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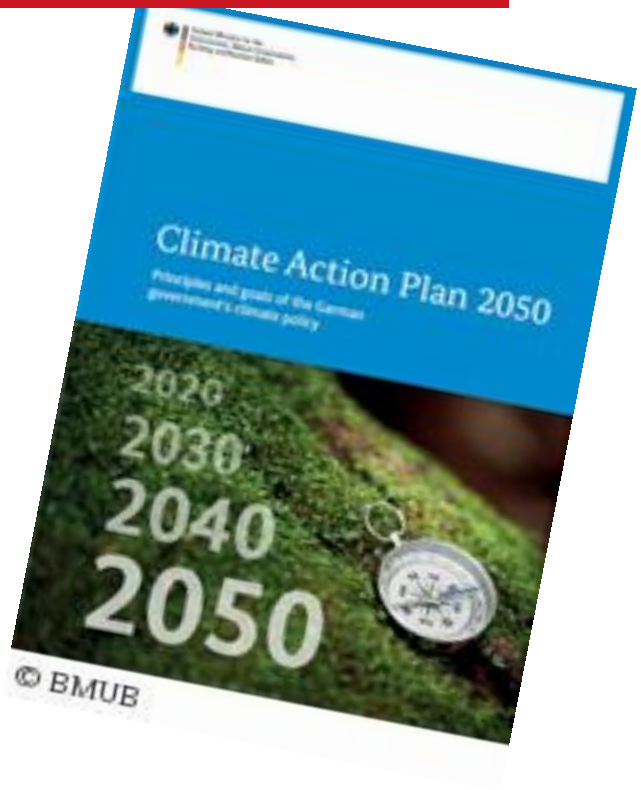
“CLIMATE, ENERGY, GREEN TECH: TRANSFORMING OUR ECONOMIES”



Institute for Global Economics (IGE),

Seoul 29th of June, 2018

Dr. Karsten Sach

Director General,

Head of Department

"International and European Policy, Climate Policy"

Federal Ministry for the Environment, Nature Conservation, and Nuclear Safety (BMU)

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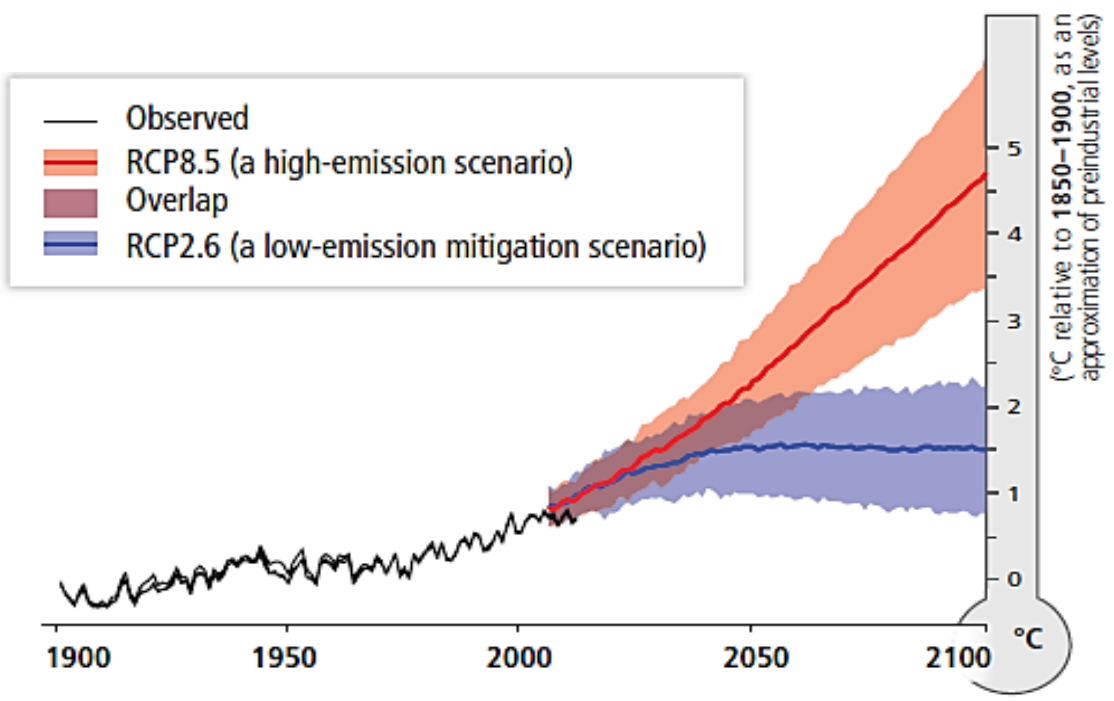
Climate change is already happening, serious impacts can be observed day-by-day

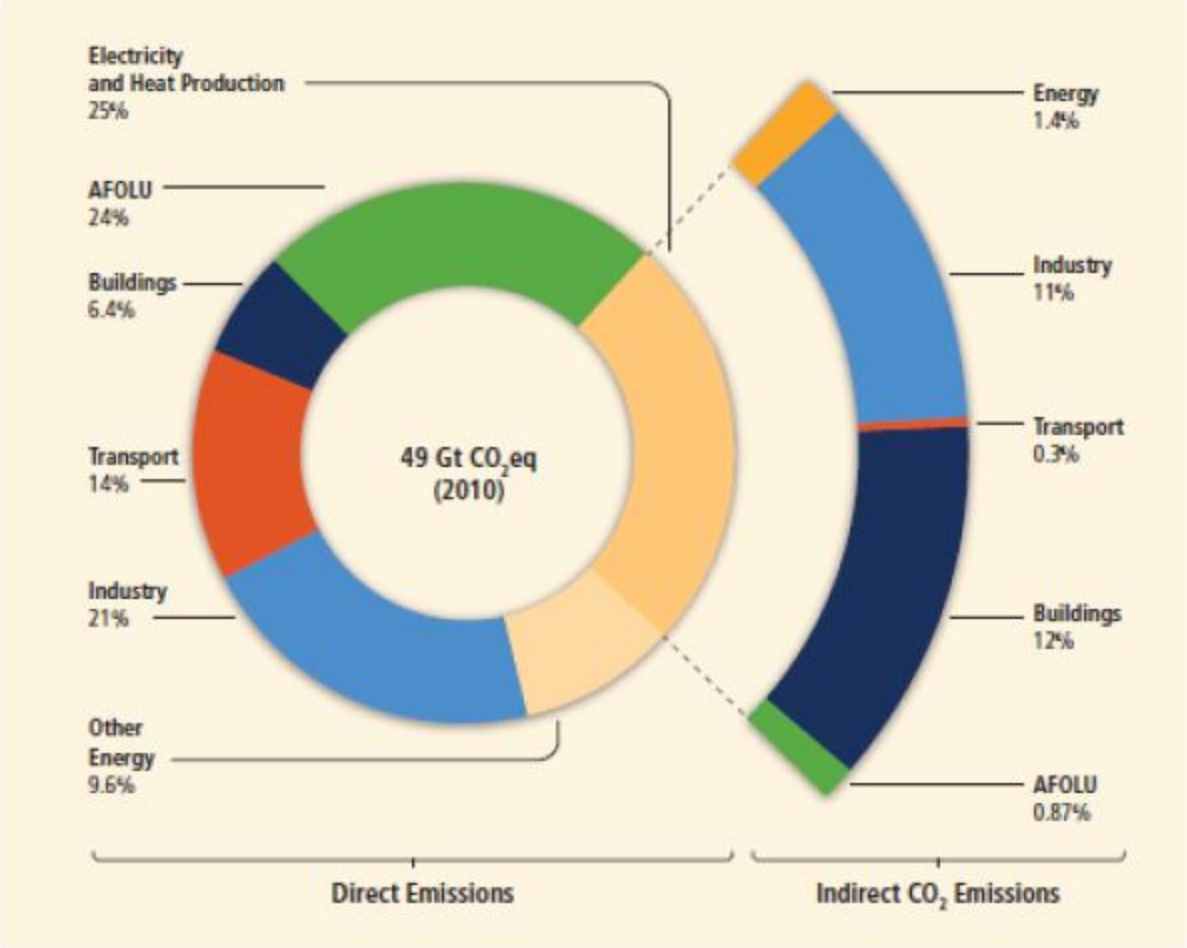
Global temperature increase 1 °C compared to 1850-1900 average

