-pasted, which is in fact a rather unlikely outcome of any diffusion process (Klingler-Vidra & Schleifer 2014). By inspiring the general policy direction or even providing negative lessons that can help followers design effective regulatory frameworks, leaders can contribute to paving the way to a collective goal for followers.

Following the same logic, leadership can contribute to a collective goal even if followers do not prioritize this objective. For example, renewable energy or other climate-friendly technologies could be adopted for their perceived co-benefits such as job creation and still contribute to the collective goal the leader pursues (thus the importance of considering issue-linking, see section VIb).

In the following section we shortly discuss the challenges of building leadership on the Energiewende as a policy model (section II) before exploring the drivers motivating Germany's Energiewende leadership (section III) and initiatives put in place for active leadership (section IV).

II. The Energiewende: a challenging basis for leadership by diffusion

A fundamental aspect of any discussion of leadership by diffusion is the nature of the underlying policy model. We will first (a) provide a brief overview of the Energiewende and its evolution before (b) discussing the challenges of building leadership by diffusion on the Energiewende.

a. What is "the Energiewende"?

The term "Energiewende"– literally translated an "energy turnaround" – has been used since the 1980s by proponents of renewable energy and nuclear phase-out in Germany (Krause, Bossel & Müller-Reissmann 1980). Several cornerstones of German energy policy have since stood out as singular for a large industrialized country: a longstanding tradition of supporting renewables (first feed-in law adopted in 1990), strong citizen participation (about half of renewables capacity is citizen-owned), and the decision to phase out nuclear power initially taken in 2000. These features led Germany to be widely acclaimed as a pioneer and leader with regard to sustainable energy (e.g. Stigson et al. 2013).

Despite its long history, it is the 2010 Energy Concept (*Energiekonzept,* Bundesregierung 2010) and the re-acceleration of nuclear phase-out following the Fukushima disaster in 2011[5] which are today most often referred to as "the Energiewende", both in the public debate in Germany and internationally. The implementation of these decisions in the "Energiewende legislative package" in June 2011 (BMU 2011) sets the following targets: an 80 to 95% reduction of greenhouse gas emissions by 2050 compared to 1990 levels, a 50% reduction of primary energy consumption by 2050 compared to 2008, a share of 80% of renewables in the electricity mix and of 60% in primary energy consumption as well as complete nuclear phase-out by 2022 (Schreurs 2013, pp. 100–101). Despite recent positive developments (Graichen et al. 2015), important progress is today mainly visible in the area of renewables in the electricity mix (27,3% in 2014), with less clear progress to date on other targets (Löschel, Erdmann, Staiß & Ziesing 2014, pp. Z-6). The implications of these results for Energiewende leadership will be addressed in the next sub-section.

Rather than limiting the term "Energiewende" to the internationally remarked decisions taken in 2010 and 2011, we argue the change brought about by these decisions merely marked the beginning of a new phase "2.0" within a more longstanding transition: Germany's energy policy moved from an Energiewende "1.0" based on making renewables market ready and phasing out nuclear power to the legislative enactment of a consensus on a full-scale transformation of the energy system and beyond (Ethikkommission, 2011).

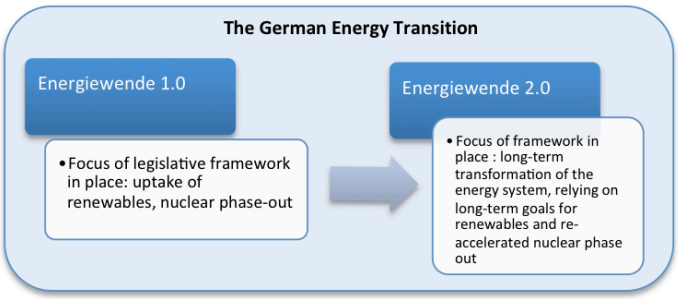

Figure 1: Two phases of the Energiewende (own summary).

This ambition had been very present with proponents of renewables and of nuclear phase-out in Germany for decades, but had not been reflected in official long-term goals before. The definition of long-term targets until 2050 then "for the first time mapped a road into the age of renewable energies" (Bundesregierung, 2010, p. 3). We use the two phases (see Figure 1) as a heuristic with a view to assess whether leadership today reflects changes to the underlying policy model.

[5] The CDU-FDP government had slowed down the phasing out of nuclear power in October 2010 before reversing this decision following the Fukushima accident in 2011.

b. Model-related challenges of Energiewende leadership

Since our focus in this paper is on leadership by diffusion, *what* can diffuse is a crucial question. Whereas Rose (2005, p. 17) uses the term "programme" to describe the "tangible embodiment of policy commitments" followers can draw lessons from, Weyland (2006, p. 18) distinguishes between "principles" and "models" that can diffuse. Underdal even speaks of "products" being supplied by leaders (1992, p. 2). Whereas a principle "charts an overall direction but not a specific course of action", a "model is one specific option from the menu offered by a policy principle" (Weyland 2006, p. 18).

Applied to the case of the Energiewende, whereas a "sustainable energy system" could be considered the "principle", the way Germany understands this maxim and translates it into policies is the Energiewende "model". As we already stressed above, leadership is by no means limited to the transfer and subsequent copy-pasting of the leader's model, but can also signify the diffusion of a principle, such as climate-friendly energy systems with followers then shaping their own models or combining policy instruments from different models. Active leadership can therefore aim at the transfer of a specific model and/or of the spread of a principle to reach a collective goal. In both cases, the nature and credibility of the domestic pioneering model do play an important role. Given the complex policy landscape and vaguely defined political goals of the Energiewende, its transferability and usability as a basis for leadership merit discussion.

