Net Zero By 2050: From Whether To How?

Zero Emissions Pathways to the Europe We Want

Ljubljana, 20 June 2019

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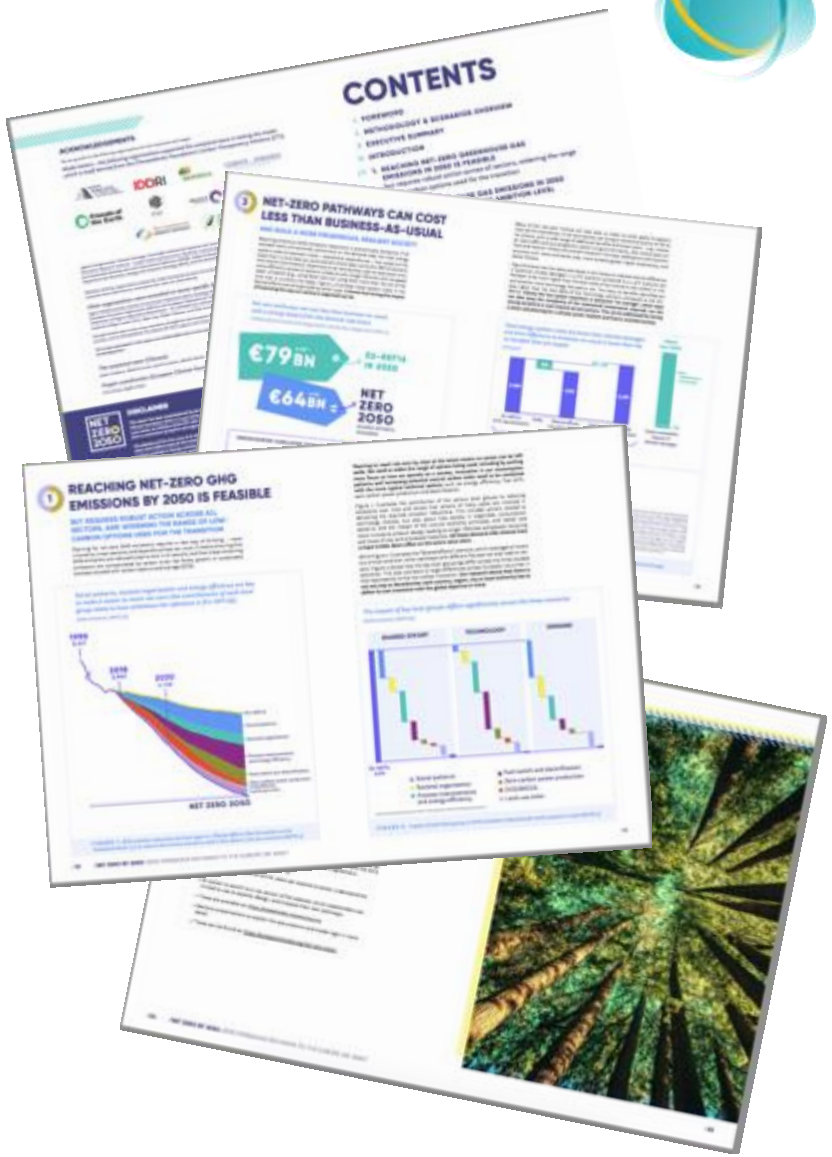
European Climate Foundation

