DOCKETED	
Docket Number:	21-lEPR-05
Project Title:	Natural Gas Outlook and Assessments
TN #:	239026
Document Title:	Presentation - Germany's National Hydrogen Strategy and the Potential for Offshore Wind Electrolysis
Description:	S1.1C Ulrich Benterbusch, Germany's Federal Ministry of Economics (BMWi)
Filer:	Raquel Kravitz
Organization:	Ulrich Benterbusch, German Federal Ministry for Economic Affairs and Energy (BMW)
Submitter Role:	Public
Submission Date:	7/27/2021 10:51:28 AM
Docketed Date:	7/27/2021

Federal Ministry
for Economic Affairs
and Energy

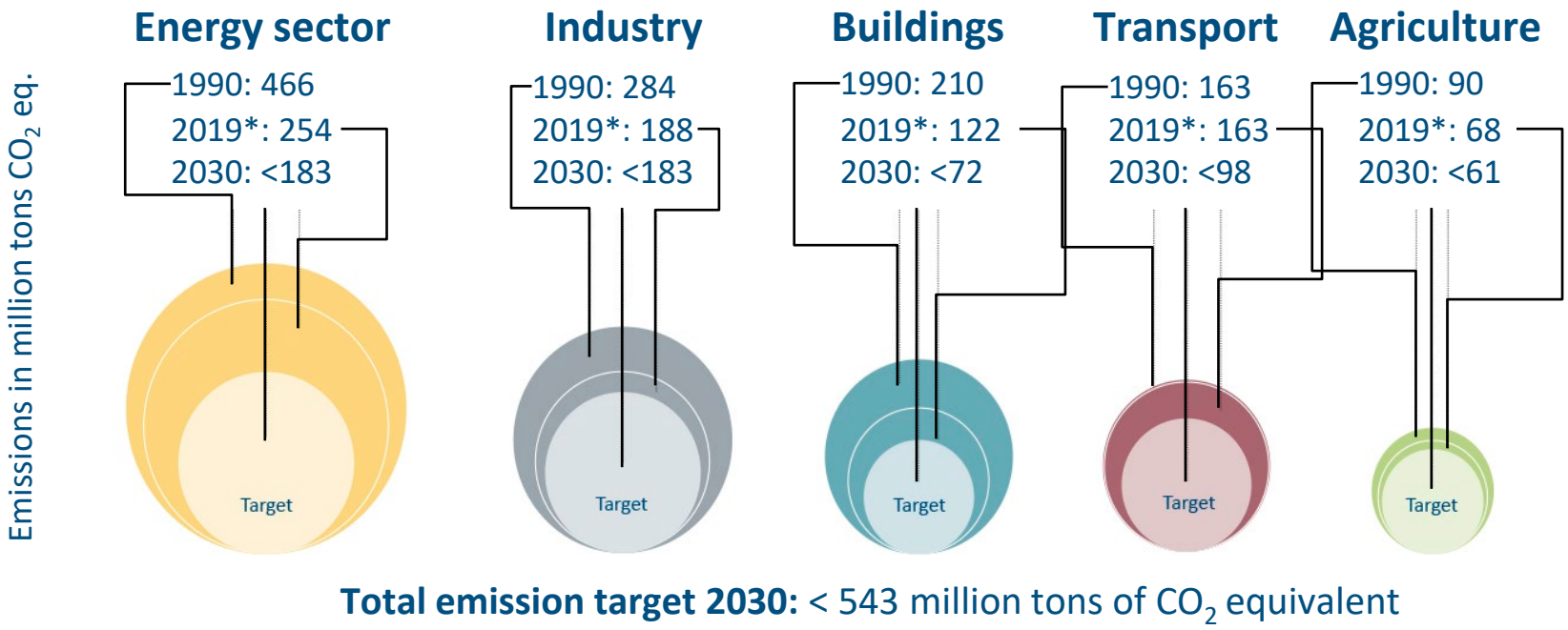
Germany's National Hydrogen Strategy and the Potential for Offshore Wind Electrolysis

Ulrich Benterbusch
Deputy Director General

Federal Ministry for Economic Affairs and Energy

Berlin, July 28, 2021

Germany has decided to become climate neutral by 2045 ⟶ All sectors need to decarbonize



Total emission target 2030: < 543 million tons of CO_2 equivalent

** Estimate*

Source: Guidehouse 2020 based on BMU 2020

Federal Ministry for Economic Affairs and Energy

Energiewende Switch to the Future

Federal Ministry
for Economic Affairs
and Energy

Strategic objectives of the German H_2 strategy

Establishing H_2 as an alternative energy carrier (esp. industry, mobility)