Even though its quantitative targets are clear, the hierarchy of political goals of the Energiewende today is only vaguely defined (Löschel, Erdmann, Staiß & Ziesing 2014, Joas, Pahle & Flachsland 2014). A study carried out by Konrad Adenauer-Stiftung, a think tank close to CDU, on emerging countries' perception of the Energiewende also reveals uncertainty among foreign stakeholders on what political goals really drive the Energiewende (Konrad-Adenauer-Stiftung 2013). In addition, the Energiewende's policy landscape (BMWi 2014a) is not an easily intelligible "master plan" where policies and instruments would be aligned towards "clearly identified ends" as in Rose's concept of a "programme" from which followers can draw lessons (Rose, 2005, p. 16).

This has at least two important implications for the ease of exerting leadership based on the Energiewende. Firstly, an unclear hierarchy of political goals of the Energiewende raises questions regarding the collective goal the model can be put at service of and may weaken the perceived legitimacy of the leader (Saul & Seidel 2011, p. 902, Underdal 1992, pp. 6–7). Secondly, with is scattered and complex set of policies and instruments, the Energiewende is a challenging diffusion item followers could draw lessons from. Even a perceived lack of specificity and clarity on the model can influence diffusion outcomes. As Klingler-Vidra shows for the example of the diffusion of the "Silicon Valley" model, "the vague nature of the Silicon Valley policy environment has meant that there has been plenty of room for interpretation on which elements of its context drove its success" (Klingler-Vidra 2014, p. 46).

In the next section, we turn our focus on the motivations for German Energiewende leadership based on an analysis of parliamentary debates (section III), before assessing how these ambitions translate into active leadership today (section IV).

III. Drivers for Energiewende leadership

As pointed out earlier, "unilateral leaders differ from pioneers by demonstrating willingness to contribute to the solution of a collective action problem" (Saul & Seidel 2011, p. 902) through their pioneering policy model. Hence, the aim of this section is to (a) assess in how far German law-makers today express an intention to exert leadership based on the Energiewende by analyzing parliamentary debates and then to (b) explore which collective goal this leadership is targeted at.

a. Consensus on the desirability of Energiewende leadership

In order to shed light on the importance and drivers of Energiewende leadership, we use plenary debates in the German Bundestag as a source of analysis. We examined the 77 plenary debates that took place in the

current legislative period in the German Bundestag until early January 2015. By looking for keywords including "Vorreiter"[6] ("frontrunner"/"leader"), "Vorbild" (model, example), "Nachahmer" (follower), "weltweit/global/international" (worldwide, global, international) used in connection with "Energiewende" or "Energiepolitik" (energy policy), we identified 133 statements (paragraphs) in 107 individual speeches from 55 different members of parliament as being relevant to assess the aim for Energiewende leadership.

We derived paraphrases[7] based on recurrent themes and patterns in these statements in the framework of qualitative content analysis (Gläser & Laudel 2010). The frequency of a specific theme is also influenced by the distribution of speaking time in the Bundestag: there is a correlation between party affiliation and frequently evoked themes as well as between party size, speaking time and the number of statements on leadership we identified. Keeping this in mind, current trends in the debate on Energiewende leadership in the German Bundestag can be characterized as follows.

Overall, in 29 out of 77 parliamentary plenary debates analyzed, the issue of international Energiewende leadership was raised, as part of more general discussions on climate and energy policy. The international dimension of the Energiewende thus qualifies as a prominent topic of parliamentary debate in Germany today. All speakers agreed Germany currently has or had an international leadership role due to its energy policy. A single parliamentarian argued other countries could and should not be forced to follow Germany's Energiewende path with regard to nuclear phase-out. The statement needs to be seen in the light of discussions around the abolishment of export credit guarantees Germany has been granting for nuclear power projects abroad.

The most prominent theme in the statements analyzed was "leadership conditioned upon success", which was present in about half of all speeches. Within this theme, international leadership is seen as a clear goal, but is conditioned upon the success of the Energiewende within Germany. It is important to underline that the "success" of the Energiewende does cover different meanings for different speakers. Members of the Green party frequently warned against the loss of leadership or argued leadership had already been lost in the light of insufficiently ambitious climate and energy policy in Germany. These statements were often linked with calls for concrete improvements to existing policies, especially with regard to phasing out coal from the German electricity mix, increasing pressure for a reform of the emissions trading system on the European level or focusing more attention on issues such as energy efficiency and transport. Members of CDU/CSU and many speakers from SPD – while also agreeing on the desirability of generating followers to the Energiewende – saw international leadership as being conditioned upon Germany's ability to show that economic competitiveness, affordability, security of supply and climate protection could all be achieved simultaneously.

The debate on "leadership conditioned upon success" is to be viewed in the context of discussions around a reform of the German Renewable Energy Act during this legislative period. Within this context, international leadership was used as an argument to legitimize measures to safeguard economic competitiveness. Several parliamentarians defended current industry exemptions from the renewables surcharge with the argument that the Energiewende would only be followed and have an impact on global climate protection if Germany's industry base was safeguarded at the same time, requiring exemptions for energy-intensive companies.

[6] The German "Vorreiter" literally translates as "frontrunner". No other acceptable term for "leader" could have been used in debates.

