

European Climate Policy

Substantial, Belated Progress Toward Net-Zero

Edgar Hertwich

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International Institute for
Applied Systems Analysis



NTNU
Norwegian University of
Science and Technology

Agenda

- The Carbon Budget
- A 2040 Target for the EU's Climate Policy – Proposal by the Scientific Advisory Board
- The EU's Climate Policy – The Scientific Advisory Board's Assessment
- Conclusions

The Advisory Board



Ottmar Edenhofer
(Chair)

Technische Universität in Berlin



Jette Bredahl Jacobsen
(Vice-Chair)

University of Copenhagen



Laura Diaz Anadon
(Vice-Chair)

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French National Research
Institute for Agriculture, Food...

The EU's 2040 climate target

European Climate Law

9.7.2021  Official Journal of the European Union L 243/1

1

(Legislative act)

REGULATIONS

REGULATION (EU) 2021/1119 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL
of 30 June 2021

establishing the framework for achieving climate neutrality and amending Regulations (EC)
No 401/2009 and (EU) 2018/1999 (European Climate Law)

THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty on the Functioning of the European Union, and in particular Article 192(1) thereof,

Having regard to the proposal from the European Commission,

After transmission of the draft legislative act to the national parliaments,

Having regard to the opinions of the European Economic and Social Committee ⁽¹⁾,

Having regard to the opinion of the Committee of the Regions ⁽²⁾,

Acting in accordance with the ordinary legislative procedure ⁽³⁾,

Whereas:

(1) The existential threat posed by climate change requires enhanced ambition and increased climate action by the Union and the Member States. The Union is committed to stepping up efforts to tackle climate change and to delivering on the implementation of the Paris Agreement adopted under the United Nations Framework Convention on Climate Change (the 'Paris Agreement') ⁽⁴⁾, guided by its principles and on the basis of the best available scientific knowledge, in the context of the long-term temperature goal of the Paris Agreement.

(2) The Commission has, in its communication of 11 December 2019 entitled 'The European Green Deal' (the 'European Green Deal'), set out a new growth strategy that aims to transform the Union into a fair and prosperous society, with a modern, resource-efficient and competitive economy, where there are no net emissions of greenhouse gases in 2050 and where economic growth is decoupled from resource use. The European Green Deal also aims to protect, conserve and enhance the Union's natural capital, and protect the health and well-being of citizens from environment-related risks and impacts. At the same time, this transition must be just and inclusive, leaving no one behind.

(3) The Intergovernmental Panel on Climate Change (IPCC) provides in its 2014 Special Report on the impacts of global warming of 1.5 °C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty, a strong scientific basis for tackling climate change and illustrates the need to rapidly step up climate action

⁽¹⁾ OJ C 364, 28.10.2020, p. 143, and OJ C 10, 11.1.2021, p. 69.

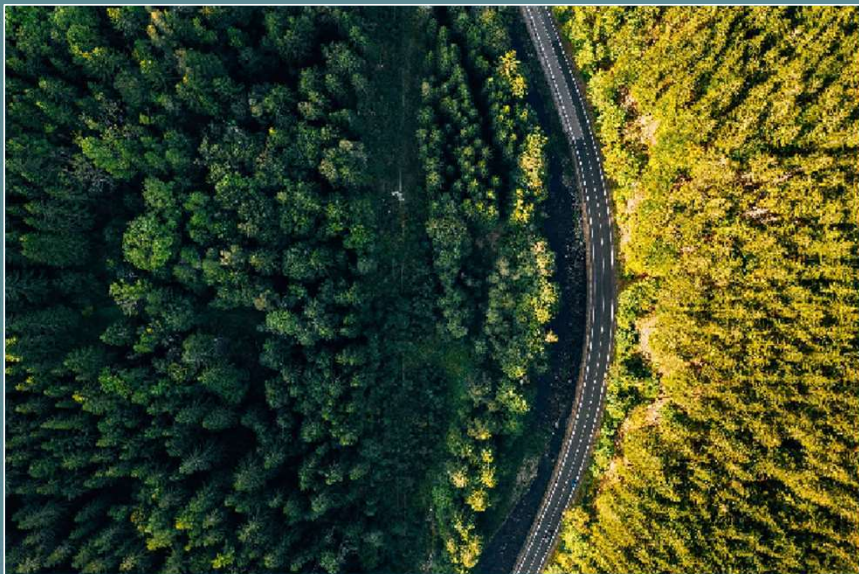
⁽²⁾ OJ C 324, 1.10.2020, p. 58.

⁽³⁾ Position of the European Parliament of 24 June 2021 (not yet published in the Official Journal) and decision of the Council of 29 June 2021.

⁽⁴⁾ OJ L 282, 19.10.2016, p. 4.



- An **EU 2040 target** is needed for a **'gradual reduction'** of emissions, and an **'irreversible transition'**
- EU targets should be based on the **'best available science'**
- Within 6 months of the 1st global stocktake, the Commission will propose a 2040 target, considering **'the latest reports of the Advisory Board'**
- The Commission will publish the projected indicative GHG budget for 2030–2050, **'taking into account the advice of the Advisory Board'**