Develop a **domestic market**

Transport and distribution **infrastructure**

Making "green" H_2 and related tech **competitive**

Promoting **R&D**

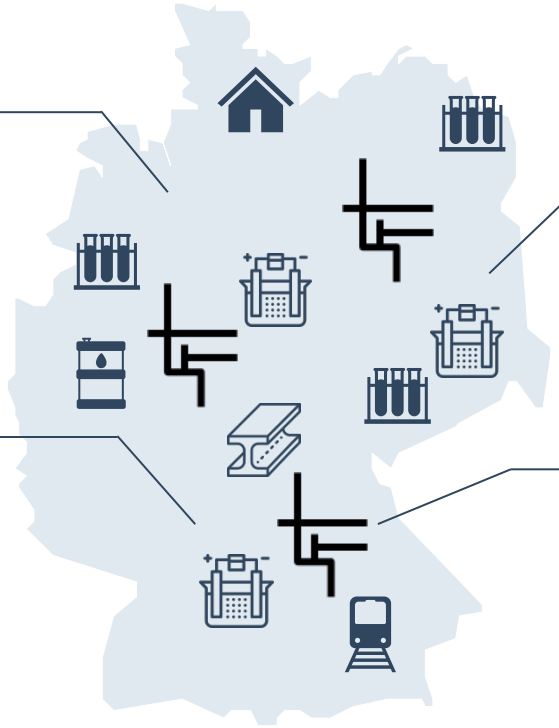
Establishing **international markets** and cooperation

Transparent certification, guarantees of origin

Future of hydrogen in Germany

Total **hydrogen demand**
in 2030
90 to 110 TWh

“Green” production capacity of
up to 5 GW added until 2030
and 5 GW more at least in 2040

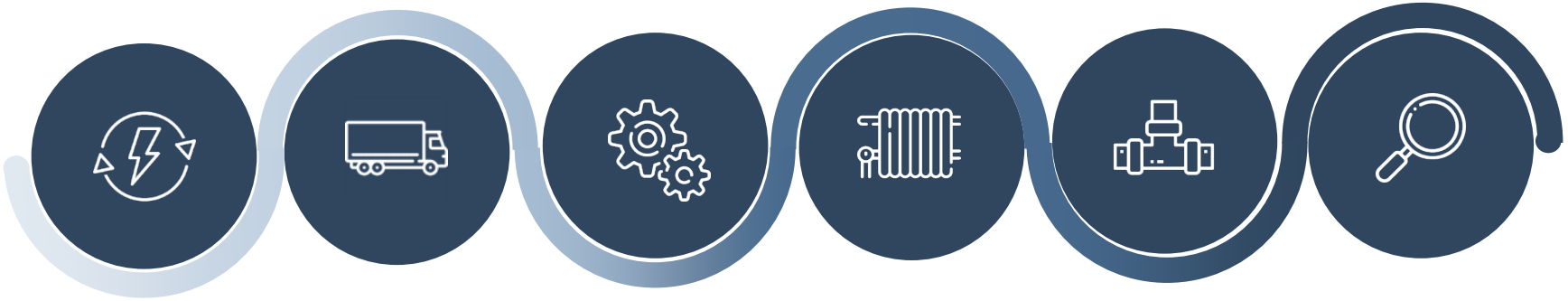


Growth in H_2 demand at first mainly in **industry** and **transport**

Build-up of needed **transport infrastructure**

Federal Ministry
for Economic Affairs
and Energy

NWS-Action Plan: Necessary steps to H_2 market ramp up



- **9 bn €** from German recovery plan (“Konjunkturpaket”)
- Start market ramp up where gap to **profitability** is comparatively small or **no other alternative**
- Successful market ramp up requires **integrated projects** along whole value chain
- **European** approach (esp. via IPCEI)

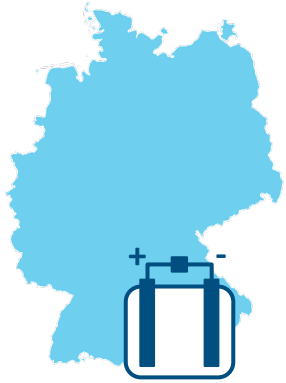
Icons: Flaticon.com

Market ramp up requires tailor-made regulation

- Fair design of state induced price components for electricity (esp. EEG-surcharge)
- Transparency on CO_2-footprint of H_2-production (need for a European methodology)
- Transitional regulatory framework for future H_2-infrastructure (EnWG revision)
- Ambitious implementation of the EU Renewable Energies Directive (RED II)
- Definition of “green” electricity
- OPEX: where needed, pilot programs (e.g. Contracts for Difference, CfD)

