

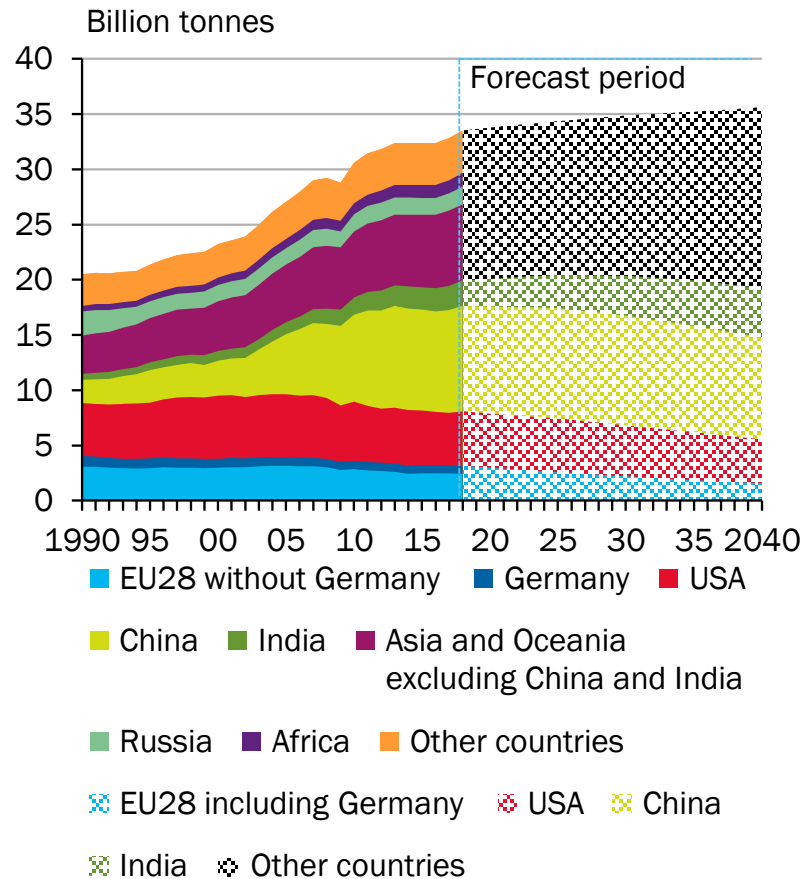
PATHS TO EFFICIENT CLIMATE PROTECTION

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Deutsch-Französisches Energieforum
18. November 2021

THINKING CLIMATE PROTECTION AND INDUSTRIAL POLICY OPPORTUNITIES TOGETHER

CO₂ emissions by country



- ↘ The switch to low-emission technologies requires deep structural change
 - ↘ Value chains are shifting
 - ↘ New markets are emerging
 - ↘ The transformation of energy supply also determines industrial policy opportunities

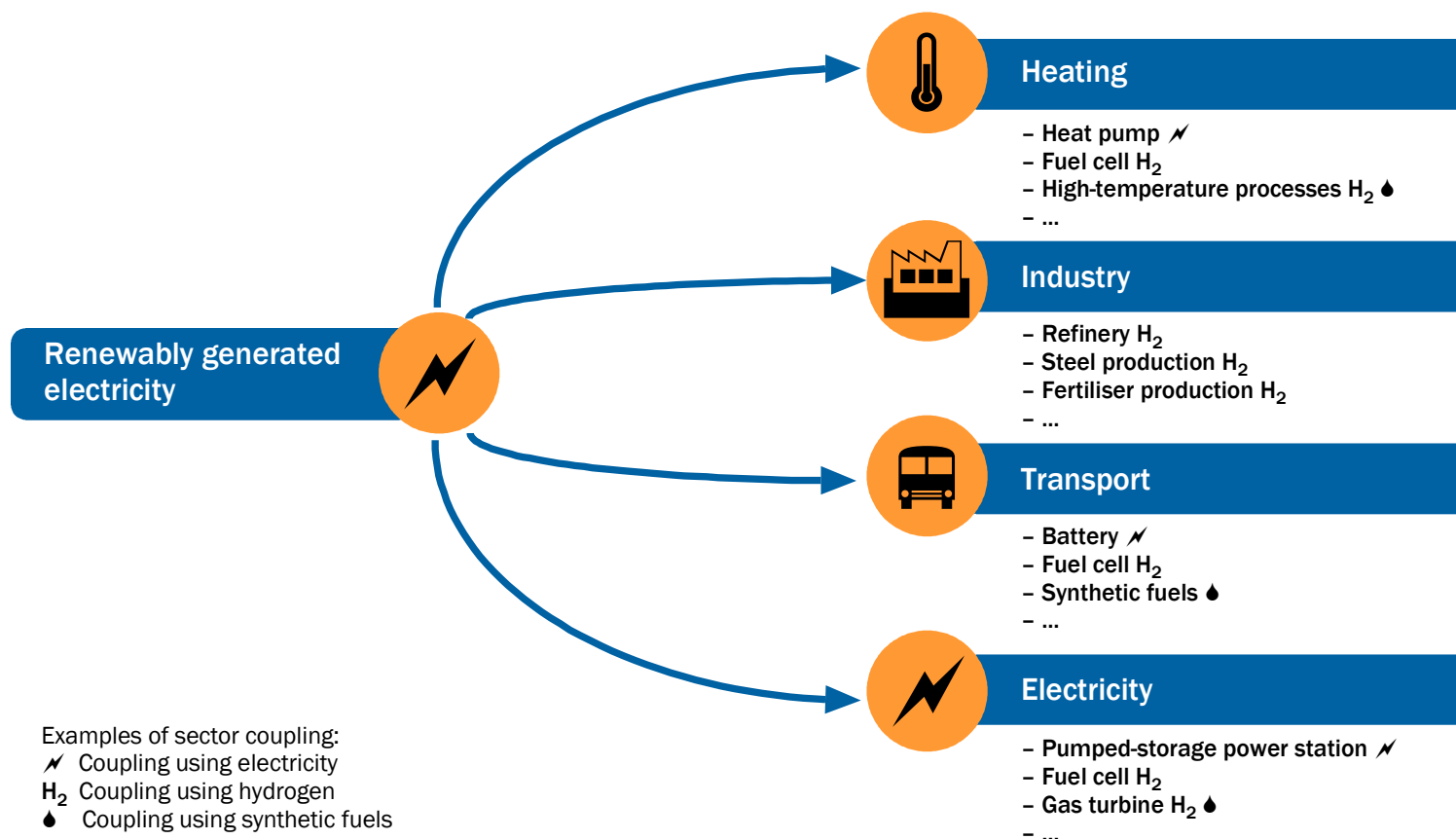
- ↘ Decision on market entry
 - ↘ What options are available to companies?
 - ↘ Today's policy has a strong influence on this, the course must be set today

