

## **Restructuring the German electricity market with new energy and environmental policies using LEAP model.**

The German Government set itself ambitious targets for energy and climate policy with the introduction of an Energy Concept in 2010. First, greenhouse gas emissions are to be cut by at least 80 % up to 2050 compared to 1990 levels. Second, renewables are to supply 80% of electricity as opposed to the 80% of electricity currently derived from fossil fuels and nuclear energy. Third, energy consumption is to be reduced by 25% up to 2050 as compared to 2008, which should already be down 10% by 2020 and energy efficiency increased at different levels. Final energy consumption in the transport sector is to be reduced by around 40% by 2050 compared to 2005. On the other hand, Germany currently imports 88% of its gas needs and 98% of its oil needs, making it heavily dependent on energy imports. In addition, due to the Fukushima disaster, Germany decided to abandon nuclear energy altogether by 2022. This faster withdrawal from nuclear power requires the swifter implementation of the far-reaching measures defined in the Energy Concept to restructure the energy system. Above all, energy policy needs to address climate change because energy consumption in Germany accounts for some 80% of greenhouse gas emissions. For the restructuring of the energy system to be successful, necessary action must be taken in all the key areas, including measures to accelerate grid expansion, boost energy efficiency or promote investment in energy research. This thesis study will focus on the above mentioned areas and develop different scenarios using the LEAP energy model to find correct future sustainable energy pathways.