[7] Themes identified were paraphrased as follows: "International leadership based on the Energiewende is an objective we pursue.", "Germany is undeniably leading on sustainable energy and/or climate policies.". "Germany's leadership role is currently threatened.", "A leadership role in in sustainable energy brings economic advantages.", "Germany has a duty/responsibility to lead and is a natural leader given its policies.", "Our leadership is to serve global climate protection.", "We should not aim for or exert leadership in energy policy.", "Our energy and climate policies are being observed.", "We can only lead if we/the Energiewende is successful in achieving climate objectives", "We can only lead if we/the Energiewende is successful in ensuring economic competitiveness", "We need to lead on energy/climate in the European debate"., "Our leadership is a contribution to development policy."

b. Climate protection as the declared collective goal of Energiewende leadership

Besides looking at the desirability of international Energiewende leadership in the eyes of parliamentarians today, we were also interested in the reasons given for why Germany should play this role. In summary, our analysis reveals that diverse drivers for leadership are present in the German parliamentary debate: a willingness to advance collective goals (mainly climate protection, see below), the aim to legitimize internal political decisions (such as maintaining industry exemptions) by framing them as a condition for leadership, the "intrinsic value of leadership" and Germany's "duty" or "responsibility" to act, the aim to push supranational/European legislation and, rarely, the hope to gain economic benefits from leadership, through export promotion and transfer advantages (on this aspects of lead markets, see Beise & Rennings 2005).

Among them, contributing to international climate protection was clearly the most prominent reason given by speakers on why Germany should aim for international leadership based on its energy policy, showing a broad consensus across parties. Germany's pioneering renewable energy policies have indeed always been linked to the aim of contributing to global climate protection by paving the way for followers (e.g. Bundestag 1988, Bundestag 2008). This position is also underlined by statements from political leaders (Merkel 2014, BMWi 2014b, Gabriel 2014) and corresponds to the result of stakeholder interviews led by Joas, Pahle, and Flachsland (2014).

Interestingly, "leadership by example" was the mode of leadership most frequently referred to and international leadership was almost exclusively discussed in broader debates on reforms, success and failures of the Energiewende itself. Concrete suggestions on how active leadership, beyond a convincing domestic model, could be designed, were rare. Among them, the creation of "alliances of the willing" or "alliances of leaders" in sustainable energy and climate policies and the importance of energy projects in development cooperation were mentioned.

As will be discussed in section VIb, the legitimacy of aiming for leadership by example, and in particular for climate leadership, based on the Energiewende as it is currently being implemented in Germany, has been subject to debate (Wambach 2014, p. 39). In particular, the climate track record of current policies and planned reforms was put into question by members of the Green party in the debates analyzed. However, for Germany to qualify as a "unilateral leader" according to our analytical framework, it only matters that there is political will to put an – even imperfectly implemented – model at the service of a collective goal. Therefore, a lack of clarity on the goals Germany pursues through Energiewende leadership can constitute an obstacle to Energiewende leadership we will address in section VI of this paper.

We will now turn to the question of how the political consensus on Energiewende leadership translates into *active* leadership (section IV). Based on this assessment, we discuss the strengths and limitations of Germany's current external Energiewende strategy in section V.

IV. Putting Energiewende leadership into action

As explained in section II, the transition from "unilateral" to "active" leadership requires active outreach to attract followers. We will now explore how Germany transforms its willingness to lead into action along the following modes of active leadership: (a) communication, (b) creating spheres of leadership, and (c) providing structural incentives to followers. Rather than claiming to be exhaustive, this overview is aimed at illustrating the nature of measures taken by Germany as an active Energiewende leader.

a. Leadership through communication: making the Energiewende model available

Providing information on the Energiewende appears as a basic condition for leadership by diffusion. As far as German public institutions are concerned, efforts have been made on making information on the transition and economic effects available to observers from abroad in English (BMWi 2014c). However, official information in English on the German Energiewende remains scarce compared to the scope of the project, with reports often only available in summarized versions, and scattered across websites. The lack of

easily accessible and comprehensive information from governmental departments has prompted private actors such as think tanks (e.g. Agora Energiewende) to communicate in English on current debates around the Energiewende. To date, the only full English-speaking website on the Energiewende (Heinrich Böll Stiftung 2014) is hosted by Heinrich Böll Foundation, a think-tank close to the German Green party. More indirectly, leadership through the generation and provision of knowledge (or "intellectual leadership", see Young 1991, p. 288) is also exerted through the German energy research program (BMWi 2014d). The program's budget increased from 399 million euros in 2006 to 809 million euros in 2013, of which 74% are dedicated to research in areas "crucial for the implementation of the Energiewende" (BMWi 2014d, p. 2).

With regard to "issue-framing", Germany follows a path of sustainable energy without nuclear power. It can however not be concluded at first sight that Germany is intensively trying to frame the debate on sustainable energy policy in a way to actively "lead against" nuclear energy. The communication on the establishment of the Renewables Club underlines each member country's freedom to choose its energy mix (BMU 2013) and Germany still until recently supported the export of technology for the use in nuclear plants abroad through credit guarantees (BMWi 2014e). In the field of development policy though, no nuclear projects are supported in partner countries (BMZ 2014). With regard to issue-linking as a potential objective of leadership through communication, Germany for example sponsors studies and issues statements on the economic opportunities of renewables globally, in particular related to job creation and "green growth" (BMU 2009; Lehr, Mönning, Missaoui & Marrouki 2012) in addition to numerous studies undertaken on the macroeconomic effects and job creation potential of the Energiewende in Germany (e.g. BMWi 2014h).

Outreach on the Energiewende to a foreign audience is ensured by various "transfer agents" (Stone 2004), with potentially differing agendas and ways to frame the energy transition, including within government. During the past legislative period, BMWi-sponsored communication and activities to promote renewables and efficiency abroad were mainly related to energy security or the promotion of exports (through dedicated export initiatives or the "Renewables made in Germany" campaign). BMU-led initiatives focused on promoting renewables, efficiency and other policies to facilitate climate protection. These differences are likely to become even more visible in the future with BMWi being fully responsible for the issue of renewables since 2013, while climate protection remains within the domain of BMUB.

Responding to increasing demand for information addressed to German embassies, the Federal Foreign Office recently also entered the field of Energiewende foreign policy by creating a dedicated unit in 2013, by elaborating internal communication material on the issue for use by embassies worldwide, and by inviting experts on an "Energiewende journey" to Germany (Auswärtiges Amt 2014).

