

Energy reference forecast and energy policy targets for Germany

Christian Lutz^{1,*}, Dietmar Lindenberger², Michael Schlesinger³, Christian Tode²

¹ *Gesellschaft für Wirtschaftliche Strukturforchung mbH, Osnabrück, Germany*

² *Institute of Energy Economics at the University of Cologne, Germany*

³ *Prognos AG, Basel, Switzerland*

** Corresponding author: Dr. Christian Lutz, Gesellschaft für Wirtschaftliche Strukturforchung mbH,
Heinrichstr. 30, 49078 Osnabrück, Germany,*

Phone: +4954140933120, Fax: +4954140933110, E-mail: lutz@gws-os.com

Paper for the 14th IAEE European Conference, October 28-31 2014 in Rome, Italy

Abstract

1 Overview

Based on international studies and a market forecast of probable energy industry development a reference scenario up to the year 2030 has been developed for Germany, complemented by a trend scenario extending out to the year 2050. Because most of the targets of the German energy concept will not (fully) be achieved in the reference and trend scenario, an additional target scenario is developed.

2 Methods

Scenarios are implemented in a set of models, a bottom-up model of the European electricity market, a set of detailed bottom-up models of final energy consumption in Germany, and a macroeconomic top-down model for Germany. The differences between the reference forecast / trend scenario and the target scenario are analyzed in view of their effect on macroeconomic variables.

Five sensitivity calculations are used to test how differing prices for fossil fuels, alternate assumptions about cost developments of renewable energy technologies, and higher CO₂ prices would affect key results.

The forecasts developed in this project as well as the scenarios are subsequently compared to current forecasts and scenarios prepared by third parties.

3 Results

In the reference / trend scenario energy-related greenhouse gas (GHG) emissions will decrease significantly. The reason for this is declining primary energy consumption and its

associated GHG intensity, which falls over the long term. Deployment of renewables and energy efficiency contribute to reducing emissions.

The target scenario shows what would be required in order to attain the energy and climate protection objectives defined in the energy concept. In the medium term the implementation of the target scenario could be handled economically; in the longer term it would have rather favorable effects.

The relations of the reference forecast and trend scenario are valid with regard to the changed assumptions in the sensitivity analyses.

4 Conclusions

The reference scenario provides a comprehensive look forward. From the view of the authors it presents probable future energy industry developments, and considers further stringent energy and climate protection policies as well as existing barriers to their implementation.

An essential prerequisite for reaching the energy and climate protection targets is efficient energy use. The increase in energy efficiency often requires investment in energy-saving technologies.

New and further developed technologies for the use and conversion of energy are the keys to increasing energy efficiency, and to the cost-effective expansion of the use of renewables.

Policy targets will only be reached, if climate protection targets are pursued as top priorities, and political solutions are found for overcoming existing barriers. This is not the most probable development.