



German Power Storage Strategy

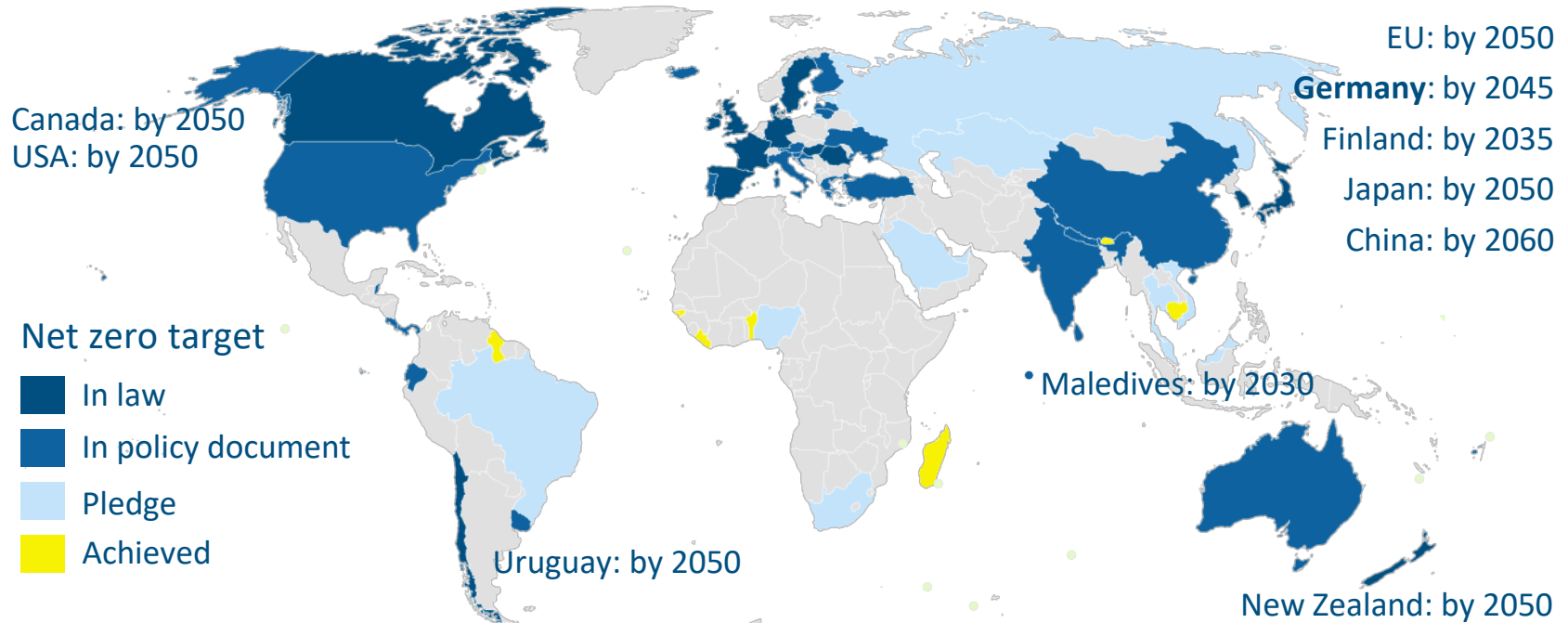
Energy Storage Hackaton, Tallinn, 22 January



