Energy Research & Scenarios

## Exploring energy markets – enhancing decisions.

TIGER

The model

TIGER is a simulation model of the European gas supply. The model is an excellent tool to analyze trade flows of natural gas under the restrictions of current or future gas infrastructure. TIGER simulates pipelines, natural gas storages, LNG regasification terminals and the corresponding interdependencies while minimizing total system costs. The results can be derived on a monthly or daily basis.

Currently, 40 countries are considered in TIGER. The European infrastructure data is stored in the geocoded data base of ewi ER&S and is updated on a regular basis. Based on the geocoded information, a fast visualization of results is possible.
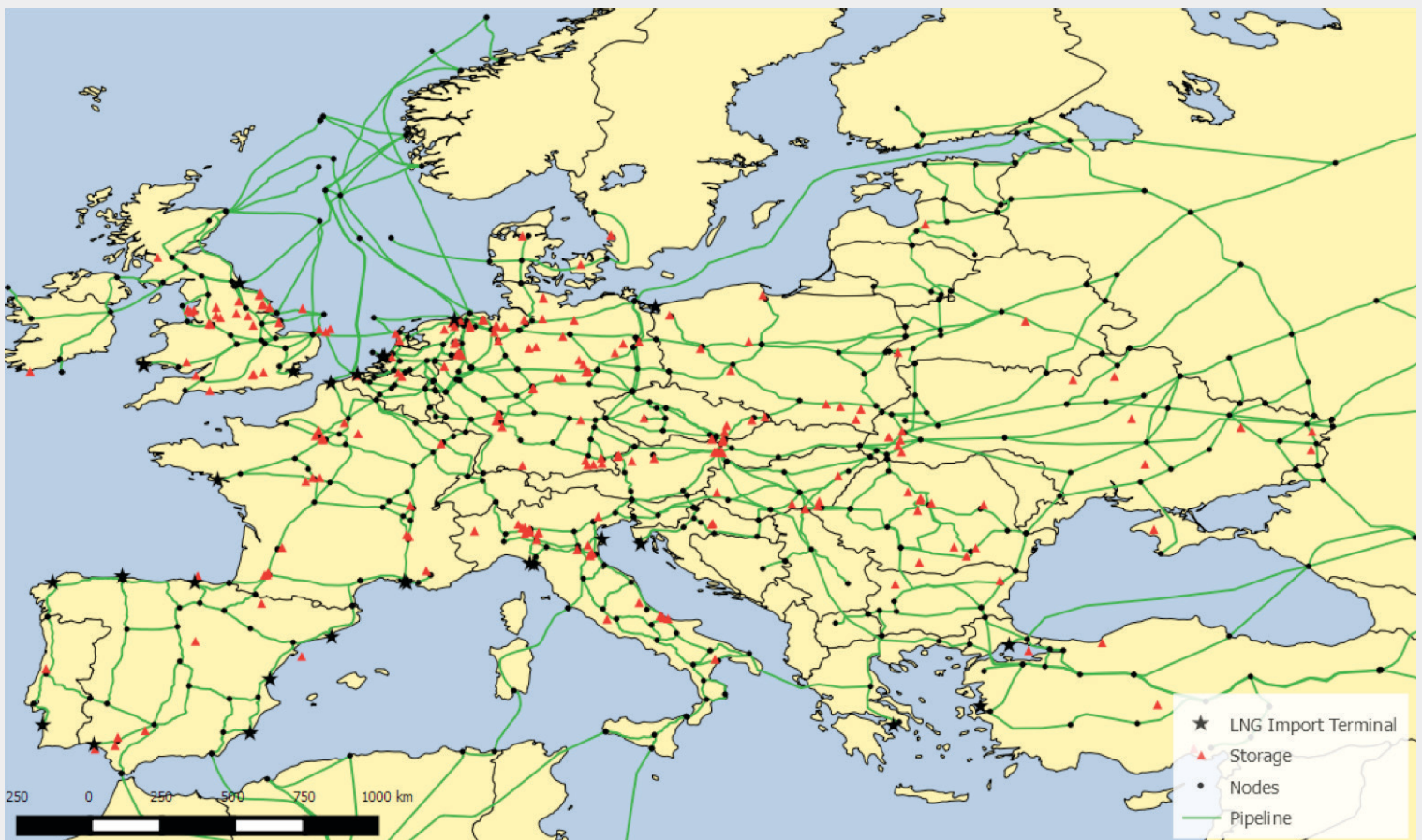
The model was developed in 2007 through an internal research project and continues to be applied in many research and consulting projects.

