NEW 4.0

The digital strategy towards a 100% RES-Region – an example from Northern Germany

ARGE Netz GmbH & Co. KG

Björn Spiegel, Director Strategy & Politics

NEW 4.0

Norddeutsche EnergieWende

SINTEG

SCHAUFENSTER INTELLIGENTE ENERGIE

Gefördert durch:

Bundesministerium für Wirtschaft und Energie

aufgrund eines Beschlusses des Deutschen Bundestages

www.new4-0.de

North German Energy Transition New 4.0
Project Idea &
Future Energy System Services

Foto: www.mediaserver.hamburg.de / Christian Sparbiehr

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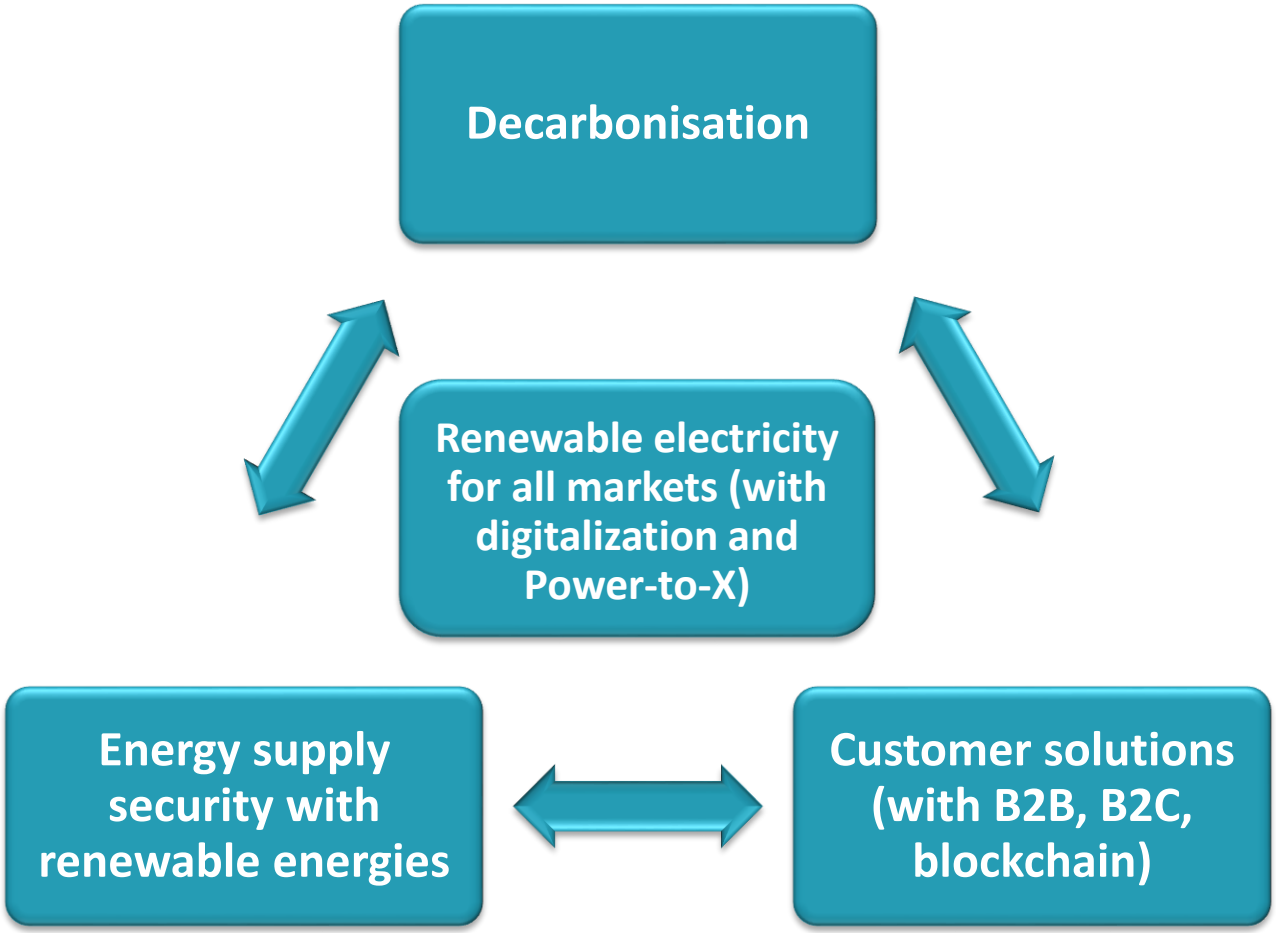
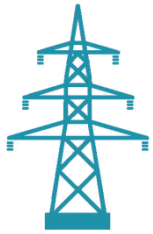
ARGE Netz – Energy 4.0

- One of the **leading groups of renewable energy producers** with more than 320 shareholder companies.
- Pooling around **4.000 megawatts** of renewable capacity, including wind, solar, biomass, solutions for storage and conversion of renewable energies.
- Running the **Renewable Power Plant:** current capacity of 1,300 megawatts, combining renewable energies, stabilizing fluctuating amounts of energy.
- Having a **broad industry focus** and are part of the steering commitee in „NEW 4.0“ and industrial partner in the Kopernikus-Project „Power-to-X“.
- Managing a **secure energy supply based on Renewables**: opening up energy markets, forcing grid expansion, enhancing power-to-x technologies.