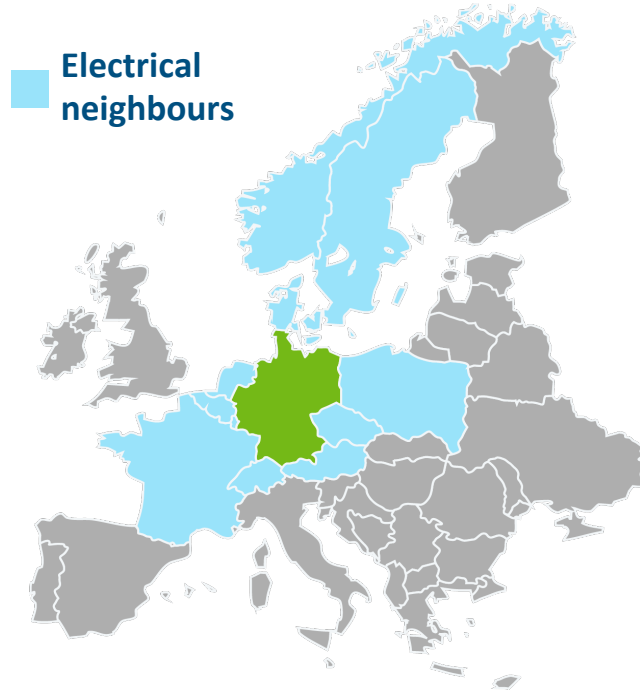
1. Power grids shift in place, storage shift in time (time machine).

2. Storage is as systemically relevant to the power system as banks are to the financial system.

Germany and a growing number of governments have implemented net-zero carbon targets



Germany is in a unique position to drive forward the transformation of the energy system in Europe



Electrical
neighbours

Economy

- Largest economy in Europe, 4th largest in the world
- Population: **83.2 million** (1.1% of global population)
- Gross Domestic Product per capita: **47,924 USD**

Energy sector

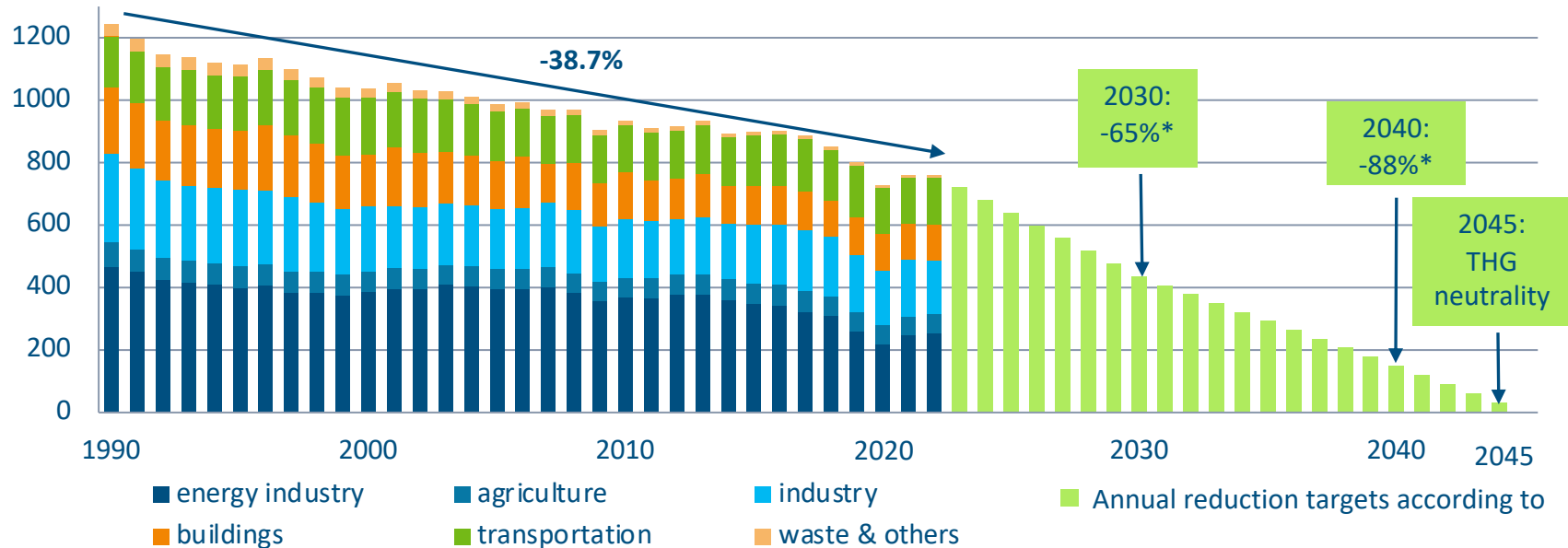
- Total power capacity: **226 GW**, renewable: **138.5 GW**
- Gross electricity production: **588 TWh**, renewable: **234 TWh**
- Renewables in electricity consumption: **41.1%**
- Electricity consumption per capita: **6,789 kWh**

