



WindNODE as a blueprint for a transition towards 100% renewables

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WindNODE in a nutshell
...a review

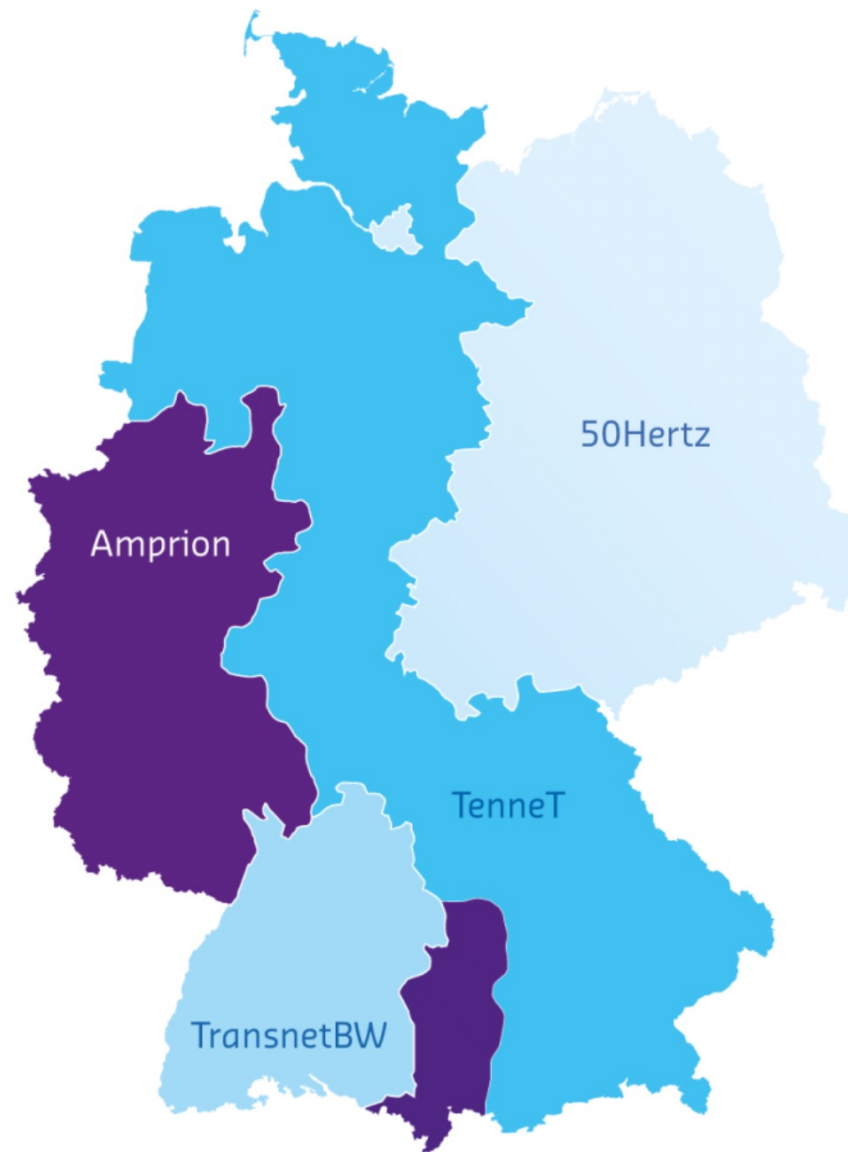
SINTEG – Smart Energy Showcases

In the funding programme "Smart Energy Showcase - Digital Agenda for the Energy Transition" (SINTEG), transferable model solutions for a secure, economical and environmentally friendly energy supply with temporarily 100% electricity generation from renewable energies are developed and demonstrated in large-scale model regions.

SINTEG

Die Projekte / Schaufenster:



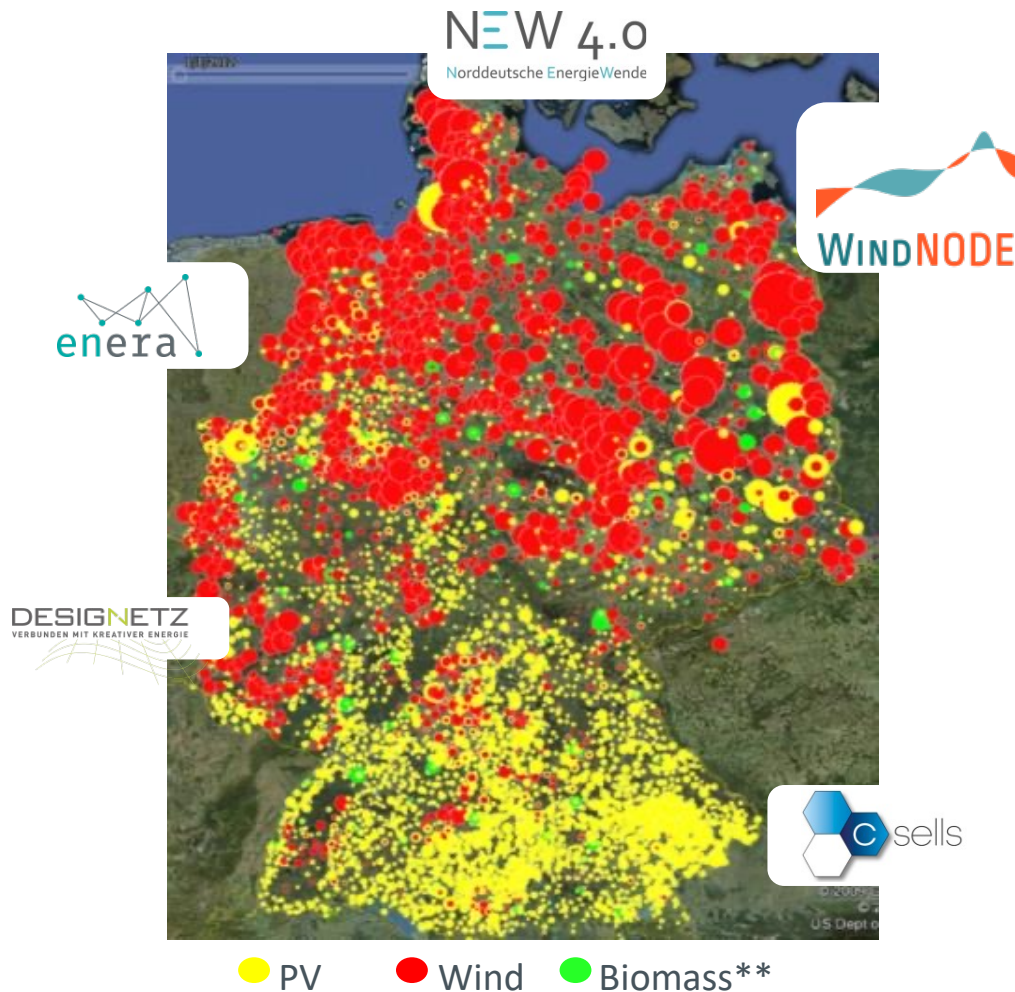


Transmission System Operator

https://www.amprion.net/Bilder/Übertragungsnetz/Systemführung/Verbundnetz-und-Regelzonen/Amprion_Regelzone_720x0.png

Field tests for the next phase of the energy transition

Overview of 5 smart energy showcases (SINTEG program*)



Challenge & Targets

Scalable solutions for efficient, eco-friendly and safe integration of large amounts (100%+) of renewables

Government Funding*, 2017-2021

230 mio. € for five SINTEG consortia,
37 mio. € for WindNODE
(plus equal amount of private funding)

WindNODE: Renewables frontrunner

- 6 states in East Germany
- > 60% renewables in electricity mix (2019), target: 100% (2032)
- Wind energy prevails
- Energy transition challenges: grid extension, lignite phase-out, ...

* "Smart energy showcases (SINTEG), funded by the German Federal Ministry for Economic Affairs & Energy (BMWi)

** as of 2018, > 1,600,000 plants, 49.628 GW wind, 41.687 GW PV [50Hertz]

More than 70 distinguished partners from industry & academia

WindNODE partners

TSO 50Hertz as manager of the consortium

Steering Group



Partners



Associated Partners

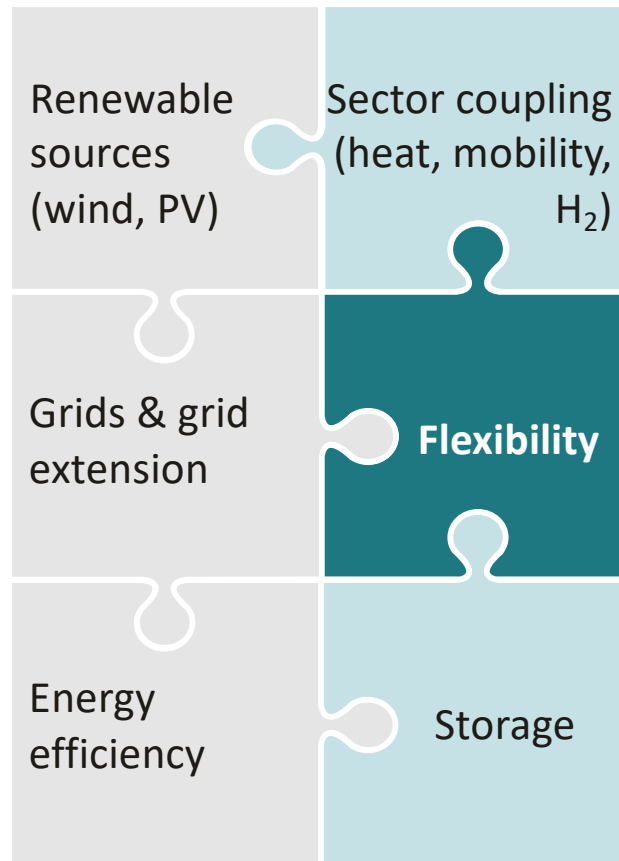


Subcontractors



Utilizing flexibility to cope with intermittence

How to reach 100% renewables?