Sources: IEA (2020a), IEA (2020a, 2020b)

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SECTOR COUPLING IS THE KEY

Sector coupling



Examples of sector coupling:
 ✓ Coupling using electricity
 H₂ Coupling using hydrogen
 ♦ Coupling using synthetic fuels

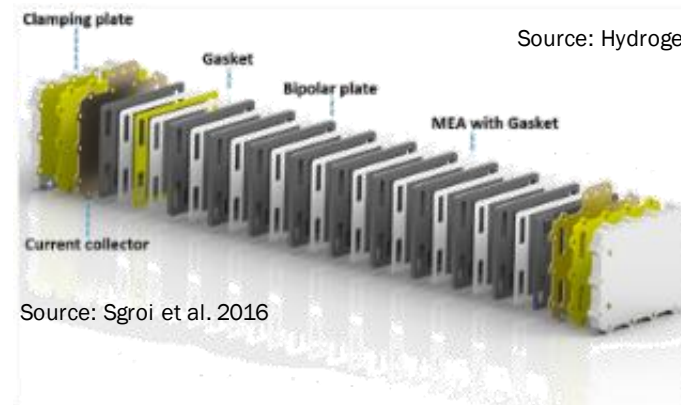
- Sector coupling is the key to reducing greenhouse gas emissions
- Industrial policy opportunities also through
 - The switch to climate-neutral energy supply and processes
 - The production of key components
- Focus on home markets and on export markets

THE EXAMPLE OF HYDROGEN: TECHNOLOGICAL FIELDS OF ACTION

- **H2 generation** of green and blue H2 (e.g. electrolysis with renewable electricity, biomass to hydrogen, pyrolysis, SMR + CCS or CCU, etc.).
- **H2 logistics** - national, European, global (pressure and cryo technologies, chemically bound. Transport in pipeline, tanker, train or truck).
- **H2 use in mobility, industry and energy** (H2-powered vehicles, H2 as a building block of chemical products, etc.)
- **H2 scaling of key components** of a future H2 economy (electrolyzers, fuel cells, logistics applications, etc.)