In addition to those institutions communicating on the Energiewende from Germany, a broad range of actors is likely to communicate on the Energiewende in potential follower countries. The bodies of German technical and financial development cooperation, GIZ and KfW Development Bank are active in more than 130 (GIZ) / 70 (KfW) countries. The energy projects carried out by these organizations (see sub-section c below) are not only sponsored by BMZ, the department in charge of development assistance, but also by BMWi, BMUB, the Federal Foreign Office or private companies. Projects then follow different priorities according to their sponsors' agendas. Besides development cooperation advisors, embassy staff, the German chambers of commerce, German companies and scientists may all contribute to Energiewende leadership by communication. This multitude of actors involved may explain the lack of a comprehensive external communication strategy for the Energiewende, as discussed in section V.

b. Institutional leadership: creating channels for diffusion

Until recently, institutionalized spheres of leadership were largely absent from the field of sustainable energy. To compensate for this lack, Germany encouraged the establishment or reinforcement of international institutions, fora and initiatives related to this field, thereby demonstrating "institutional leadership" (Saul & Seidel 2011, p. 907). By creating numerous bilateral energy partnerships with countries including Morocco, Tunisia, Nigeria, Norway, South Africa, Russia, Brazil, India (BMWi 2014g), founding the (now inactive)

Renewables Club and providing substantial financial and technical support to international and regional initiatives such as the REN21 network, the International Feed-in Cooperation, the French-German Renewables Office, the Transatlantic Climate Bridge or RCREE in the MENA region, Germany created a network of institutions and initiatives providing "international or transnational channels through which policies and instruments are communicated" (Busch, Jörgens & Tews 2005, p. 150). As Tänzler and Wolters (2014, p. 149) note, the "normative power" of the multitude of fora and alliances present in the field of sustainable energy today, "many of them initiated by Germany", mainly relies on sharing cognitive resources and building capacity. Among those institutions, the creation of IRENA can be regarded as the most visible success of Germany institutional leadership (Röhrkasten & Westphal 2013). Its establishment is a consequence of the "renewables2004" conference held in Bonn (BMZ 2010). Bringing together 3.600 participants from 154 countries, the conference clearly demonstrated Germany's willingness to lead in the field of sustainable energy, well before the start of an Energiewende "2.0".

Germany has also used institutions with a broader mandate to promote its renewables agenda. For example, Germany pushed for the establishment of the Mediterranean Solar Plan within the Union for the Mediterranean and for a German official being given responsibility for the energy area within its secretariat (Ratka 2014, pp. 139–140, Bundestag 2010). Although interests linked to the German-led Desertec Industrial Initiative played a role, leadership on the Mediterranean Solar Plan was also framed in the context of climate protection (Bundestag 2010).

c. Structural leadership: incentives & capacity-building

Germany exerts structural leadership in the field of sustainable energy by providing incentives to potential followers, in particular to developing countries, with a view to render sustainable energy technologies and policies better known, implementable and affordable. It needs to be stressed at this point that these programs are not targeted at "exporting" the Energiewende exactly as it is implemented, but to promote the uptake of renewables and energy efficiency abroad. With almost 6 billion euros spent between 2004 and 2011, energy represents the biggest share of the BMZ budget (BMZ 2014, p. 9), making Germany the most important bilateral donor in the field of sustainable energy in a number of countries. Development aid expenses in the field of energy are set to double, with a target of 3.6 billion euros in loans and grants to be committed *annually* to the field of sustainable energy through development assistance up to 2030 (BMZ 2014, p. 12, KfW 2014). Additional means for bilateral and multilateral climate projects are made available by BMUB, especially through the International Climate Initiative .

Incentives can be monetary when it comes to financing renewable energy projects through loans and grants provided by the German development bank KfW (KfW 2014). For example, Germany provides the biggest share of financing (more than 650 million euros) for the world's biggest solar power complex in Morocco and funds demonstration projects. Often, structural leadership is however non-monetary. This includes technical assistance, capacity building, the identification of renewables potential in partner countries through studies (a prominent example being the TERNA country studies: GTZ 2009), training and technology transfer (Jacob, Bär, Beucker, Clausen & Fichter 2014).

We provide a cursory overview of current and recent initiatives related to active leadership for sustainable energy in Table 1 in the annex. Against the background of these initiatives, a decrease in resources for international energy and climate cooperation in Germany's 2014 budget has been heavily criticized by NGO Oxfam (Kowalzig 2014a). This development is linked to the decrease of available resources in Germany's energy and climate fund due to lower revenues from the sale of emissions certificates in the EU emissions trading system. For 2015, the resources foreseen for bilateral climate and energy cooperation are however likely to reach levels similar to earlier years (Kowalzig 2014b), with approximately 1.8 billion euros reserved for bilateral climate finance in 2015. This amount is to be spent in addition to German pledges to multilateral climate funds, including a total of 50 million euros to be committed by Germany to the Climate Adaptation Fund and 750 million euros to the Green Climate Fund over the next years.

d. Challenges in assessing the effectiveness of Energiewende leadership

Effective leadership by diffusion manifests itself in (1) a proliferation of policies similar to or inspired by the leader's model and (2) facilitating the achievement of a common goal. As outlined in section I.d, evaluating the global effectiveness of leadership by diffusion and establishing causal links between modes of leadership and followers' policy decisions is hardly possible outside in-depth case studies and process-tracing. Our aim in this sub-section is therefore not to formulate a final judgment on whether Energiewende leadership has been effective, but to discuss indications and indicators.