Current emission trends threaten global prosperity and security



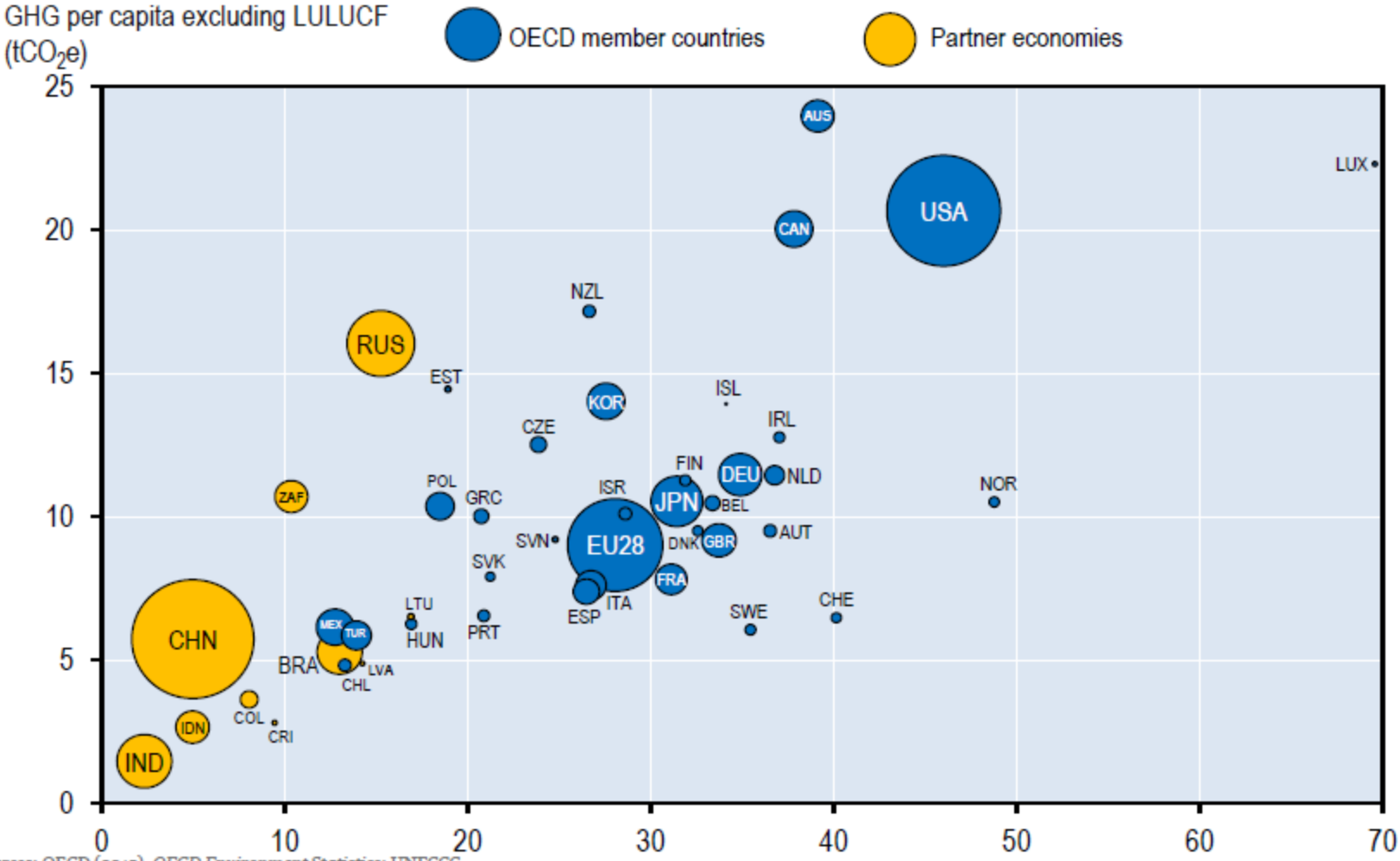
Source: IPCC 2013

Greenhouse Gas Emissions by Economic Sector



Source IPCC AR5 WG3 SPM

All countries have different starting points



Sources: OECD (2015), *OECD Environment Statistics*; UNFCCC (2015), *GHG inventory data*; IEA (2015), *IEA CO_2 Emissions from Fuel Combustion Statistics*

Investing in Climate,
Investing in Growth

Boosting economic growth does not mean locking the world into a high-emissions future,
provided pro-growth reforms are combined with coherent climate policy and alignment of policies across the economy

OECD
BETTER POLICIES FOR BETTER LIVES

Investing in Climate, Investing in Growth

More ambitious climate policies **will not harm growth**

The combined actions of more ambitious climate policies and economic reform still deliver a net GDP increase in the long run.

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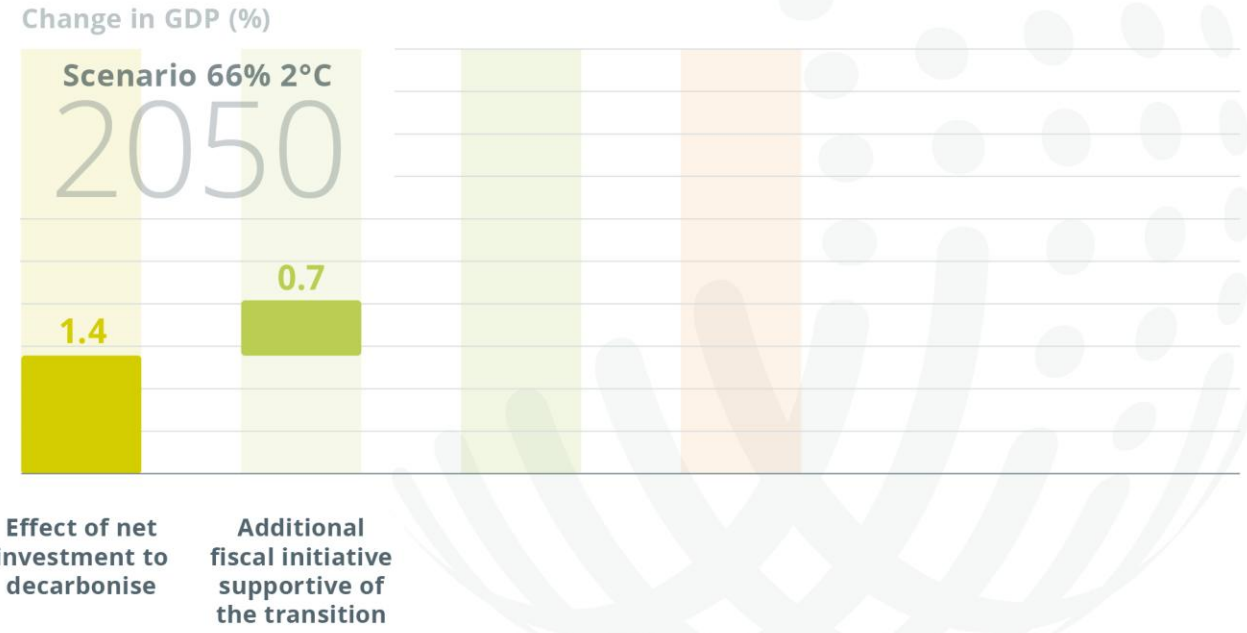

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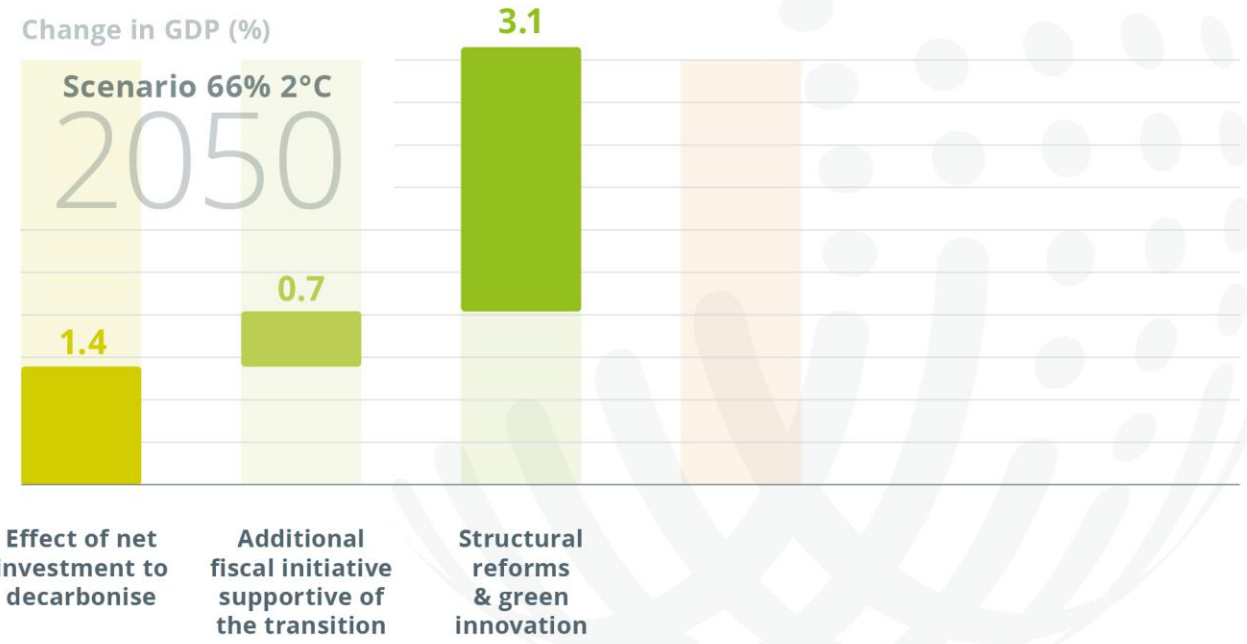

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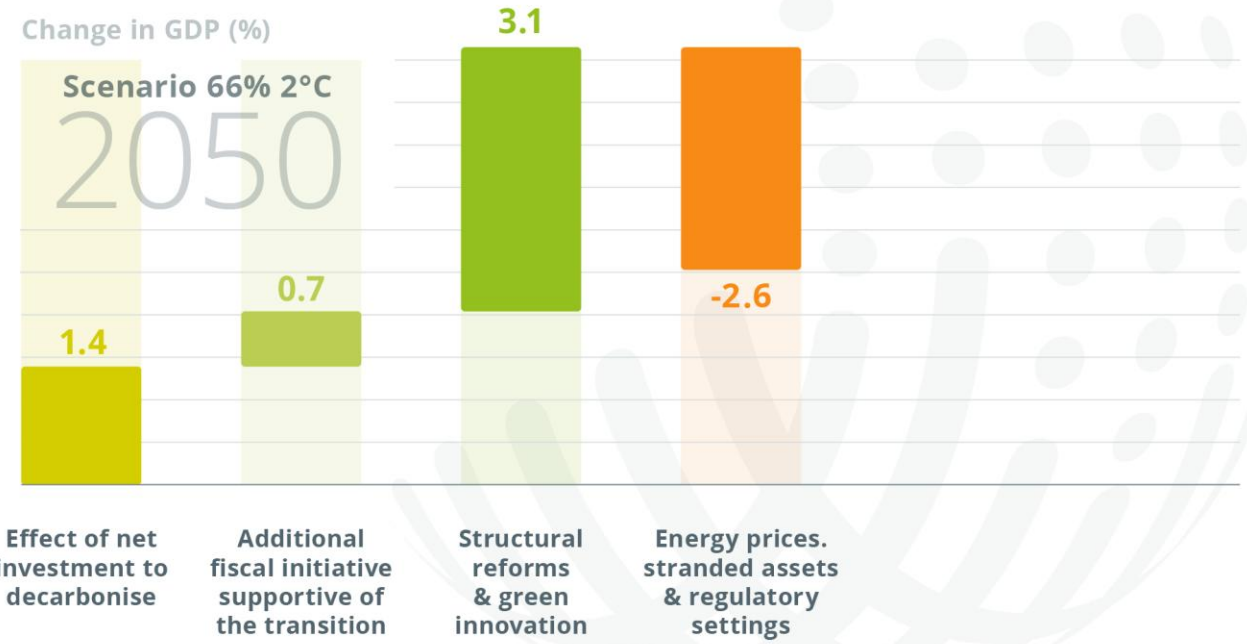