3 main goals
in the energy market of tomorrow



Digital Renewable Power Plant for the synchronisation of generation and consumption in real-time



Grid

Market

Renewable Power Plant

Digital operating platform for a secure energy supply based on renewables

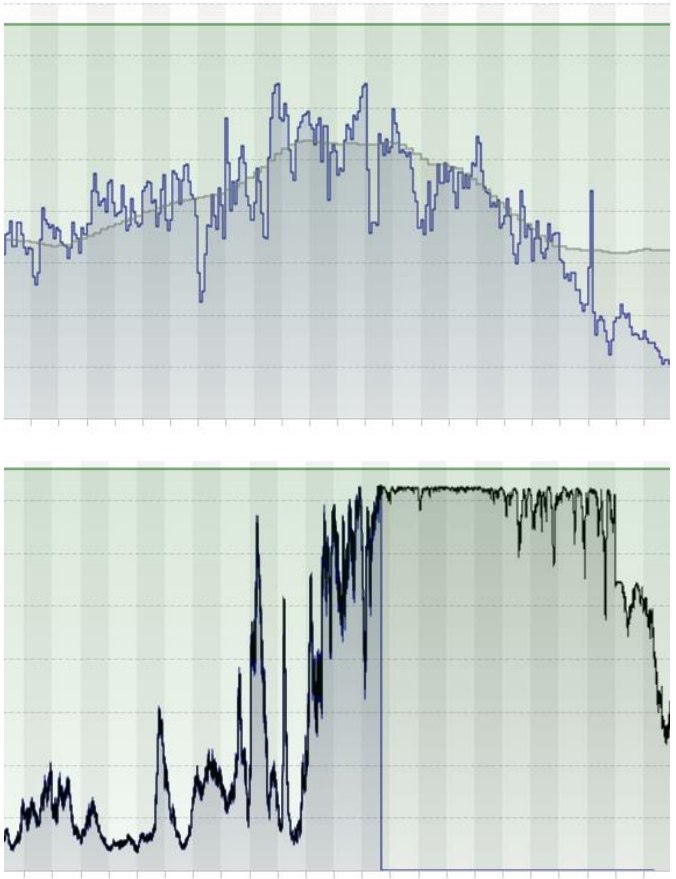
Renewable producers:
flexible & fluctuating sources

Flexible prosumers:
households, industry, small application

Renewable Power Plant of ARGE Netz -

The operating platform for the Energiewende

- **Data hub** combining production and consumption in "**real time“**.
- **Demand-actuated** energy supply, generating **timetables**.
- Smart connected renewables create **security of supply** based on Renewables.
- **Aggregator** role: marketing and processing of renewable energy production.



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Energy situation of the Hamburg /Schleswig-Holstein region

4.5 Mio. residents

Schleswig-Holstein as a region of production, Hamburg as region of consumption, 36 000 RES installed

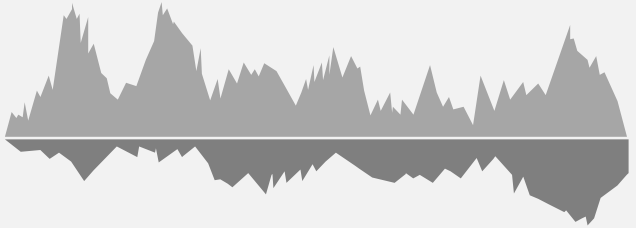
Industry hub in Hamburg, huge potential of flexibilization

Wind energy production will be quadrupled by 2035, three times more compared to electricity demand

x4

Interconnector: Energy hub north-Europe: Southlink, northlink, west-coast-link, offshore windfarms

Disparities: extreme and increasing disparities between production and load needs to be managed.