**Scientific advice for the
determination of an EU-wide 2040
climate target and a greenhouse
gas budget for 2030–2050**

Advisory Board's recommendations on the EU's 2040
climate target

The carbon budget

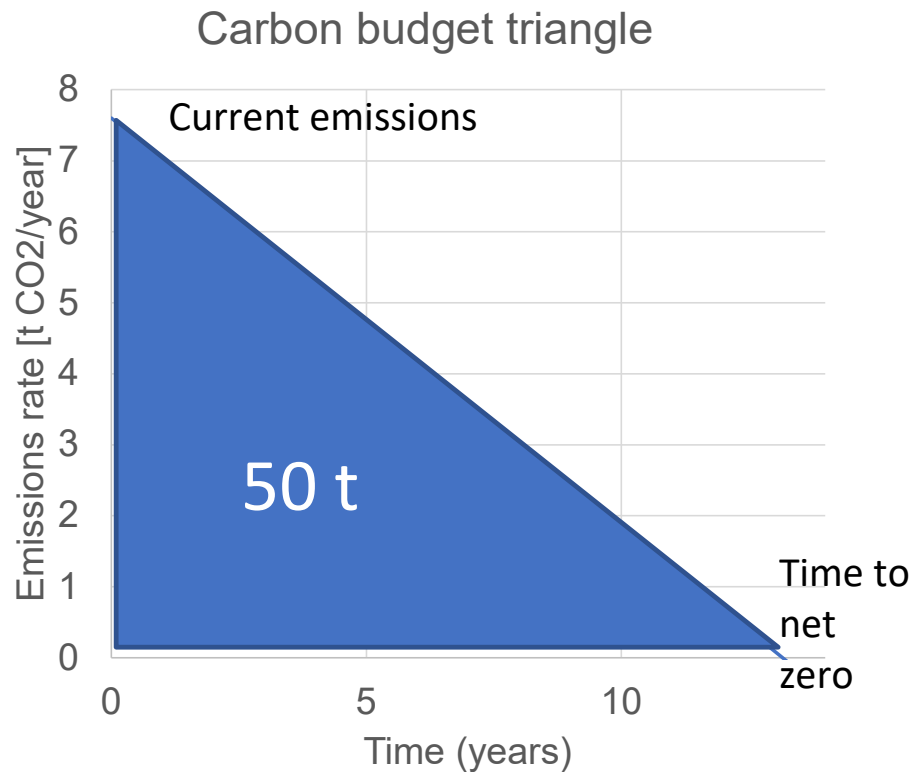
x ppm atmospheric CO₂
concentration = y Gt CO₂ emitted

Carbon budget: 400 Gt CO₂ for
1.5°C from 2020 (global)

Carbon budget per person:
50 t CO₂

Current emissions: 46 Gt CO₂

How fast do we need to get to net-zero?



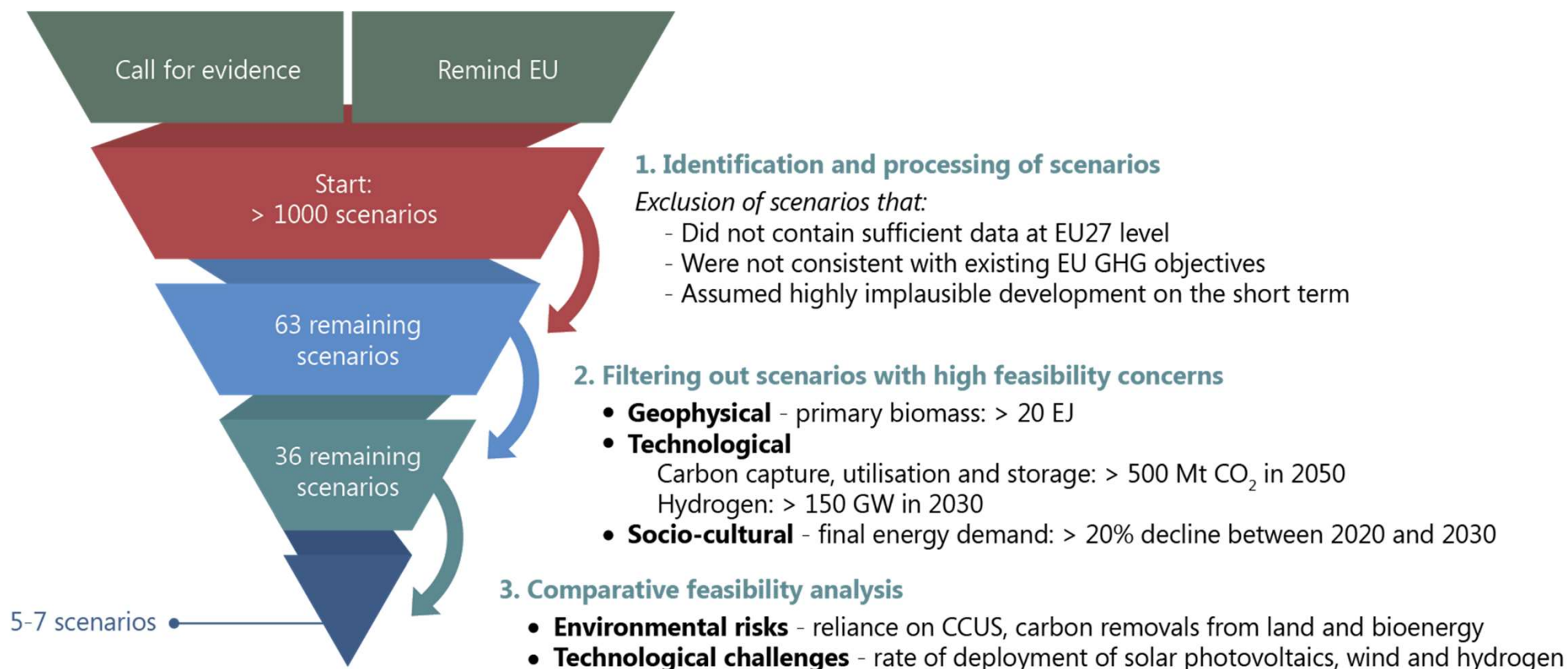
$$\text{budget} = \text{rate} * \text{time} / 2$$

$$\text{time} = 2 * \text{budget} / \text{rate}$$

$$\text{time} = 2 * 50 \text{ t} / 7.6 \text{ t/a} = 13.2 \text{ a}$$

$$\text{Slope} = - 0.58 \text{ t/a}$$

Considering the latest scientific evidence on emission scenarios compatible with 1.5°C and EU targets



Feasibility: implied EU GHG emission budgets for 2030–2050 and 2040 reductions by different ranges of scenarios

Range of scenarios	Number of scenarios	Implied range for an EU budget for 2030–2050 (Gt CO ₂ e)	Implied range for an EU 2040 reduction target (% reduction vs. 1990)
Scenarios	36	8–19	83–96%
within environmental risk levels (less reliance on CCUS, carbon removals from land, and bioenergy)	7	11–16	88–95%
within environmental risk levels and technological deployment challenge levels (less rapid scale-up of non-biomass renewables)	5	13–16	88–92%

#1

The Advisory Board recommends keeping the EU's greenhouse gas emissions budget within a limit of 11 to 14 Gt CO₂e between 2030 and 2050.

Staying within this budget requires emission reductions of 90–95% by 2040, relative to 1990.

This range considers multiple dimensions of fairness and feasibility of the emission reductions.