Germany has developed a wide variety of instruments and programs to promote the uptake of renewable energy and energy efficiency measures abroad, in particular in developing countries. Looking at the high number of countries having introduced renewable energy targets and policies while being supported by German programs (GIZ 2013), Energiewende leadership strongly appears to have been effective to date. Studies show a high degree of interest for the Energiewende from decision-makers and experts around the globe (Konrad-Adenauer-Stiftung 2013, Konrad-Adenauer-Stiftung 2014, Agentur für Erneuerbare Energien 2014a). References made to the German energy transition example in countries deploying renewables (MAP 2014), and the global spread of feed-in tariffs (REN21 Secretariat 2014) are indicators for the German energy transition setting an example. This is true in particular with regard to its main pillar, a high share renewables in the electricity mix, and to a lesser extent for nuclear phase-out (Schreurs 2013).

Assessing the effectiveness of Germany's current approach to Energiewende leadership can not be reduced to counting countries having adopted policy instruments similar to those used in Germany, above all feed-in tariffs (e.g. Solarify 2014). First of all, where lesson-drawing by followers led to an adaptation of the German experience to the local context, for example through the choice of alternative policy instruments such as auctions, the effectiveness of Energiewende leadership, may concern principles rather than models. Secondly, German Energiewende leadership aims at the promotion of renewables and energy efficiency, rather than at the implementation of exact copies of German policies abroad (including nuclear phase-out), which also supports the idea of leadership being targeted at the diffusion of principles rather than an "export" of the Energiewende model. Thirdly, the diffusion of renewable energy policies is of course also encouraged by other countries and organizations and not limited to German Energiewende leadership. Measuring the contribution of Energiewende leadership to the diffusion of sustainable energy policies can therefore only be attempted through in-depth case studies. Over one hundred interviews led in Morocco and South Africa[8] however clearly show an impact of both the German Energiewende model and of active policy promotion by Germany on energy policy debates and decisions in favor of renewable energy and energy efficiency, even where policy instruments eventually chosen differ from the German example.

The declared intention of Energiewende leadership is to support global climate protection as shown in section III. By communicating and providing knowledge on the design of regulatory frameworks, the feasibility and technical aspects of renewables, followers are to be enabled to leapfrog into low-carbon energy systems. In many cases, renewables will not replace current generating capacity, but reduce the part of fossil fuels compared to a business as usual scenario. The very feasibility of this leapfrogging is facilitated by the impact of Germany's pioneering policies on technology prices: in the early years of renewable deployment – and especially for photovoltaics – the German energy transition crucially contributed to driving down technology prices (IEA 2013, p. 128). Such a contribution is likely to "leverage additional mitigation as – ceteris paribus – other regions will increase the deployment of these less costly technologies" (Edenhofer, Flachsland, Jakob, & Lessmann 2013, p. 18).

Building up on successful and longstanding German efforts to promote renewables worldwide through incentives, technical support, the creation of dedicated institutions and passively, through reduced prices for renewable technologies and the provision of a prominent policy example, a debate is now needed on how

[8] Steinbacher, K., ongoing PhD project „Exporting the Energiewende?", Environmental Policy Research Centre, Freie Universität Berlin.

Energiewende leadership can be designed in the future to facilitate far-reaching energy system transformations in follower countries, in line with the declared ambitions of the German Energiewende. We will discuss this question in the next section (V) and formulate recommendations before concluding.

V. Discussion: Towards Energiewende leadership 2.0

We have shown so far in this paper that Germany's willingness to lead internationally based on its Energiewende (section III) resulted in active leadership across various channels (section IV). We will now discuss what elements of Energiewende leadership, both external (a) and internal (b) ones, need to be addressed in the design of a leadership strategy "2.0".

a. The external dimension of Energiewende leadership 2.0

German Energiewende leadership, as much as the underlying policy model, are in a transition phase. Thus, a main challenge for Germany is to develop an approach to Energiewende leadership in line with the degree of ambition of its model.

Crucially, a coherent "external Energiewende strategy", which streamlines the activities of different departments and public bodies and clearly states the objectives of German Energiewende leadership is still missing, as underlined by Messner and Morgan (2013). Although climate protection is the most present driver for Energiewende leadership, several measures such as the export initiatives for renewables and energy efficiency (Bundesregierung 2013), and their project development programs in developing countries are targeted at opening export markets for German companies from the renewables and efficiency sector. They often involve the same organizations as other development assistance projects, which are more exclusively targeted at poverty reduction or climate protection. The diversity of existing programs and the different objectives they pursue may create confusion among partners on the extent to which Germany is acting as a "honest broker," pursuing the objective of climate protection, or rather in its own economic interest, which can impact the perceived legitimacy of leadership by Germany. This does not imply that the existence of transfer agents from various backgrounds is an inherent obstacle to leadership by communication on a multi-faceted project like the Energiewende. Neither do we argue that interests will need to be fully aligned across sectors and departments or that leadership requires full self-sacrifice from the part of the leader. However, coherence in official communication and transparency on the official aims of Energiewende leadership will likely add to the effectiveness of leadership by diffusion.

Despite growing worldwide attention for the German energy transition after the Fukushima disaster in 2011, efforts on communicating comprehensively and transparently on the "daily business" and instruments of the German energy transition, appear insufficient given the project's degree of complexity and ambition. Political signals regarding resources for active Energiewende leadership are ambiguous (Kowalzig 2014b). An effective external Energiewende strategy will necessarily include measures to communicate effectively, transparently and comprehensively on the Energiewende, increasing the "availability" of the model to potential followers. An official blog or website (Westphal 2012, p. 7) on the German energy transition in different languages or an increased number of road shows and delegation visits can be elements of such a communication strategy.