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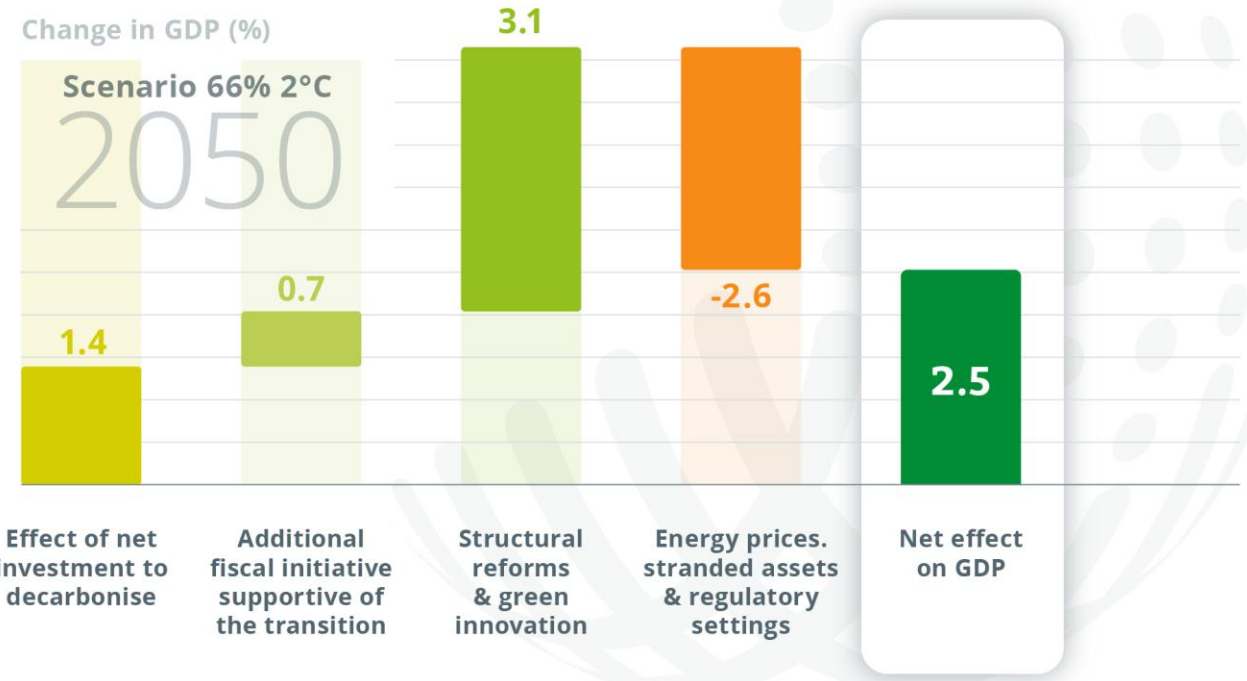

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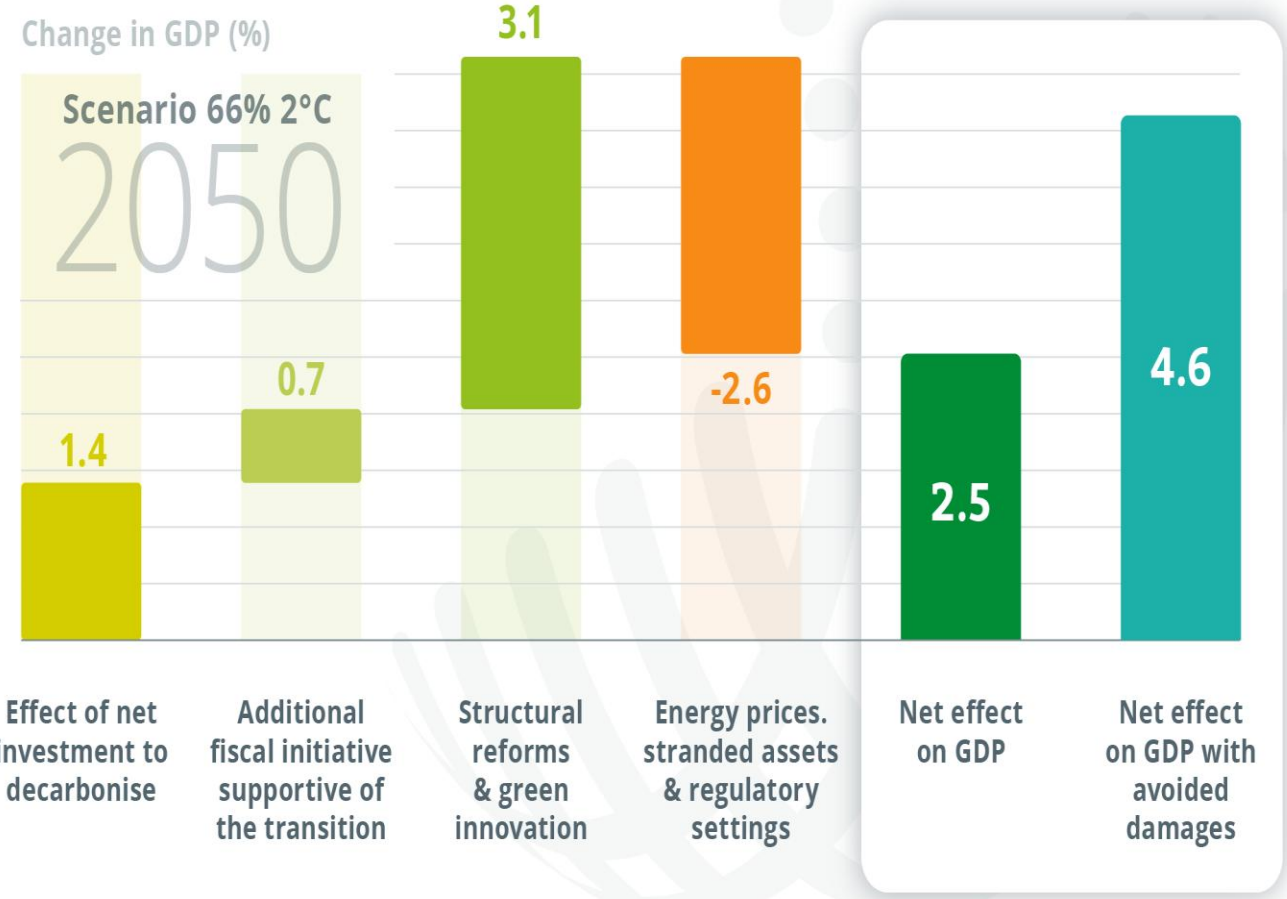

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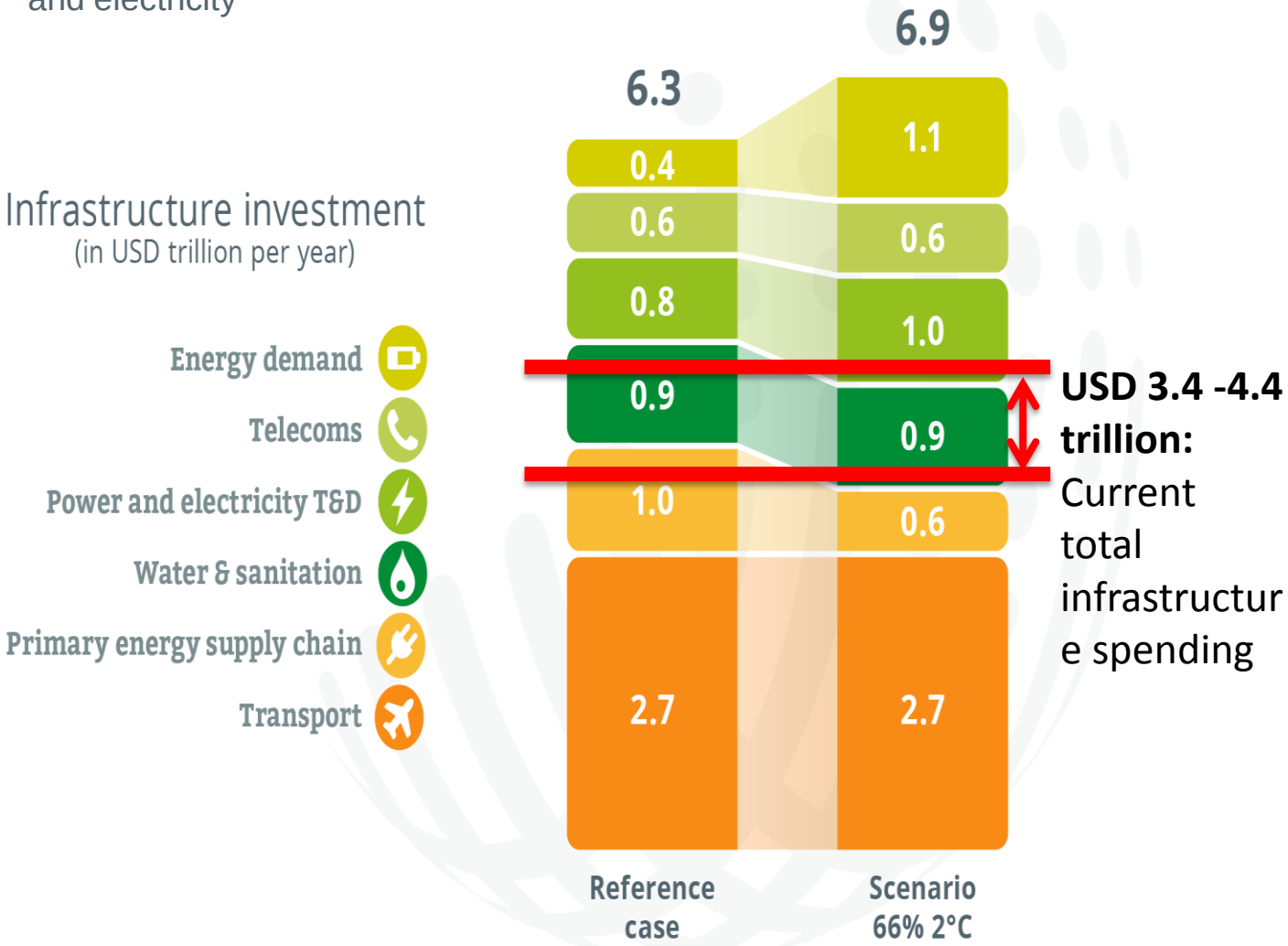
Investing in Climate, Investing in Growth

An ambitious 2°C scenario requires only a 10% **increase** in infrastructure investment

Increased expenditures are needed in energy demand and electricity



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Investing in Climate,
Investing in Growth