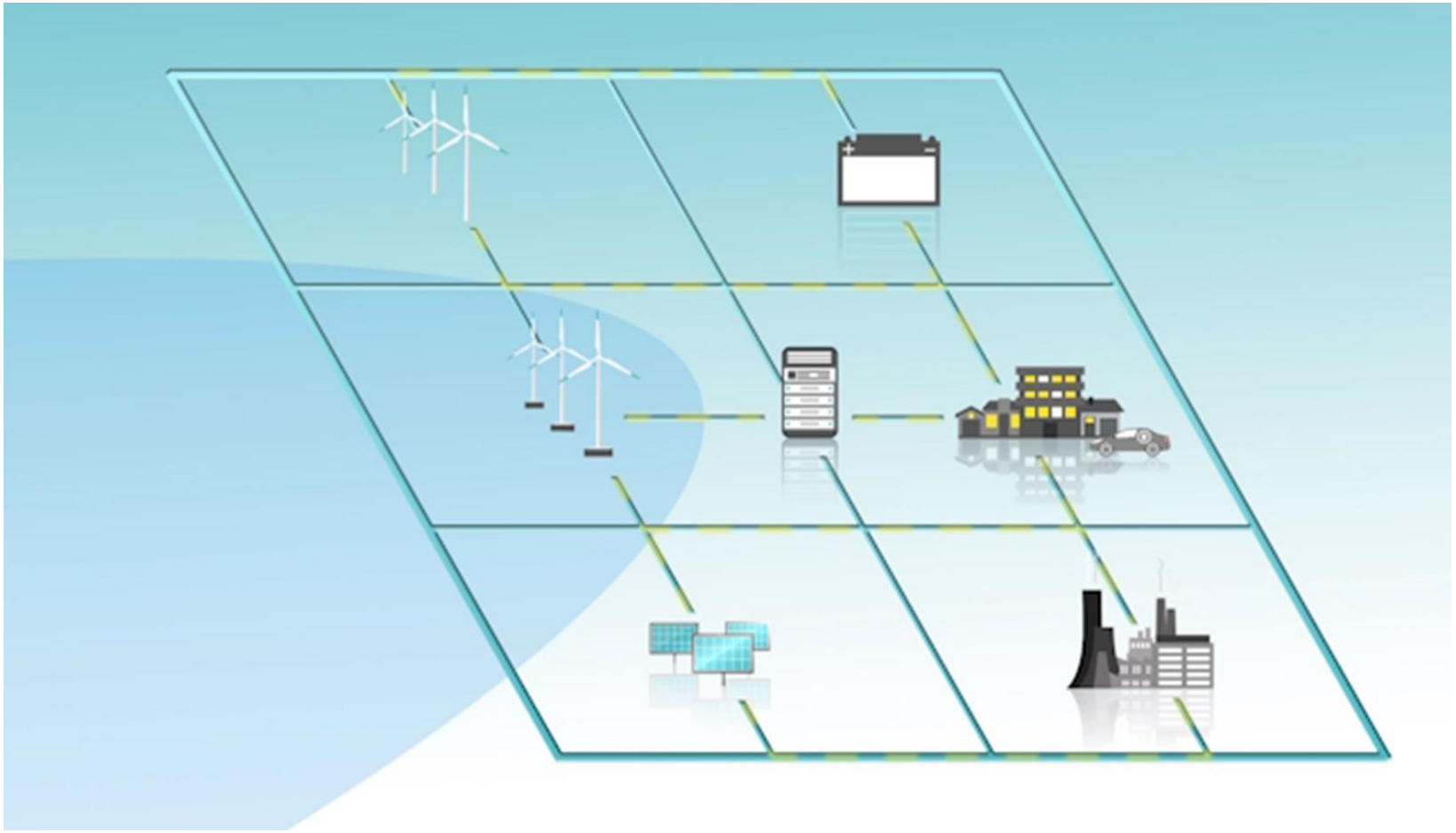


The model region provides representative the main challenges of the energy transition

Synchronization of RE-Production and Consumption

Quelle: qub-media

Holistic system integration:
Flexible and smart networking, digitalisation



Dual strategy of NEW 4.0

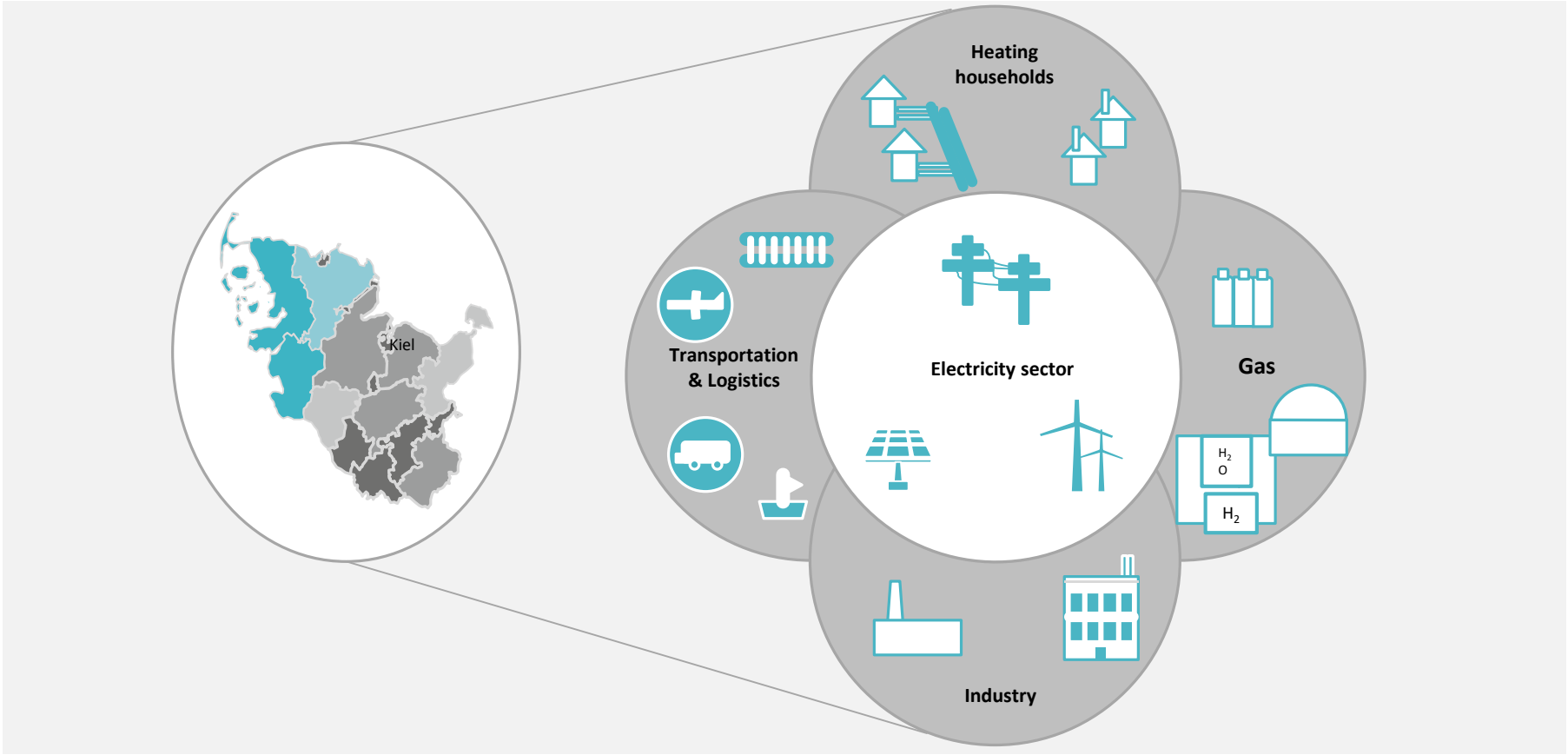
NEW 4.0 solves the main challenges of the energy transition with a dual strategy:

increase electricity export	+	increase local energy-self-utilization, converting surplus
…into other regions through the efficient use and development of the energy infrastructure in the region		…introducing flexibility measurements and sector coupling converting power in other energy forms (heat, mobility, hydrogen)