Attracting followers eventually depends on the "extent to which supply 'matches' demand" for leadership (Underdal 1992, p. 2). Leadership therefore needs to take into account followers' needs and possibly differing objectives. Transferring knowledge and providing impulses towards more sustainable energy systems is possible even if priorities or preferences in terms of policy instruments differ between leaders and potential followers. The objectives pursued by followers, obstacles to and potential drivers for climate-friendly policies need to be fully understood through ongoing dialogue, for example through the further multiplication of bilateral energy partnerships.

Where climate protection is not a top objective, potential co-benefits of transformation in line with followers'

priorities – be they job creation, industrial policy, security of supply or others – can then be addressed and adapted "policy narratives" around energy transitions be developed (Tänzler & Wolters 2014, p. 142).

Sharing knowledge and financial resources in order to facilitate the uptake of technologies likely to benefit both followers' priorities and the collective goal leaders wish to contribute to is thus required (Westphal 2012, p. 3). This approach has successfully been adopted in leadership activities such as projects implemented by GIZ linking energy efficiency and renewables to job creation (Lehr, Mönning, Missaoui & Marrouki 2012). Given the decrease in market prices for renewable energy technologies, also due to German pioneering, decisions for renewables will be increasingly based on economic considerations. The resulting easier access to technologies requires adapted, sometimes less visible, support activities, such as the transfer of know-how on grid integration and "soft skills" for comprehensive energy system transitions to happen.

A crucial aspect of an Energiewende leadership strategy 2.0 is linking Germany's efforts to those of other leaders and aspiring leaders around the globe. Whether it is reviving and enlarging the Renewables Club or creating other alliances, joining forces between willing climate leaders in a club (Messner, Schellnhuber, & Morgan 2014; Edenhofer, Flachsland, Jakob & Lessmann 2013; Weischer & Morgan 2013; Victor 2011) appears as an important element of a leadership strategy that lives up to the ambitions of Energiewende "2.0". Despite some potential drawbacks, these "coalitions of the responsible" (Klingenfeld 2011, p. 155) can develop a force of attraction, serve as forums for exchange, for coordinated investment, innovation, research, development and deployment (Keohane & Victor 2010, p. 22; Anadon et al. 2011, p. 273). If designed properly, these clubs could prove more effective in contributing to the collective action problem of climate protection in the short run than the cumbersome decision-making processes of a comprehensive climate regime.

b. The internal dimension of Energiewende leadership 2.0

Rethinking Energiewende leadership today is required by an increase of the declared ambitions of the German energy transition itself. Germany's aim to find followers for a profound energy system transformation requires an open debate on the design and targets of Energiewende leadership "2.0", but also on the way the policy model is implemented on the domestic level in Germany.
There is a direct link between a leader's policy model and leadership that can be built on it. Since climate protection has been put forward as a main objective of Energiewende leadership (see Section III), the underlying model needs to contribute to this objective in a convincing and credible manner. The way the Energiewende is currently being implemented in Germany has however sparked debate on the country's contribution to the collective goal of climate protection.

On the one hand, this debate concerns the sincerity with which climate protection is pursued as the primary goal of the Energiewende (Vorholz 2014), pointing to a lack of clarity on the hierarchy of political objectives the German government wants to pursue (Joas, Pahle, & Flachsland 2014). On the other hand, the Energiewende's current strong sectorial focus on power generation, with less concrete action on efficiency, heat and transport, has been criticized. Within the power sector, low prices for emissions certificates led to an increased use of coal in recent, pushing gas-fired plants out of the market and leading to rising C02 emissions in Germany, despite considerable and growing shares of renewables in the mix (Graichen & Redl 2014). The Energiewende's "climate paradox" and a growing risk of failure to reach the intermediary 40% greenhouse gas reduction target by 2020 prompted the government to adopt a national climate action plan in December 2014 (BMUB 2014).

Although latest figures seem to indicate a reversal of the trend, with decreasing emissions and progress on energy efficiency in 2014 (Graichen et al. 2015), an effective carbon price signal is needed if the reduction of greenhouse gases is the main objective the German government pursues with the Energiewende. In addition to inducing mitigation by increasing the price of carbon-intensive forms of energy, an effective carbon price signal would create a persistent incentive for technological innovation on both the supply and demand side, channeling research and development in areas where innovation is needed. The Energiewende's ability to

trigger innovation is indeed not a marginal point (Kübler 2014, p. 32): as Borenstein (2014) points out, leaders should seek to impact global climate protection by developing innovative technologies and frameworks, considering whether and how "that knowledge can be applicable in other parts of the world" and thus facilitate learning and diffusion.

Active leadership based on the promotion of renewables, especially in developing and emerging countries, will continue to constitute an important contribution Germany can make towards climate protection. Yet, Germany's ambition to act as a climate leader, requires an open debate on the implementation of its own policy model and on scaling up ambitions domestically to ensure credibility and attractiveness of the model in the future as well. As Eckersley puts it "given the scale of change required to move towards a low-carbon global economy, state climate leaders are necessarily transformational leaders, and their performance and recognition as international leaders, and their ability to attract followers, may be considerably enhanced by climate leadership at the domestic level (….)" (Eckersley 2011, p. 10). To ensure leadership towards this goal remains legitimate and convincing, the political will of German decision-makers to pursue climate protection as a priority and adjust policies accordingly where needed, should not leave any doubt.

Conclusion

Our analysis of the Energiewende case through the lens of leadership by diffusion shows that Germany is not only a pioneer in the field of sustainable energy, but is also a willing and active leader. Although a global assessment of the effectiveness of Energiewende leadership is beyond the scope of this paper, there is little doubt that German leadership through various channels has facilitated the diffusion of sustainable energy policies. The focus of Germany's leadership efforts in this field is in line with the experience of Energiewende "1.0", where introducing considerable shares of renewables to the electricity mix was the core aim. With this target now achieved in Germany and an increasing number of other countries, Germany is heading towards a fundamental transformation of its energy system - an Energiewende "2.0" - that requires ambitious leadership in order to effectively generate followers and facilitate the achievement of the collective goal of climate protection pursued through Energiewende leadership.