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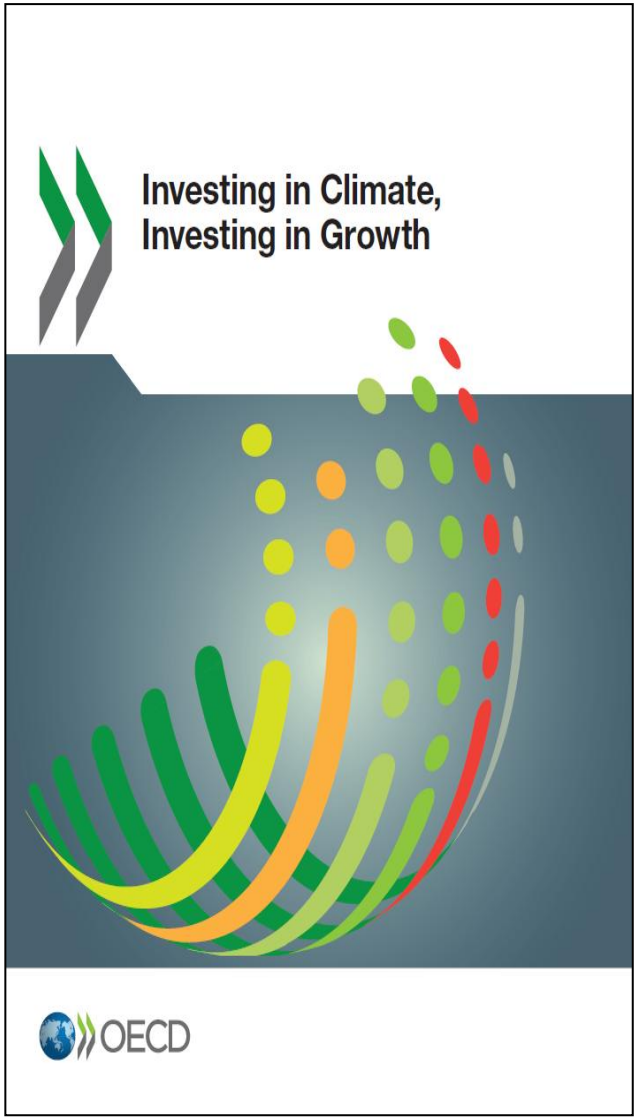
The full report and further information on *Investing in Climate, Investing in Growth* can be found at

http://oe.cd/G20climate



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Download: https://www.bmu.de/en/publication/greentech-made-in-germany-2018-environmental-technology-atlas-for-germany/

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Key Findings

1) Green technologies and resource efficiency technologies are rising to become the driving force of sustainable development worldwide.
2) Paris Agreement and the 2030 Agenda need environmental technology and resource efficiency products, processes and services
3) The global market volume for environmental technology and resource efficiency exceeded the 3 trillion euros mark in 2016, ending the year at 3,214 billion euros
4) The German green tech market is expanding at a rate of 8.8 percent per year – considerably faster than the international market.
5) In 2016, Green technologies accounted for 15 percent of Germany's gross domestic product (GDP), a figure forecast to rise to 19 percent by 2025.

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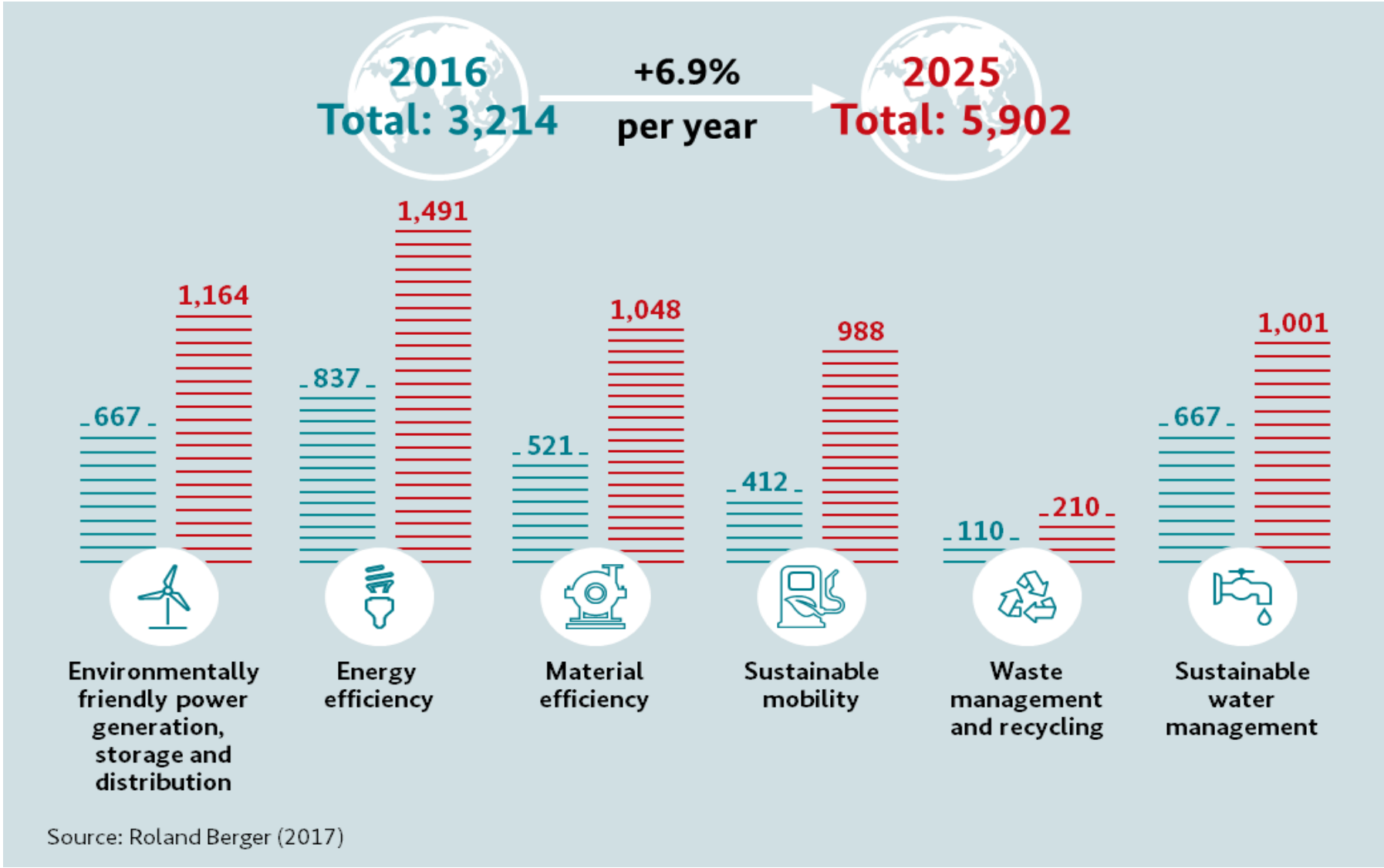
GreenTech is driving force for sustainable development around the globe



Source: Roland Berger (2017)

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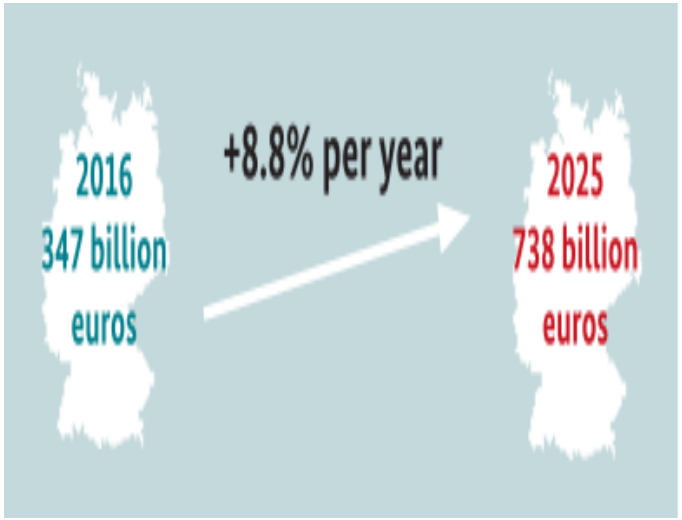
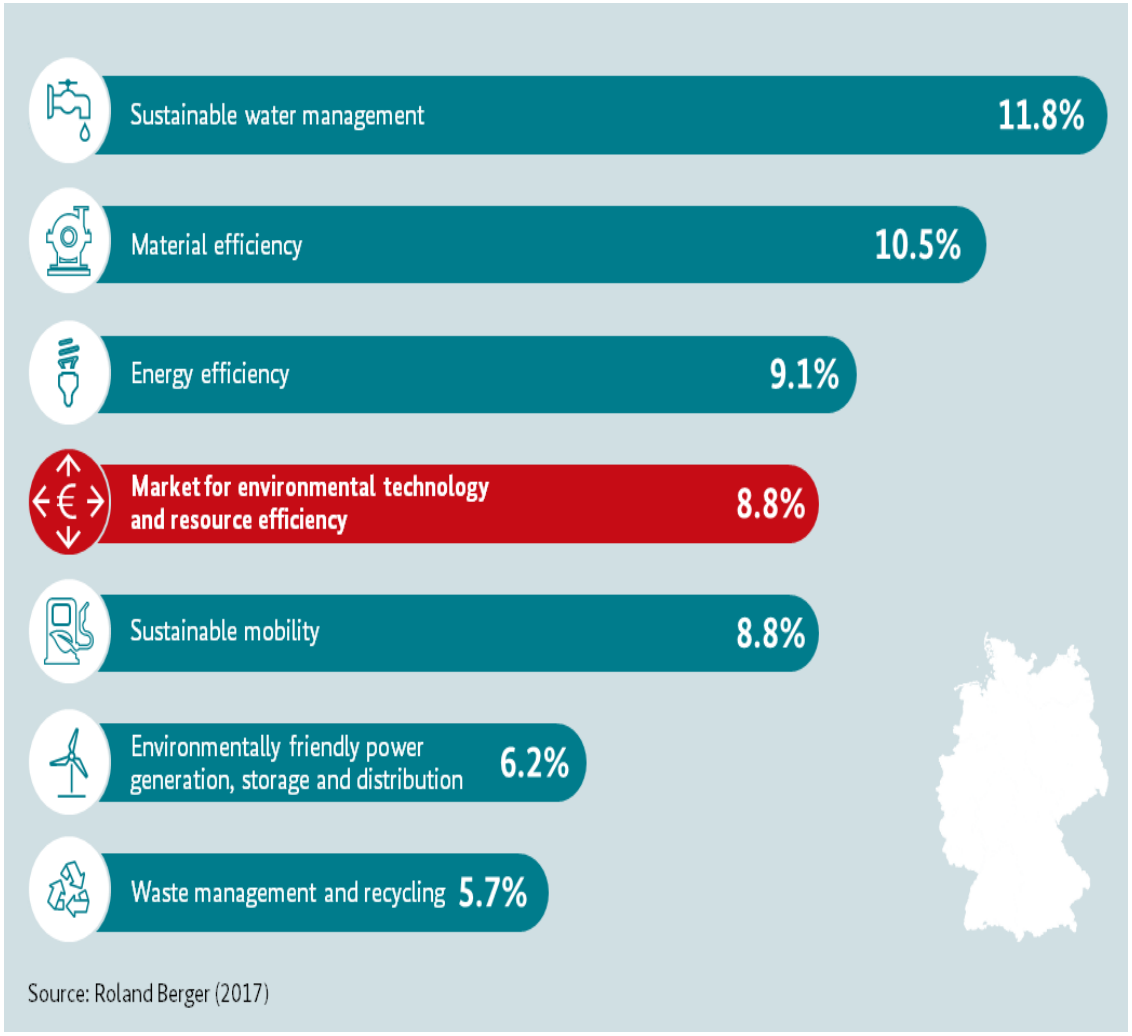
Robust demand for green tech in Germany