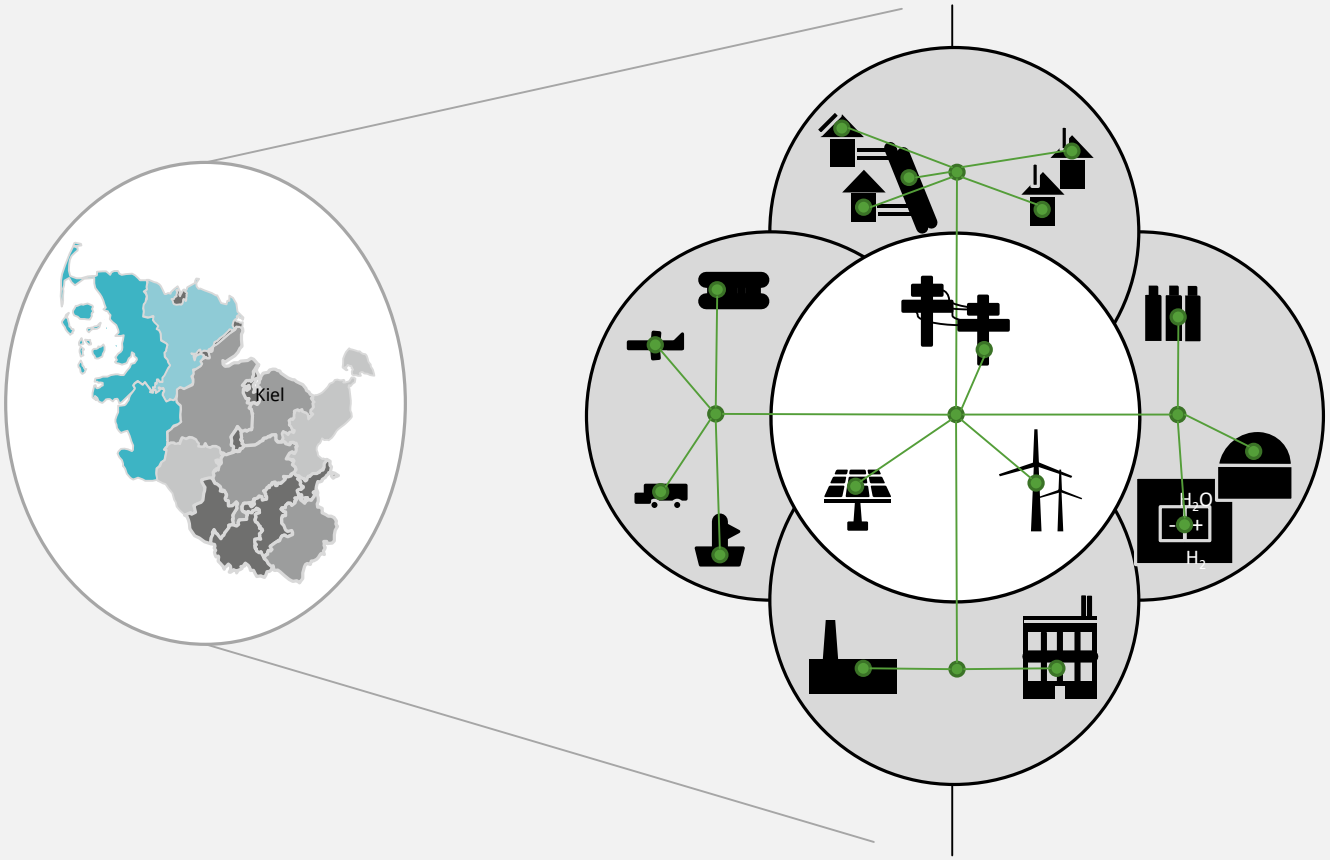
Intelligent Information- and Communication Technology (ICT)

battery-, high-temperature-, compressed air-storage, virtual power plants, market platforms	+	power-to-heat, power-to-gas, CHP, power-to-steel, power-to-steam