Source: Toyota

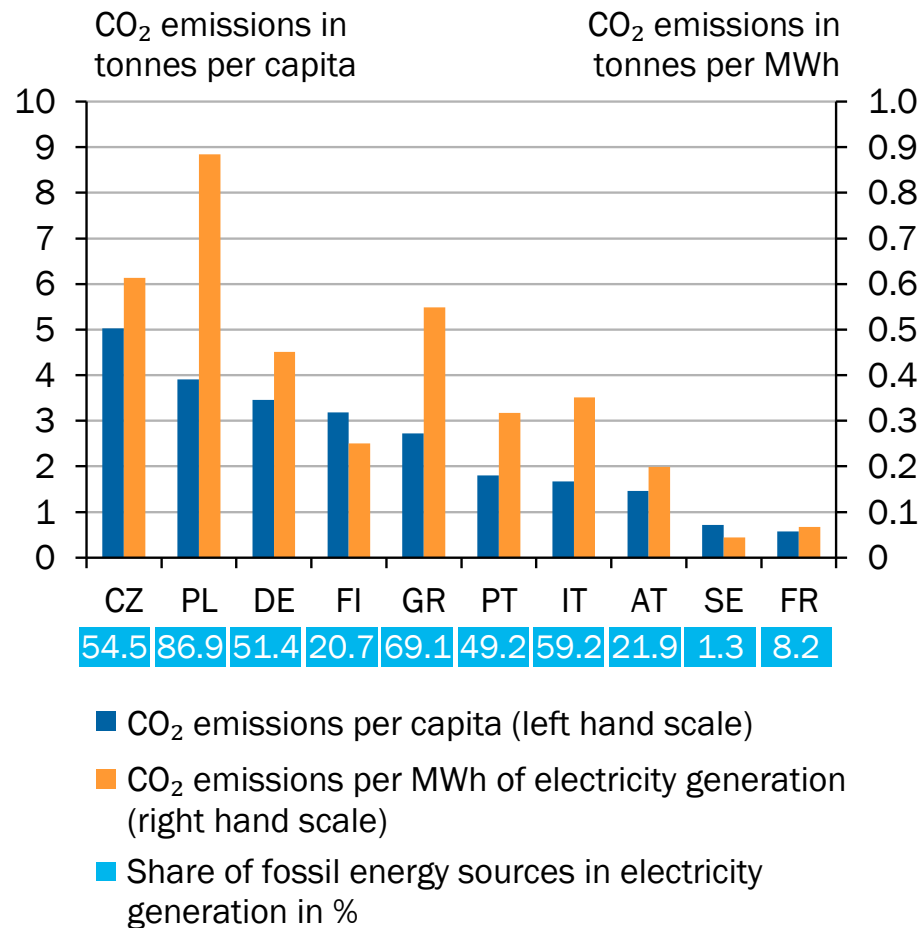


Source: Hydrogenious LOHC Technologies

Source: SgROI et al. 2016

TRANSITORY RISKS AND CHALLENGES

CO₂ emissions in electricity generation in 2018

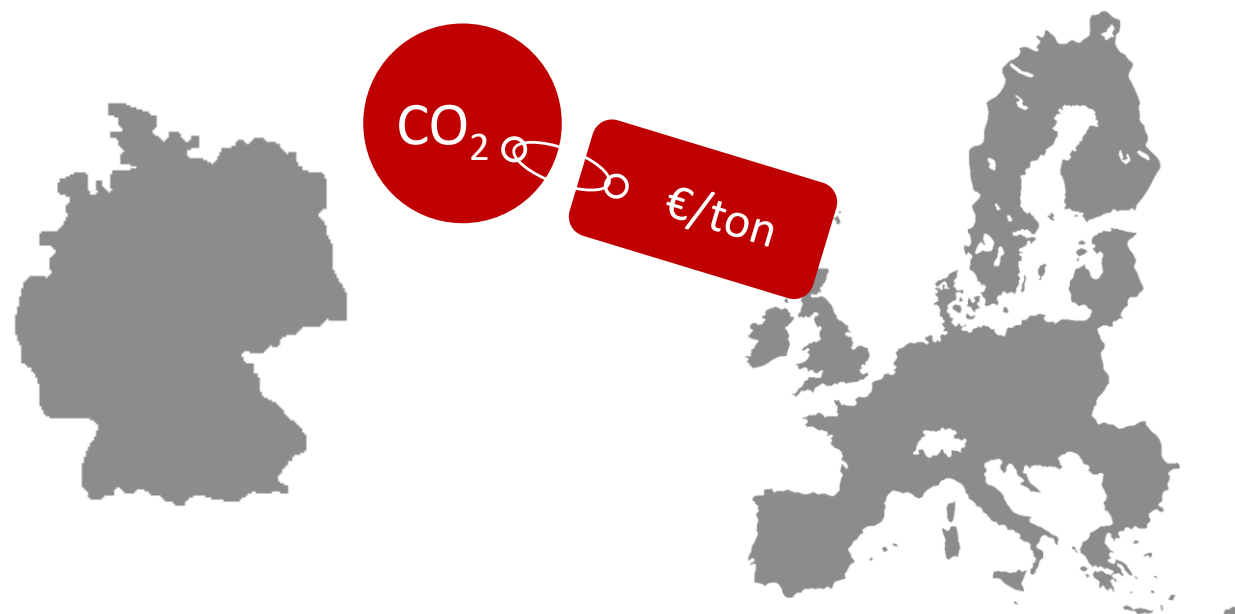


- ↘ Emission intensity of energy supply today is very heterogeneous within the EU
- ↘ Decarbonization of all sectors as a challenge
- ↘ The structure of value creation is decisive:
 - ↘ Extraction of fossil fuels and raw materials,
 - ↘ Manufacturing oriented
 - ↘ Service oriented

STRENGTHENING MARKET-ORIENTED INSTRUMENTS

Reform the German energy price system.

- Secure and tighten CO₂ price path.
- Elimination of levies on electricity and partially compensation via revenues from CO₂ pricing
- Reduce electricity tax to the minimum rate of the EU energy tax directive.



Reform and expand European climate protection instruments.

