

Reaching a Net Zero Economy

German Pathways and Methodology

Dr. David Jacobs (IET) on behalf of GIZ

Vietnamese-German Energy Partnership

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About the speaker



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Dr. David Jacobs
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Dr. David Jacobs

- Founder and director of IET
- Focus on sustainable energy policy and market design
- 18+ years experience in renewable energy policies
- Advise for BMWK on energy transition topics
- Advise for energy transition in Vietnam (MOIT, EREA, CEC, NA, etc.).

Agenda

- 1. Global Climate Protection Framework and Net Zero Targets
- 2. The German Methodology for Establishing a Net Zero Plan

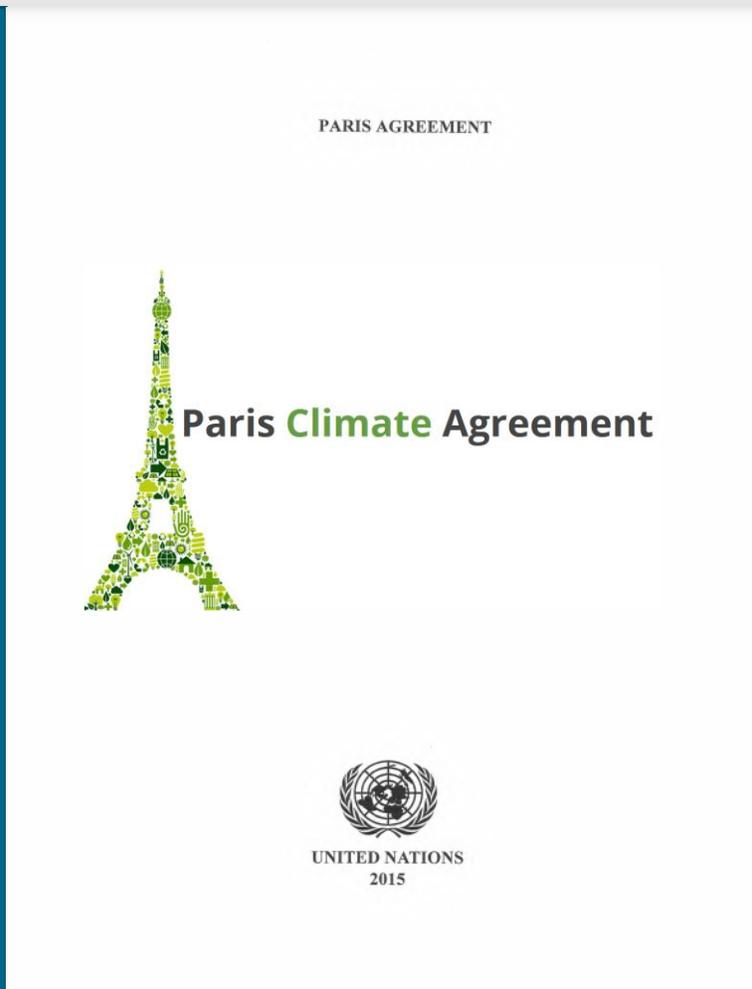