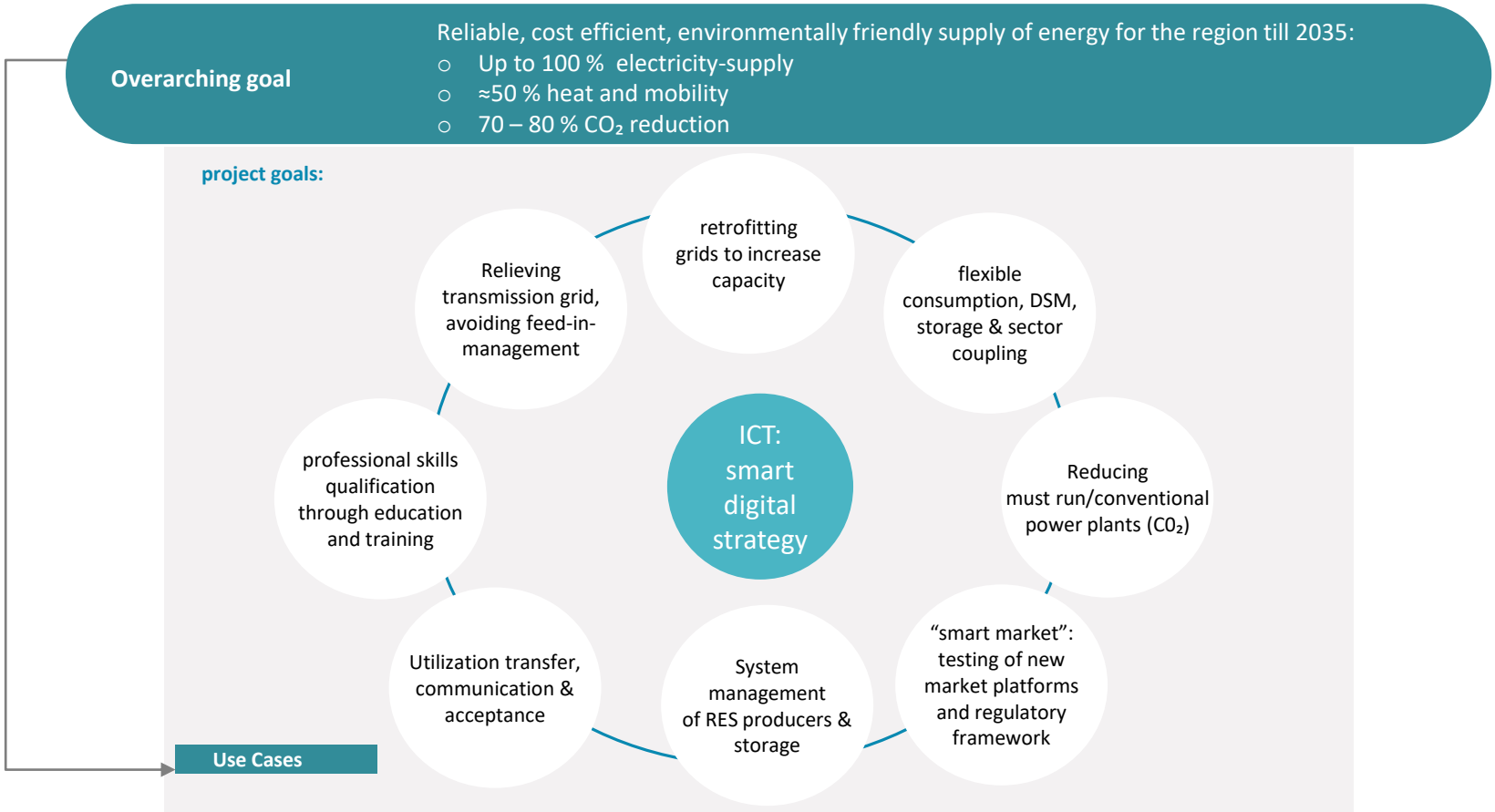
Sector linkage NEW 4.0 – Coupling of all life areas with RE



NEW 4.0 sector linkage: Digitalization and ICT



Targeted System and Strategy



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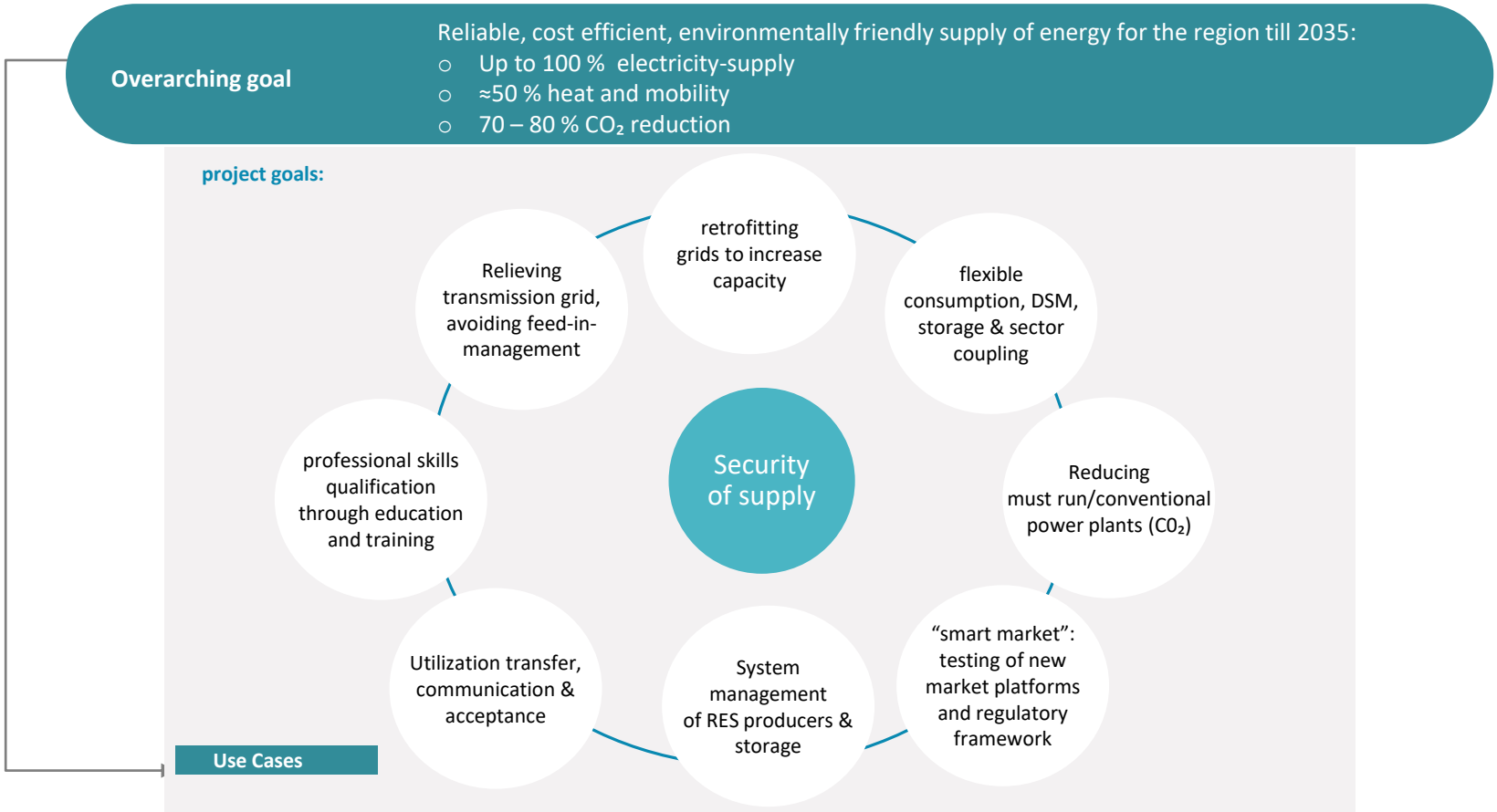