- Energy tax directive
- European emissions trading
- Border carbon adjustments

Design and communicate energy price reforms correctly.

- Take distributional effects into account.
- Use income in a targeted and transparent manner.
- Communicate reforms convincingly.

CONSIDERING DISTRIBUTIONAL AND INCENTIVE EFFECTS

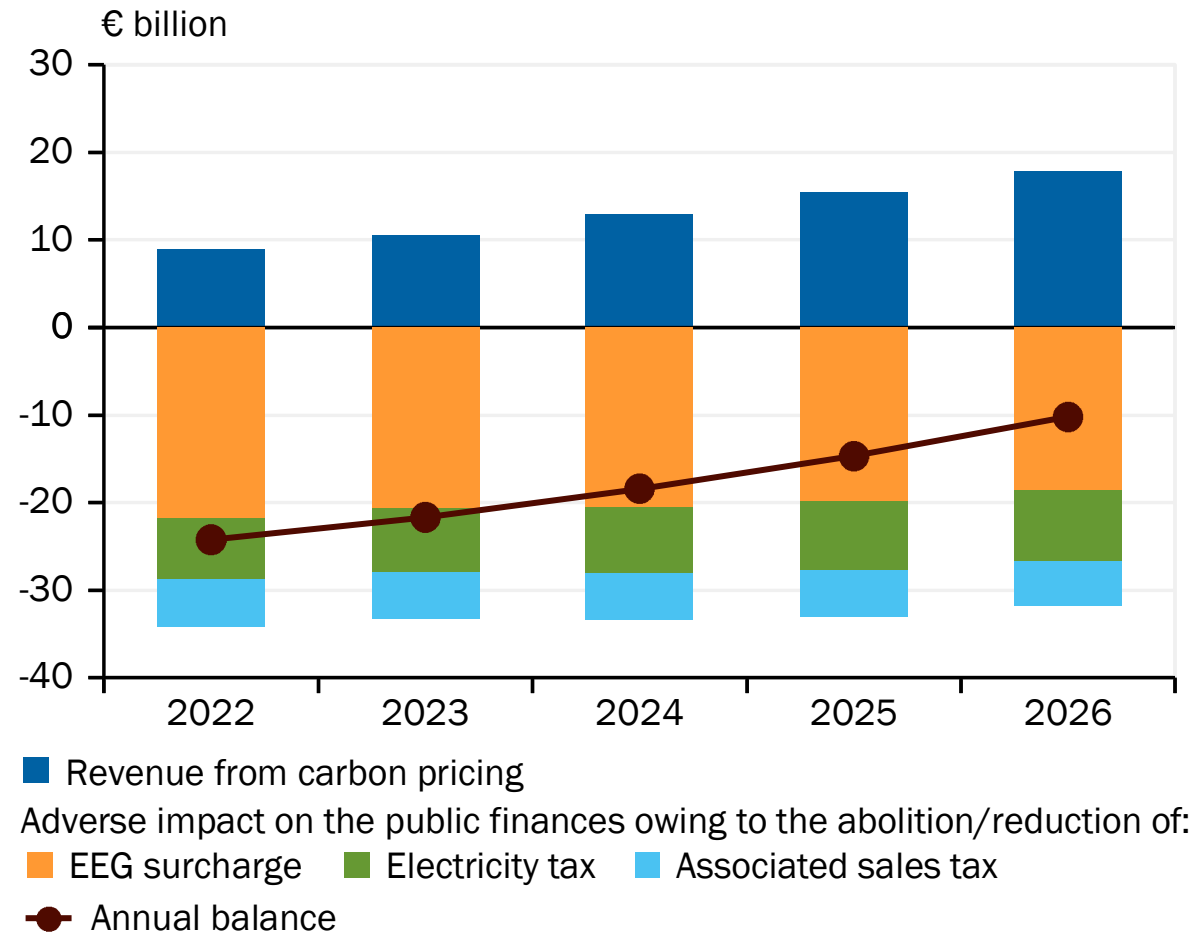
Reduction of levies and charges

- Remove EEG levy as a component of the electricity price
- Reduce electricity tax to European minimum rate

Various advantages

- Planning security for companies and households
- Compensation for burden caused by CO2-pricing
- Investment incentives for new, low-emission technologies
- Reduction of bureaucracy