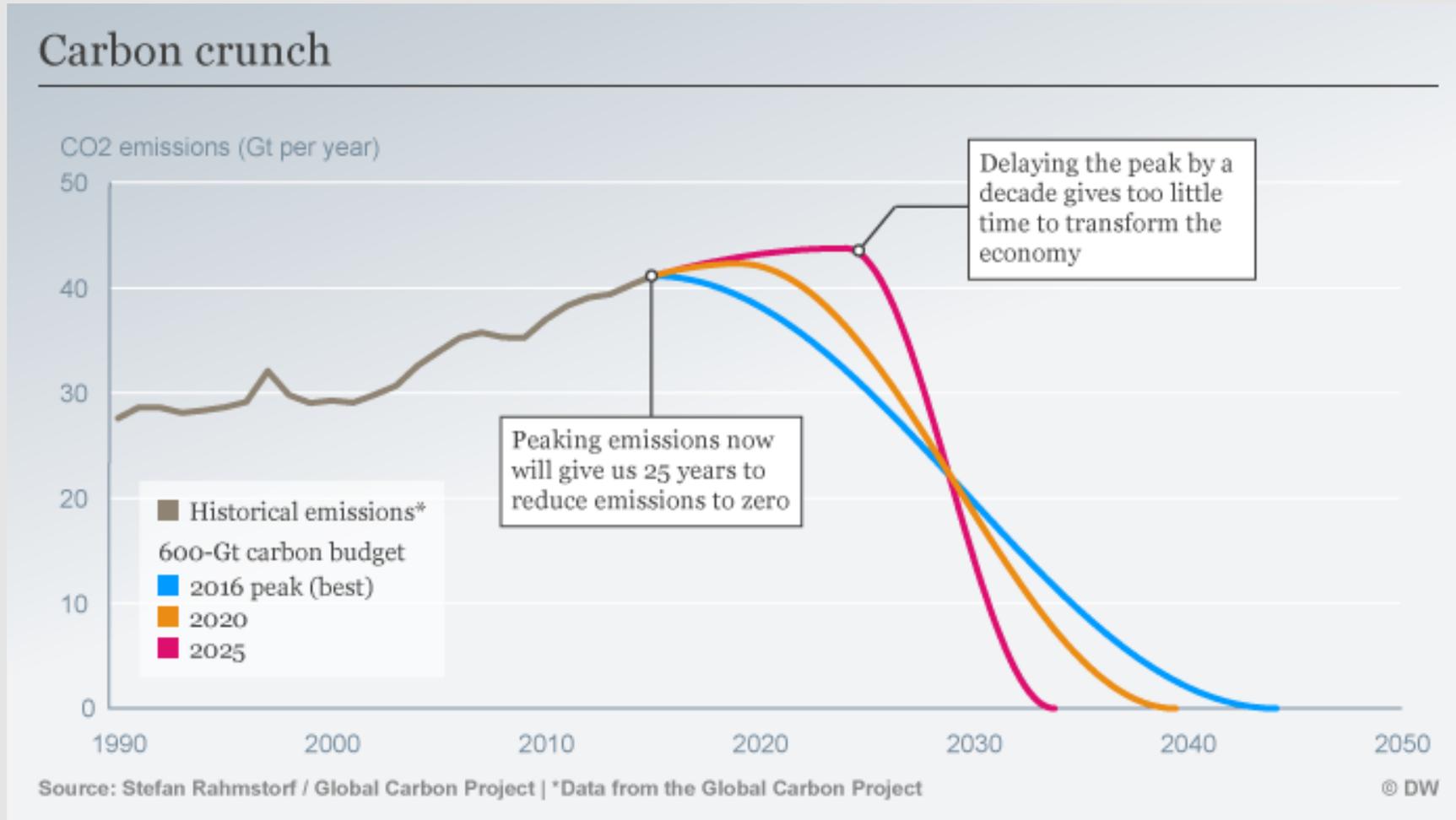
1. Global Climate Protection Framework and Net Zero Targets

The objectives of the Paris Agreement

“...to limit the rise in the global average temperature to well **below 2 degrees Celsius (°C), and ideally 1.5°C**, by the end of the present century, compared to pre-industrial levels.”



The sooner we ACT, the easier it will be



The Meaning of Net Zero

All sub-sectors of the energy sector need to move to low or zero carbon fuels and technologies, including heating and cooling, transport, and the electricity sector



Net zero means that countries will cut greenhouse gas emissions to as close to zero as possible, with any remaining emissions re-absorbed from the atmosphere by so-called **carbon sinks** (e.g., oceans and forests) (IPCC 2021, Fankhauser et al. 2021).