A main requirement for effective leadership towards climate protection is for Germany to clearly define the hierarchy of its own Energiewende policy objectives and substantiate its aim for international leadership with constantly convincing action at the domestic level. Likewise, the hierarchy of objectives to be reached through international Energiewende leadership also needs to be clearly defined and supported with action and sufficient resources.

As a fundamental prerequisite for leadership, transparent communication on the implementation of the Energiewende in Germany is necessary, to ensure availability of the model to potential followers. This means rendering information accessible on achievements and current reforms of the Energiewende, and on the instruments put in place to deal with the challenges of a transformation in the making. Furthermore, effective leadership requires permanent dialogue with potential followers. This dialogue, within existing and additional energy partnerships, might lead to a focus on issue linking and co-benefits of climate-friendly technologies if followers do not prioritize the goal of climate protection. Overall, the development of an external Energiewende strategy that is consistent across governmental departments appears as a necessary basis for effective leadership on the basis of an Energiewende "2.0".

Leaders provide innovative policy solutions and, through their domestic trial-and-errors, reduce risks for followers. In a complex and ever-changing policy field such as sustainable energy and climate protection, the real value of leadership lies in the fact that some countries "dare to dare" and encourage others to do so as well by sharing knowledge and resources. Throughout all aspects of leadership - those linked to the policy innovation as well as those linked to external action - successful Energiewende leadership requires legitimacy. This means devising a leadership strategy that is based on credible domestic action for climate protection, clear objectives, and, above all, dialogue at eye-level with those observing the Energiewende from afar.

Annex

List of abbreviations

BMU (until 2013)	Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit	Federal Ministry for the Environment, Nature Conservation and Nuclear Safety
BMUB (from 2013)	Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit	Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety
BMWi	Bundesministerium für Wirtschaft und Energie	Federal Ministry for Economic Affairs and Energy
BMZ	Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung	Federal Ministry for Economic Cooperation and Development
CDU	Christlich-Demokratische Union	German Christian-Democratic Union (party)
CSU	Christlich-Soziale Union	German Christian-Social Union (party)
EU		European Union
GIZ	Gesellschaft für International Zusammenarbeit	German Agency for International Cooperation
IRENA		Internationale Renewable Energy Agency
KfW	Kreditanstalt für Wiederaufbau	German Development Bank
MENA		Middle-East North Africa
RCREEE		Regional Center for Renewable Energy and Energy Efficiency
REN21		Renewables 21 Network
SPD	Sozialdemokratische Partei Deutschlands	Social-Democratic Party of Germany

Table 1: Non-exhaustive list of measures and programs related to active leadership in the field of sustainable energy policy

Initiative/Program	Managed by	Partner/Targeted countries	Start	Objective	Resources/Instruments
International Climate Initiative (Internationale Klimaschutzinitiative)	BMUB	Approx. 80 developing & emerging countries.	2008	Financing mitigation, adaptation, biodiversity and REDD+ projects in developing and emerging countries.	At least 120 Mio/year (first financed by auction revenue from emissions trading, now from BMUB household). 2008-2013:411 projects with a total volume of 1,45bn euros. Currently 65 with a focus on renewables and 68 with focus on energy efficiency.
Bilateral Energy Partnerships (Energiepartnerschaften)	BMZ, BMWi, BMUB and/or AA	India, China, Brazil, Russia, South Africa, Morocco, Tunisia, Mongolia, Ukraine, Turkmenistan, Kazakhstan, Angola, Nigeria, Turkey & Norway.	Dependent on country. Last EPs signed: Morocco, Tunisia, South Africa.	Depends on bilateral agreement, from energy security to transfer of experience and technology.	Mainly act as a platform for projects financed by other means (such as development assistance). Degree of activity and institutionalization (secretariats) varies. Partnerships and working groups within initiated by different departments depending on country. 5,4 million foreseen from Energy and Climate Fund for bilateral partnerships in 2014.
Renewables Club (Club der Energiewendestaaten)	BMU (today unclear)	Denmark, France, India, China, United Kingdom, Morocco, South Africa, United Arab Emirates, Tonga, Germany, IRENA-Secretariat.	2013 (June)	Exchange of experience and knowledge, global leadership, demonstrating example.	Purely ideational - mutual agreement. No further meeting since creation in June 2013.
German Climate and Technology Initiative (Deutsche Klima- und Technologieinitiative)	BMZ&BMUB	Diverse developing & emerging countries.	2011	Promotion of climate-friendly technologies (in which German companies do have experience) in partner countries, integrated approach of financial & technical cooperation.	Financed through emissions auctions revenue (Environment and Climate Fund, EKF) in the past. Between 2011 and 2013, 1bn euros have been granted, further budget unclear.