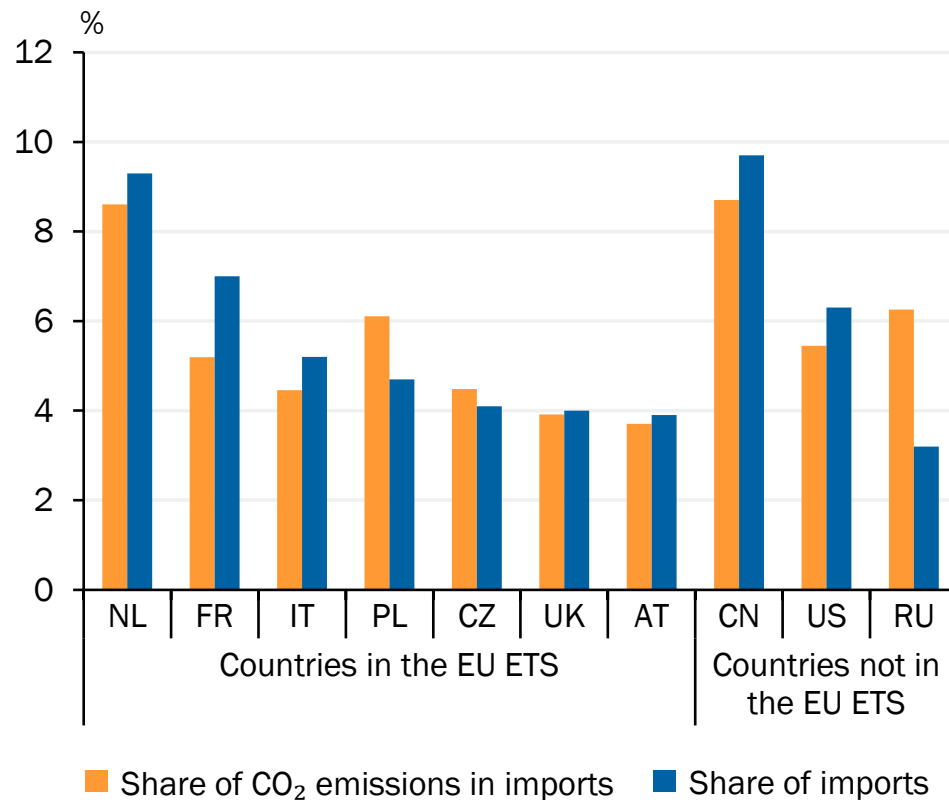
Overall fiscal impact of national carbon pricing and energy price reform



Sources: Federal Ministry of Finance, dena (2020), own calculation

CARBON BORDER ADJUSTMENT OR “CLIMATE CLUB”?

CO₂ emissions of German imports in 2015 by country of origin



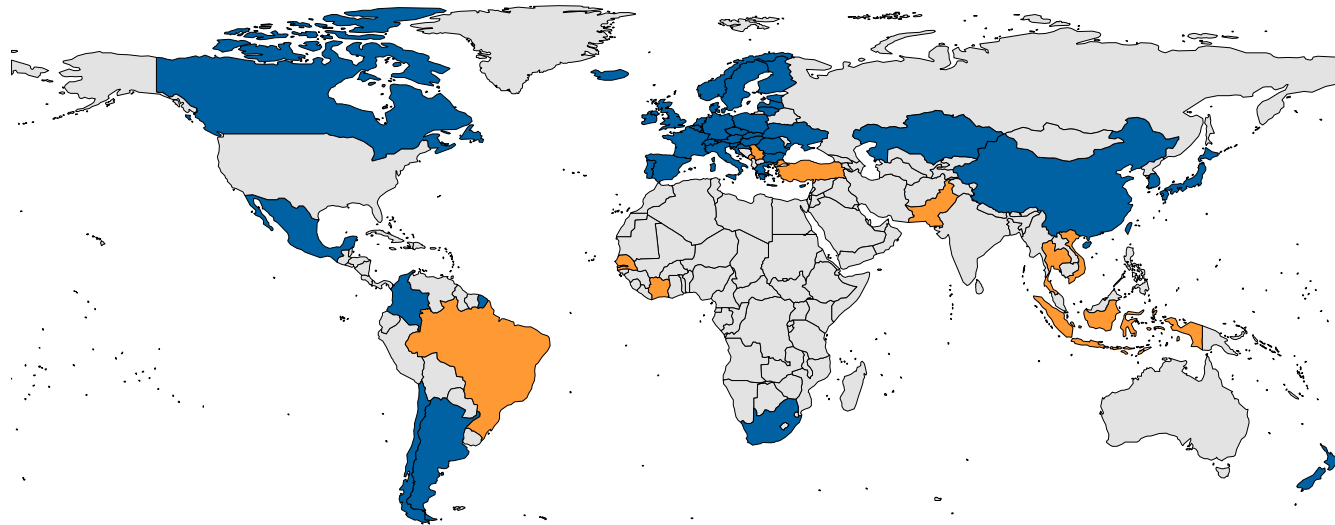
Sources: Federal Statistical Office, own calculations

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- Carbon Border Adjustment announced in the “Fit for 55” package
 - ↘ Steel and iron, cement, aluminium, fertiliser, electricity
 - ↘ Free allocation phased out until 2035
 - ↘ Pilot phase 2023-26
- Should prevent carbon leakage and maintain competitiveness, but
 - ↘ Cumbersome administration and monitoring
 - ↘ Legal and political uncertainty
 - ↘ Potentially retaliation if interpreted as trade barrier

STRENGTHEN INTERNATIONAL CLIMATE COOPERATION

Cross-regional and national carbon pricing mechanisms in 2021



■ Existing emission trading system or carbon tax ■ Considerations to implement carbon pricing

