Tulipa Energy Model

TulipaEnergy

Open Modelling, Better Decisions

Tulipa is an open-source tool for modelling and comparing European-scale energy systems.

Through cutting-edge research into more efficient and flexible modelling techniques, Tulipa can tackle problems that are too large and detailed for other tools – unlocking analyses once thought impossible. As the energy transition grows in complexity, decision-makers need transparent, innovative tools like Tulipa to inform robust decisions in an uncertain world.

What questions can Tulipa answer?

Tulipa can help answer questions such as:

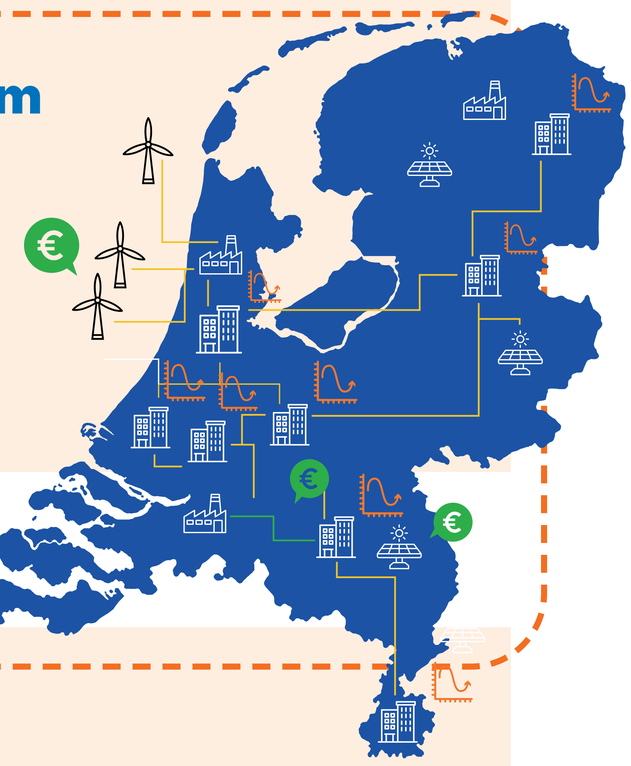
- How much flexible energy supply and demand is available? How much may be needed in the future?
- How could different investment decisions impact the balance and generation mix of the energy system?
- Where could there be grid congestion in the future? How would placing [technology] at [location] impact congestion?
- How would different policy targets influence investment and dispatch decisions?
- How would a future energy system handle different weather patterns and extreme events (such as dunkelflaute)?

What is *energy system optimization*?

In energy system optimization there are two problems: the investment (or expansion) problem and the dispatch (operations) problem.
By comparing a base 'most likely' scenario to alternative 'what if' scenarios, we can see the impact of policies and decisions on outcomes such as energy costs, renewables usage, storage requirements, and grid congestion.

Investment problem

How should we **build-up** the energy system to balance supply and demand, for the minimum cost?

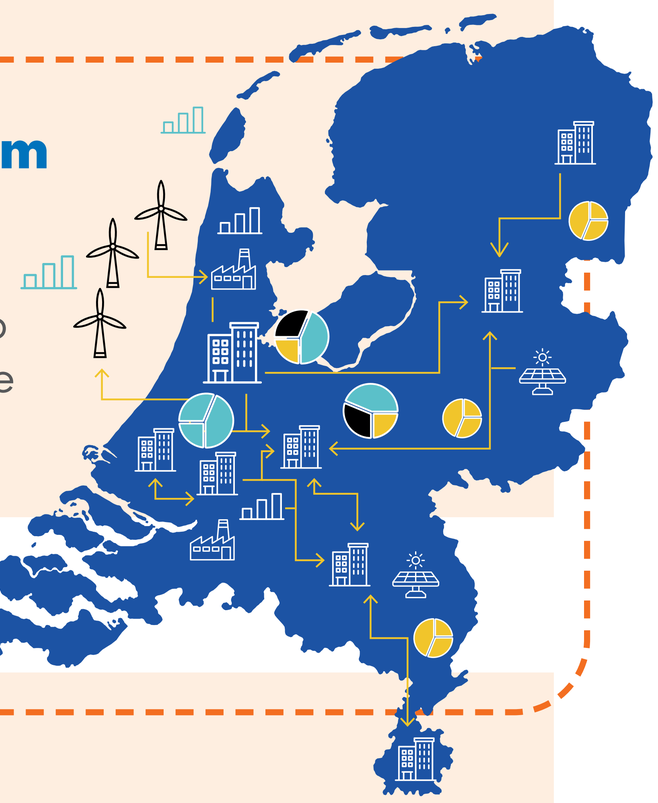


Input
Current System
Future Demand
Options

Output
New system
Investments

Dispatch problem

How would an energy system **function** throughout the year to satisfy demand, for the minimum cost?



Input
New system
Weather
Demand

Output
Operations
Costs

Partners

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