Highly detailed modelling of the European infrastructure is possible with TIGER as it accounts for

- 40 countries in Europe or neighboring Europe, represented by more than 600 nodes
- More than 900 pipeline sections between nodes
- More than 200 natural gas storages with type specific injection / depletion profiles
- More than 30 existing and potential LNG import terminals

Furthermore, long-term contracts as well as entry-exit tariffs between hub regions are included in the model.

TIGER – Precise Simulation of European Gas Flows

Applications of the model

Infrastructure Occupancy Rates

TIGER simulates the economically optimal, physical and traded natural gas flows. Based on the optimal flows, existing and potential bottlenecks in the pipeline grid can be identified. Furthermore, the usage of natural gas storages and LNG terminals is included in the model output.

Scenario Analyses addressing Security of Supply

TIGER enables analyses examining the security of supply of the European natural gas markets. For instance, unforeseen developments such as a cold spell or the failure of a supplier or of an infrastructure element can be simulated. The effects on the gas supply can be quantified.

Price Estimators

One output of TIGER is the relative price estimators of European gas hub prices. Price differences in space and time can be consistently derived.
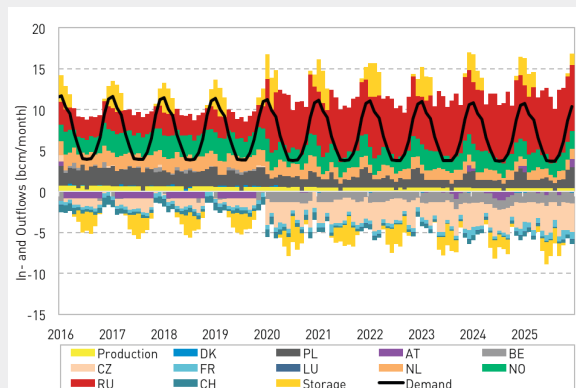

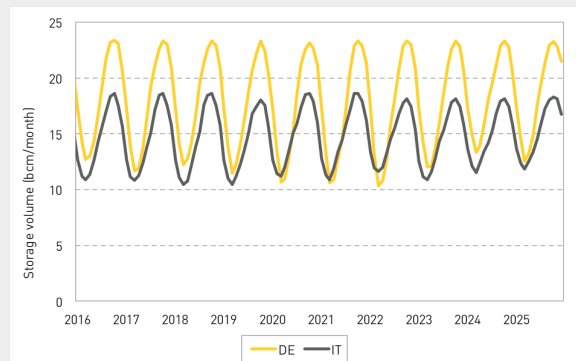**Figure 1:** Gas Balance for Germany (monthly simulation)

Figure 2: Natural gas storage usage for selected countries (monthly simulation)
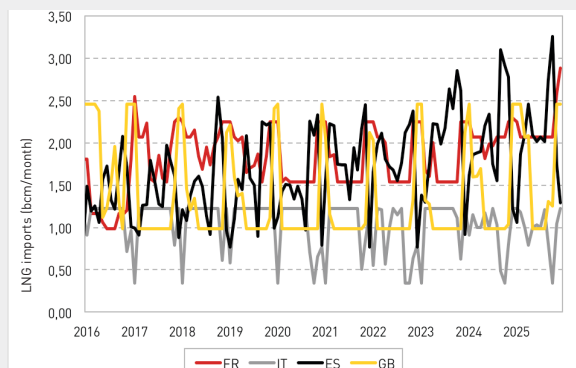

Figure 3: LNG imports in selected countries (monthly simulation)