□ No carbon pricing mechanism

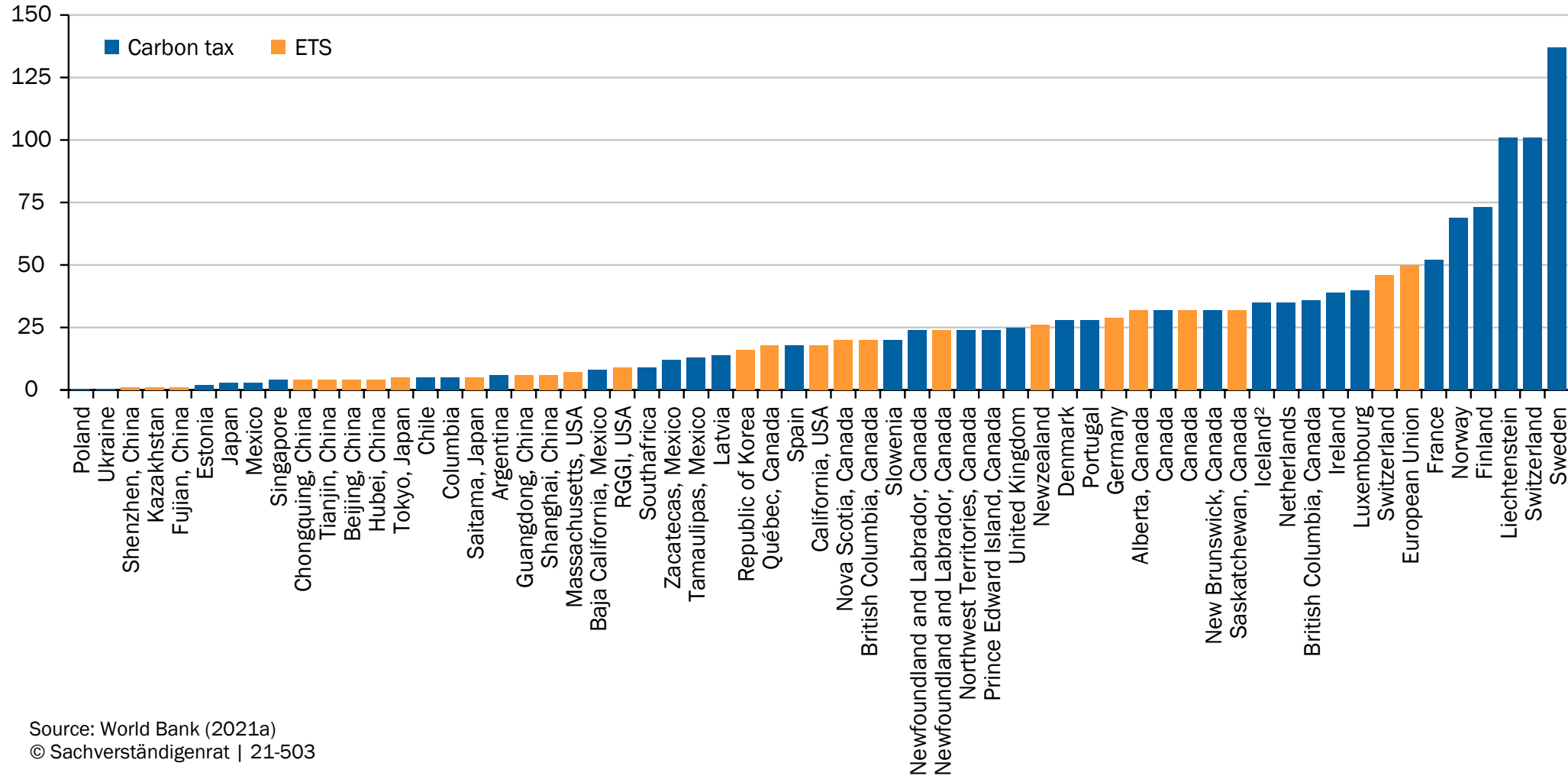
Sources: EuroGeographics for the administrative boundaries, World Bank

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- Expansion of the EU ETS as a starting point for global climate cooperation
- Use renewable energies to diversify own energy dependency
- Coordination in a climate club could reduce carbon leakage and make climate policy more efficient
- Establish reliable methods for calculating emissions from countries, products and investments.