An aerial photograph of a high-speed train traveling through a dense, green forest. The train is a sleek, modern design with a blue and white color scheme. It is positioned on a set of tracks that cut through the forest. The text is overlaid on the image, with the main title in large white letters and the subtitle in smaller white letters below it. The logo of the European Scientific Advisory Board on Climate Change is in the bottom right corner.

Towards EU climate neutrality: progress, policy gaps and opportunities

Key findings and recommendations of the European Scientific
Advisory Board on Climate Change

EU climate objectives in the European Climate Law

9.7.2021 EN Official Journal of the European Union L 243/1

I

(Legislative acts)

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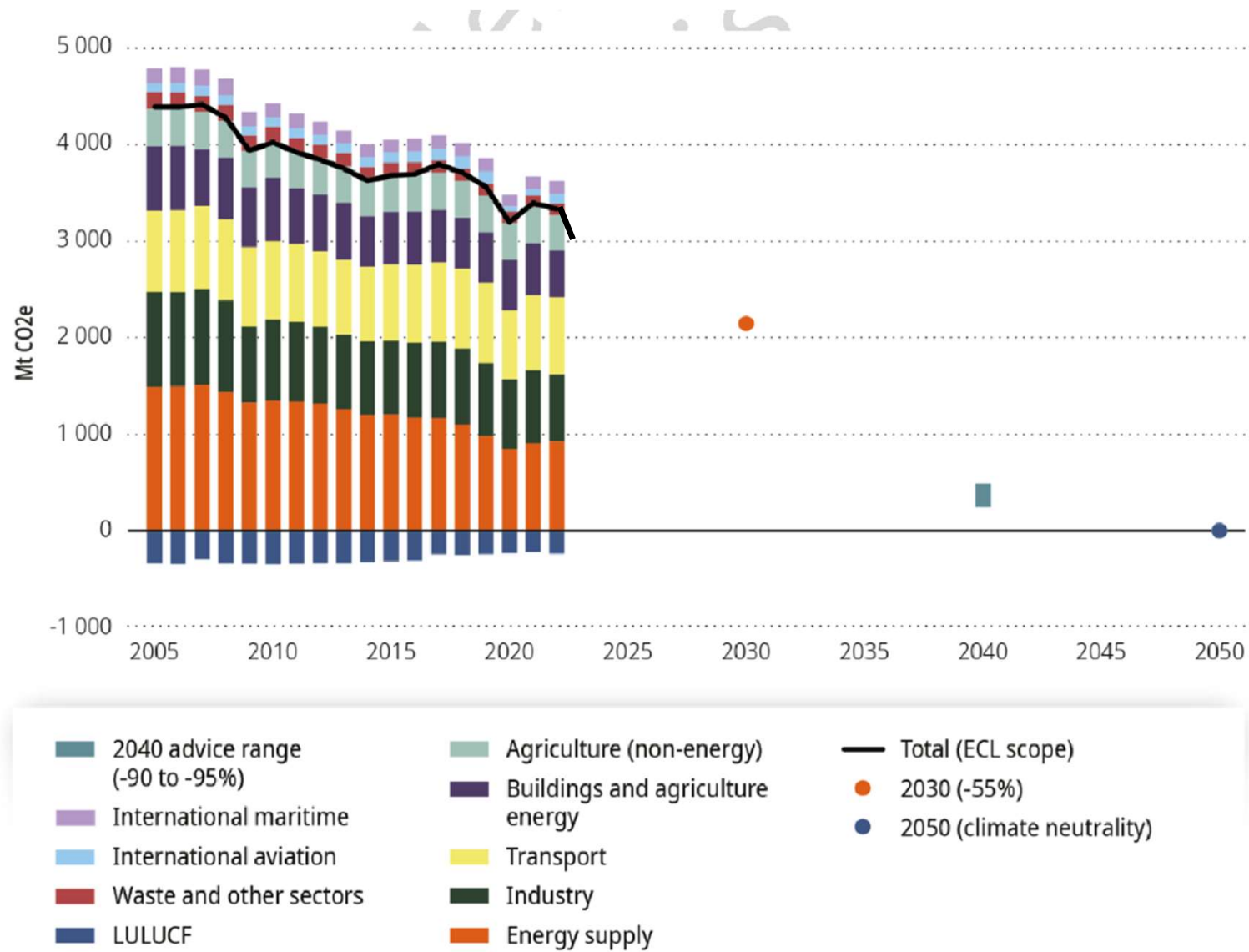
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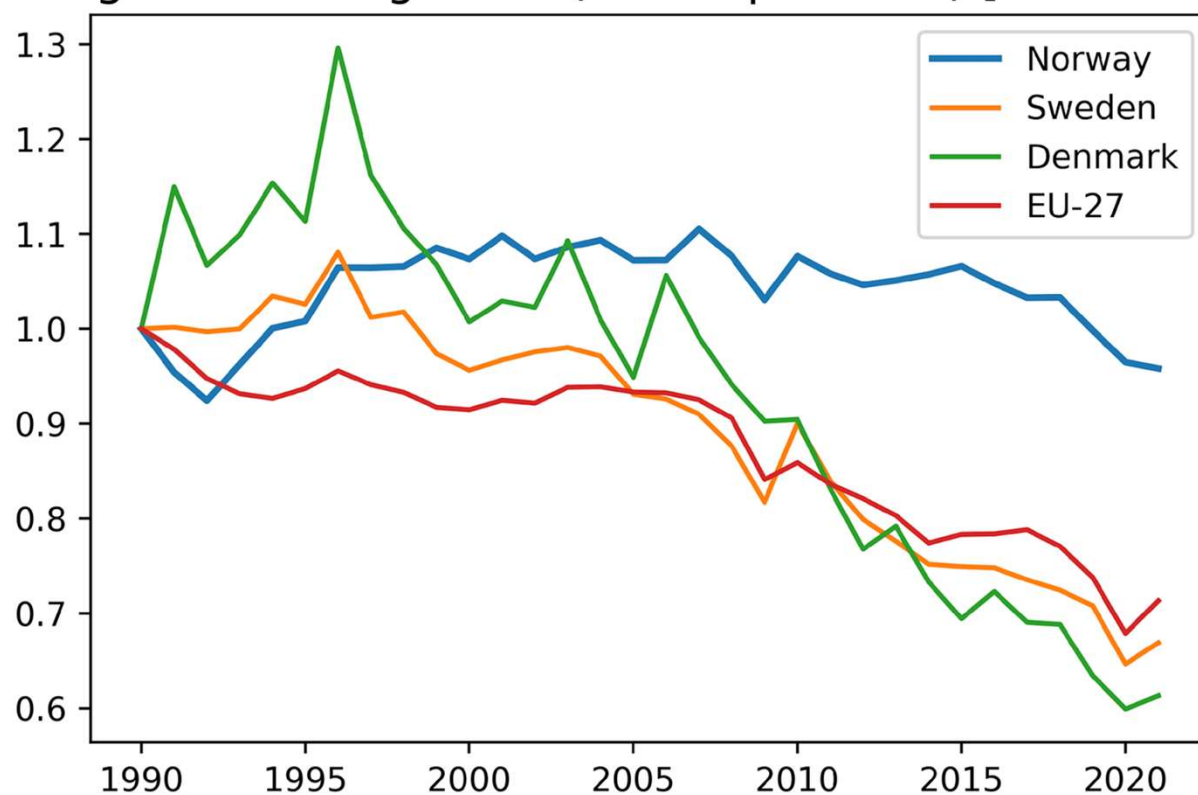
⁽⁴⁾ OJ L 282, 19.10.2016, p. 4.