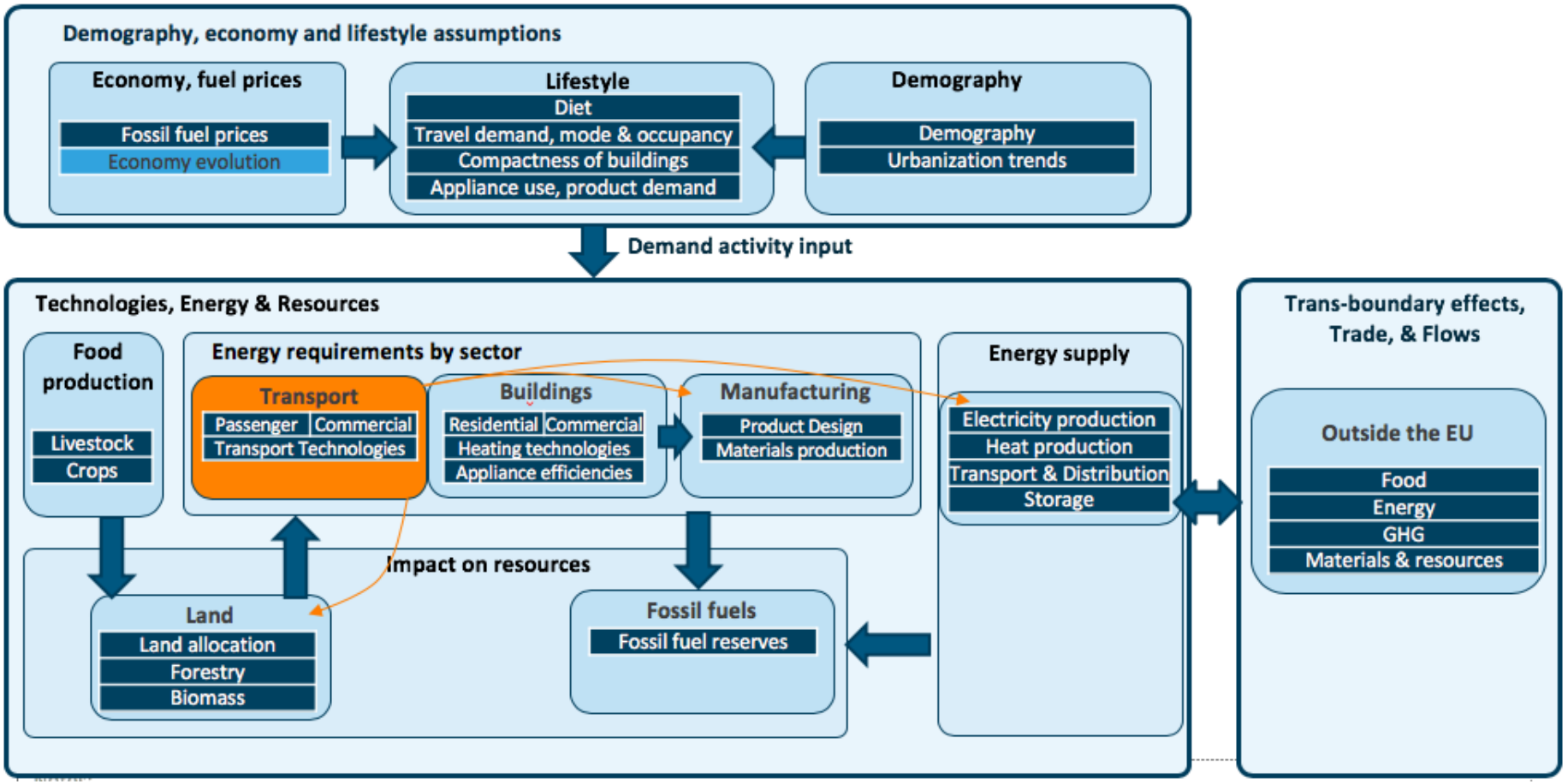
Overview

1. Introduction
2. **Reaching net-zero GHG emissions by 2050 is feasible** but requires robust action across all sectors, and widening the range of low-carbon options used for the transition
3. **Net-zero GHG emissions in 2050 requires raising the 2030 ambition level** to set Europe on the right trajectory, and picking the right near-term actions
4. **Net-zero pathways can cost less than business-as-usual** and build a more attractive, resilient society