The Meaning of Net Zero

Net zero targets versus full decarbonization

Net zero GHG emissions

- Overall balance of greenhouse gas emissions (GHG) produced, and emissions taken out of the atmosphere (e.g., via carbon sinks such as forests).
- In other words, a certain number of emissions are still feasible if they are offset with either carbon sinks or with carbon sequestration.

Full decarbonization

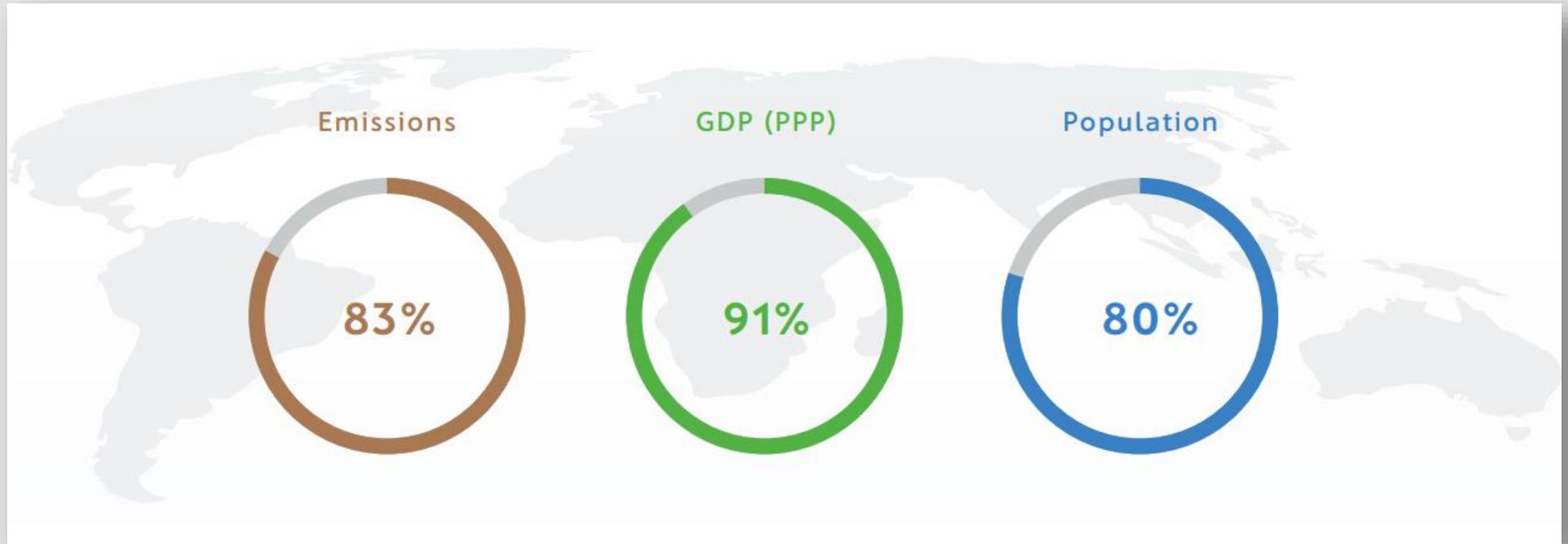
- This concept refers to the process of reducing the CO₂ emissions, with the end goal of achieving a fully decarbonized economy.
- No more CO₂ would be emitted into the atmosphere due to the burning of fossil fuels (i.e., no need to balance remaining emissions with carbon sinks such as forests).
- Many climate scientists argue that in the long-term (e.g., post-2050), negative emission will be required. In order to extract carbon from the atmosphere, full decarbonization might become necessary.