Source: Roland Berger (2017)

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Development of german climate policy

- since 1990 – year of the German reunification – **significant progress** in climate change mitigation
  - **decoupling** economic growth from greenhouse gas emissions and **surpassing the reduction targets** of the Kyoto Protocol´s first CP
  - **Energiewende** with integration of a large share of wind and solar power into the energy market
    - with **renewable energy's rising** share in gross electricity consumption as well as rising contribution to mitigation of GHGs → proved that restructuring our energy supply is an ongoing stimulus for growth, investment and employment

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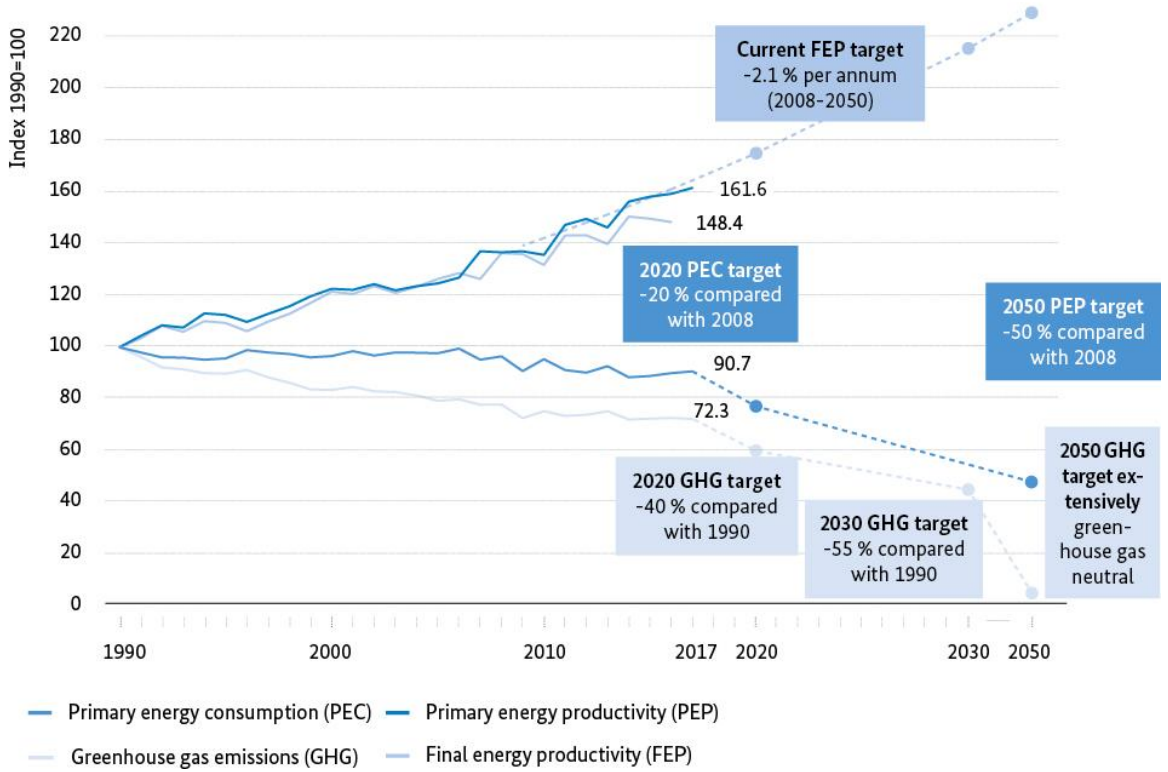
Economic growth, GHG emissions and energy productivity



Source: BMU Climate Action in Figures 2018, based on UBA (2018b)

Depicted is the decoupling of economic growth and energy productivity from GHG emissions and primary energy consumption.

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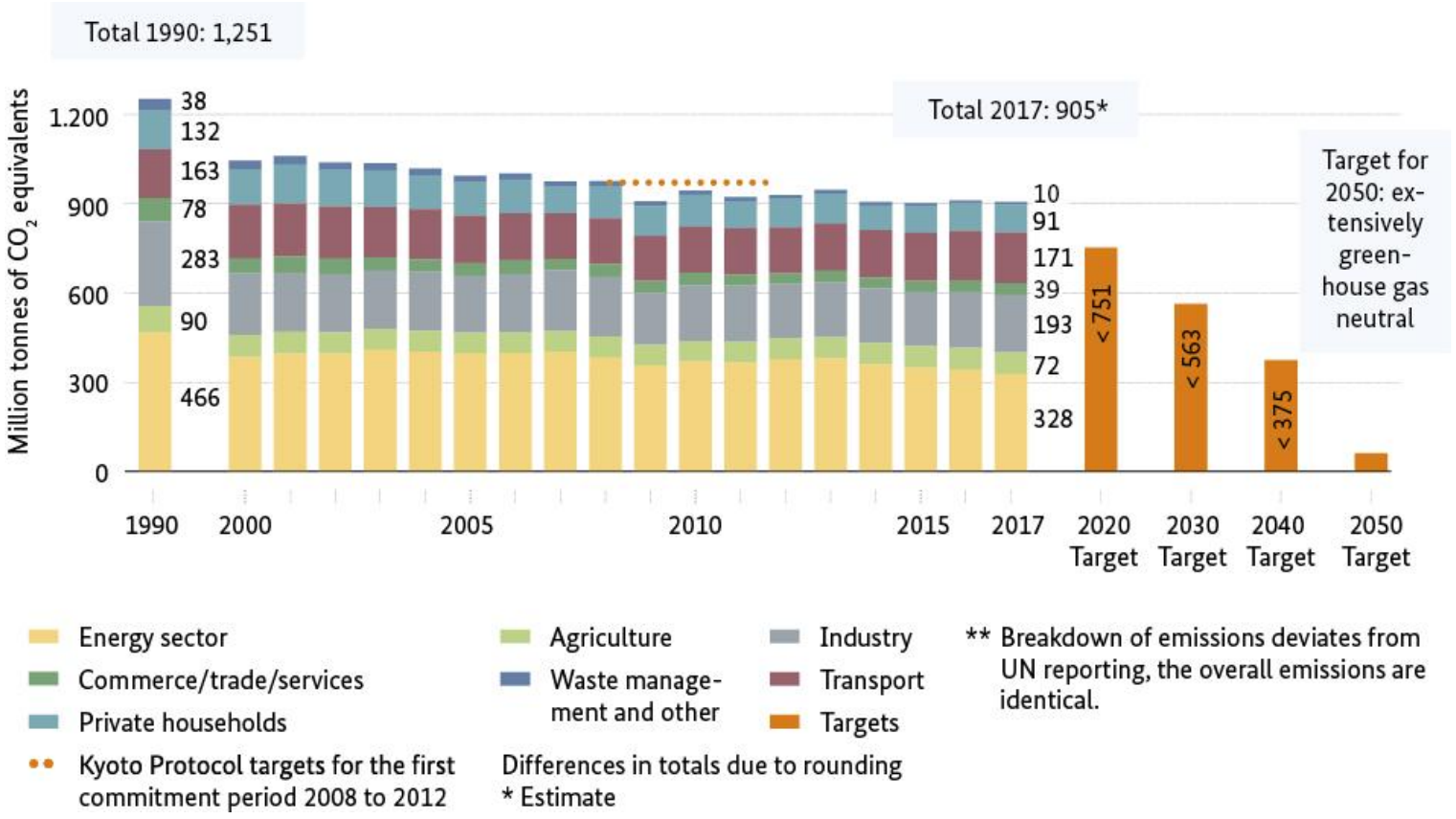
Recent Emission Trends (March 2018)



Challenges ahead

- projections show **difficulties** to reach our **national 2020 commitment**, and **our European target** for the sectors outside of the Emission Trading System, including the transport, building and agriculture sectors
- conclusion: we need **far-reaching political measures** and **decisions** to enhance the transition to a low carbon society → similar situation with specific circumstances for all western highly industrialized countries like the UK and Germany
- **German case**: one challenge to bring together structural change and changing our energy supply at the same time
  - By the end of 2021 we will have phased out nuclear power plants, and at the same time we are discussing how to phase out coal fired power plants in the midterm