- In pursuit of the **Paris Agreement 1.5°C temperature goal**:
 - EU climate neutrality by **2050 at the latest**
 - at least 55% net reduction by **2030** compared to 1990
- Reports of the Advisory Board should inform specific tasks of the European Commission:
 - **2040 target** and indicative 2030–2050 emissions budget
📄 Advisory Board recommendations on an EU 2040 target
 - regular assessment of **EU progress** and of the **consistency of EU and national measures** towards EU climate goals
📄 Advisory Board report on progress and consistency



15 years of reducing GHG emissions in the EU

All greenhouse gases - (CO₂ equivalent) [normalized]



- Climate policy making and structural economic change

Table 3 Summary overview of progress on the adoption of climate-relevant policies

Topic	Initiative	Legislative status
Carbon pricing and effort sharing	EU ETS for stationary installations (revision)	Adopted
	EU ETS 2 for buildings, road transport and additional sectors	Adopted
	Carbon Border Adjustment Mechanism	Adopted
	Effort Sharing Regulation (revision)	Adopted
Energy	Renewable Energy Directive (revision)	Adopted
	Energy Efficiency Directive (recast)	Adopted
	TFN-F Regulation (revision)	Adopted
	REPowerEU plan	Adopted
	EU electricity market design (revision)	Tabled
	Hydrogen and decarbonised gas market package	Close to adoption
	Methane Regulation	Close to adoption
	Energy Taxation Directive (revision)	Tabled
Buildings	Energy Performance of Buildings Directive (recast)	Close to adoption
	Construction Products Regulation (revision)	Close to adoption
Industry	Batteries Regulation	Adopted
	F-Gas Regulation (revision)	Close to adoption
	Net-zero Industry Act	Tabled
	Critical Raw Materials Act	Close to adoption
	Industrial Emissions Directive (revision)	Close to adoption
	Ecodesign for Sustainable Products Regulation	Close to adoption
	Packaging and Packaging Waste Regulation (revision)	Tabled
	Waste Framework Directive (revision)	Tabled
Transport	Right to Repair Directive	Tabled
	Green Claims Directive	Tabled
	CO ₂ emission standards for cars and vans (revision)	Adopted
	Alternative Fuels Infrastructure Regulation	Adopted
	ReFuelEU Aviation Regulation	Adopted
	Carbon Offsetting and Reduction Scheme for International Aviation	Adopted
	EU ETS for aviation (revision)	Adopted
	FuelEU Maritime Regulation	Adopted
	CO ₂ emission standards for heavy duty vehicles (revision)	Tabled
	End of life vehicles Regulation (revision)	Tabled
Carbon removal	Trans-European Transport Network Regulation (revision)	Close to adoption
	Regulation on the use of railway infrastructure capacity in the single European railway area	Tabled
Agriculture	Combined Transport Directive (revision)	Tabled
	Certification framework for carbon removals	Tabled
Land use	Sustainable food systems legislative framework	Announced
	LULUCF Regulation (revision)	Adopted
Finance and investment	Nature Restoration Law	Close to adoption
	Soil Health Law	Tabled
	Taxonomy Regulation (for sustainable investment)	Adopted
	Social Climate Fund	Adopted
	Just Transition Fund	Adopted
	European Green Bond Regulation	Adopted

Notes: Measures are classed as 'adopted' if the legislative process has been fully completed, 'close to adoption' if interinstitutional/trilogue agreement has been reached, 'tabled' if at a different stage of the