Greenhouse gas emissions

- total: **762 Mt CO₂ e** (2.1% of global emissions, 7th largest worldwide)
- per capita: **9.2 tCO₂ e**

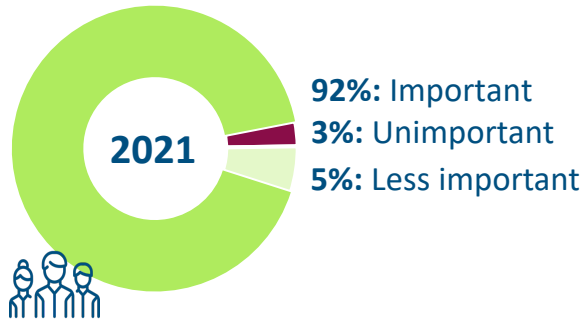
Germany has made progress in reducing its emissions, but more action is needed

Greenhouse gas emissions and reduction targets in Germany

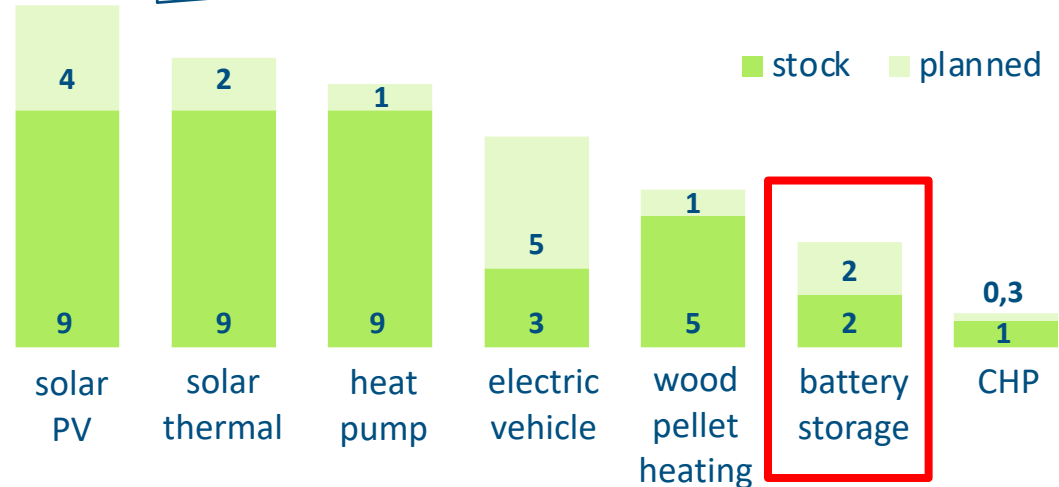


The *Energiewende* enjoys wide support within the German population

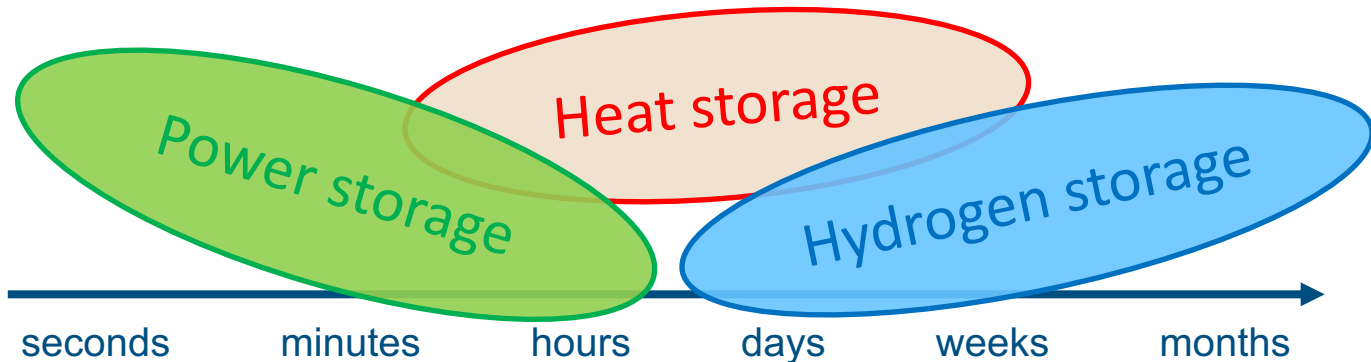
Support of the Energiewende (in %, 2021)