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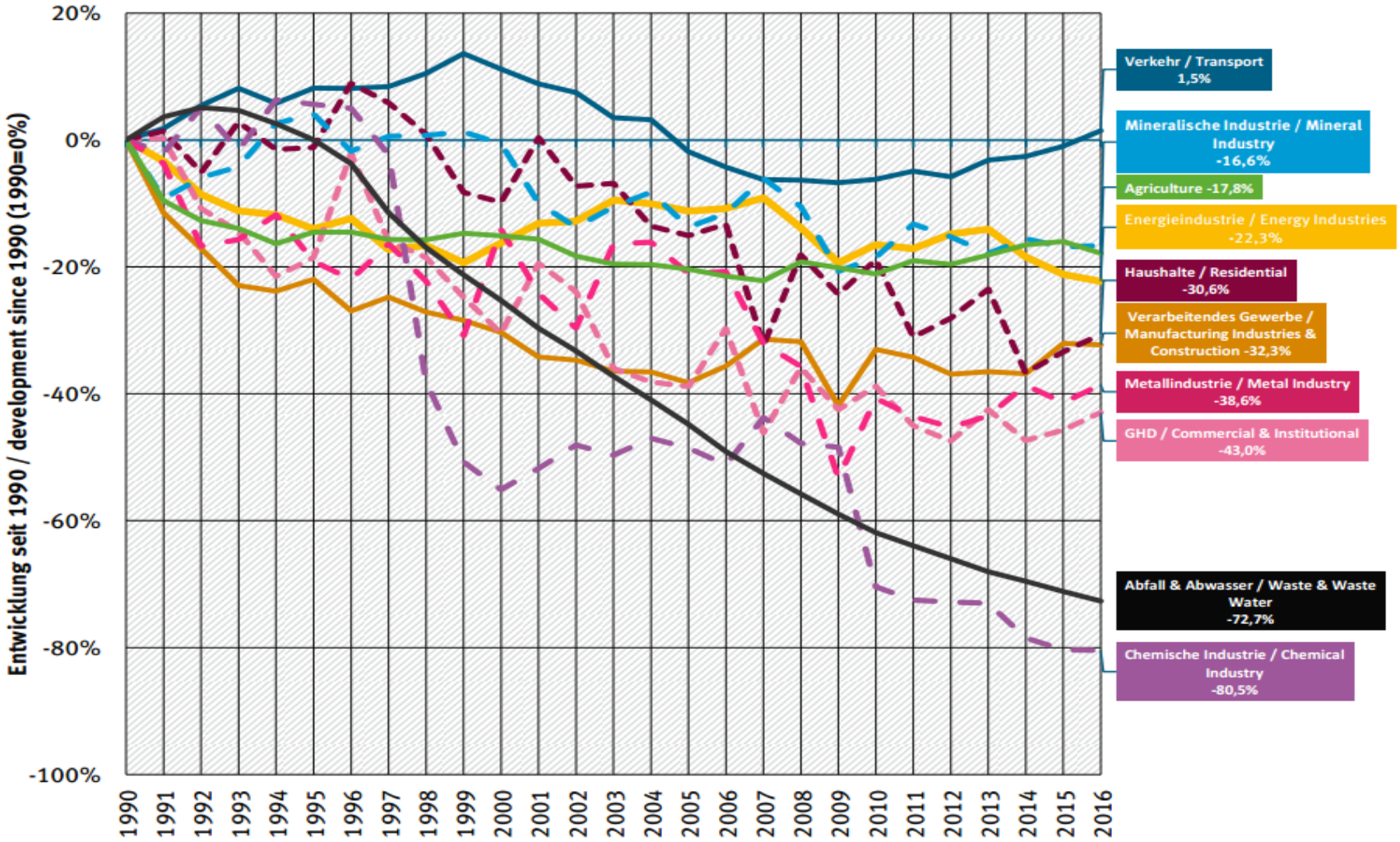
Trends by Sector



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Long term perspective

- **long-term perspective** is key facing the challenges
- **long-term strategies** are the instrument for planning the transformation towards a climate-friendly economy and society
- **Germany** developed the **Climate Action Plan 2050 as its long term strategy** as one of the first countries according to the request in the Paris Agreement, presentation of the strategy in **November 2016**
- developing the Climate Action Plan 2050 was one of the **priority tasks** in the Environment Ministry during the last legislative period

PARIS2015
UN CLIMATE CHANGE CONFERENCE
COP21·CMP11

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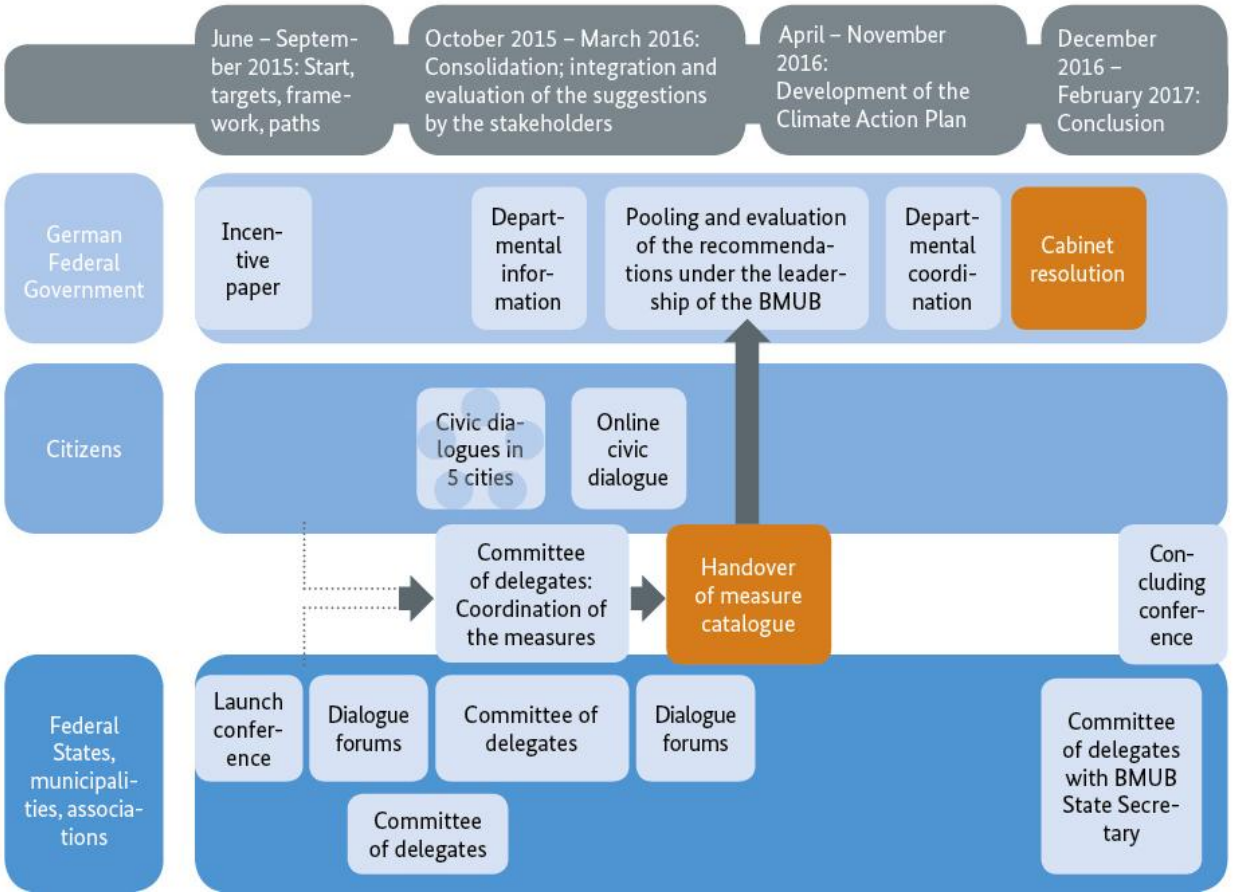
Development of the Climate Action Plan 2050



Source: BMUB Climate Action in Figures 2017

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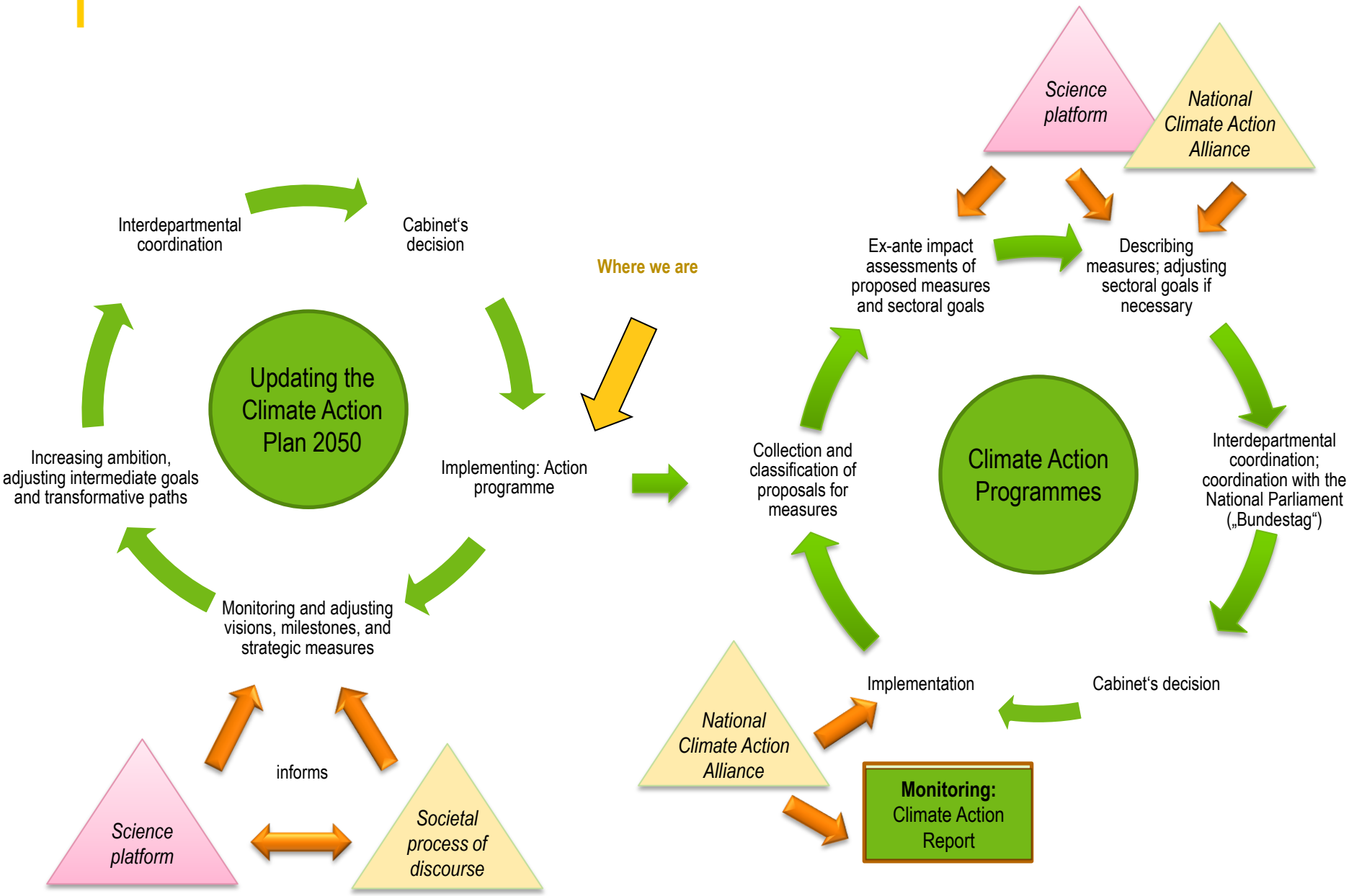
Learning process



Key features of the Climate Action plan

- long term greenhouse gas mitigation strategy for Germany based on a **2050 target (minus 80 to 95 percent vs 1990)**
- guiding principle of **extensive greenhouse gas neutrality** in Germany by the middle of the century = translating the objective of the Paris Agreement of greenhouse gas neutrality in the second half of the century
  - **guiding principles and transformative pathways for all sectors** by 2050
  - **targets** (emissions corridors) for all sectors for 2030
  - **key measures** for every sector
- establishes **a learning process** enabling raising of ambition as envisaged by the Paris Agreement
- **political strategy** adopted by the Cabinet in November 2016