Introduction



Building the CTI 2050 Roadmap Tool



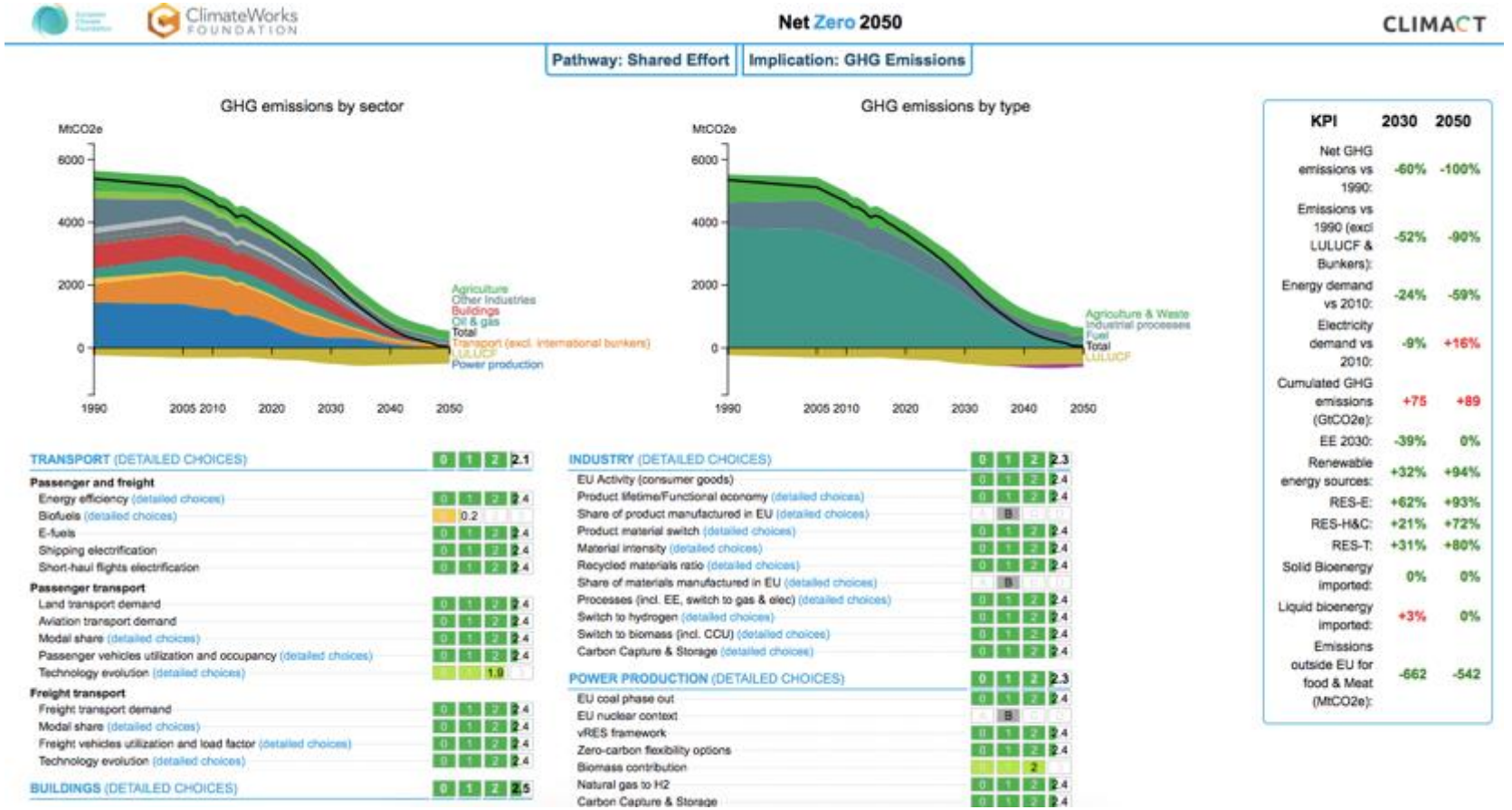
Source: Climact

Four levels are used to create scenarios

Level 0	Level 1	Level 2	Level 3
• **Current ambition** • Current legal measures, "BAU"	• **Increased ambition** • More extensive use of existing technologies	• **Ambitious** • Significant effort based on high implementation of available technologies	• **Transformational** • Max implementation requiring fast deployment and, in some cases, some type of innovation

Source: Climact

Open source webtool: https://stakeholder.netzero2050.eu



Stakeholders tested the model and developed scenarios (summer 2018)

elementenergy

IDDRI

IBERDROLA

Department for Business, Energy & Industrial Strategy

E3G

CLIMATE & STRATEGY PARTNERS

Friends of the Earth

Institute for European Environmental Policy

Agora Energiewende

Grantham Research Institute on Climate Change and the Environment

The Coalition for ENERGY SAVINGS

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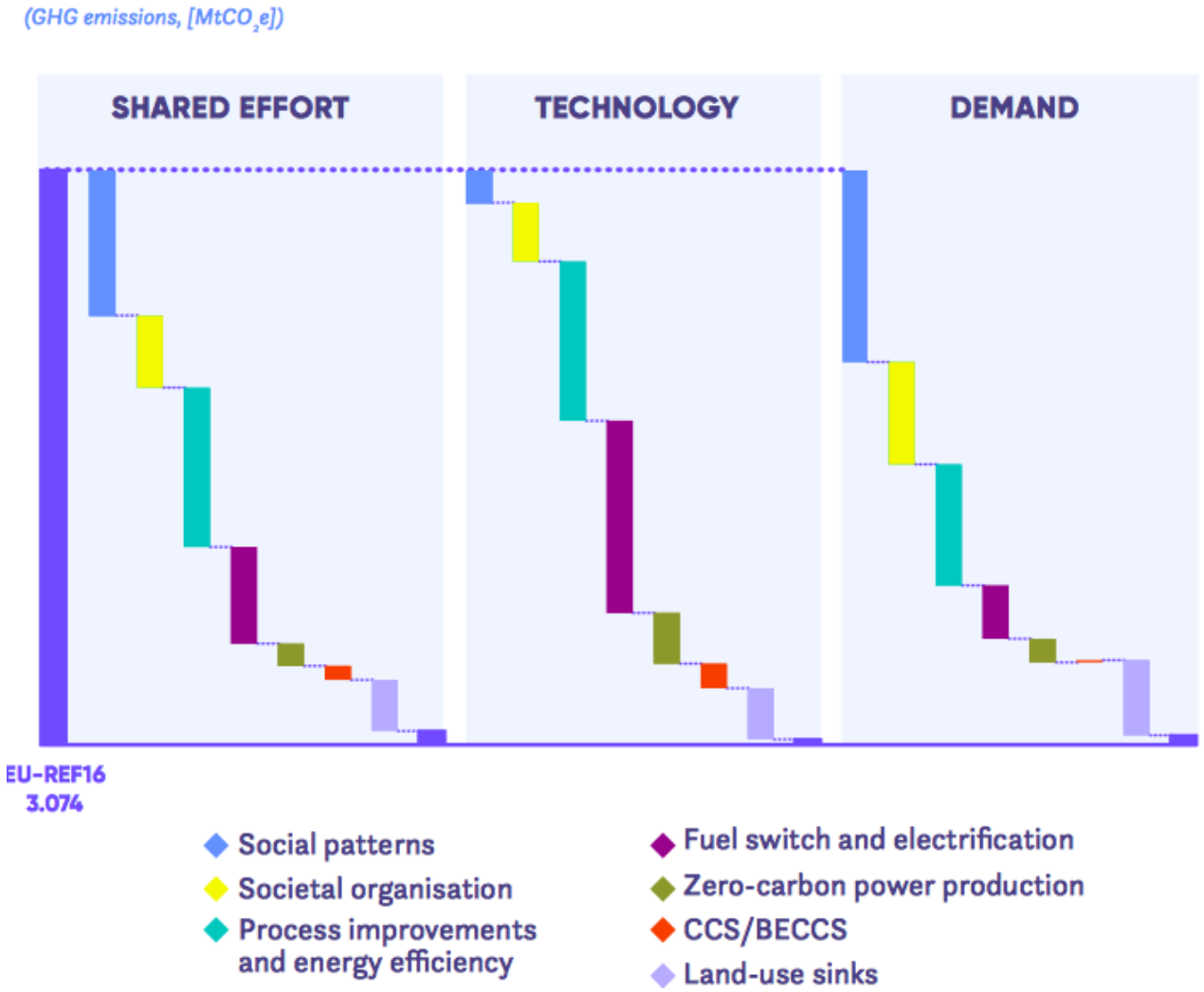
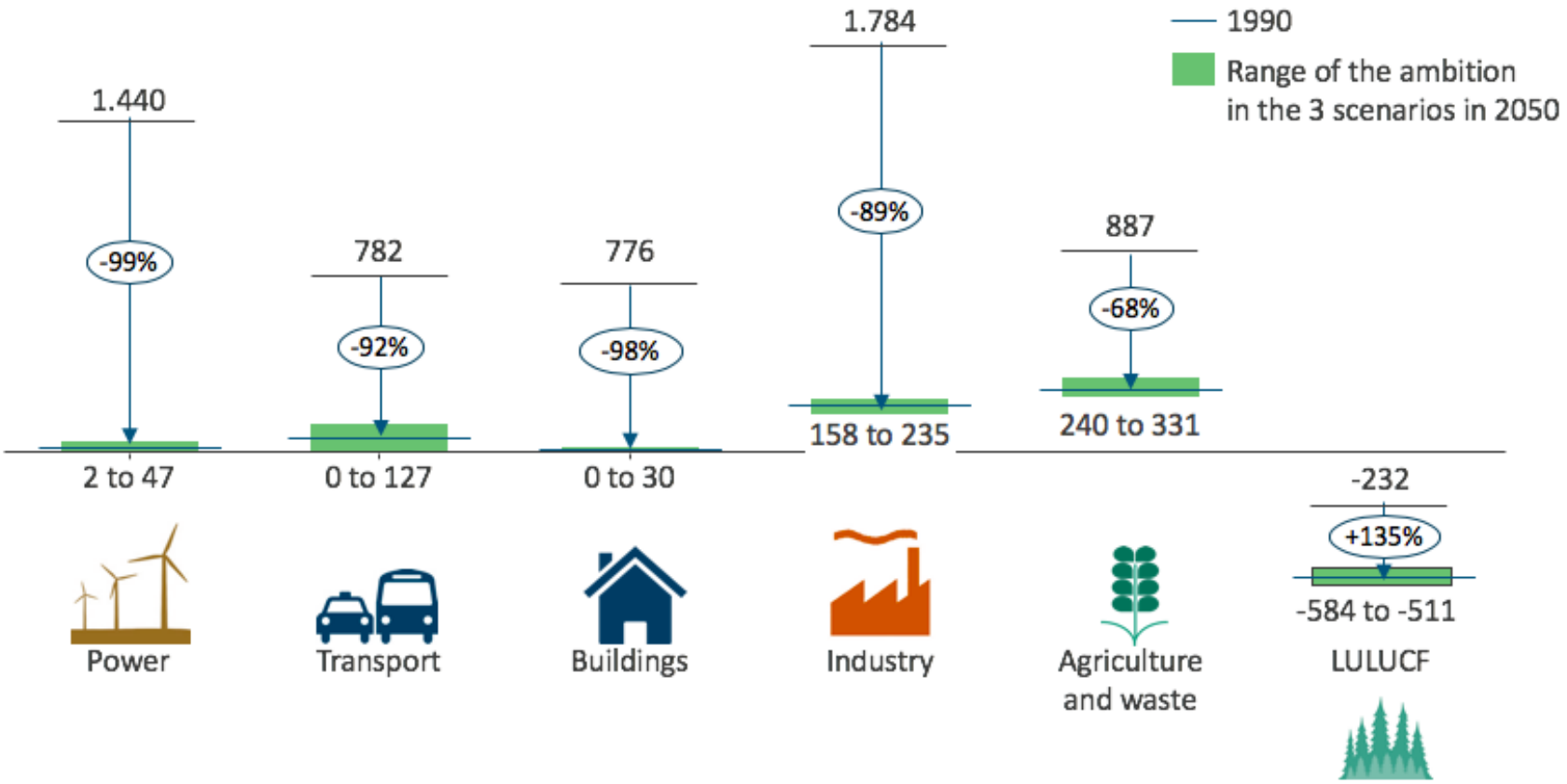
Reaching NZ2050 is possible via a range of pathways



Source: ECF/Climact 2018: Net Zero By 2050: From Whether To How –

High ambition is needed in all sectors, whatever the chosen pathway

GHG emission reductions by sector between 1990 and 2050 in the 3 net-zero scenarios (Shared efforts, Technology, Societal organization) [MtCO2e/year]