- Previous cycle climate policies

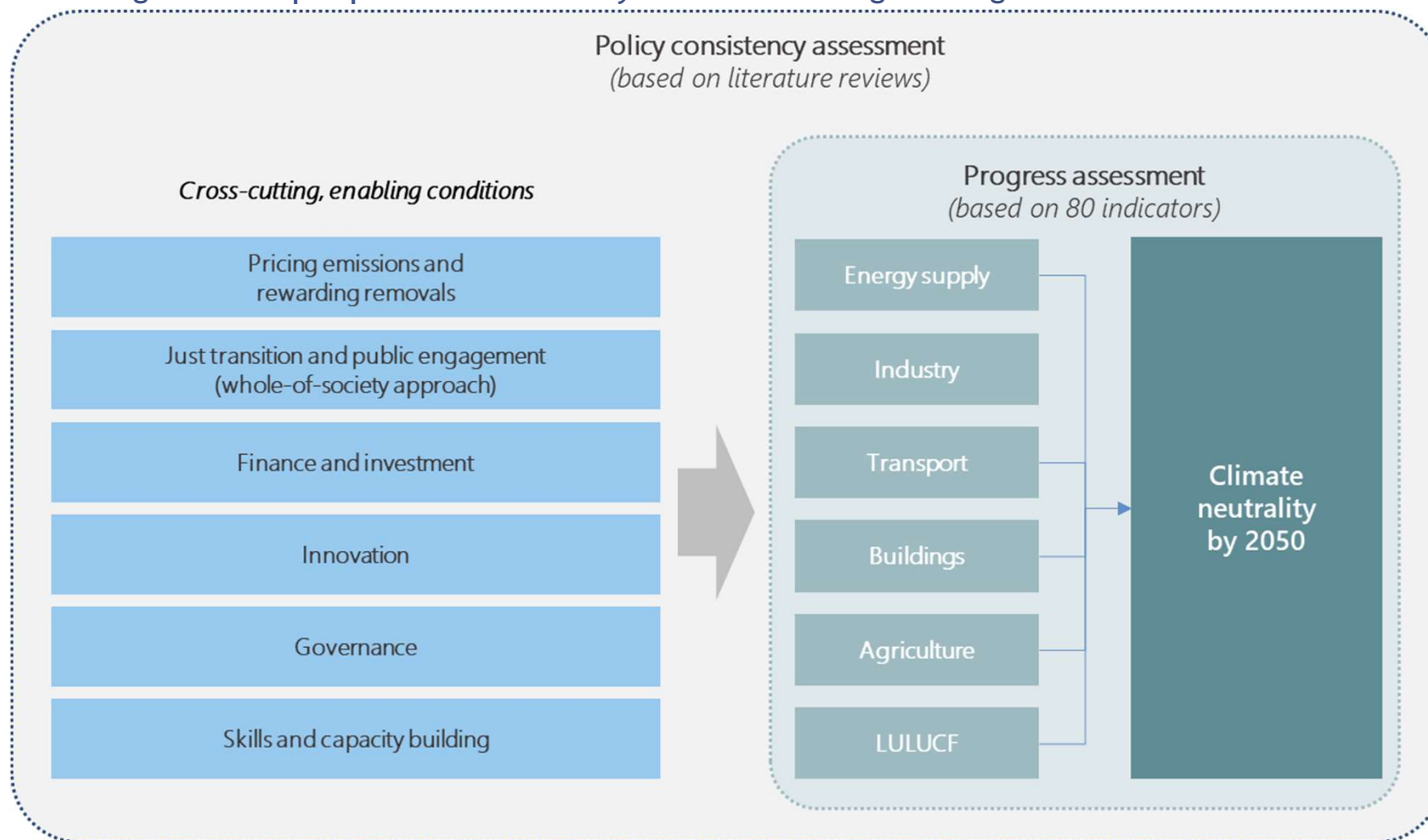
Policy consistency assessment based on needs, gaps and recommendations

The report identifies:

- **needs**: what needs to happen for the EU to remain on track to climate goals?
- **gaps**: are there any gaps in the current policy framework?
 - **policy gap** = no policy in place
 - **ambition gap** = policy in place but insufficiently ambitious
 - **implementation gap** = ambitious policy in place but poor implementation
 - **policy inconsistency** = policy in place is counterproductive
- **recommendations** to address these gaps

The report assess progress and policy consistency

Combining a sectoral perspective with an analysis of cross-cutting enabling conditions



Sectoral assessment framework: emissions, outcomes, levers and enablers

GHG emission
reductions

= expected **contribution of each sector** towards -55% by 2030 and climate neutrality by 2050

outcomes

= main results to be achieved on the **demand** side and the **supply** side to drive emissions reductions

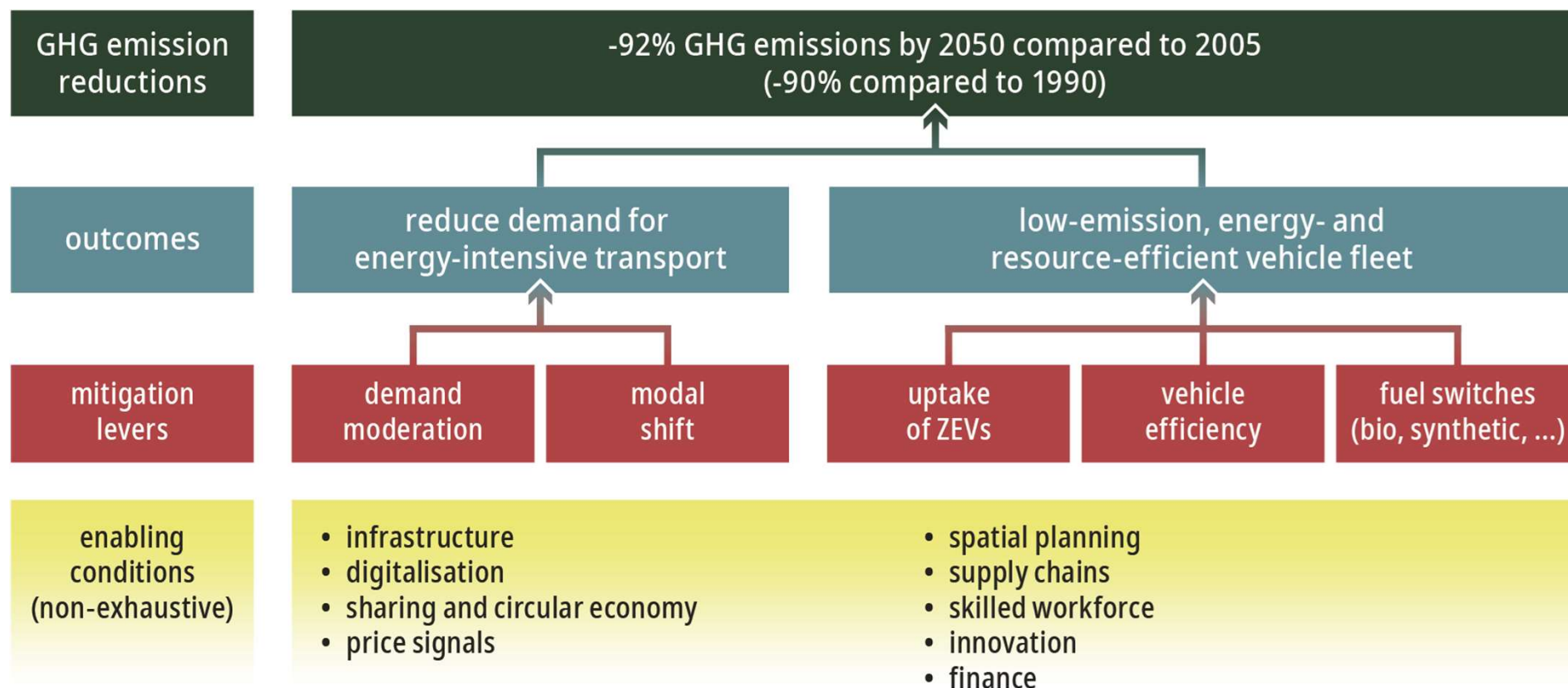
mitigation
levers

= **changes that can deliver** the desired outcomes

enabling
conditions
(non-exhaustive)

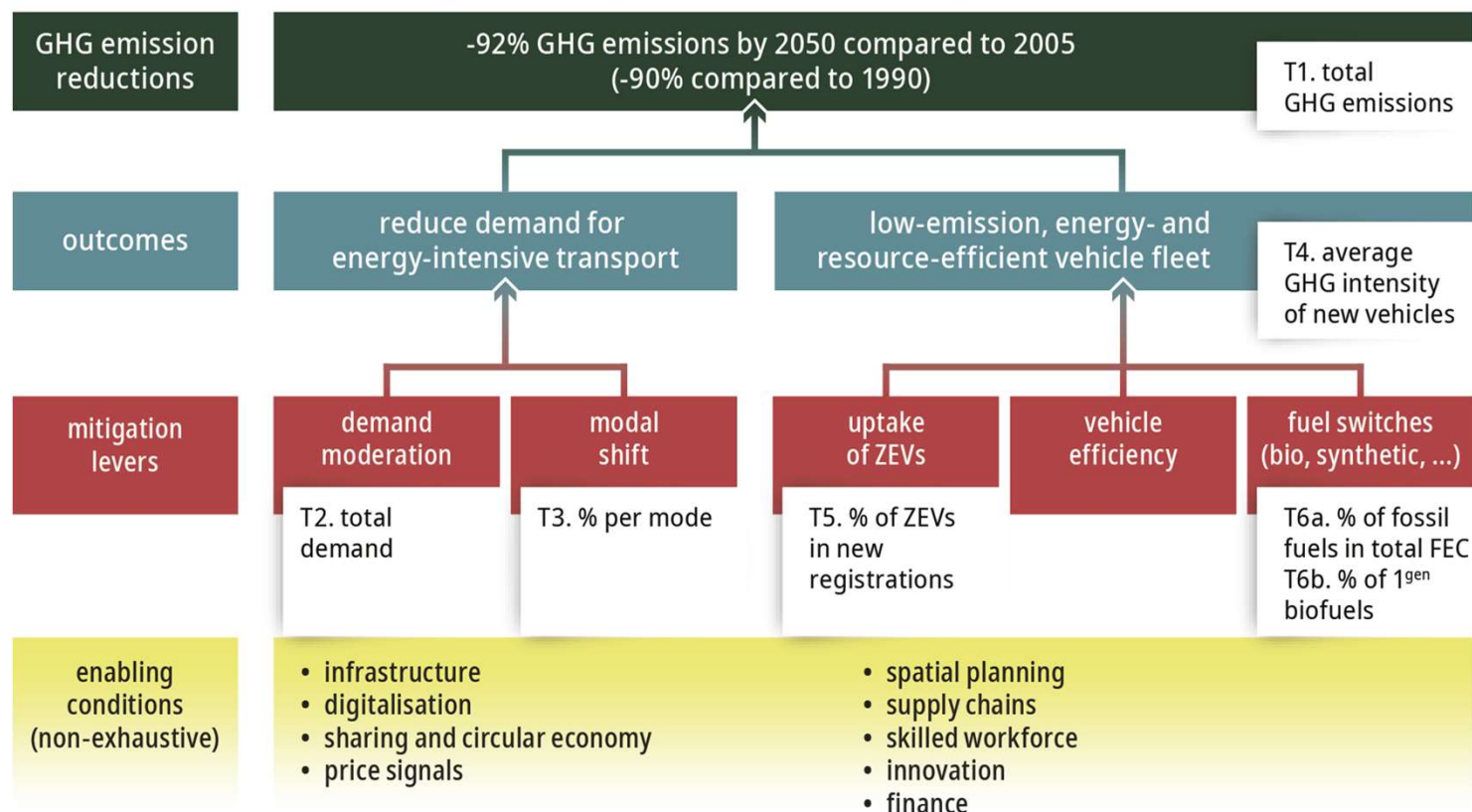
= **changes that can facilitate or are crucial to** the activation of different levers
(sector-specific or cross-cutting)

Sectoral assessment framework: emissions, outcomes, levers and enablers – e.g. for transport



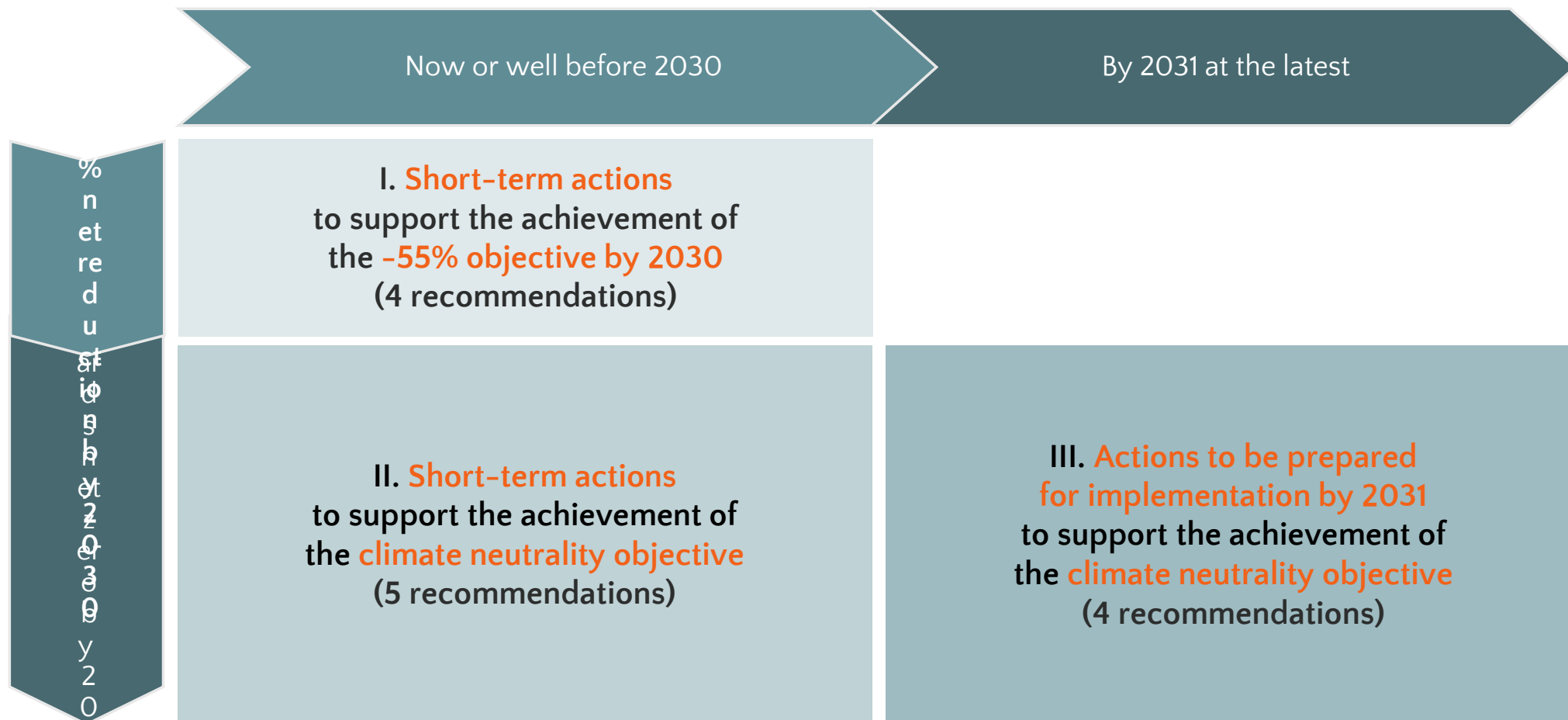
Tracking sectoral progress based on indicators

We then selected indicators to track progress along the different building blocks

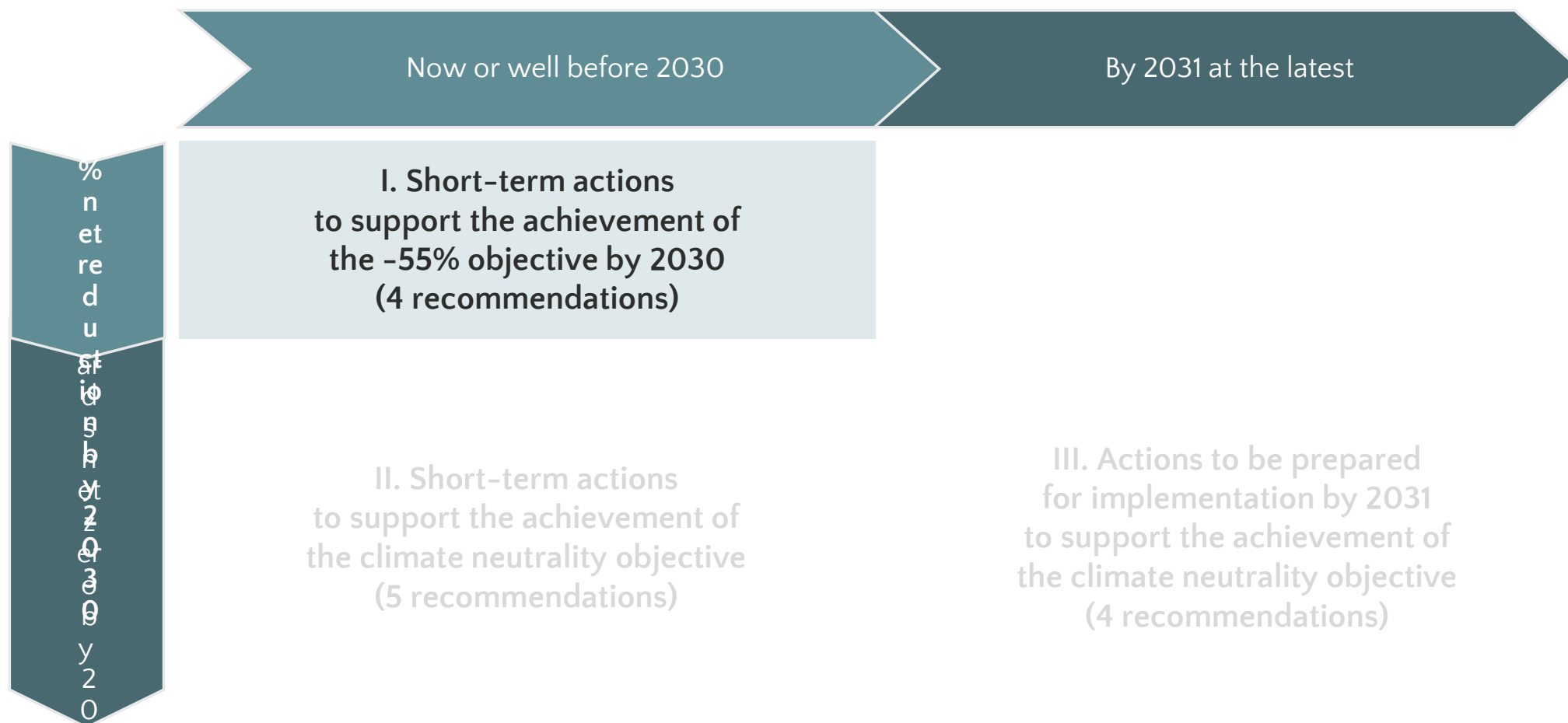


The Advisory Board structured its recommendations around policy targets and action urgency