Net Zero Tracker

<https://zerotracker.net/>

As of 2022, a total of 136 countries have already committed to reach net-zero goals by mid-century



Source: <https://ca1-nzt.edcdn.com/Net-Zero-Tracker/Net-Zero-Stocktake-Report-2022.pdf?v=1655074300>

International Background:

The Role of Energy

Net zero
emissions in
the global
energy sector
by 2050



Coal demand will need to
reduce by 90%



Gas demand will have to
reduce by 50%



Oil demand will have to
reduce by 75%

*“No need for **NEW** oil, gas or coal exploration
investments”*

Flagship report

Net Zero by 2050





Carbon Border Adjustment Mechanism (CBAM) and Risks for Carbon Intensive Economies

Several countries, including the EU as a whole, are currently considering introducing **carbon border adjustments**. Countries with high-carbon economies would be at a **strategic disadvantage in global trade**.

The **carbon intensity** of each economy will **determine to what extent its products will be subject to import duties**, and how competitive the each national economy will be in terms of global trade!

2. The German Methodology for Establishing a Net Zero Plan



Establishing Net Zero Pathways:

Methodology

STEP 1



Determine economy-wide emission reduction targets (2030, 2040, 2045) in line with a net zero pathway

STEP 2



Determine sectoral emission reduction targets (for the energy sector and all other sectors), including annual emission reduction targets

STEP 3



Determine policies and measures in the electricity, heating and transport sector that will enable target achievement

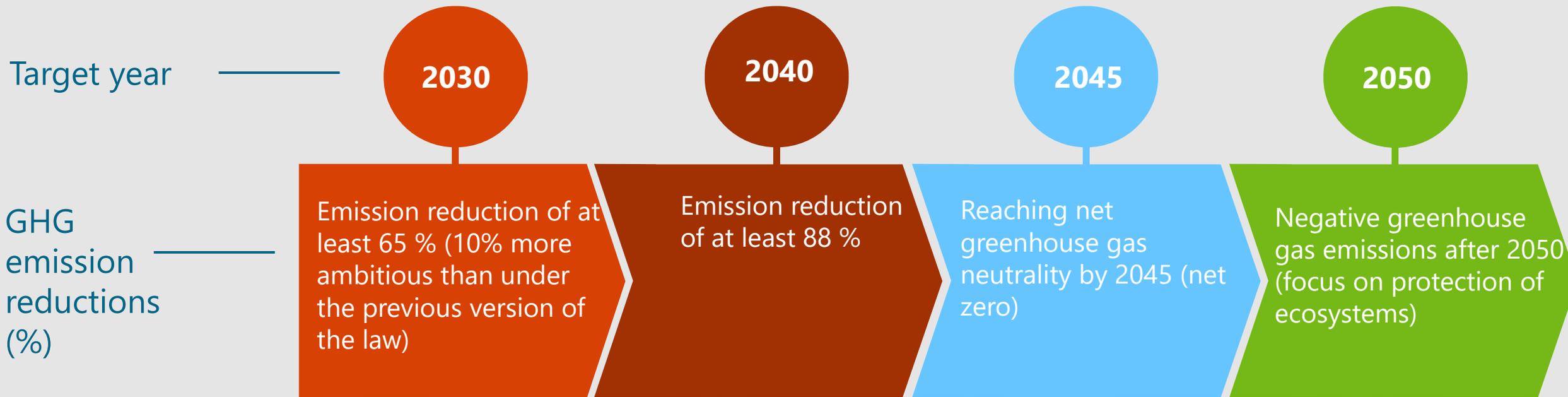
STEP 4



Establish regular monitoring of targets and measures; implement additional measures if targets are not achieved

Establishing Net Zero Pathways:

Case Study Germany – Overall Targets

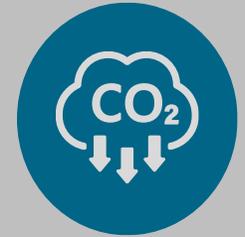


Source: IET based on German Climate Protection Law

Establishing Net Zero Pathways:

Case Study Germany – Sectoral Targets

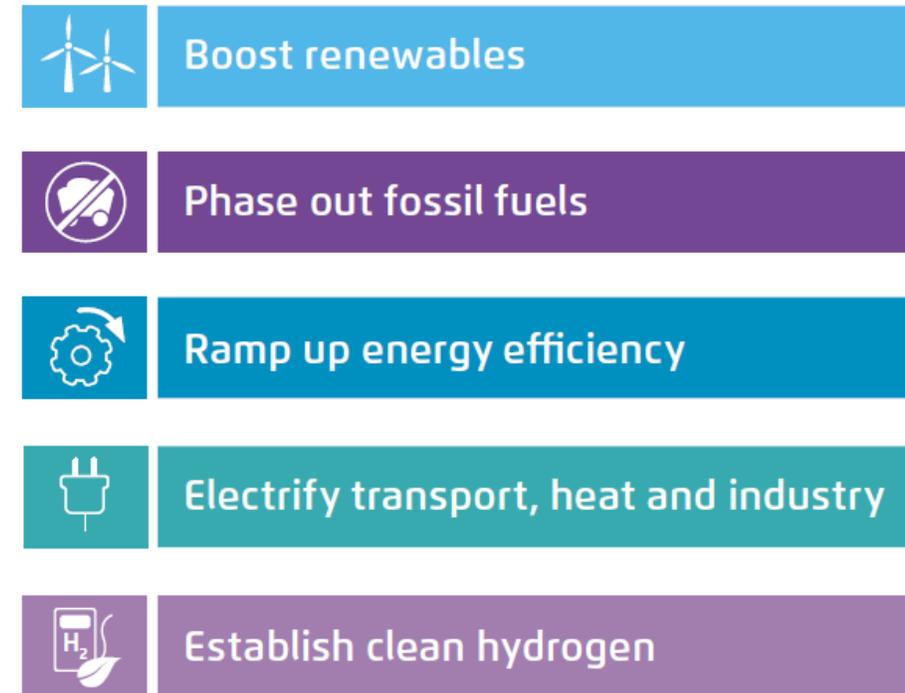
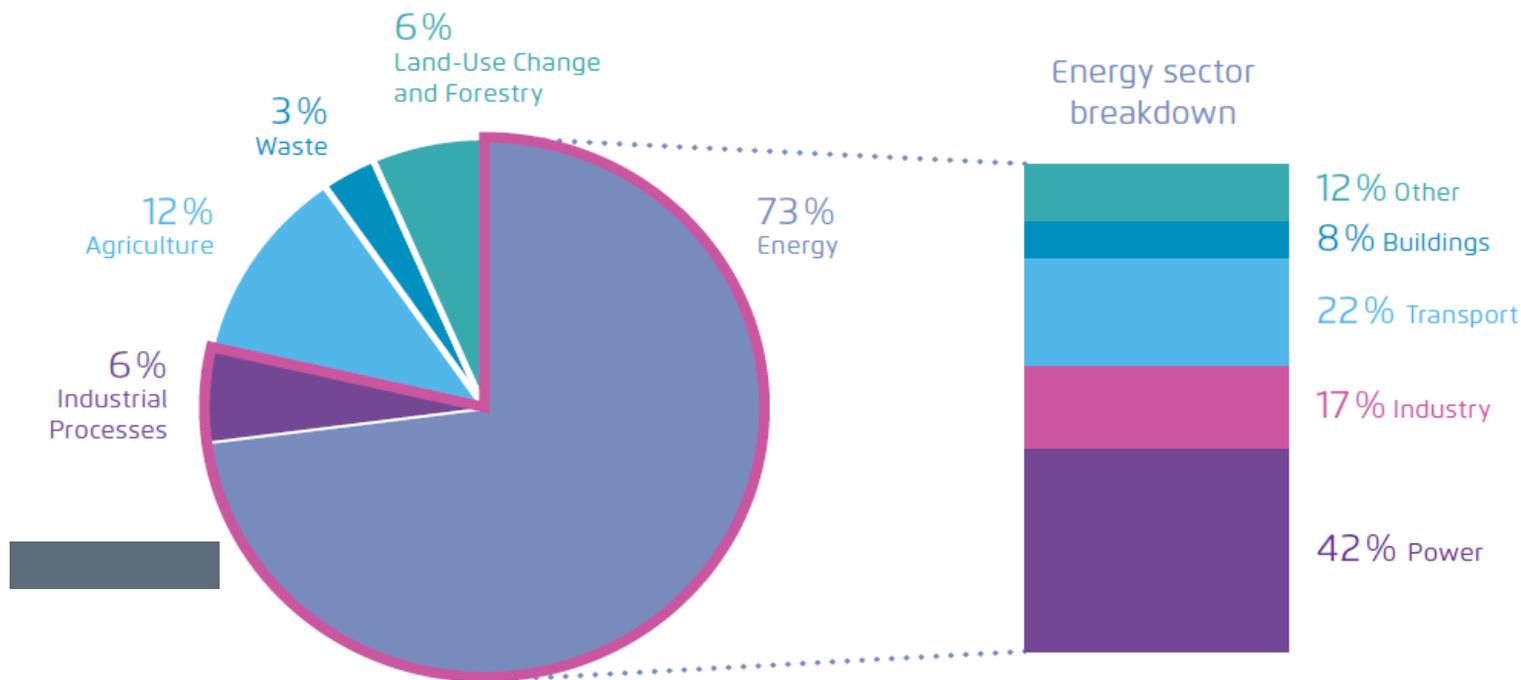
STEP 2