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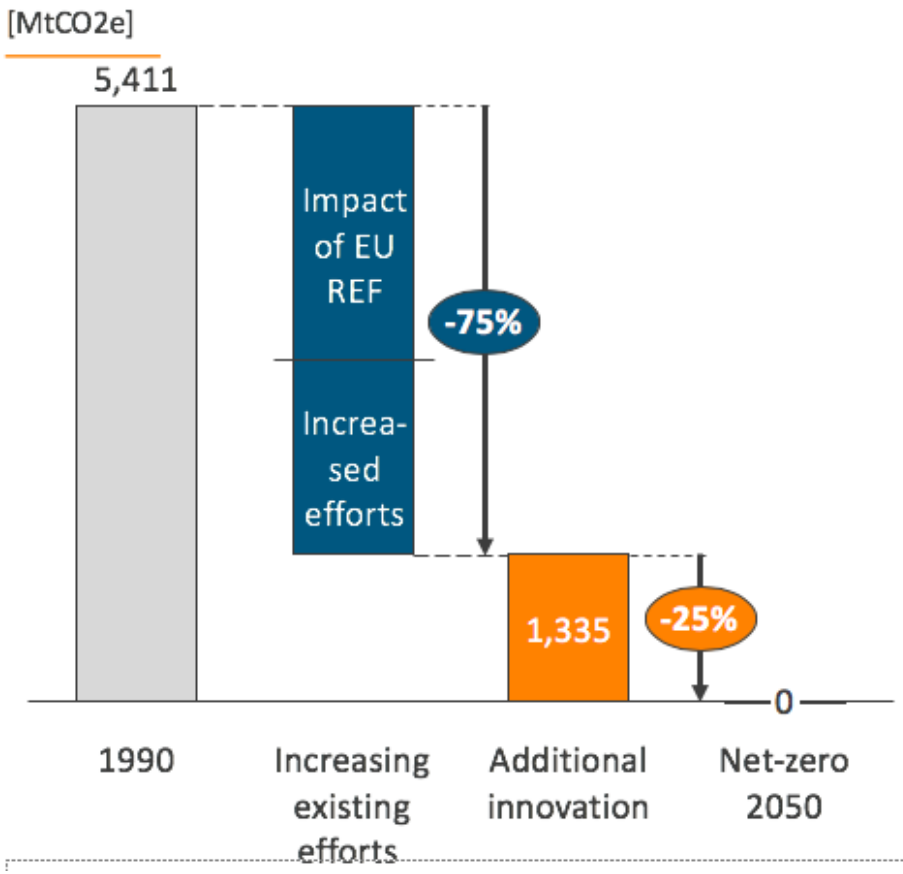
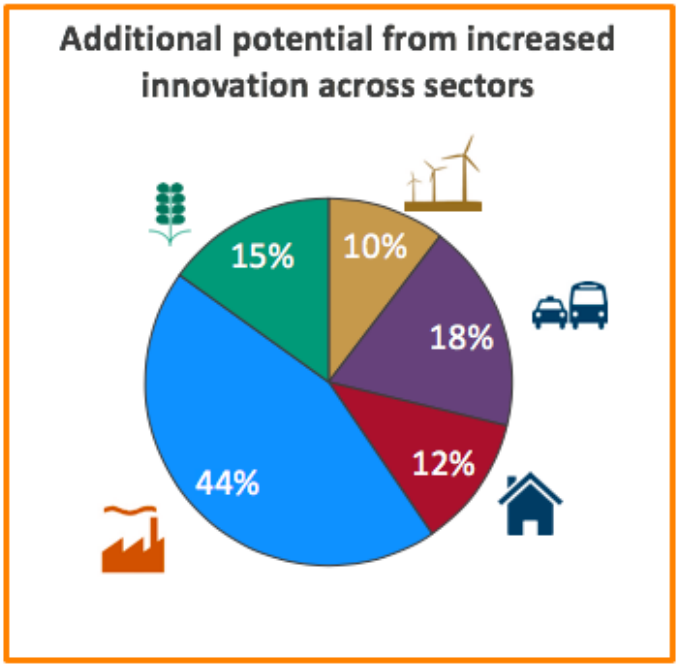
75% of the effort: upscaling known solutions; 25% of the effort: "innovation"





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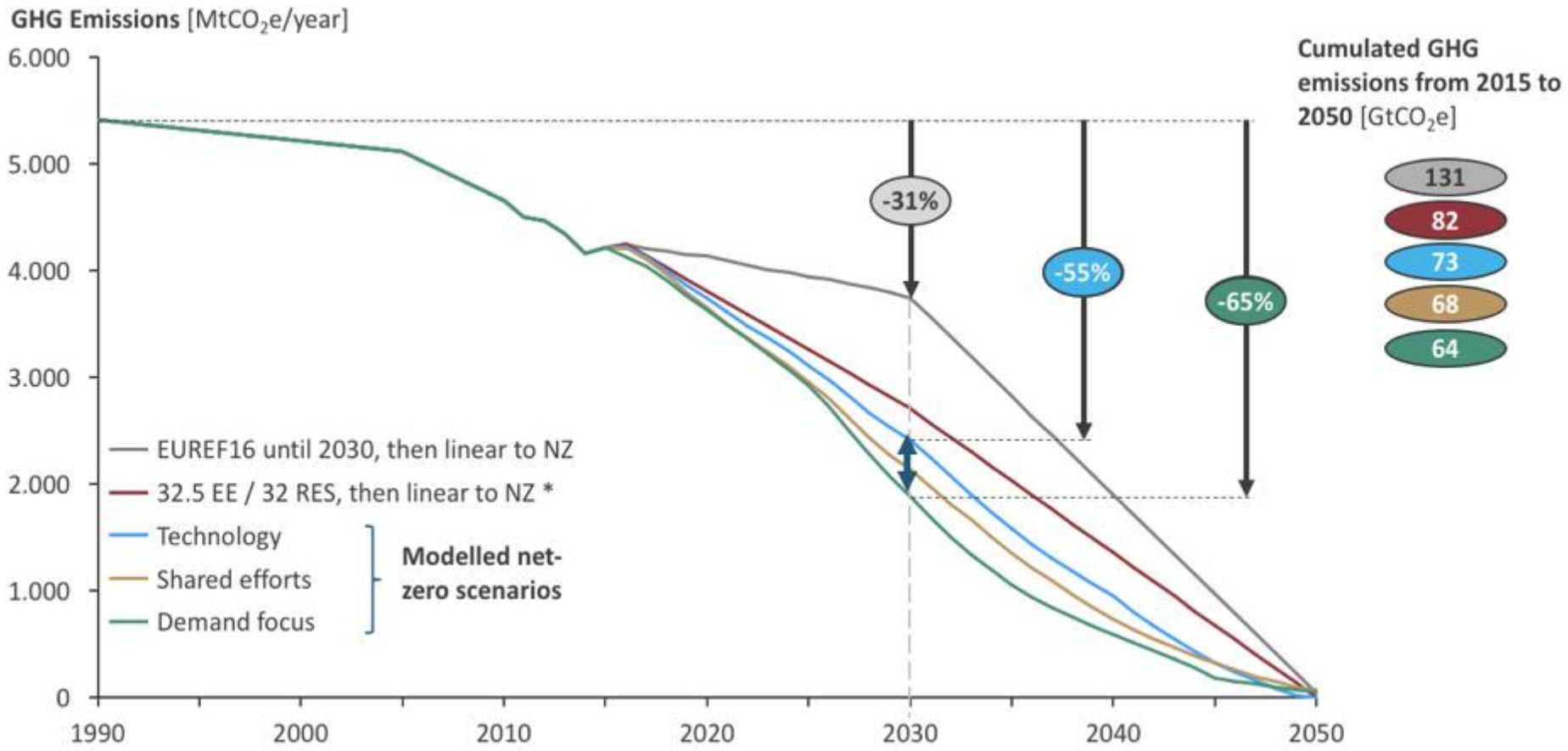
Latest EU legislation reaches ~50% below 1990 levels; 55-65% is needed



‘No regret’ actions to implement by 2030

Sector	Example of “no-regret” action
Transport	- Stabilizing transport demand - The car share decreases to 70% from around 80% today
Buildings	- Reaching 3% annual renovation rate (deep retrofit) - Sector transition: From 2030, new buildings must be « energy positive »
Industry	- Significantly reducing the demand for material and products (functional economy, circular economy, innovation)
Power	- Nearly complete phase-out of coal - Wind and solar should reach at least 50% of power production
AFOLU	- land-use must fully integrate climate change - Design incentives for afforestation - Meat consumption must be reduced by at least 25%

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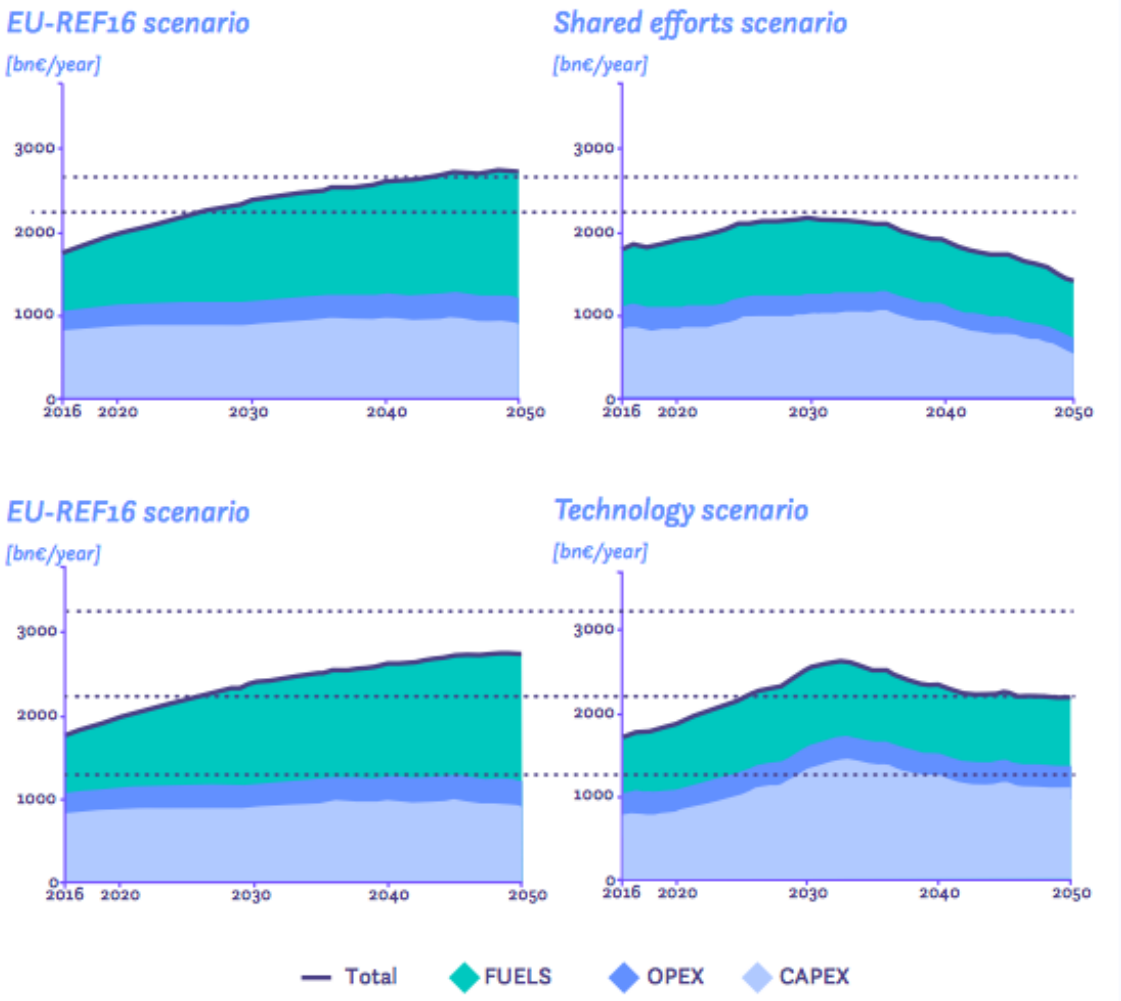
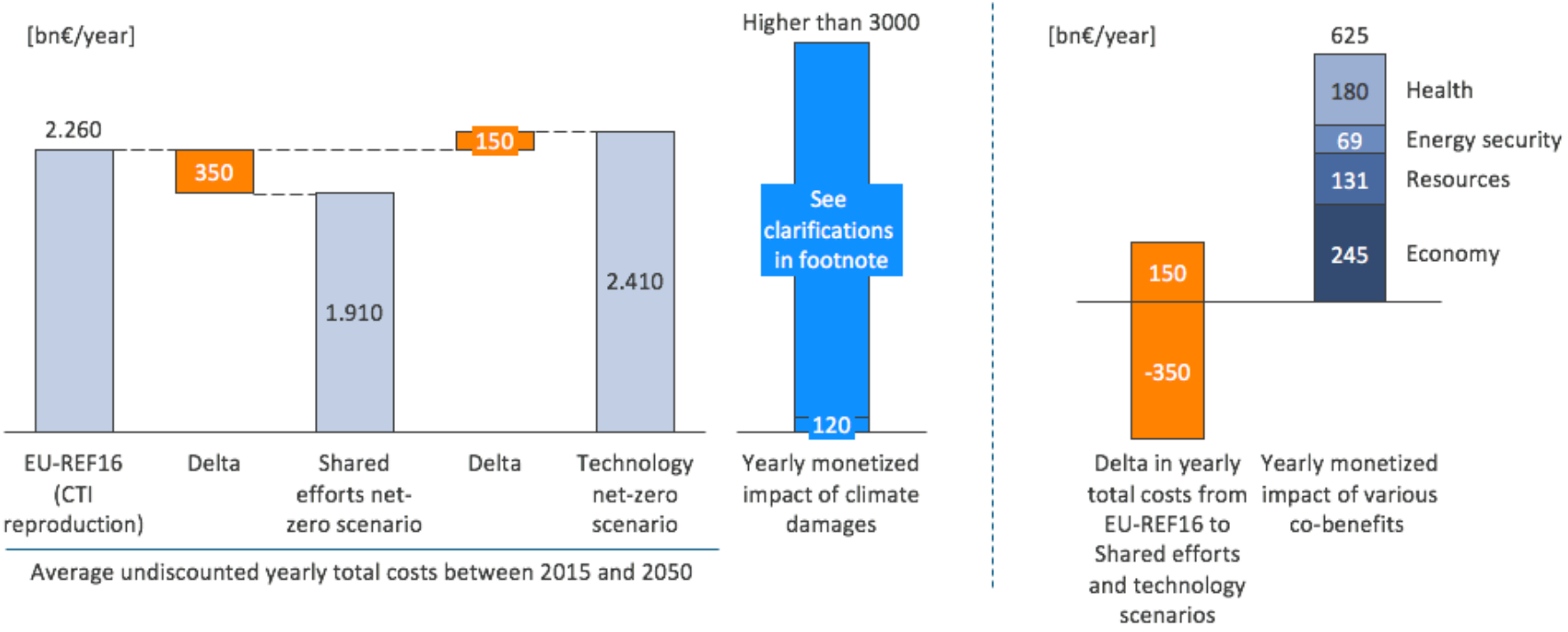
Net zero pathways can be cost-negative in the mid- to long-term, especially with social and model evolution