The WindNODE approach

- ✓ **Identifying demand-side flexibility options**
> 200 MW exemplary flexibility in industry, businesses, neighbourhoods
- ✓ **Developing use cases for flexibility**
Flexibility platform for grid congestion management
- ✓ **Creating value from energy data**
Smart distribution grid; control centers for sector coupling; AI-based forecasting
- ✓ **Living lab**
> 30 real-life demonstrators; application of regulatory sandbox

Abundance of technical flexibility options

Fields of action and results (1/4)

✓ **Identifying flexibility options**
(technical potential)

- ✓ **Developing use cases for flexibility**
(economic potential)
- ✓ **Creating value from energy data**
(digitalisation in the energy space)
- ✓ **Living lab**
(blueprints, narrative, dissemination)

- 4 Siemens factories, Berlin
- Flexibility in water & sewage treatment, BWB
- Model supermarkets at Lidl & Kaufland
- PtH/PtC at GASAG Solution Plus
- Germany's biggest PtH (120 MW) at Vattenfall
- High temperature heat storage (650 °C) by Lumenion, GEWOBAG, Vattenfall
- Fluid ice storage unit, ILK Dresden
- ...



Flexibility platform for grid congestion management

Fields of action and results (2/4)

- ✓ Identifying flexibility options
(technical potential)
- ✓ **Developing use cases for flexibility**
(economic potential)
- ✓ Creating value from energy data
(digitalisation in the energy space)
- ✓ Living lab
(blueprints, narrative, dissemination)

- WindNODE flexibility platform starts test operation, 11 Nov 2018, by 50Hertz, Stromnetz Berlin and various DSOs
- First real trade at the flexibility platform, 14 March 2019, with offers by Lidl, Siemens and Vattenfall
- Continuation of test operation



Digitalisation in the energy industry

Fields of action and results (3/4)

- ✓ Identifying flexibility options (technical potential)
- ✓ Developing use cases for flexibility (economic potential)
- ✓ **Creating value from energy data (digitalisation in the energy space)**
- ✓ Living lab (blueprints, narrative, dissemination)

- Hackathon „Energyhack² – enery for a smart city“ at Stromnetz Berlin
- Demonstrator „KEMS – Community energy management system“ at IBAR, Cottbus
- Energy data market place at Fraunhofer FOKUS
- High-resolution forecasting of RES generation, by Solandeo
- ...



Living lab („Reallabor“): making energy transition tangible

Fields of action and results (4/4)

- ✓ **Identifying flexibility options**
(technical potential)
- ✓ **Developing use cases for flexibility**
(economic potential)
- ✓ **Creating value from energy data**
(digitalisation in the energy space)

✓ **Living lab**
(blueprints, narrative, dissemination)

- 30 “visitor sites“
- “energy & art“
- Solar Punk Festival SPF2018
- e-stories
- WindNODE Academy
- WindNODE Challenge
- Various international visits and delegations
- ...



More than 30 “visitor sites“ have been opened

Here: Siemens showroom for industrial flexibility



Experience Demand Side Management
@ Siemens Showroom (Berlin, Nonnendammallee)

Energy meets Art



Making energy transition exciting

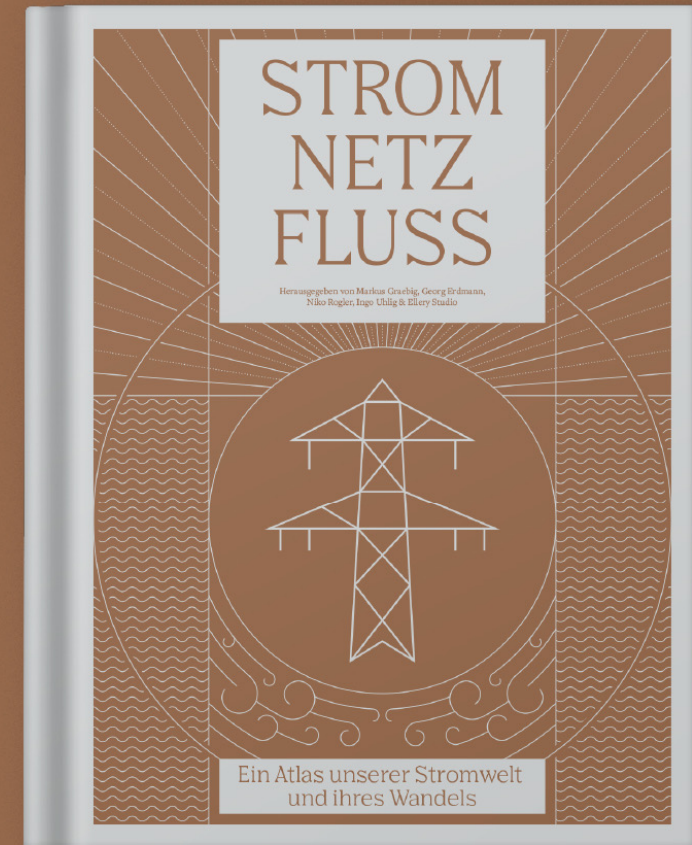
STROM, NETZ, FLUSS

Ein Atlas unserer
Stromwelt und
ihres Wandels

stromnetzfluss.de



**ellery
studio**



What is a *living lab* („Reallabor“)?

What are the management insights?

Much more than just another research grant: narrative & network – and regulation as part of the experiment

Why did partners participate in WindNODE?

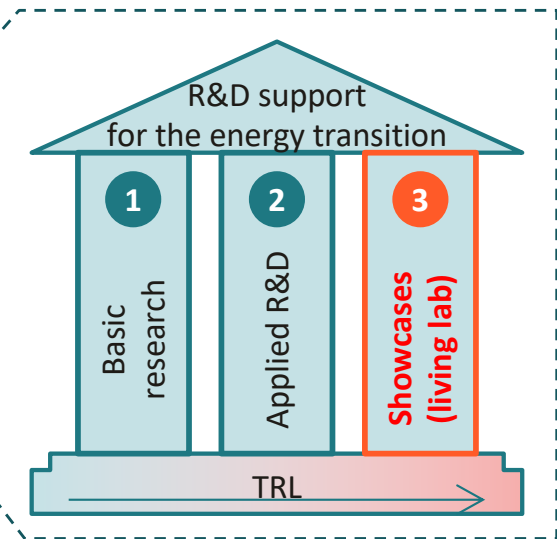
Traditional
research grant



Grant



F&E-Ziele



Living lab
(„Reallabor“)



Network



Regulatory
sandbox



Narrative,
visibility,
reputation

About *moving targets and carrots without sticks*

Experience from the WindNODE management

- (1) Research grants are no speedboats
- (2) Coordination by a strong, neutral trustee
- (3) Multi-stakeholder management: *carrots without sticks*
- (4) Mind the synthesis of results
- (5) Keep the network alive

What's next –
on the way towards 100% renewables?

Coal phase-out by 2038: opportunity for future model regions?

Germany's coal phase-out



○ Share of total structural aid per lignite mining region

Lignite will be phased out by 2038 ...

- ... currently mined in open pits in 3 active regions
- ... contributed 28.7% to German electricity mix and 54.3% of the sector's CO₂ emissions (2018)

~ EUR 50 bn. total support for coal phase-out:

- EUR 14 bn. for major investment in the regions
- EUR 26 bn. of projects of common interest (e.g., infrastructure)
- ~ EUR 10 bn. compensation payments

What's next?
efficiency and sufficiency

SUZANNA

SUZANNA explores how sufficient lifestyles can be more strongly integrated into successful climate protection.



Project

In addition to technical innovations in the fields of the energy transition, there is considerable potential for climate action in the economical and thoughtful use of energy, raw materials and resources. The efficiency factor, that is, technological progress, is joined by the sufficiency factor, which focuses on lifestyles.

This is where the SUZANNA project comes in, departing from the observation that the social perception of sufficiency has changed in the recent past. Many are beginning to discover the positive sides of this concept: restrained and quality-conscious consumption, smaller but attractively and intelligently designed living environments, sharing instead of owning – this “light luggage”, as so fittingly put by the band Silbermond, gives shape to sustainable lifestyles.

SUZANNA deploys an analysis based on social sciences to establish how people feel about these ideas, and uses the results of that analysis to develop supply models for the energy industry and find the narratives of a positive sufficiency culture.

[Overview](#)

[Contact](#)

SUZANNA

Principal: [Federal Ministry for Economic Affairs and Climate Action](#)

Project partner: [Arepo](#) , [Institut für ZukunftsEnergie- und Stromstoffsysteme](#)

Duration: 01/2022–06/2024

foi um prazer, muito obrigado!! 😊