Innovation is key for the TSO of the future

Innovation in threefold: technical - social - system

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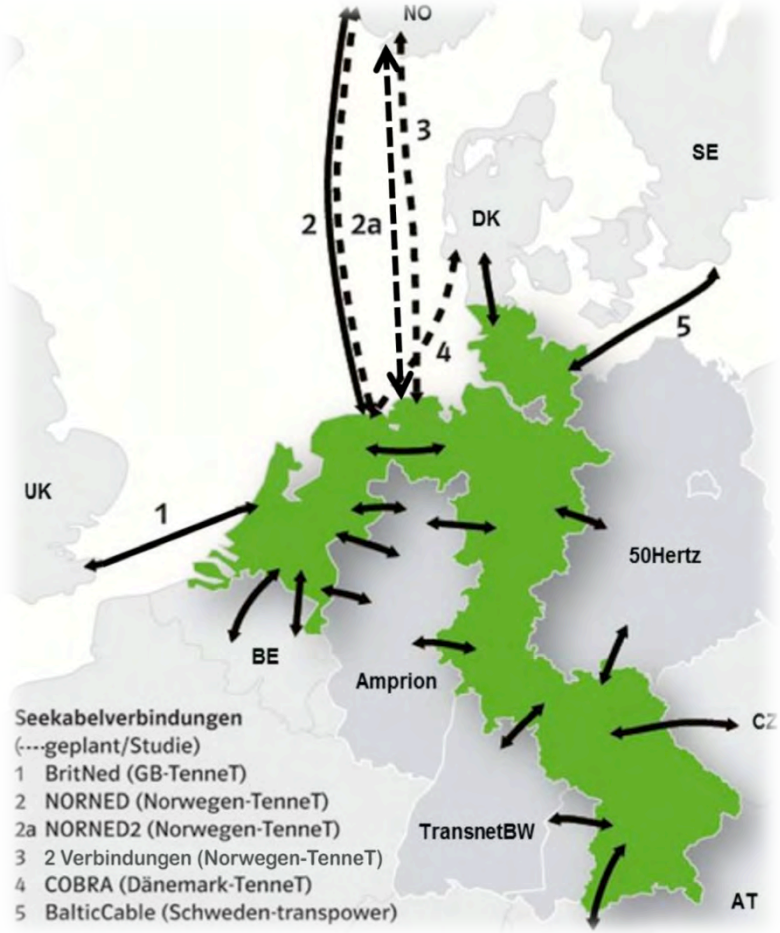
Taking power further

TenneT – EU's first cross border TSO

- Grid 20.800 km (110 - 380 kV)
- Connecting 36 mln consumers
- Turnover 1.8 bn.€
- EBIT 362 mln.€
- Assets 10.3 bn €
- Staff 2.300
- Investing 13 bn

  (next 10 yrs for market integration and integration RES



Technical innovations: Wintrack towers

- Reduce the width of magnetic fields
  (60% less compared to conventional towers)
- Minimalistic design, less impact on landscape

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Technical innovations: cabling 380kV

- Applying 20 km of 380kV underground cable is state of the art… and the world is watching with great interest!
- Cooperation with europacable

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Joint paper on underground cabling

Partial undergrounding complementing EHV overhead lines to accelerate grid extensions: the EnLAG opportunity!

Joint position paper of TenneT and Europacable

Introduction

Grid extensions define the success of Germany's "Energiewende". According to the German "Netzentwicklungsplan", more than 4.000 km of new Extra High Voltage (EHV) power transmission lines will have to be built and more than 4.000 km will have to be refurbished by 2022 – a distance from Berlin to Tokyo. So far, we haven't even reached Warsaw.

Quicker permitting procedures, thorough planning and higher acceptance by residents are the most important cornerstones for acceleration of grid extensions. Widening the range of technical possibilities for power transmission lines – including different tower designs and partial undergrounding – can offer an important contribution. It is for this reason that TenneT and Europacable jointly strive to enable partial undergrounding as a technical standard option.

Specifically, we endorse:

- **The appropriate deployment of partial undergrounding in sensitive areas in the context of an accelerated realization of EnLAG pilot projects;**
- **The creation of an evaluation programme for partial undergrounding accompanied by independent scientific experts;**
- **The creation of framework requirements for partial undergrounding for future projects of the German transmission grid following the completion of the evaluation programme.**

