Low-carbon strategies towards 2050: Comparing ex-ante policy evaluation studies and national planning processes in Europe

Mariësse A.E. van Sluisveld, Andries F. Hof, Detlef P. van Vuuren, Pieter Boon, Patrick Criqui, Felix C. Matthes, Jos Notenboom, Sigurd L. Pedersen, Benjamin Pflüger, Jim Watson

A Copernicus Institute of Sustainable Development, Utrecht University, Utrecht, The Netherlands
b PBL Netherlands Environmental Assessment Agency, The Hague, The Netherlands
c GAEL-EDDEN, Laboratoire Économie du développement durable et de l’énergie, Grenoble, France
d CNRS, Centre National de la Recherche Scientifique, Paris, France
e Öko Institut, Berlin, Germany
f Danish Energy Agency, Copenhagen, Denmark
g Fraunhofer-Institut für System- und Innovationsforschung (ISI), Karlsruhe, Germany
h UK Energy Research Center (UKERC), London, United Kingdom
i Science Policy Research Unit (SPRU), University of Sussex, Brighton, United Kingdom

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ABSTRACT

The European Union (EU) is committed to reducing its greenhouse gas (GHG) emission levels by 80%–95% in 2050 compared to 1990 levels. Various approaches have been developed to secure and evaluate the progress made towards this objective. To gain insights into how EU Member States are aligning to this collective long-term objective, we systematically compare the planning and ex-ante evaluation processes for five EU countries (respectively Denmark, France, Germany, the Netherlands and the United Kingdom). The comparative analysis consists of a qualitative comparison of (1) the governance of long-term policy planning and evaluation processes, (2) the national arrangement for quantitative (model-based) ex-ante policy evaluation and (3) the national arrangement for qualitative ex-ante policy evaluation (stakeholder participation). In a second step we conduct a quantitative comparison of national model-based ex-ante evaluation studies to assess the relative differences between the considered routes and the differences across the various countries. Although the five Member States plan policies along the same EU objective, we find a high diversity in how long-term commitments are established, governed and evaluated on the national level. Model-based scenario analyses are commonly used to explore and evaluate the possible national routes towards the EU 2050 objective. However, as these processes mostly concentrate on domestic action, they pay little attention to how domestic policies are affected by, or affecting, other international activities throughout Europe. Hence, current findings suggest that cross-border collaboration and stakeholder participation could further strengthen the analytical understanding of required transformative change in Europe and subsequently lead to a more durable long-term solution over time.

1. Introduction

The European Union (EU) is committed to reducing its greenhouse gas (GHG) emission levels by 80%–95% in 2050 compared to 1990 levels. In order to track the progress of Member States in mitigating their GHG emissions, the EU has established various regulations and reporting obligations to monitor the current trends (ex-post evaluation) and provided guidelines to articulate on prospective trends (ex-ante evaluation) (EC, 2004). Most of the established monitoring and reporting practices have been oriented towards the documentation of (national) GHG emissions and the implementation of the Kyoto Protocol (European Union, 2013). However, since the adoption of the ‘2020 Climate and Energy package’ in 2009 (European Union, 2009a,b,c), which introduced new policies and legally binding legislations for the year 2020, new challenges for monitoring and reporting have arisen. For example, the EU Renewable Energy Directive (RED), as one of the new policies in the ‘Climate and Energy package’, has been translated into various National Renewable Energy Action Plans (NREAPs), which...
outline the considered routes towards realising the national renewable energy ambitions by 2020. Likewise, Member States have adopted national (non-binding) commitments on total primary or final energy consumption as part of the EU Energy Efficiency Directive (EED) (EEA, 2014). As a result, these specific ambitions and commitments have been monitored and evaluated over time.

As these targets for 2020 need to be seen in a broader context of meeting long-term ambitions, such as the pledged commitments for 2030 (GHG emission reductions of 40% compared to 1990) (European Commission, 2014), 2050 (GHG emissions reductions of 80%–95% compared to 1990) or the end of the century (well below 2 °C) (European Commission, 2011), the planning, coordination and documentation efforts of both the EU and the Member States need to be improved. This is acknowledged in the EU 2030 framework (European Commission, 2014), in which the European Commission proposed a new governance scheme to enhance the insights into the alignment of Member States to various long-term objectives (European Commission, 2016). Hence, along the EU 2030 framework, the EU has established the ‘Energy Union’ to streamline and integrate the various co-existing policy frameworks into one cohesive strategy. As part of this, Member States are asked to prepare national energy and climate plans with quantified detail towards 2030 and a more in-depth perspective towards 2050. These plans are intended to warrant the consistency of national commitments to the various long-term EU policy objectives (European Commission, 2015).