Federal Ministry
for Economic Affairs
and Energy

A large part of the hydrogen needed in Germany will have to be imported

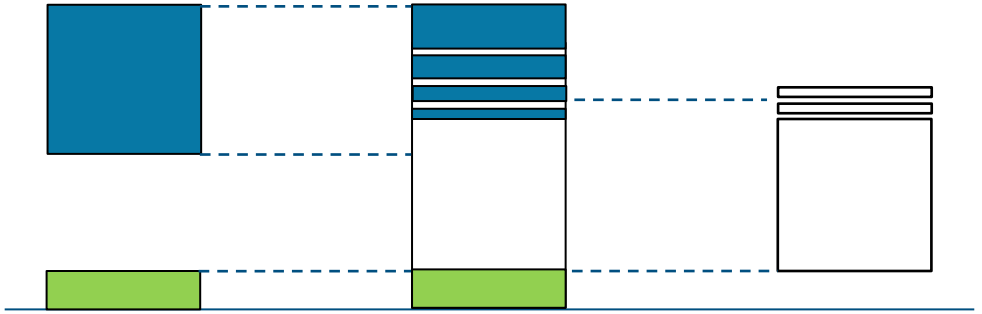


5 GW

Green H_2 production capacities planned for Germany 2030

Grey H_2 **domestic production** 2020

55 TWh



14 TWh

Green H_2 **domestic production** 2030

90-110 TWh

H_2 demand **expected** 2030

XX TWh

H_2 demand not covered by domestic production 2030

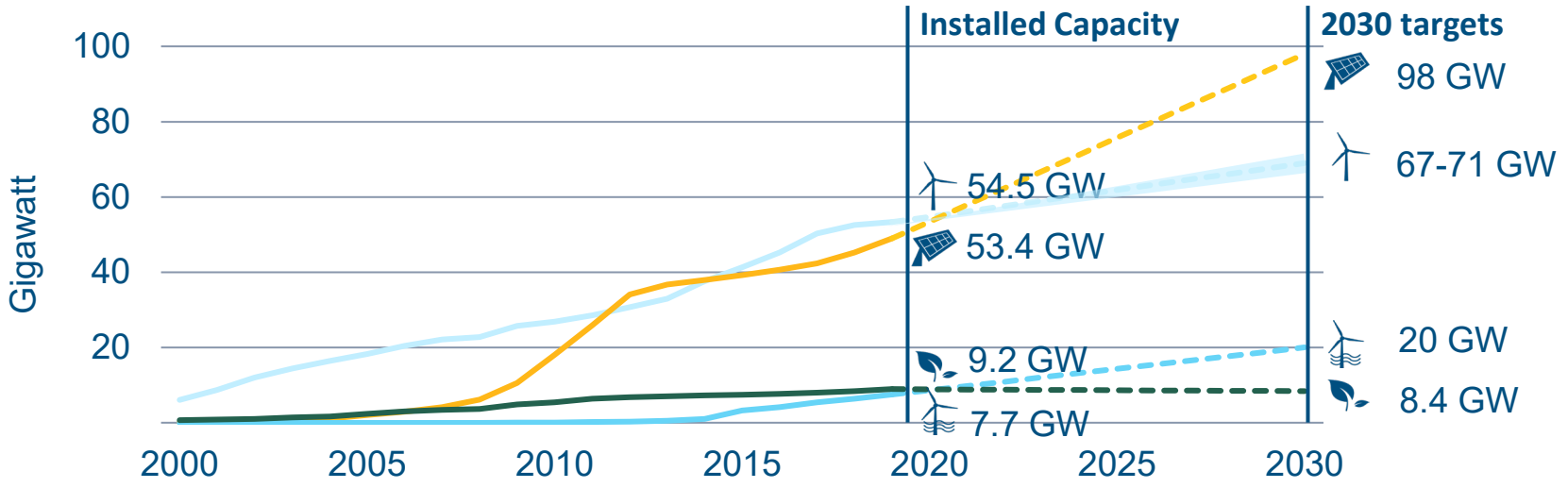
International cooperation

Funding tools

- **Funding guideline for PtX production facilities abroad**
- **H2 Global** - Auctions for purchase and sale of H2/ derivatives and compensation by government for difference in purchase and sale prices.
- **Individual subsidies:**
  - Siemens Energy project funding notice in Chile handed over on 02.12.20
  - Grant decision for Thyssen Krupp project in Saudi Arabia handed over on 16.12.20
- **H2 Uppp** - project to support smaller private sector projects through accompanying services
- Participation in **bilateral innovation funds** to support H2 production

Technology-specific capacity expansion targets make deployment of renewables plannable

Renewable energy installed capacity 2000-2020 and capacity targets for 2030 per technology



Source: Guidehouse 2021 based on BMWi 2020, BReg 2019, EnSaG 2018, EEG 2017, BNetzA 2019 & Agora Energiewende 2021