Participation of German households in technologies contributing to the Energiewende (in %, 2021).

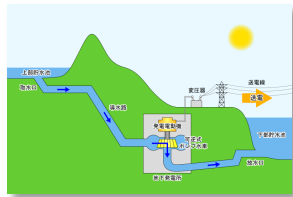


Energy storage strategy: Big picture to combine strengths



Storage categories and purpose

Measure 1:
Barrier analysis
(Same rules for all!)



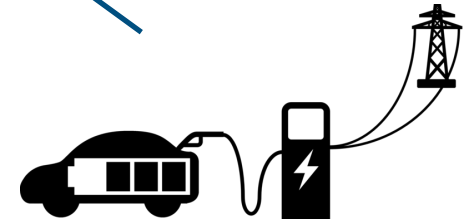
Hydro pump storage
39 GWh →



Battery farms
1,2 GWh ↑



Home storage
6 GWh ↑



Bidirectional cars
40 GWh ↑



Batteries



System services (FCR, aFRR)
Arbitrage

PV self-consumption
increase

Use of home storage systems

Measure 2:
Context of Renew-
able Energy Levy



Summer: Party!



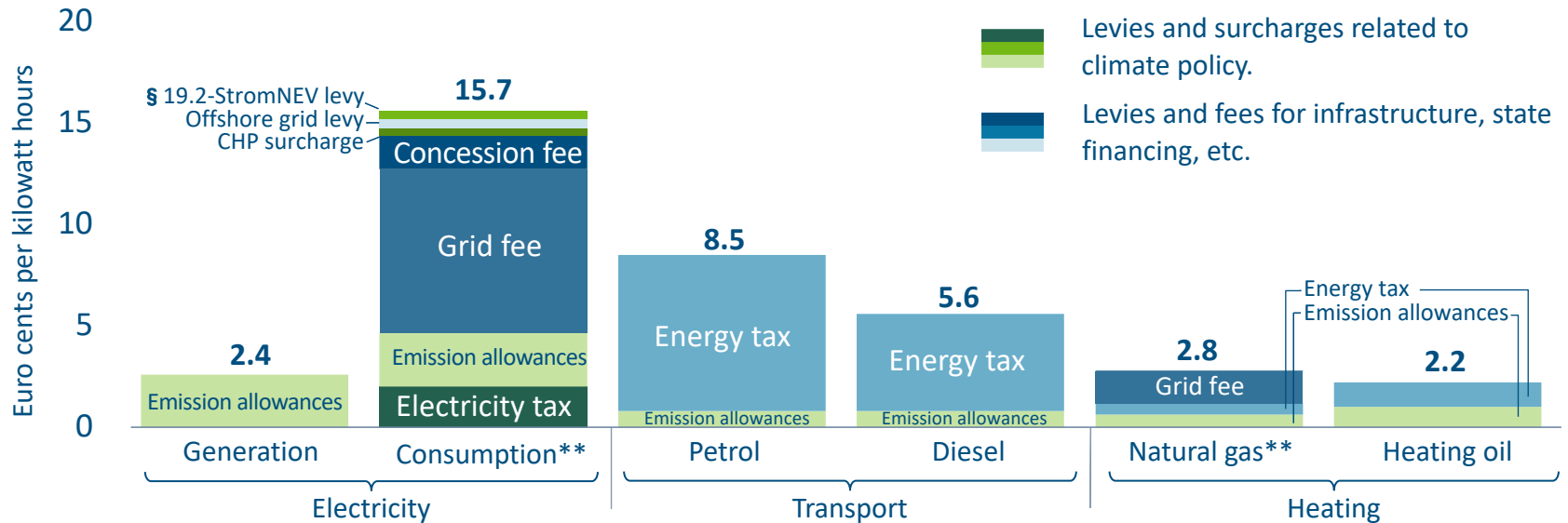
Winter: Blues!