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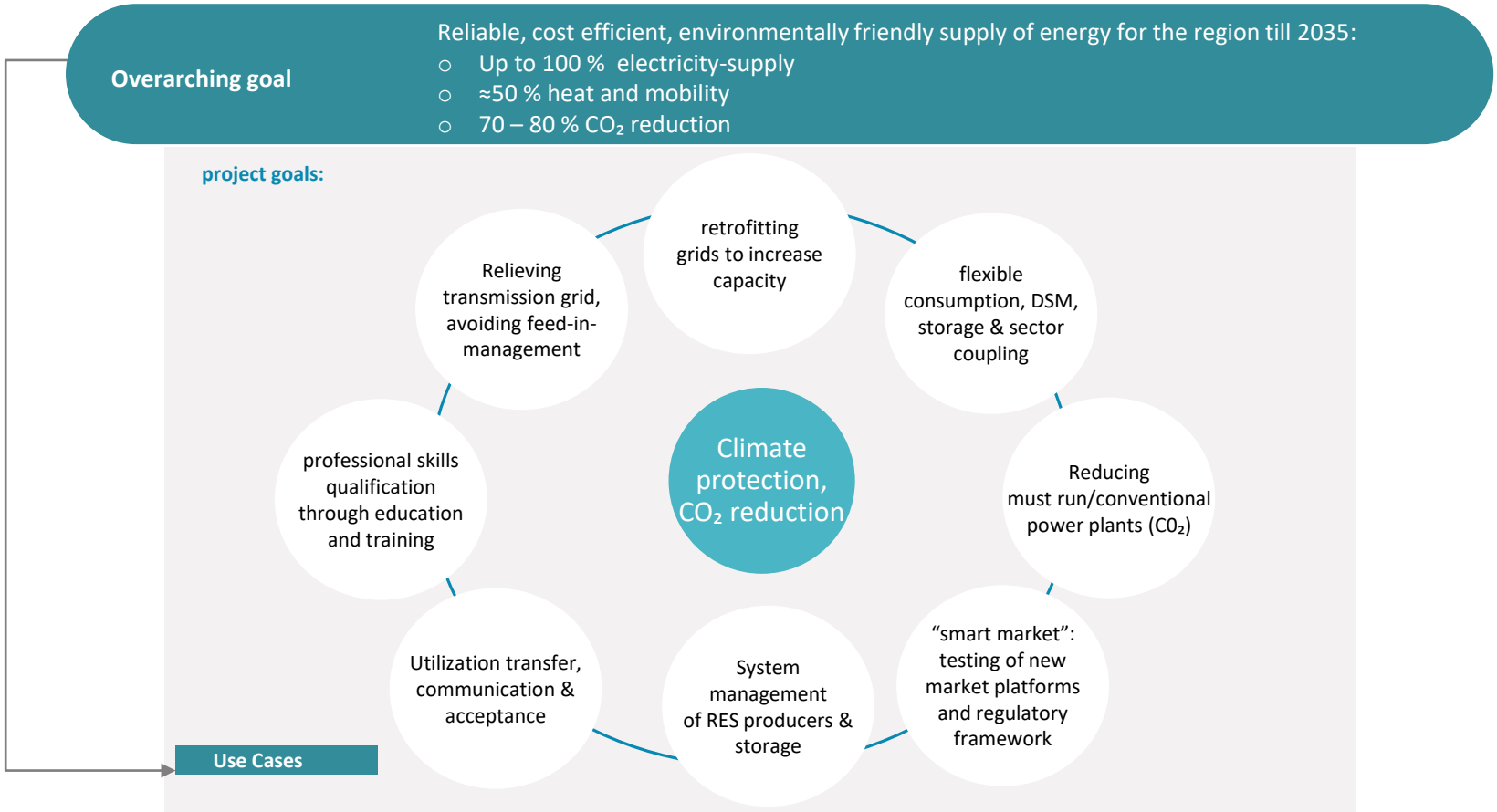