| Annual emissions (million tonnes of CO ₂ -equivalents) | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 |
|---|------|------|------|------|------|------|------|------|------|------|------|
| Energy sector | 280 | | 257 | | | | | | | | 108 |
| Industry sector | 186 | 182 | 177 | 172 | 165 | 157 | 149 | 140 | 132 | 125 | 118 |
| Buildings sector | 118 | 113 | 108 | 102 | 97 | 92 | 87 | 82 | 77 | 72 | 67 |
| Transport sector | 150 | 145 | 139 | 134 | 128 | 123 | 117 | 112 | 105 | 96 | 85 |
| Agricultural sector | 70 | 68 | 67 | 66 | 65 | 63 | 62 | 61 | 59 | 57 | 56 |
| Waste sector and others | 9 | 9 | 8 | 8 | 7 | 7 | 6 | 6 | 5 | 5 | |

Source: IET based on German Climate Protection Law

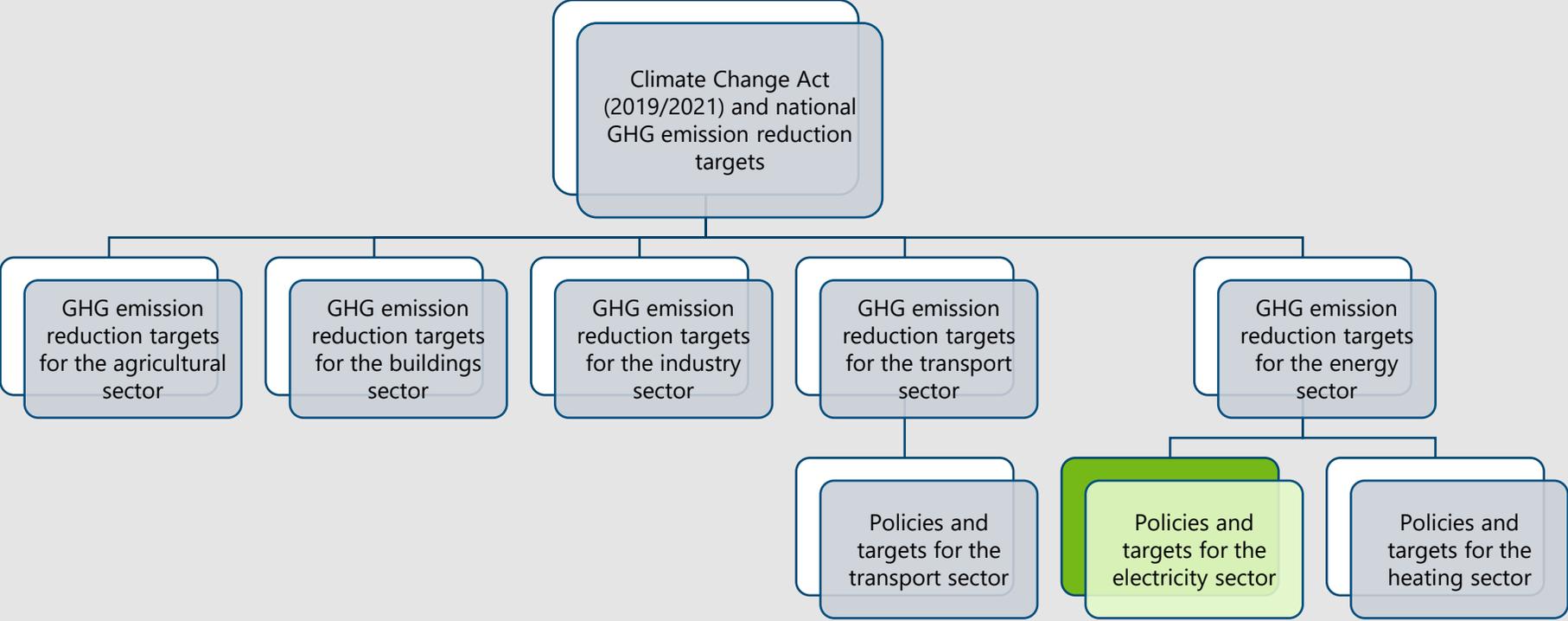
5 main strategic pillars to bring emissions to net-zero:



