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# Security, justice and the energy crossroads: Assessing the implications of the nuclear phase-out in Germany



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## HIGHLIGHTS

- We develop the *Energy Crossroads* framework as a means to analyse the *Energiewende*.
- The strategy's short and medium term concerns focus on the security of supply.
- Long term goals are driven by aspects of environmental justice.
- Targeted development of national FiTs is needed alongside a functioning carbon market.

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## ABSTRACT

The nuclear melt-down in Fukushima resulted in diverging energy policy decisions across the world where Germany decided to opt out of nuclear electricity production. Yet, the government's decision-making framework for energy policy decisions does not accurately reflect important drivers for the strategy change. This paper presents the *Energy Crossroads* framework as a more comprehensive tool to analyse the drivers and impacts of the nuclear phase-out. 20 expert interviews were performed across business participants as well as policy makers in the national and international energy context. Results show that Germany has adopted an environmental justice, rather than energy security, stance in their nuclear phase out policy, with significant long-term consequences.

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## 1. Introduction

The nuclear meltdown in Fukushima dramatically demonstrated the social, environmental and economic risks involved in an energy strategy relying on nuclear technology. Within days after these events, the German government decided to phase-out all its nuclear electricity capacity by 2022, and the 8 oldest of Germany's 17 nuclear power plants (NPPs) were immediately put out of operation. This phase-out constitutes part of the overall energy strategy called "*Energiewende*" (translated: energy turnaround), which sets out the goal of increasing the share of renewables within the electricity mix, to reduce oil and gas imports, contribute to the mitigation of climate change, as well as terminating the reliance on nuclear electricity generation (BMW, 2014).

We propose a new framework of analysis, which captures the

impacts of the *Energiewende* with regards to energy security, economic, social and environmental dimensions more accurately than the frameworks currently used. It does so by extending the current decision-making framework used by the government in the context of the *Energiewende* by including a social sphere, allowing for an overall more accurate impact assessments of energy strategy decisions. Further, by taking a broad perspective on impacts emerging from the *Energiewende*, the investigation goes beyond existing research, as it identifies and acknowledges the reciprocal relationship across the dimensions.

## 2. Conceptual framework: The energy crossroads

Within the context of an effective transition towards a renewable energy future, involving the disengagement of nuclear energy, German political discourse is dominated by the energy policy triangle (SPD, 2011) similar to the energy trilemma notion (Gunningham, 2013). This consists of three aspects: (1) energy security, (2) economic feasibility and (3) environmental

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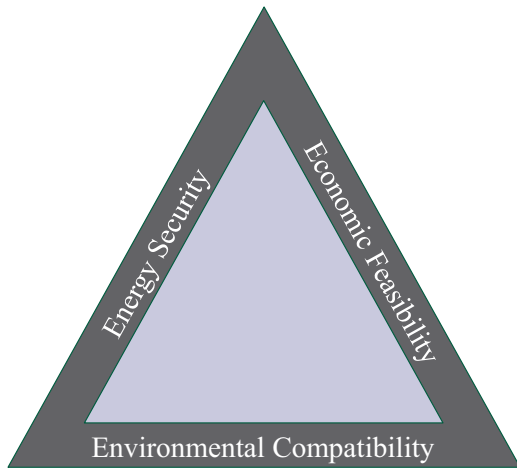


Fig. 1. Original energy policy triangle. Source: Adapted from SPD (2011).

compatibility as seen in the triangle represented in Fig. 1. The triangle is used by the German government as a guiding principle for decision-making and is driving energy policy decisions (Mahnke, 2013). The geometrical properties of the energy policy triangle, where sides are of equal length and angles are of equal size, shape an image which suggests that the same weighting of importance is devoted to the different aspects within the triangle, as declared explicitly in the coalition contract between the two ruling parties (CDU/CSU & SPD, 2013). Governments and energy companies across Europe are using the triangle within their strategic documents (EC, 2007, 2012; BDEW, 2009; RWE, 2014; E.ON., 2006). The phase-out of nuclear energy after the events in Fukushima in 2011 was driven by the social and environmental risks of nuclear technology pointed out again by the Fukushima incident. Four years later, experts still discuss the energy security implications of the phase out. This might suggest that some aspects of the triangle were prioritized when others were neglected in haste. Furthermore, longstanding public opposition seems to have influenced the decision (Goodfellow et al., 2011). To analyse the driving dimensions of the policy decision to phase out nuclear, an adaptation of the framework is required to develop a clearer picture.

The new energy strategy pursued by Germany moves from a rather centralized energy production by few, large power plants to a decentralized strategy, consuming more physical space and therefore affecting more people directly as well as impacting more upon the natural environment. Following this reasoning it comes as a surprise that the triangle, used to guide energy policy decisions, does not explicitly contain a social dimension.

This social dimension is critical to the decision to phase-out nuclear energy. Germany has a long-standing history of social movements against nuclear energy. Peaceful protests in Wyl led to the cancellation of the NPP construction plans. Other less peaceful protests also contributed to shape German public opinion and discussion over time. In 1983 anti-nuclear opinion effectively led to the first election of the Green party into Parliament, where their foremost goal was to abandon nuclear electricity production in Germany (Glaser, 2012; Schreurs, 2012). Another contributory factor is the active participation and public involvement in the Energiewende. Already in 2010 about 40% of the German renewable energy capacity was owned by members of the public (Trendresearch, 2011). At the same time the decision for the nuclear phase-out in favour of more RES reduces the oligopolistic power over electricity production of the “big 4” energy companies in Germany. Thus, energy policy must seek to actively encourage greater public participation.

The ethics commission on safe energy provision was convened by the German government to assess ethical and technical aspects of the nuclear phase-out and to suggest measures for the transition to more renewable energy solutions. The commission found that increased public involvement in both planning as well as participation in the final technological solutions is key for a successful Energiewende. Members of the public have multiple roles here. In their role as consumers they are to increasingly demand efficient energy solutions and services to foster a reduction of electricity needed. Furthermore they are encouraged to strengthen their role of co-producers of electricity both at home, and in participating in municipal energy systems (Ethics Commission, 2011). These roles reinforce the importance of the social dimensions within the Energiewende.

For these reasons Knopf et al. (2011) add a fourth dimension of *societal acceptance* to the triangle. While this attempts to include social measures, it is rather inaccurate as societal acceptance can stem from other factors like economic or contextual reasons, not necessarily touching upon issues of social justice.

The original energy policy triangle as well as the alteration by Knopf et al. (2011) neglect to sufficiently account for political decisions from either governments or companies. The desire to achieve all aspects in the triangle is laudable, and yet, rather naïve. Energy policy involves inescapable choices. We explore here a central dichotomy between prioritizing energy security or environmental justice concerns (as set out in Fig. 2). The conceptual novelty of this framework is indeed the implication that energy policy is often pursued in either a security or justice direction, sometimes in spite of the best intentions of policy actors. As we explore in this paper, such prioritizations often change over time. With regards to the dimension of energy security, this study focuses on the security of electricity supply, as the Energiewende and the nuclear phase-out primarily imply a change in the electricity system. There is a wide range of definitions of energy security within the literature (see Sovacool and Saunders, 2014), assuming different scopes for energy security whilst representing the complexity as well as the contextual nature of energy security. Kruyt et al. (2009) define energy security as *availability, accessibility, affordability and acceptability* of energy, combining all aspects covered by the extended energy policy triangle into one concept.

The four A's of Kruyt et al. (2009) are, however, from the perspective of energy security. This leads to an over-prioritization of security of supply and economic viability concerns. Environmental justice allows us to question more thoroughly issues of social acceptance and environmental compatibility. We often assume government decisions are made upon the realpolitik hardheaded decisions of finance and resources. We argue below that the German government has adopted a more environmental justice stance towards nuclear energy, and indeed the Energiewende. Environmental justice is “based on the principle that all people have a right to be protected from environmental pollution and to live in and enjoy a clean and healthful environment” (Agyeman and

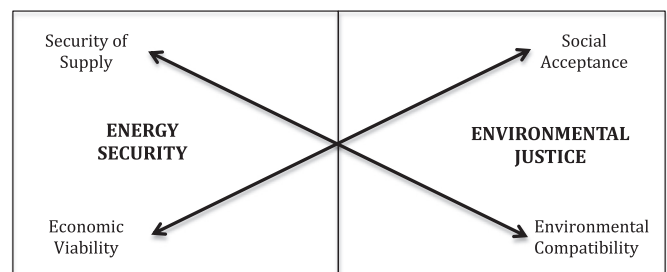


Fig. 2. The energy crossroads.

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