CURRENTLY VERY HETEROGENEOUS CO2 PRICE LEVELS

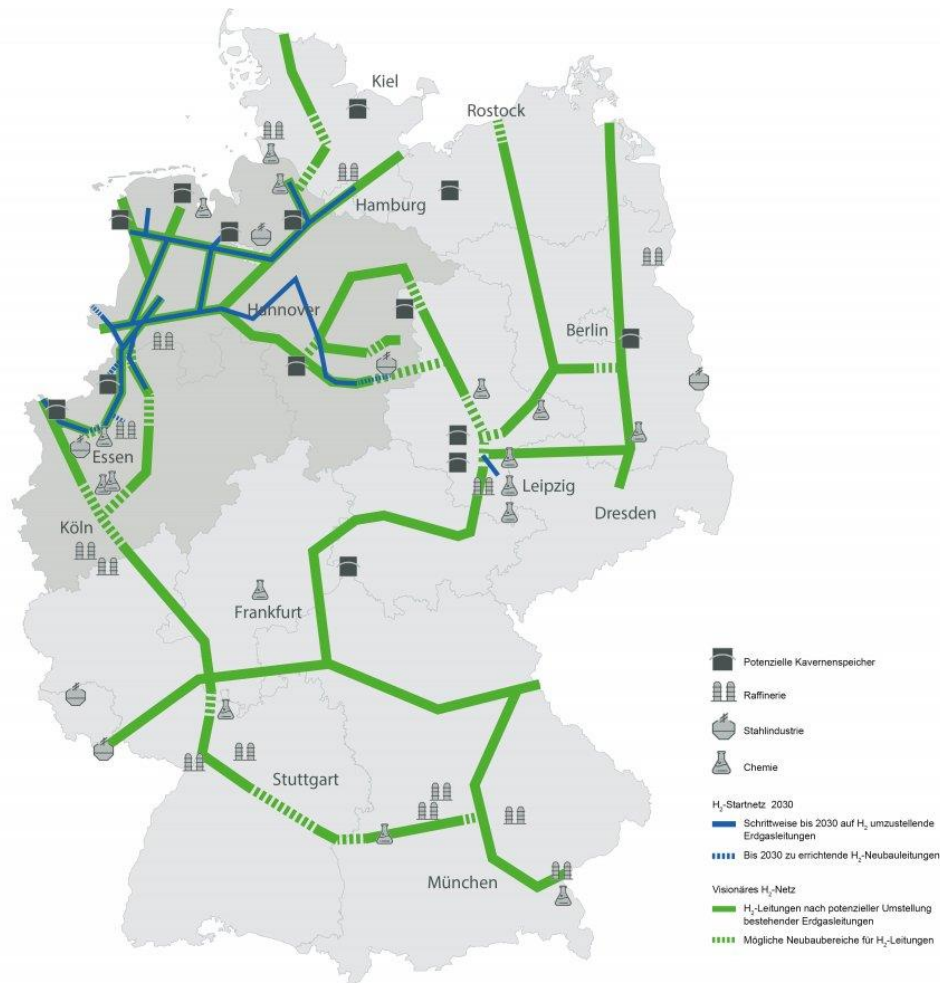
CO₂ prices in April 2021
US dollar/tCO₂



Source: World Bank (2021a)
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SUPPORT CO2 PRICES

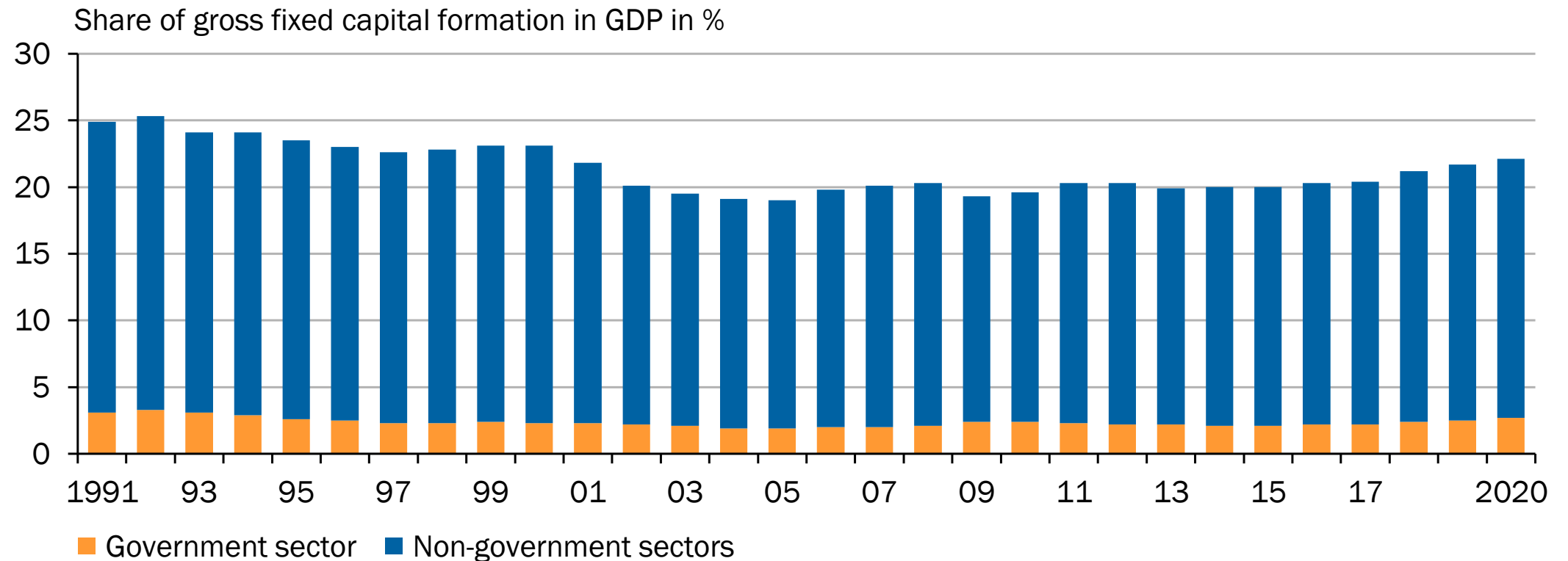
H₂-Startnetz 2030



- Significantly accelerate infrastructure development
- Accelerate planning and approval procedures
- Train and further educate skilled workers
- Selective and temporary subsidies