Given the overall recent nature of planning towards 2050 on the national level, we present an overview in this paper of the various activities undertaken by the EU Member States to steer towards this goal. As such, the main research questions of this study are as follows:

- How are ex-ante planning and evaluation processes organised across different European countries?
- Are existing representative national scenarios consistent with the long-term European policy objective for 2050?

We focus on five EU Member States (respectively Denmark, France, Germany, The Netherlands and the United Kingdom) which together account for 52% of total GHG emissions in the EU in 2014 (EEA, 2016). As such, the collective movement of these governments is considered important in the light of meeting the EU 2050 objective. Given how several north-western European countries have driven the EU climate policy agenda in the past (e.g. Germany and the United Kingdom) (Jordan and Liefferink, 2004), it provides an experience base to which other countries can be compared and contrasted.

## 2. Methodology

### 2.1. Qualitative evaluation of national long-term planning and evaluation processes

To qualitatively evaluate how long-term planning processes for climate and energy policy have been embedded in various national policy contexts, we draw a typology based on three elements that have been recognized in political science literature as contributing to lasting policy stability (see Hovi et al. 2009, p.29). These three elements are interpreted in this study as (1) the institutional and procedural arrangements for long-term planning, (2) the national arrangement for quantitative (model-based) ex-ante policy evaluation and (3) the engagement of (public) stakeholders in national planning or evaluation processes. To frame the selected countries along this typology we have drawn insights from literature, extracting information from national and European policies and regulations or research papers on long-term policy evaluation. Additional insights have been drawn from an expert workshop inviting national policy makers and experts familiar with policy planning and ex-ante policy evaluation processes (van Sluisveld et al., 2016).

### 2.2. Quantitative evaluation of ex-ante (model-based) policy evaluation

Various tools are available to assess the appropriateness of long-term strategies in a consistent and quantitative manner, ranging from very simple tools (e.g. checklists, decisions trees) to very complex tools and methods (e.g. cost-benefit analysis, risk analysis and scenario analysis via computer-based models linking empirical relationships in mathematical formulas) (Nilsson et al., 2008). As model-based scenario analysis has been the most frequently used method in climate policy assessment (Wei et al., 2015), we compare a variety of existing model-based scenario studies to evaluate the planned policy directions across the five EU Member States.

We distinguish between two types of model-based scenario analysis types; those designed to study the developments on a national level (national model-based scenario studies) and those designed to study national developments in a broader European context (European model-based scenario studies). The former category can represent the long-term perspective of a single EU Member State in great detail, whereas the latter category can employ a consistent evaluation method across the full range of EU Member States. In the following sections we will describe both categories in more detail.

#### 2.2.1. National model-based scenario studies

As quantitative ex-ante evaluation studies in line with the national 2050 ambitions are yet to be submitted within the context of the Energy Union, we draw insights from existing model-based scenario studies. For practical reasons, we have selected one representative national model-based study per country. To warrant the representativeness of these studies, we have specifically selected studies that (1) are conducted relatively recently, (2) include one or more policy scenarios in line with the EU 2050 ambitions and (3) could be regarded as studies with a high formal status (authoritative) in each country (see Table 1 for an overview).

For **Denmark**, we have selected the multi-pathway assessment of the Danish Energy Agency (2014). Studies by the Danish Energy Agency (DEA) can be considered as authoritative, as national model-based analyses by the DEA are usually subjected to approval processes that involve the minister and various stakeholders and research institutes. Moreover, all scenarios in this study aim for a fossil-fuel independent energy system, which is consistent with the current policy direction of Denmark.

For **France**, we focus on the four marker scenarios that have been identified during the National Debate on the Energy Transition (DNTE) in 2013 (Grandjean et al., 2014). The marker scenarios represent four stylised pathways that meet the French GHG emission reduction target of 75% by 2050. The scenarios differ in focus on how the French energy system is to be transformed (varying in terms of high and low energy

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دریافت فوری متن کامل مقاله

امکان دانلود نسخه تمام متن مقالات انگلیسی
امکان دانلود نسخه ترجمه شده مقالات
پذیرش سفارش ترجمه تخصصی
امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
امکان دانلود رایگان ۲ صفحه اول هر مقاله
امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
دانلود فوری مقاله پس از پرداخت آنلاین
پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات