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## ***SOCIAL ACCEPTANCE AND ENERGY PATHWAYS: DEVIATIONS OF PUBLIC OPINION AND ENERGY TARGETS***

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### **(1) Overview**

Many countries in the EU aim to transform their energy supply towards a more sustainable system. However, considerably different pathways are taken by the countries in the EU, e.g. some countries are continuing the use of nuclear power and want to enhance their nuclear portfolio (e.g. Great Britain), while other countries want to phase out nuclear power generation in a short period (e.g. Germany). One major reason for different preferences of transition pathways in the respective countries is the public opinion and the level of acceptance. For the case of Germany, our study aims to evaluate proposed pathways for the electricity system by the German Government with respect to the acceptance of the population in Germany.<sup>1</sup> Thereby the study emphasize acceptance on a total system perspective, which is in contrast to the focus of most acceptance studies concentrating on acceptance on a local level for a specific technology (e.g. wind power plants or transmission lines).

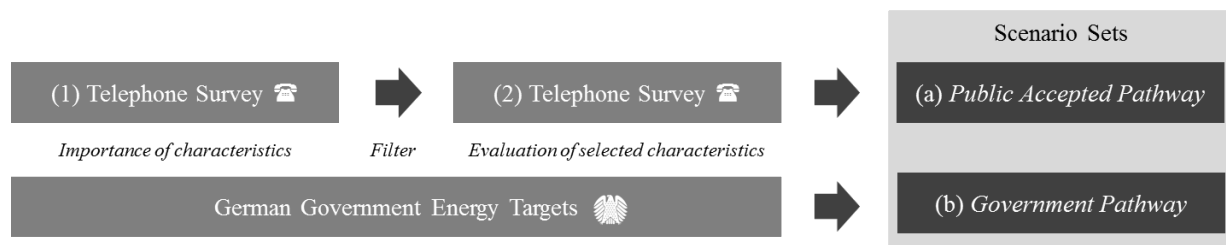
The study consists of three parts. In the first part, we utilise a two-step telephone survey design to determine a pathway with high acceptance by the German population. In the second part, we make use of electricity market modelling in order to assess important acceptance factors for the derived acceptance optimized pathway and for the proposed pathway by the German Government. Finally, both pathways are compared and possibilities for improving the German energy transition targets with respect to acceptance issues are discussed.

### **(2) Methods**

For the study, a two-step survey design is used to discover variability over time and to derive a preferred electricity supply pathway for the German population:

- (1) The first survey is used to filter the most important characteristics of an electricity supply system (October to November 2013, n=1,006). In total twelve characteristics or rather acceptance factors for the energy policies of economic efficiency, security of supply, and environmental stability are ascertained.
- (2) In the second survey, a qualitative assessment of the most important characteristics as well as the willingness to pay for a future electricity supply system is conducted (February to March 2014, n=1,012).

In order to gain a representative picture of the public opinion in Germany, telephone surveys based on random sampling methods are applied in the study. Further, a factorial weighting procedure is used to reduce differences between the sample and the demographic structure of the German population.



**Figure 1: Derivation of Scenario Sets**

While the results of both surveys are used to determine the first scenario set (a) *Public Accepted Pathway*, the second scenario set is derived by publications of the German Government (b) *Government Pathway*. The applied derivation process is illustrated in Figure 1.

<sup>1</sup> A minimum level of public understanding with respect to the energy transition discussion in Germany can only be assumed for the electricity sector. Therefore, the study is limited to the consideration of the electricity sector.

In order to gain a consistent comparison base for both scenario sets with respect to costs and emissions, the model ELTRAMOD is applied for a time period to 2030 (Müller et al., 2013). ELTRAMOD is a bottom-up electricity market model with a temporal resolution of 8,760 hours, which optimizes the cost-minimal generation dispatch for Europe as well as additional investments in power plants and storage facilities for Germany. Capacities for the remaining European countries are set as exogenous parameter for this analysis. The international exchange of electricity between European countries is presented in ELTRAMOD by a net transfer capacity approach (NTC flow based).

### **(3) Results**

The first survey (1) reveals that low levels of local emissions, global emissions, electricity costs for households, technology risks as well as a secure power supply and the availability of raw materials are evaluated as the six most important characteristics of an electricity supply system (Schubert et al., 2014).

The second survey (2) focus on qualitative evaluation of a preferred electricity system with respect to the most important characteristics – except of secure power supply, which is assumed as given, and electricity costs, which are evaluated on a quantitative basis. The survey discloses that more than fifty percent of the German population is in favour for strong reductions of local and global emissions as well as a significant increase of renewable power generation. Further, more than three quarter of the population oppose the further usage of lignite and nuclear power production. The willingness to pay of the population for such a transition pathway is stated average ten percent above today's prices for electricity and sets the limitations for the financial acceptance.

The results of the survey are the base for the first scenario set (a) *Public Accepted Pathway*, which assumes a phase-out of lignite power generation and has more ambitious transition targets than the second scenario set (b) *Government Pathway*.

### **(4) Conclusions**

The study presents differences between a *Public Accepted* and the *Government Pathway* in Germany. It also points out the challenge to meet the accepted willingness-to-pay for further development towards a sustainable electricity supply. The public support for the energy transition based on a total system perspective will be the necessary requirement to overcome the resistance on a local level for infrastructure projects. Therefore, policy makers should consider adjusting energy transition targets and pathways in order to achieve a higher approval of the public for the transition project.

### **(5) References**

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### **(6) Acknowledgement**

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