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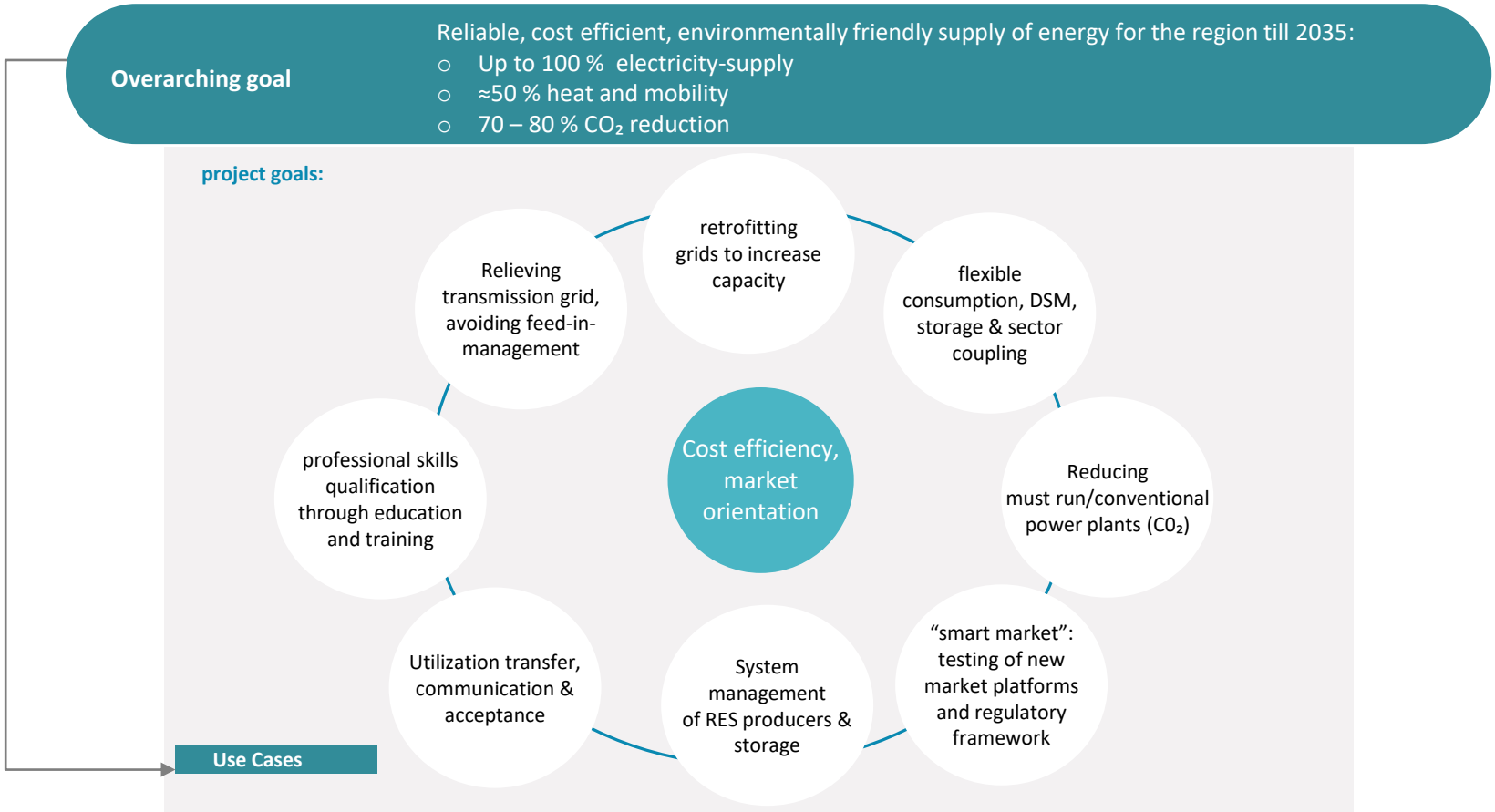