The Renewable Energy Source Act (EEG): Targets

Targets: Combining climate and energy policy

STEP 3



The Renewable Energy Act: Targets

New climate mitigation targets:

| GHG Emission Reduction Targets | 2020 | 2030 | 2040 | 2045 | 2050 |
|--------------------------------|-------|-------|-------|----------|----------|
| Before 2021 | -40 % | -55 % | | | Net Zero |
| New targets | -40 % | -65 % | -80 % | Net Zero | |

Targets: Adjusting the objectives of the energy sector to the more ambitious climate targets

New targets for the renewable energy law (EEG) (electricity sector)

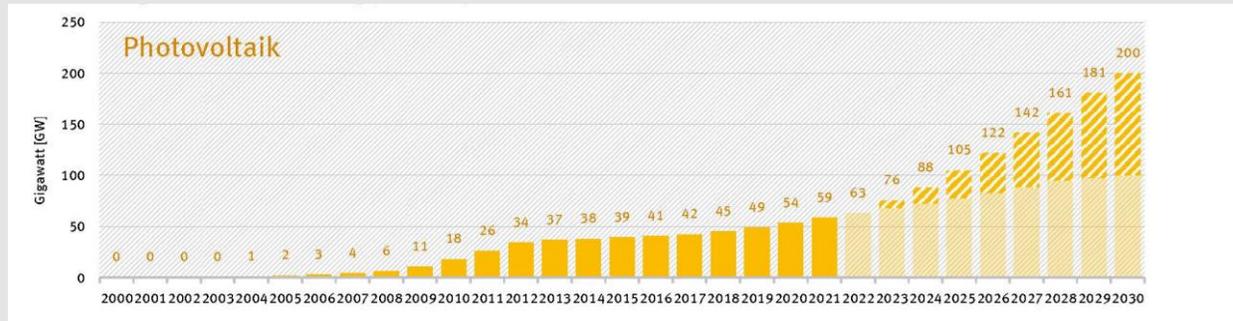


| Share of renewable energies in final electricity consumption | 2020 | 2030 | 2035 | 2040 | 2050 |
|--|---------------|---------------|----------------------------|------|----------------------------|
| Before 2021 | At least 35 % | At least 65 % | | | Climate neutral (net Zero) |
| New targets | At least 35 % | At least 80 % | Climate neutral (net Zero) | | |