Electricity has the highest level of taxes, levies, and grid fees compared to other energy sources

Measure 3:
Grid fees

Tax, levies and grid fees on energy carriers in Germany, August 2022



Source: Guidehouse 2022 based on BDEW 2021, EEA 2021 & Ember 2021

* VAT not included
** Private Households

The power storage strategy consists of a coordinated set of measures

- 1 Barrier analysis
- 2 Context of the Renewable Energy Levy
- 3 Grid fees
- 4 (Grid) construction costs
- 5 Acceleration of grid connections
- 6 Promoting local acceptance
- 7 Removal of approval hurdles
- 8 Ensuring system stability
- 9 Improvements for system services
- 10 Evaluation of grid boosters
- 11 Activation of bidirectional charging
- 12 Obstacles for pumped hydro storage
- 13 Power storage as a flexibility option
- 14 Determine power storage potential
- 15 Setting up storage statistics
- 16 Supporting innovation and research
- 17 Promoting battery cell production
- 18 Industry query

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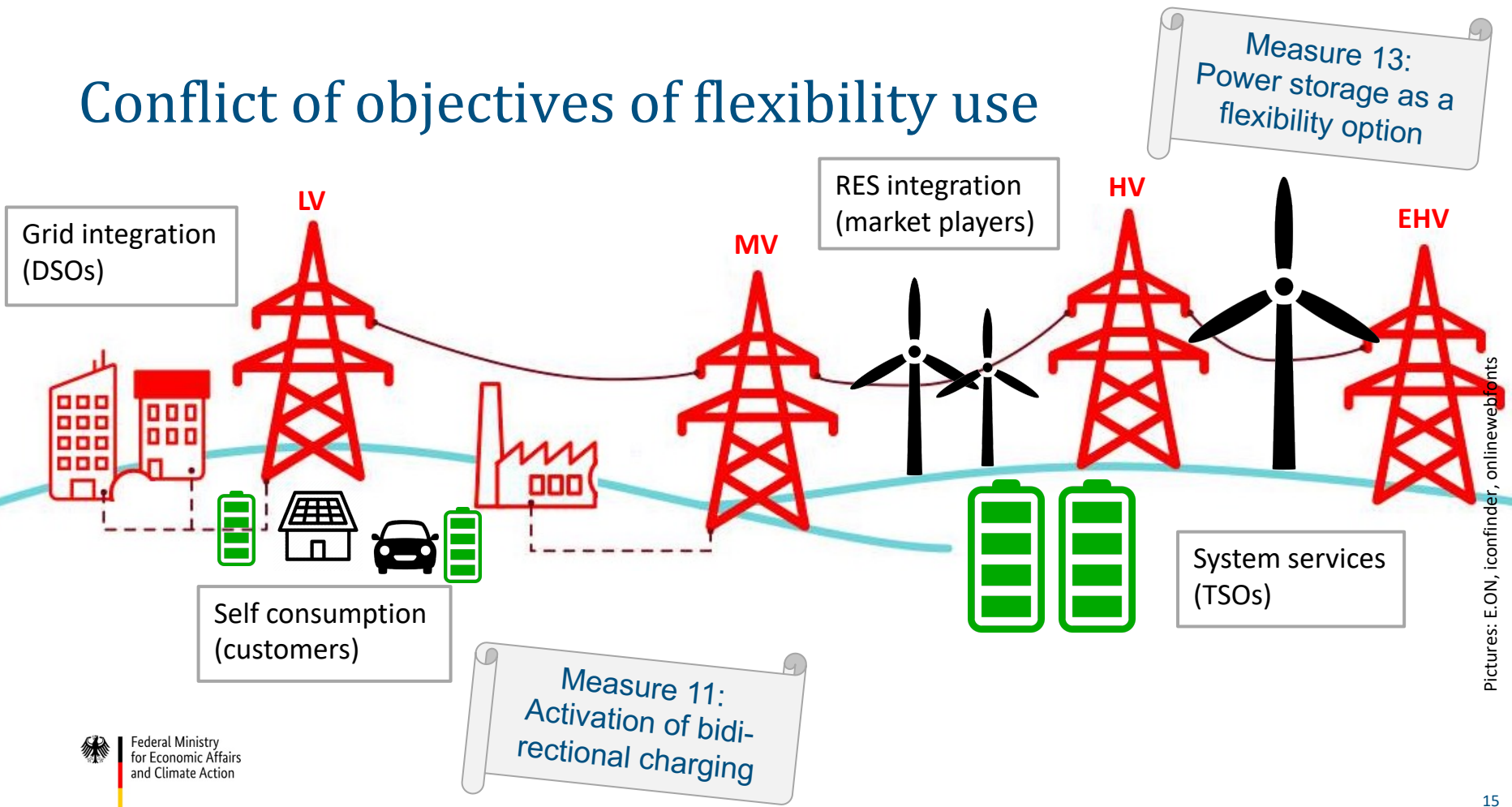
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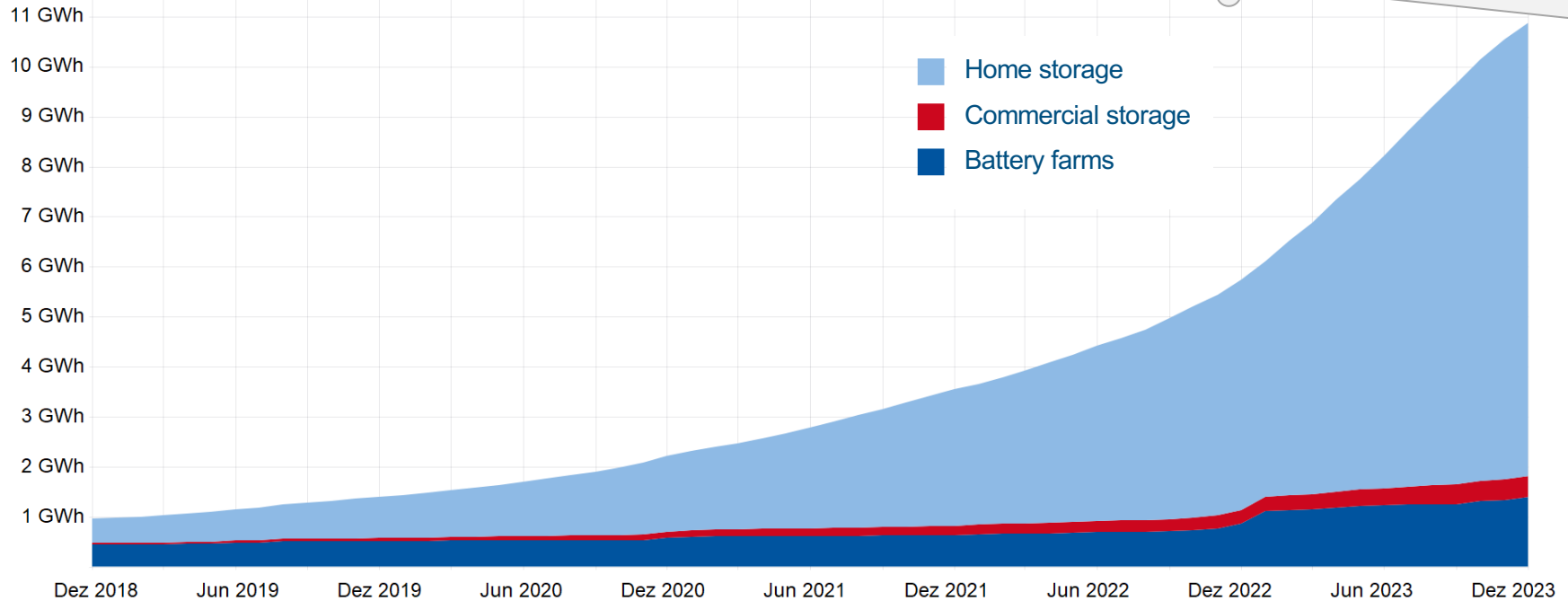
Conflict of objectives of flexibility use