Initiative/Programme	Managed by	Partner/Targeted countries	Start	Objective	Resources/Instruments
Initiative for Cimate and Environmental Protection (Internationale Klima- und Umweltschutzinitiative)	BMZ	Diverse developing & emerging countries.	2008 (successor of special facility on RE and EE).	Promotion of renewable energy and energy efficiency investments through preferential loans.	Min. 250 Mio. of loans and grants per year foreseen for 2014 from financial cooperation budget (Haushaltsplan BMZ, Einzeplan 23)
Export Initiative Renewables (Exportinitiative Erneuerbare) & Project Development Programme (Projektentwicklungsprogramm)	BMWi	Target countries defined each year, based on evaluation of market opportunities for German companies, identified by dena (German energy agency).	2002	Creating, opening, strengthening export markets for German technologies, ultimate goals "creation of jobs in Germany" and "contribution to global climate protection".	13,5 Mio. budget in 2014.
Export Initiative Energy Efficiency	BMWi	Target countries defined each year, based on evaluation of market opportunities by dena. Main beneficiaries: German companies.	2007	Creating, opening, strengthening export markets for German technology, ultimate goals "strengthening German economic competitiveness" and "contribution to global climate protection".	Delegation visits and trips to potential and current export markets, market analysis. (446 measures from 2007 to 2013). 5 Mio budget in 2014. About 200 trips organized 2007-2013. Since 2007, the associated Project Development Programme, implemented by GIZ in selected countries, aims at the creation of favorable market conditions (pull factors) and awareness-raising among stakeholders.
Renewables Made in Germany	BMWi, implemented by dena.	General public, potential buyers of German equipment and business partners.	2002.	Create an easily recognizable label for German RES technology.	Informational. Label and website shall provide information on suppliers (company directory), technologies, institutions.
renewables 2004 conference	BMU and BMZ	154 countries present, over 3600 representatives.	2004	Discuss how the share of renewable energy can be significantly increased.	Joint declaration, preparatory conferences, (e.g. MENAREC 1) and follow-up conferences (IRECs in Beijing, Washington, Delhi, Abu Dhabi), creation of the REN21 network supported by Germany; gave impulse for creation of IRENA.

Initiative/Programme	Managed by	Partner/Targeted countries	Start	Objective	Resources/Instruments
Special Facility for Investment in Renewable Energy and Energy Efficiency	BMZ/KfW	Numerous developing countries.	2005-2008	Investments in renewable energy, efficiency, climate adaptation of eco-friendly transport	500 million euros of preferential loans disbursed. Initially foreseen for a period of 5 years from 2005 to 2009. Demand from partners so important that the 500 million euro budget only lasted until 2007. Was followed by IKLU.
Energy for Sustainable Development	BMZ	Energy is a sectorial focus sponsored through this programme in 24 out of 50 partner countries: Afghanistan, Egypt, Armenia, Albania, Azerbaijan, Bangladesh, Bosnia, Brazil, Georgia, India, Kosovo, Morocco, Mexico, Mongolia, Montenegro, Nepal, Pakistan, Senegal, Serbia, South Africa, Tunisia, Uganda and Ukraine.	2002	Increase access to sustainable energy in partner countries.	Dependent on partner country, overall budget in 2013 was 2bn euros, which makes energy the single largest share of BMZ budget. Between 2004 and 2011, 6 billion euros were spent on bilateral energy projects. BMZ's objective is to increase the yearly budget for energy projects to 3.6bn euros by 2030 to give 100Mio. people in partner countries access to energy. Projects mainly implemented by GIZ and KfW.
Office franco-allemand pour les énergies renouvelables (Franco-German office for renewable energies)	Initiated by BMU, now: independent association sponsored by BMWi.	Energy companies, utilities, renewable energy industry associations, Ministries.	2006	Exchange of knowledge between France and Germany, creating links between actors, translation of legislative and other texts.	Conferences, translations, provision of information. Cooperation strengthened in 2013 (50 year anniversary of Elysee treaty), initially created as “coordination point for wind energy", since 2013 "office for renewable energies.
International Feed-in Cooperation (IFIC)	BMUB	Co-founder Spain, partners Greece and Slovenia.	2005	Exchange of knowledge about FiT, feeding in knowledge about FiT into policy discussions, exchange of knowledge on FiT improvement..	Initiated at Bonn renewables2004 conference. Workshops (10 to date), few research papers on FiT. Last meeting October 2013: Discussion about RES promotion in the light of EU guidelines.

Initiative/Programme	Managed by	Partner/Targeted countries	Start	Objective	Resources/Instruments
Energizing Development (EnDev)	Multilateral	Initiative financed by the Netherlands, Germany, Norway, Australia, the UK and Switzerland	2005	Giving households and small-scale businesses in developing countries access to sustainable energy.	11 Mio. people gained access to energy services through EnDev since 2005. German GIZ acts as lead agency.
Renewables 21 (REN21)	Multilateral	General public, policy-makers and stakeholders worldwide.	2005	Publication of yearly renewables global status report, transfer of knowledge and information.	Secretariat in Paris co-managed by GIZ. Creation of REN21 pushed by BMU/BMZ as a consequence of renewables 2004 conference.
International Renewable Energy Agency	Multilateral	Over 140 signatory countries.	2009	Dialogue, transfer of information and experience on renewables, exchange of best practice.	Informational. Technical secretariat in Bonn, Germany. General secretariat Abu Dhabi. Pushed by BMU and BMZ.
EU Energy Initiative – Partnership Dialogue Facility (EUEI-PDF)	Multilateral	Focus on Africa.	2004.	Promote pro-renewables and pro-efficiency framework conditions in developing countries.	Country and regional studies, thematic studies, policy advice. Secretariat managed by GIZ. Funded by Austria, the European Commission, Finland, France, Germany, the Netherlands, and Sweden.
International Partnership on Mitigation and MRV.	BMUB	63 partner countries, co-founders are South Korea and South Africa.	2010	Exchange of knowledge on LEDs, NAMAs and MRV.	Meetings back-to-back with UN meetings. Launched in the framework of Petersberg Dialogue 2010.
Clean Energy Ministerial	US Secretary of Energy Steven Chu	23 countries representing 80% of CO2 emissions.	2009	Share best practices to promote clean energy worldwide.	Annual ministerial meetings. Germany co-chairs working group on solar and wind energy with Denmark and Spain to "promote the deployment of renewable energy worldwide".
Petersberg Dialogue	BMUB	Ministers from numerous countries.	2010	Build momentum for and complement international climate negotiations.	Yearly meetings co-chaired by Germany with hosts of next international climate conference. Take place in Germany.

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