TRIGGER PRIVATE INVESTMENT

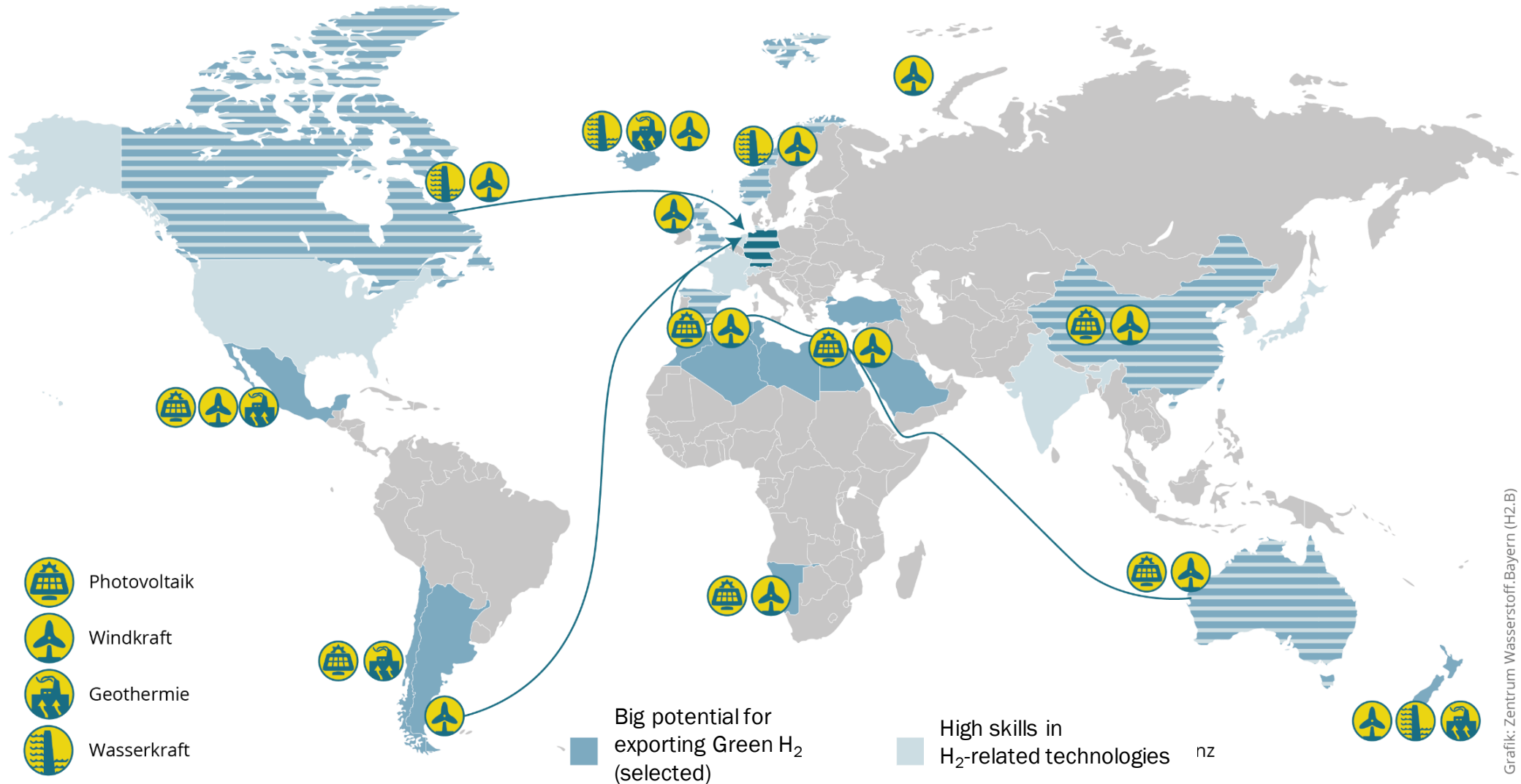
Development of private and public investment in Germany



Source: Federal Statistical Office

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THE GLOBAL ENERGY SUPPLY IS BEING REORGANIZED



Grafik: Zentrum Wasserstoff, Bayern (H2.B)

FASTER SUCCESS IN CLIMATE PROTECTION

- ↘ Strengthen market-oriented instruments
- ↘ Benefit from sectoral and temporal flexibilities
- ↘ Carefully consider distributional effects
- ↘ Support CO2 pricing
- ↘ Trigger private investment
- ↘ International focus of climate policy

VIELEN DANK FÜR IHRE AUFMERKSAMKEIT.



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