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Sector targets in the Climate Action Plan 2050

Field of action	1990 (in million tonnes of CO_2 equivalents)	2014 (in million tonnes of CO_2 equivalents)	2030 (in million tonnes of CO_2 equivalents)	2030 (reduction in % compared to 1990)
Energy sector	466	358	175–183	62–61 %
Buildings	209	119	70–72	67–66 %
Transport	163	160	95–98	42–40 %
Industry	283	181	140–143	51–49 %
Agriculture	88	72	58–61	34–31 %
Subtotal	**1209**	**890**	**538–557**	**56–54 %**
Other	39	12	5	87 %
Total	**1248**	**902**	**543–562**	**56–55 %**

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Governance

- **German Environment Ministry** is **in charge** of climate protection policy and therefore of the Climate Action Plan
- Environment Ministry will also be **in charge of overseeing** the **implementation** and the **further development** of the plan
- **main responsibilities** for measures lies with the ministries in charge of the respective sectors
- **integral parts** of the further development of the Plan and it´s implementation are
  - a continuous **dialogue** with stakeholders
  - the **scientific platform** to involve the scientific community

Further information on the Climate Action Plan (download):
www.bmub.bund.de/N53483-1/

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Lessons learnt – the sectoral approach

- **key strategic element** is breaking down of reduction target of 55 percent for 2030 and allocation of responsibilities **to the individual emission sectors** energy, buildings, transport, industry and agriculture
- respective **sectors** and **ministries** in charge within Government have to take on much **greater responsibility**
- **Every sector** has to deliver
- **discussions** within sectors are being **encouraged**; recent example: **German Industry Federation** has published a study in January that has been consulted with all relevant manufacturing sectors (*will be presented later*).

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German climate policy in the new Legislativ period – outlook I

- the **coalition agreement** constitutes a good and robust basis for further work including:
  - it **confirms** the national, European and international **climate targets** for 2020, 2030 and 2050.
  - it confirms the **Climate Action Plan 2050** and it´s full implementation
  - it **announces** a **Climate Action Act** to be adopted in **2019** to ensure the achievement of the sectoral targets of the Climate Action Plan in 2030

German climate policy in the new Legislativ period – outlook II

- Establishment of a commission tasked with developing proposals for phasing out **coal power plants** as well as proposals for **closing the gap** toward our ambitious national mitigation target for 2020 as soon as possible
- combination of these activities with development of the **first action programme** to implement the Climate Action Plan
- **preparatory work** for first action program has **begun last year** within Government, program will be developed this year
- action program will comprise **specific measures** to ensure that we **achieve** our **2030 targets** for the energy, buildings, transport, industry and agriculture sectors
- integral part of the work is a comprehensive **impact assessment** for the potential measures of this program

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Climate Pathways for Germany: Study presented by BDI (Federal Association of German Industry) January 2018

https://www.bcg.com/de-de/publications/2018/climate-paths-for-germany-english.aspx

BDI: „Climate Paths Germany“ (2)

This study (The Boston Consultancy Group (BCG), Prognos) is a result of a comprehensive process with the German Industry: 70 companies and associations as well as a board of renowned economists involved in more than 40 workshops.

Outcome:

- "current policies path" will achieve a GHG-reduction of “only” 61 % by 2050 (compared to 1990);
- however: 80 % GHG reduction is technically feasible and macroeconomically viable, requires in the considered scenarios strong policy framework incl. effective carbon leakage protection;

BDI: „Climate Paths Germany“ (3)

- 95% GHG reduction would push the boundaries of foreseeable technical feasibility and current social acceptance: phasing out all fossil fuels, importing renewable fuels (power-to-liquid/gas), use of unpopular technologies such as CCS and reducing emissions from livestock;
- several “game changers” could reduce efforts and costs such as technologies for the "hydrogen economy" and for carbon capture and utilization, however more R&D efforts necessary;

BDI: „Climate Paths Germany“ (4)

- **cost impacts** (80% Scenario): additional investments of €1.5 trillion to 2.3 trillion by 2050, including about €530 billion to continue existing efforts or 1.2 to 1.8 % of Germany’s GDP through 2050;
- however after deduction of energy savings “only” around €470 billion to 960 billion by 2050 (roughly €15 billion to 30 billion per year);
- climate paths would trigger **extensive modernization activities in all sectors of the German economy** and
- could provide opportunities to **German exporters in growing "clean technology”** markets. Studies see global market volume growing to €1 trillion to 2 trillion per year by 2030;

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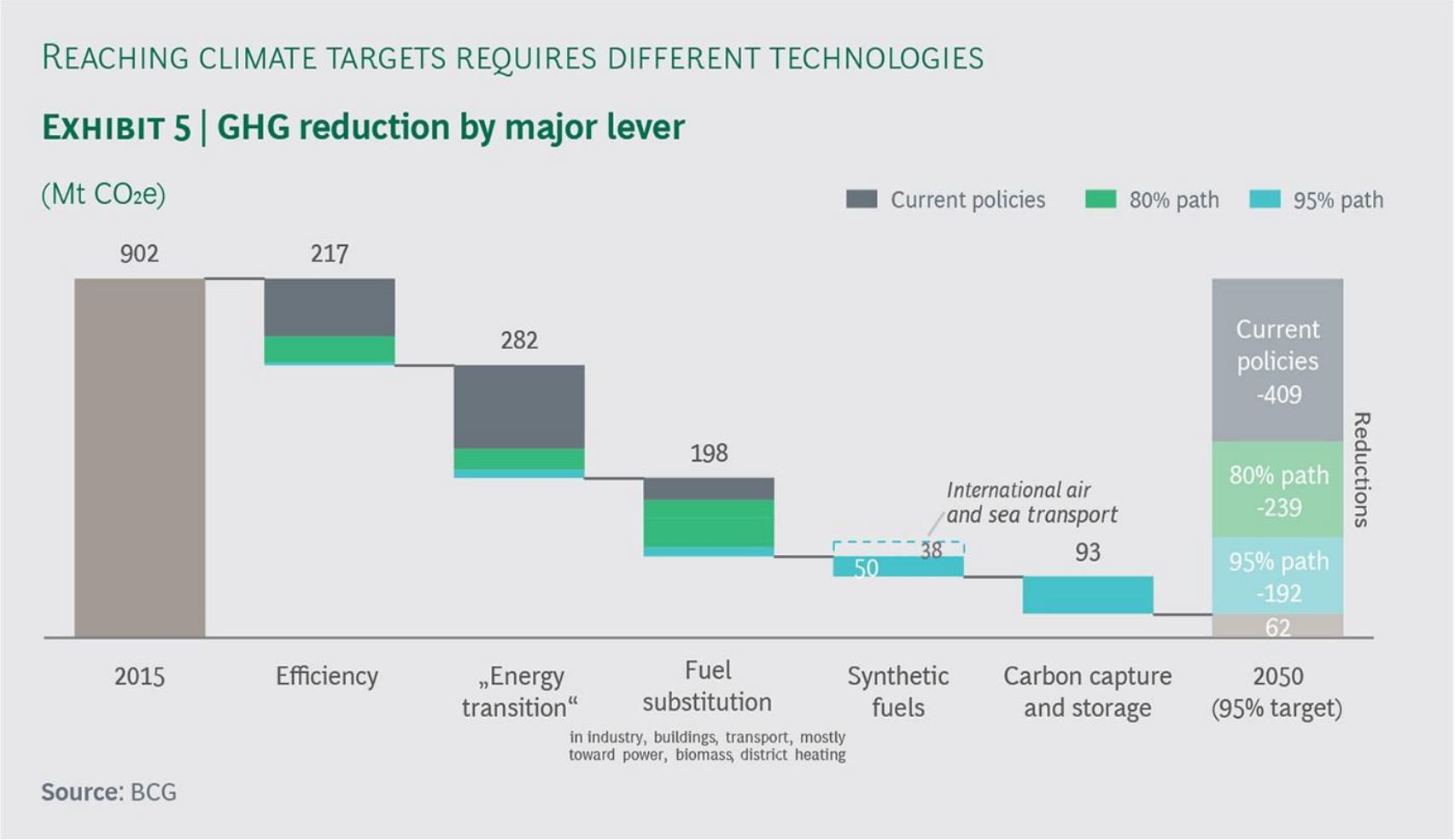
BDI: „Climate Paths Germany“ (5)



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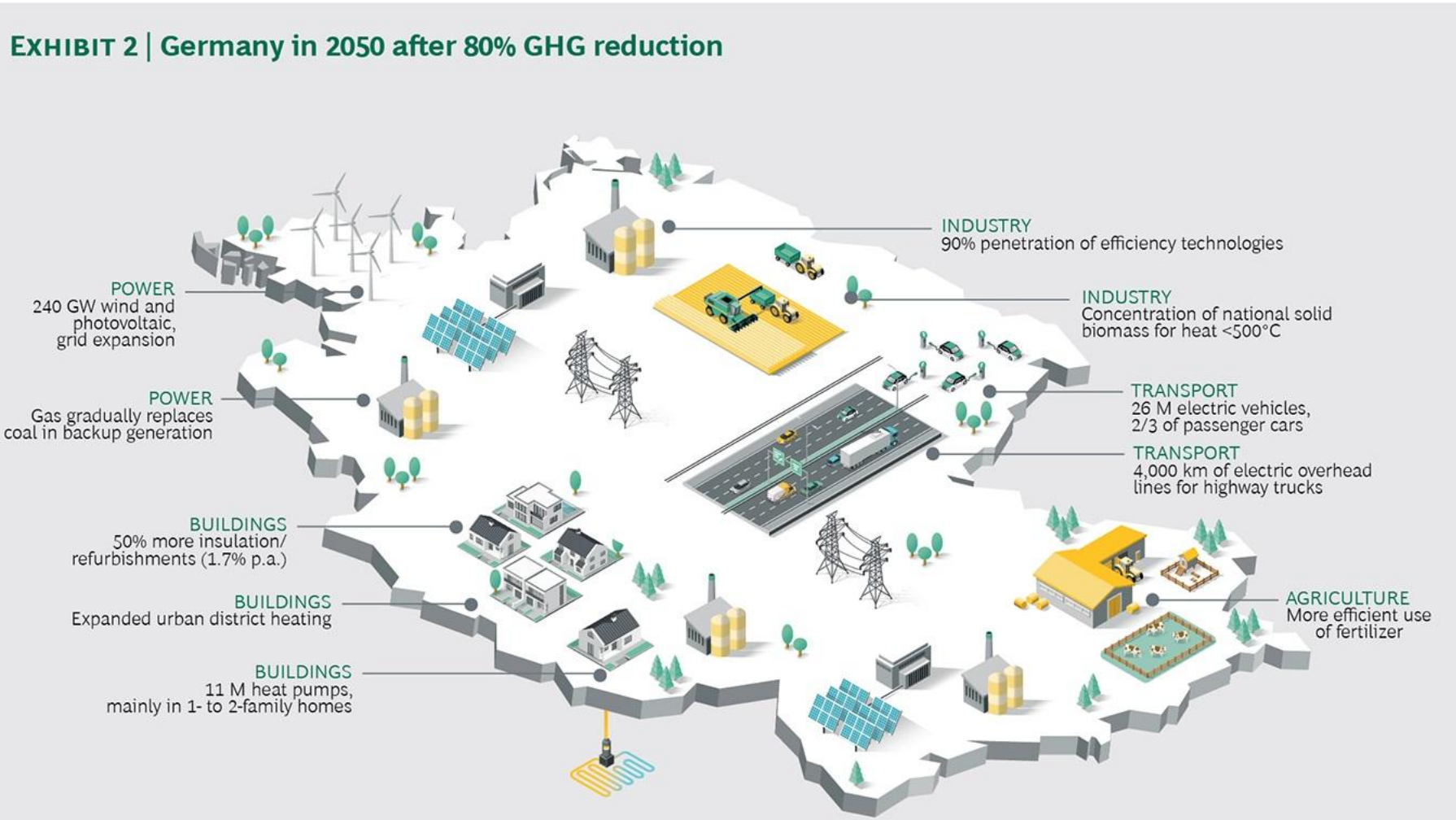
BDI: „Climate Paths Germany“ (6)