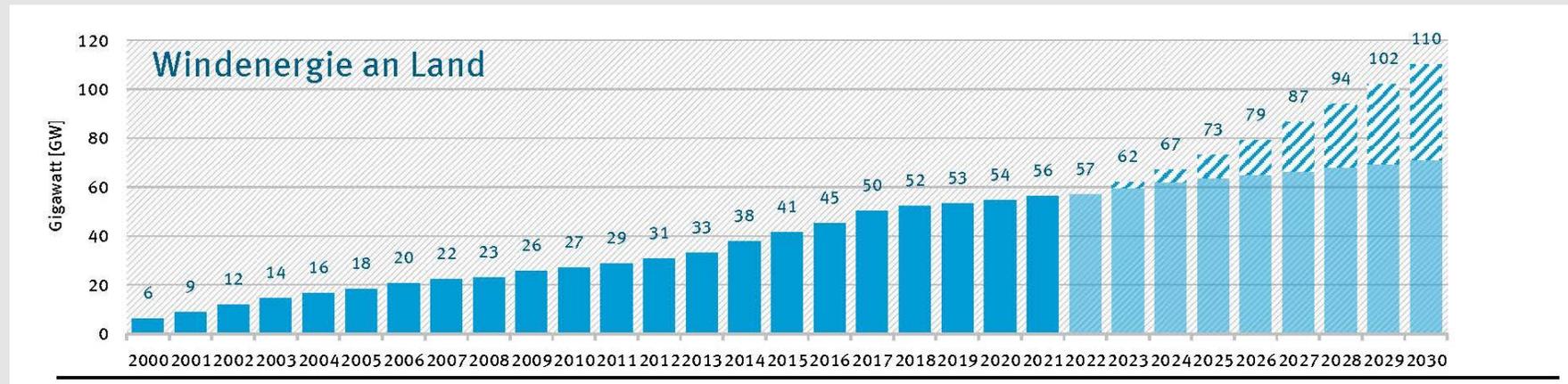
The Renewable Energy Act: Targets

Targets: Adjusting the objectives of the energy sector to the more ambitious climate targets

New PV deployment targets:

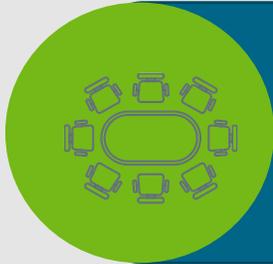


New onshore wind deployment targets



Establishing Net Zero Pathways:

Case Study Germany – Monitoring



The Climate Action Law also stipulates the role of an independent expert council to evaluate the progress towards a net zero economy in Germany.



Five experts are selected for a five-year term by the government. The experts cover different academic fields that are relevant for climate policy, including economics, political science, social sciences and natural sciences.



The council presents emissions development reports, and an assessment of policy impacts every two years

STEP 4



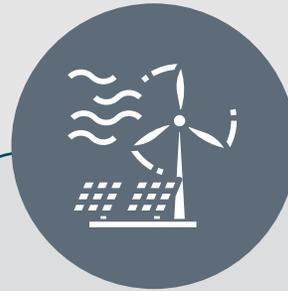
Establishing Net Zero Pathways:

Case Study Germany – Monitoring Energy

Transition

INDICATORS

- Share of renewable energy sources (RES) in gross final energy consumption
- Share of RES in gross electricity consumption
- Renewable electricity generation by technology
- Gross electricity generation by energy source
- Share of RES in heating and cooling consumption
- Share of RES in the transport sector
- EEG surcharge by technology
- Sum total of EEG surcharge plus electricity prices on the exchange



Evaluation
field

Renewable
Energy

STEP 4



The report presents information on the annual progress being made with regards to the achieving quantitative targets of the energy transition.



A points-based system is used to evaluate progress towards these quantitative targets

3. List of References and Further Reading



List of References and Further Reading

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Thanks for your
attention