Example of Landscape integration plan

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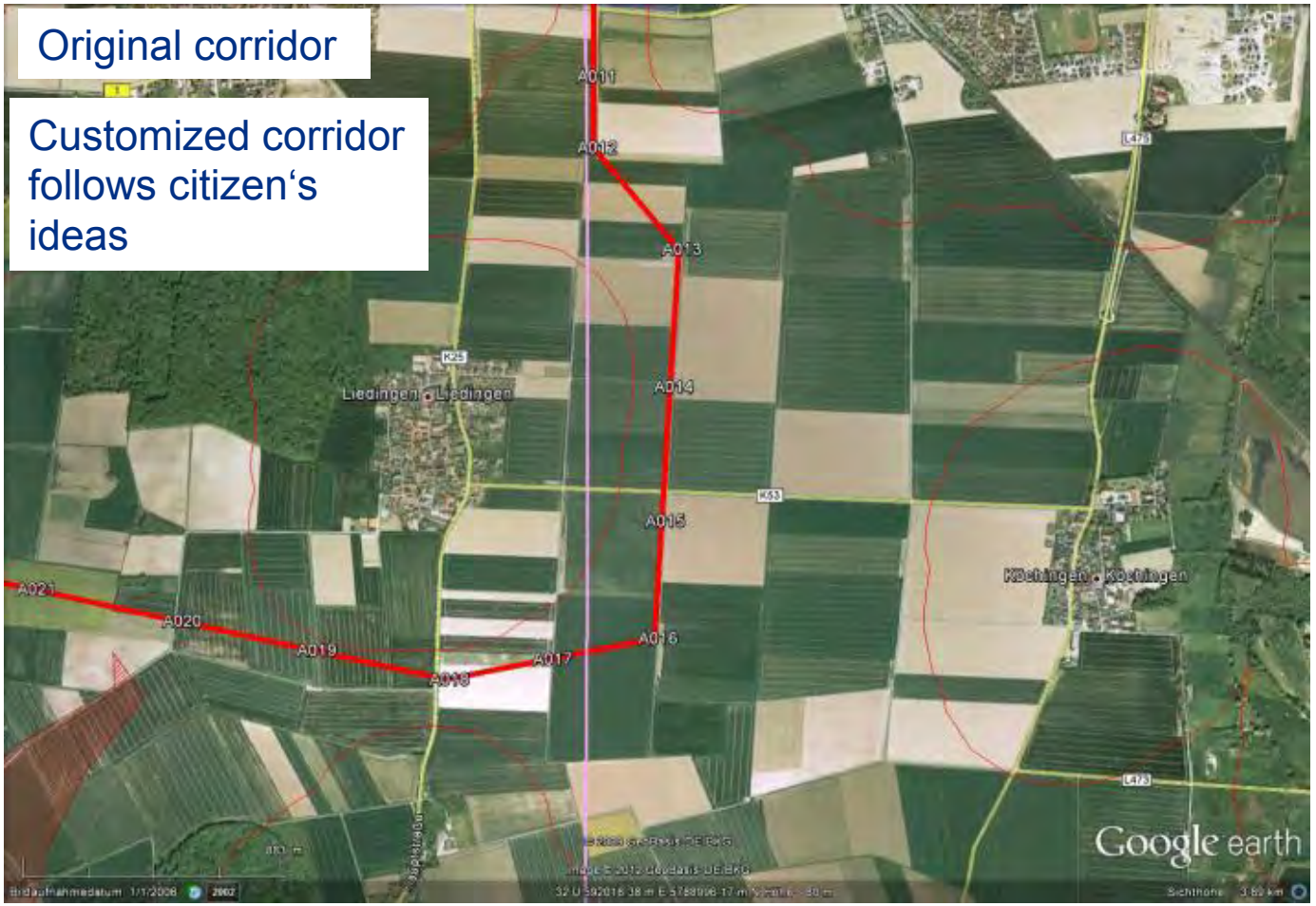
Five guidelines for a sustainable market design

See some extra slides

Dialogue process Wahle-Mecklar

- Involving people early into planning process
- TenneT checks 450 km alternative corridors for a 230km line – example:



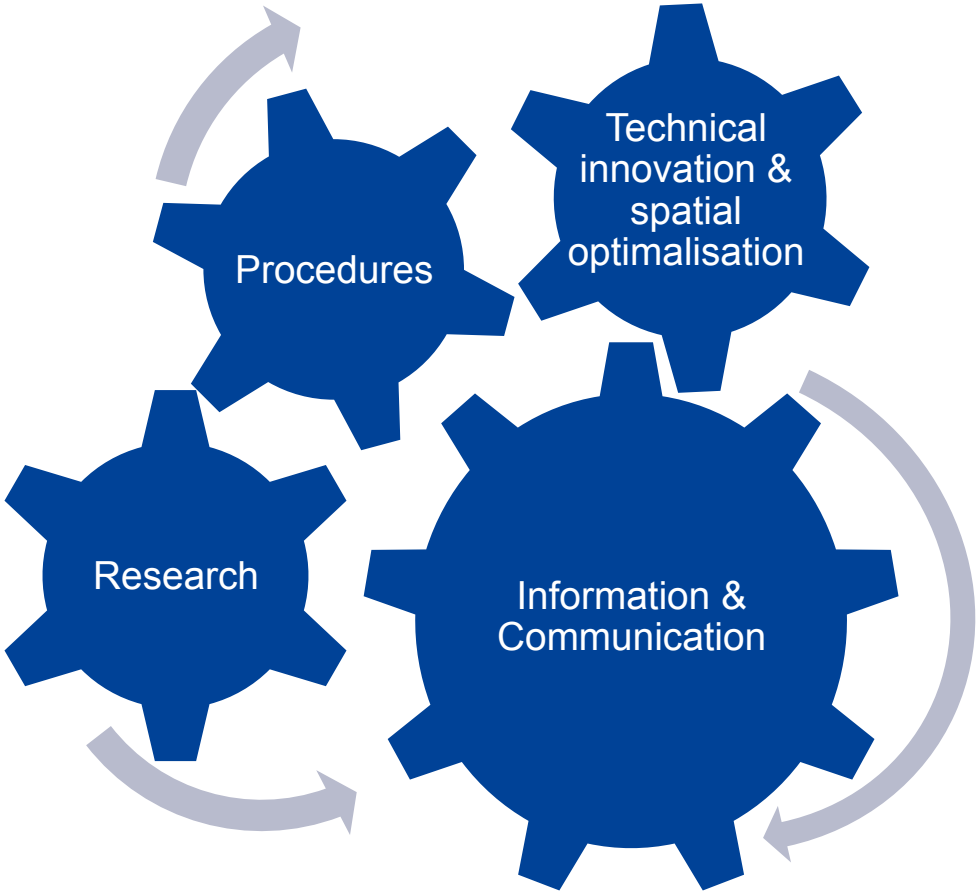
How did/do we tackle NIMBY in the NL

A. specific (Dutch) procedures for spatial planning and decision making

B. applying technical innovation and spatial optimization

C. extensive research on all local Facts & Figures (with EIA)

D. intensive and proactive information & communication



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