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EU climate and energy framework 2030

EU is committed to reducing emissions by at least 40% until 2030.

	GHG emissions reduction (compared to 1990)	Share of renewables in final energy mix	Improvements in energy efficiency
2050	**– 80-95 %**		
2030	**at least – 40 %**	**32% (tbc)**	**32.5% (tbc)**
2020	**– 20 %**	**20 %**	**20 %**

- Foundation for INDC submitted in March 2015 before COP21 and ratification in September 2016
- Long-term: Greenhouse gas neutrality as early as possible – will soon be defined in more detail in a new EU climate strategy

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KEY POLICY INSTRUMENT: EU EMISSION TRADING SYSTEM

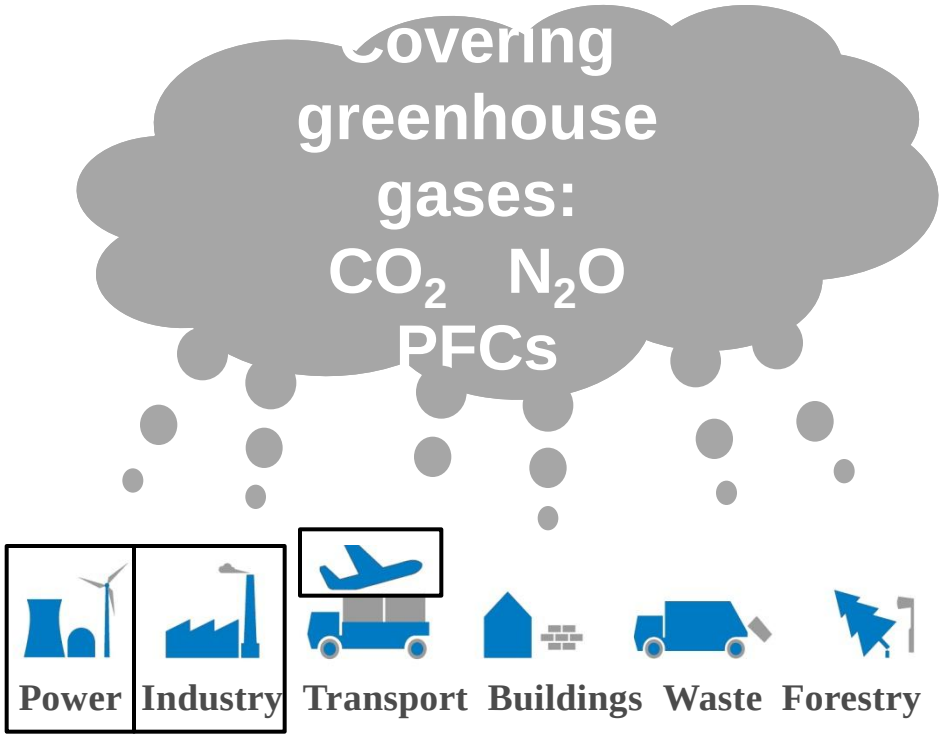
EU Emission Trading System (ETS) covers about 11,500 installations in the sectors energy, industry and aviation

Sectors

- **Energy**: Power and heat generation
- **Industry**: Energy-intensive sectors incl. oil refineries, metallurgy, cement, lime, glass, ceramics, pulp, paper, cardboard, acids, bulk organic chemicals
- **Civil aviation**: intra-EU flights

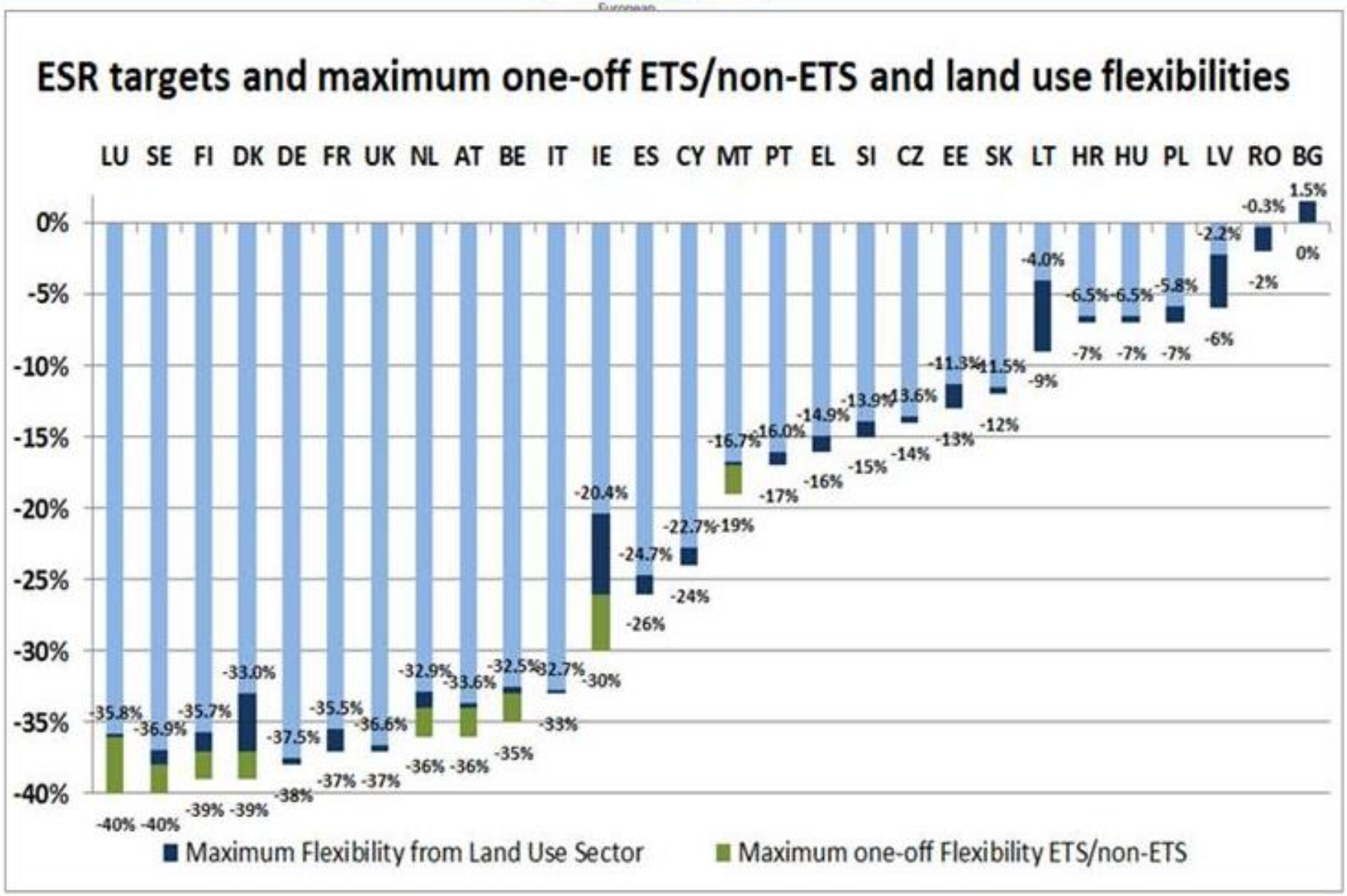
Thresholds

- Energy: 20 MW annual thermal capacity per installation
- Industry: Varying thresholds; small installations with < 25,000 tons of CO_2e may be excluded
- Aviation: 10,000t CO_2 /year



KEY POLICY INSTRUMENT: EFFORT SHARING REGULATION

- Key instrument reduce EU GHG emissions in the sectors buildings, transport and agriculture by **30% compared to 2005**
- Established binding greenhouse gas targets for all member states based on GDP per capita of member states
- Legislative proposal for period 2021-2030 published by European Commission in July 2016


ESR targets and maximum one-off ETS/non-ETS and land use flexibilities
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Maximum Flexibility from Land Use Sector
Maximum one-off Flexibility ETS/non-ETS

OUTLOOK: WHAT'S NEXT?

- New long-term EU climate strategy
- Talanoa Dialogue on international level – contribution of EU to raise global ambition?
- New Multi-Annual Financial Framework for period after 2020 and Common Agricultural Policy
- Sustainable finance: Framework for private finance in climate action

Conclusion

1) Climate change and sustainable development challenges offer significant more opportunities than causes burdens for the economy as a whole and the business sector.
2) Technological innovations („Green Tech“) are the key for energy transition and pathways to achieve GHG mitigation in line with climate targets of the Paris Agreement PA).
3) This transformation needs a robust policy framework in terms of continiously reviewed promotion mechanism, financial incentives and phased out misalaignments.
4) German Climate Policy as well as Climate Policy in G20 MS need more power and coherence to achieve PA targets.
5) Industry is still too reluctant to explore the rich opportunities for business development.

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Presentation can be downloaded from:
www.igenet.com

Thank you for your attention