Net zero pathways mean avoided climate damages and societal co-benefits

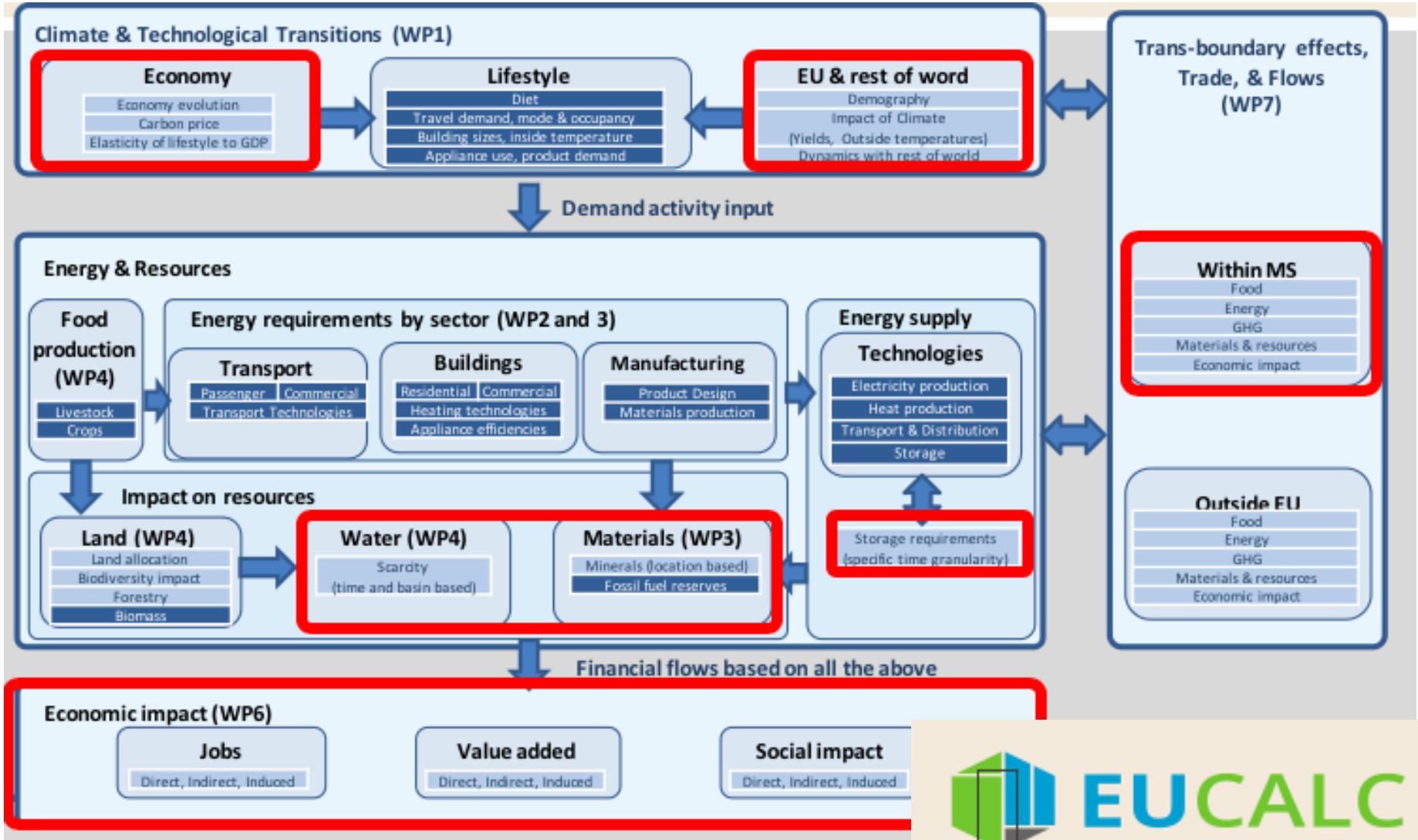


Source: Yearly costs are from the EU-CTI 2050 Roadmap project, co-benefits are derived from the COMBI project https://combi-project.eu/ and they are focused on buildings, transport and industry efficiency so they should be taken as a minimum amount, figures specifically for health are from a study by DG Energy (2018), and the impact from climate damages is based on EEA report on "Climate change, impacts and vulnerability in Europe 2016" and finally the article by Burke et al. in Nature « Large potential reduction in economic damages under UN mitigation targets" comes to potential damages of US$ 20 trillions globally. Taking today's share of Europe in global GDP of ~17% this would lead to a figure around EUR 3000 to 4000 billions, significantly above the costs and investment requirements.

Source: Climact

Diving deeper: Net Zero 2050 series

The EU Calc model adds Member State granularity and more detail



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Concluding thoughts

1. **Net zero is essential, but it won't happen by chance. We have to plan to get there:** to understand the pathways, and then consciously translate these insights into near term policies ("backcasting").
2. Planning also opens up awareness of **social impacts of the transition,** so that they can be need to be proactively addressed.
3. Member States can use the preparation of **National Long Term Strategies** to understand and signal what they need.

Thank you!

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Back up slides

“Towards Fossil-Free Energy in 2050”

- Cross-sectoral report on NZ50 vision for power, heat & road transport sectors
- Key take-aways:
  - **Fossil-Free energy systems** in 2050 are **technically feasible** in different configurations
  - **Smart electrification** and **buildings efficiency** key pillars, with important complementary role for **green hydrogen** as seasonal store of energy.
  - Green gas should be **targeted to high value applications** (seasonal storage, industry, shipping, aviation)
  - Zero carbon energy systems come with modestly **positive macro-economic impacts**

All scenarios involve major structural change in the economy