Federal Ministry for Economic Affairs and Energy

Energiewende Switch to the Future

Offshore Wind Energy in Germany

- Offshore wind plays an important role for Germanys Energy Transition as decarbonisation option but also industrial opportunity
- The offshore wind industry in Germany accounts for 1.9 billion EUR in annual investments and nearly 25.000 employees
- 2020: revision of the offshore wind energy act with increased capacity targets
    - 20 GW by 2030
    - 40 GW by 2040
- Sites, support & grid connection awarded through centralised tender model

Federal Ministry for Economic Affairs and Energy

Energiewende Switch to the Future

Germany's offshore wind targets increase long-term planning security for investment

- Long-term targets increased to 20 GW by 2030, 40 GW by 2040
- Streamlining of administrative procedures for offshore wind projects
- In cases of multiple zero-subsidy bids for an auction area, the bid is awarded by lot

Ceiling prices for auctions

2021	7.3 ct/kWh
2022	6.4 ct/kWh
2023	6.2 ct/kWh

ct: cent / kWh: kilowatt hour

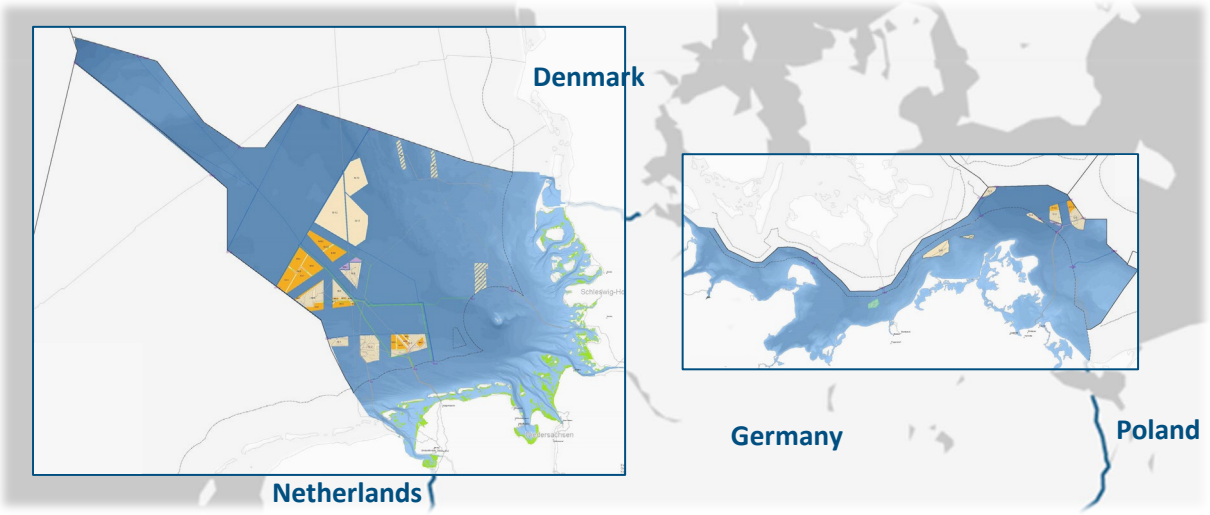
Source: Guidehouse 2020 based on NERA 2020 & BMWi 2020

Federal Ministry for Economic Affairs and Energy

Energiewende Switch to the Future

Capacities in the North and Baltic Sea

Spatial Development Plan for North Sea and Baltic Sea Exclusive Economic Zones (EEZ)



Offshore wind energy in Germany

- In operation by 2020: 7.7 GW
- Capacity target 2030: 20 GW
- Capacity target 2040: 40 GW

Areas for offshore wind energy
Area under examination
Site for offshore wind energy
Site under examination
Testing area
Offshore wind park with expected operation by 2025

Source: Guidehouse 2020 based on SOW 2020, & AGEB 2020

Federal Ministry for Economic Affairs and Energy

Energiewende Switch to the Future

Potential for Offshore Hydrogen Production

- Offshore hydrogen production has great potential to meet future hydrogen demand in Germany.
- Several pilot projects shortlisted for federal funding:
    - **Aquaventus**: Integrated electrolyser in offshore-wind power plant, combined with pipeline to North Sea island
    - **Lingen Green Hydrogen**: Offshore-electricity production provides power for onshore H2 production
- After successful technology demonstration, an adequate **regulatory and support framework** is essential for market ramp-ap.
- **Draft regulation** that grants sites for pilot projects is currently in consultation process between government departments.
- Cooperation with **neighbouring countries** of the North and Baltic sea essential to exploit synergy effects in planning and implementation.

Federal Ministry
for Economic Affairs
and Energy

Thank you for your attention !

Ulrich Benterbusch
Deputy Director General
buero-iia2@bmwi.bund.de