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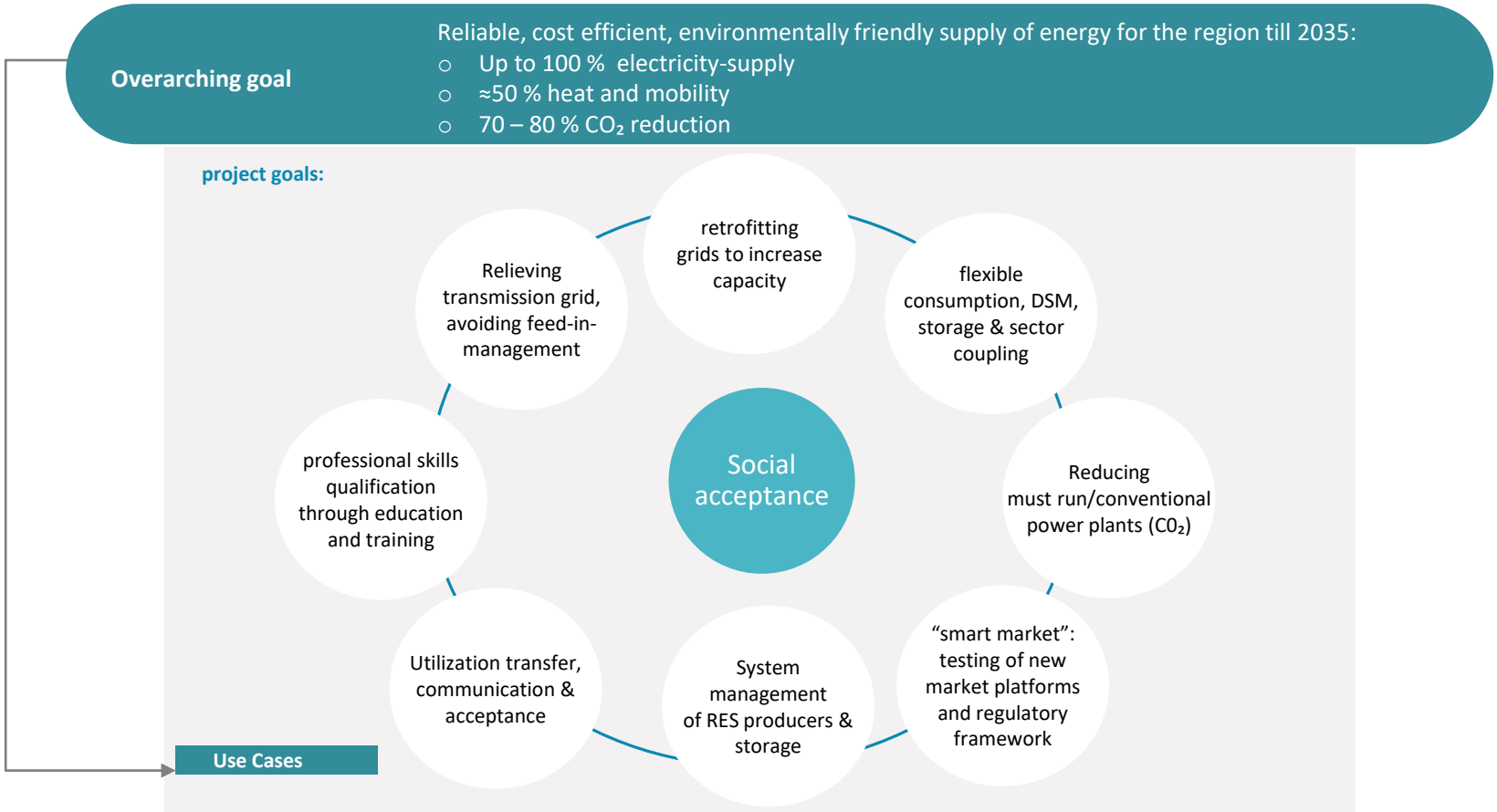


Strong network of demonstrators
300 MW flexibility, storage, 1,600 MW virtual power plants

NEW 4.0

Battery Storage (48 MW)
Reactive power (38 MVar)

Renewable Energy Power Station
Virtual Power Plant for System Integration (1,300 MW)

Compressed air storage (12 MW)

Second Life Batteries (+4/ -4 MW)

Electrolyser (+3 MW)

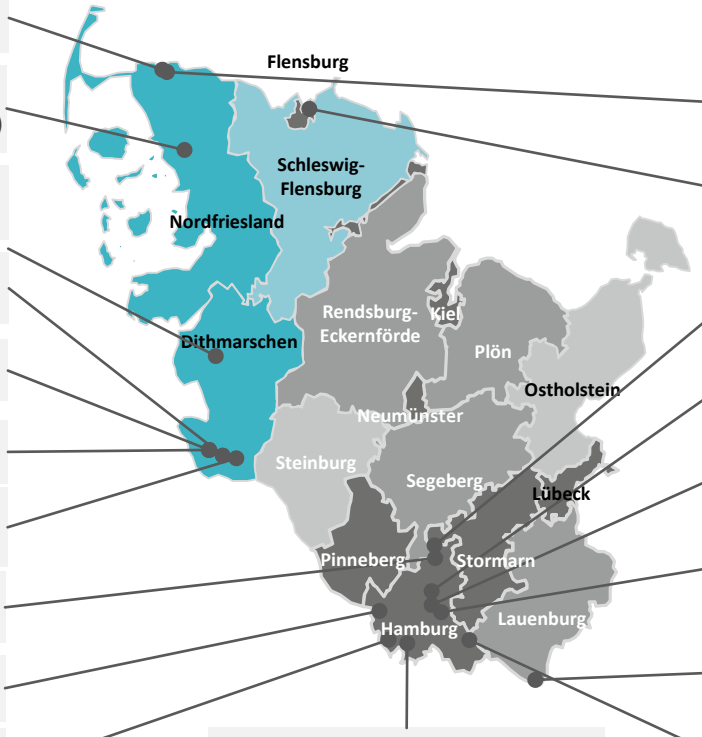
Battery Storage(+5/ -5 MW)

PtH as CHP replacement (+4 MW)
PtH for thermal Oil (+7 MW)

PtH district heating grid (+40 MW)
PtH in local heating grid (+6 MW)

Power-to-Steel (+10 MW)
billet heating

Flexibilization of aluminium electrolyse (+13.2/-6.6 MW)



Scale 1:1.000.000

VPP from CHP(+/- 1.2 MW)
PtH with VPP (+/- 0.8 MW)

Electrolyser (+1.3 MW)

PtH with district heating grids(+0.8 MW)

Smart Home

PtH with over night storage heater

high temperature storage
(+5.4 /- 1.8 MW)

Power-to-Steam (+20 MW)

PtH for thermal oil (3 MW)

Battery storage in wind farm (+1.3/ -1.3 MW)

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