Pictures: E.ON, iconfinder, onlinewebfonts

Dynamic battery growth in Germany

Measure 15:
Setting up storage
statistics



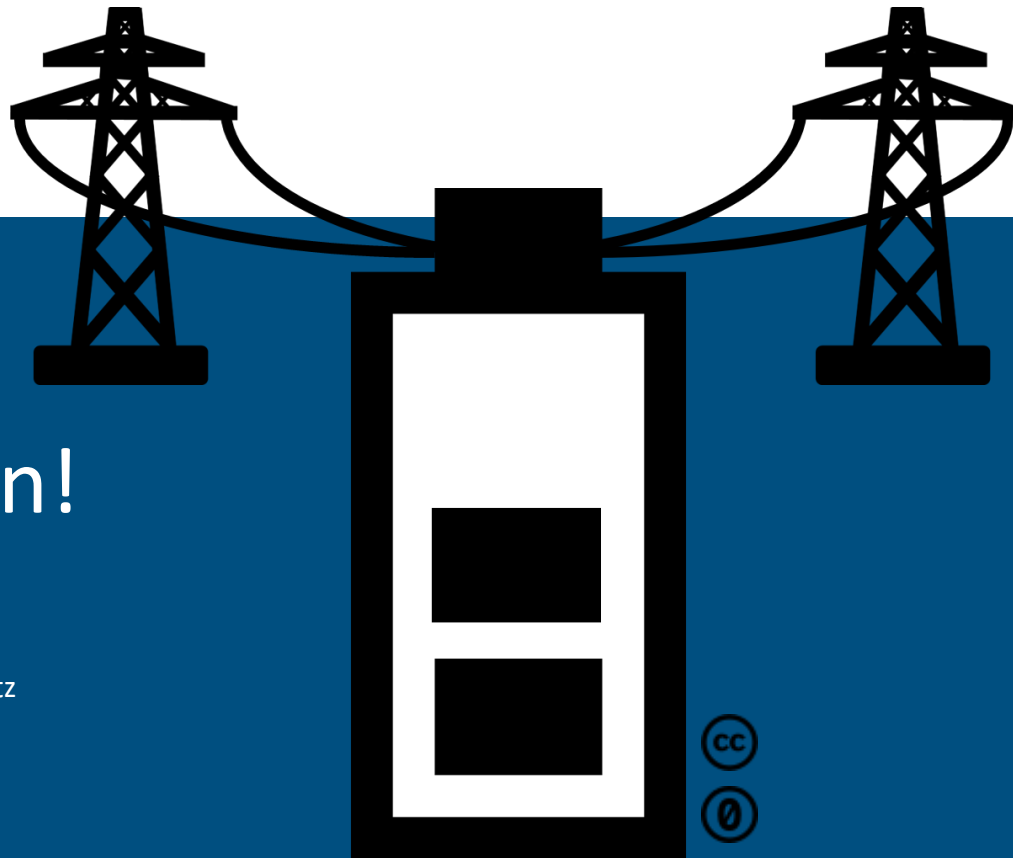
Source: MaStR



Measure 17:
Promoting battery
cell production



Federal Ministry
for Economic Affairs
and Climate Action



Thank you for your attention!

Contact details

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