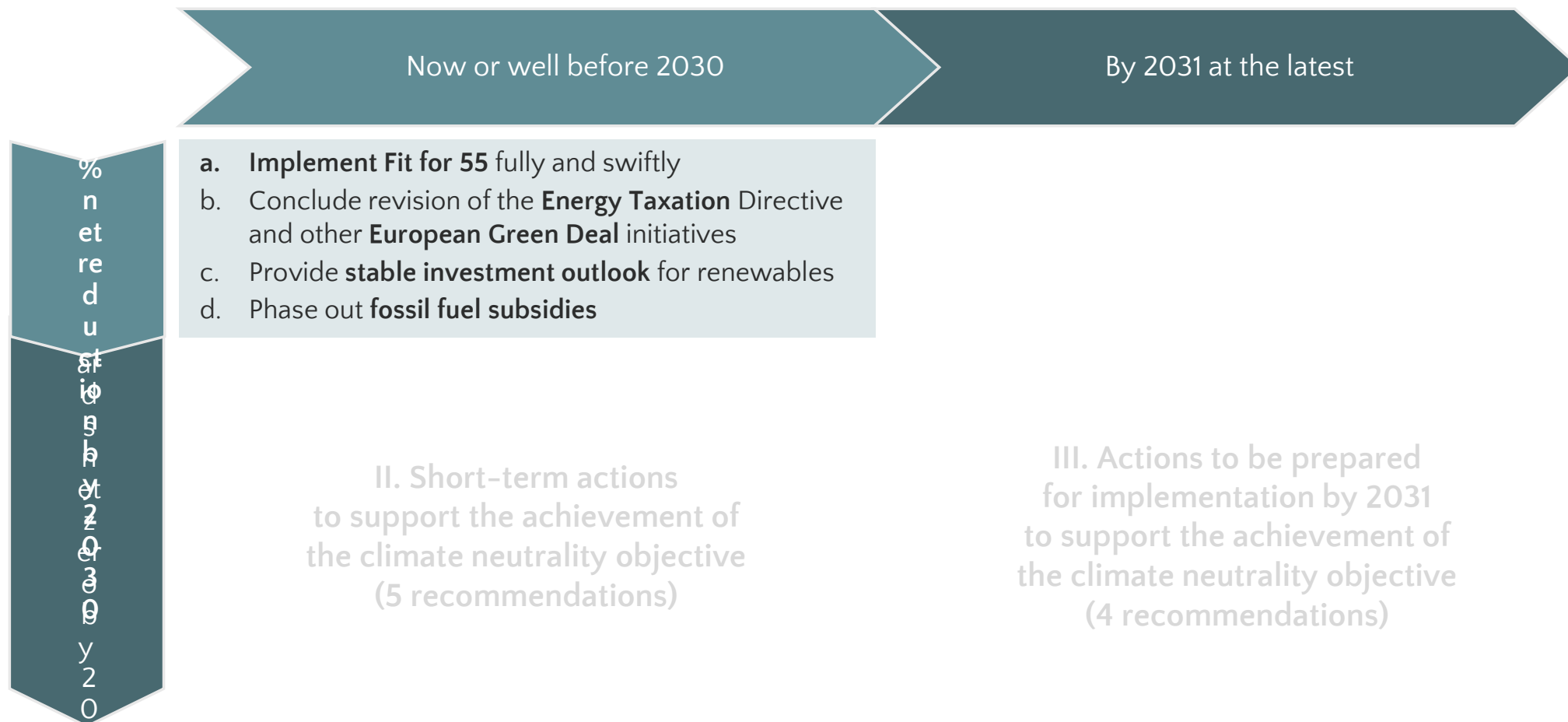
Overall recommendation: focus on immediate implementation and continued action to achieve EU climate goals



I. Short-term actions to support -55%

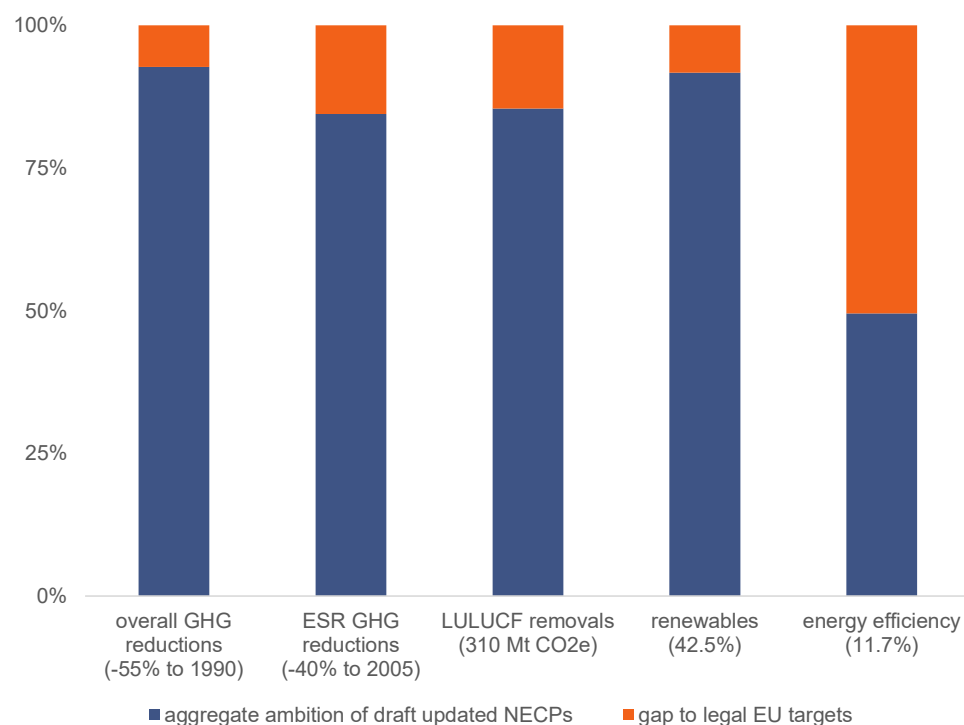


I. Short-term actions to support -55%



I.a Urgently adopt and implement Fit for 55 through national measures

Commission's analysis of gaps between draft national plans and EU 2030 objectives



- Fit for 55 largely depends on **national implementation**
- Draft updated national energy and climate plans (NECPs) **insufficiently ambitious**
- **Only 7 years** left to 2030

- ❓ Bring final updated **NECPs in line with 2030 targets**
- ❓ Urgently adopt and **implement national measures**
- ❓ European Commission should ensure full **compliance** of NECPs with EU laws, and enforce if necessary

Source: European Commission, EU wide assessment of the draft updated National Energy and Climate Plans (2023)

I.b Adopt pending legislation aimed at supporting greenhouse gas reductions

Examples of key legislative initiatives that remain to be adopted

Headline strategy	Legislative initiative	Status
Fit for 55	Revision of the Energy Taxation Directive	Tabled, not yet adopted
EGD sectoral strategies	Regulation on the use of railway infrastructure capacity	Tabled, not yet adopted
	Legislative framework on Sustainable food systems	Announced, not yet tabled
Other	Net-Zero Industry Act	Tabled, not yet adopted
	Revision of the electricity market design	Close to adoption

Stalled in Council

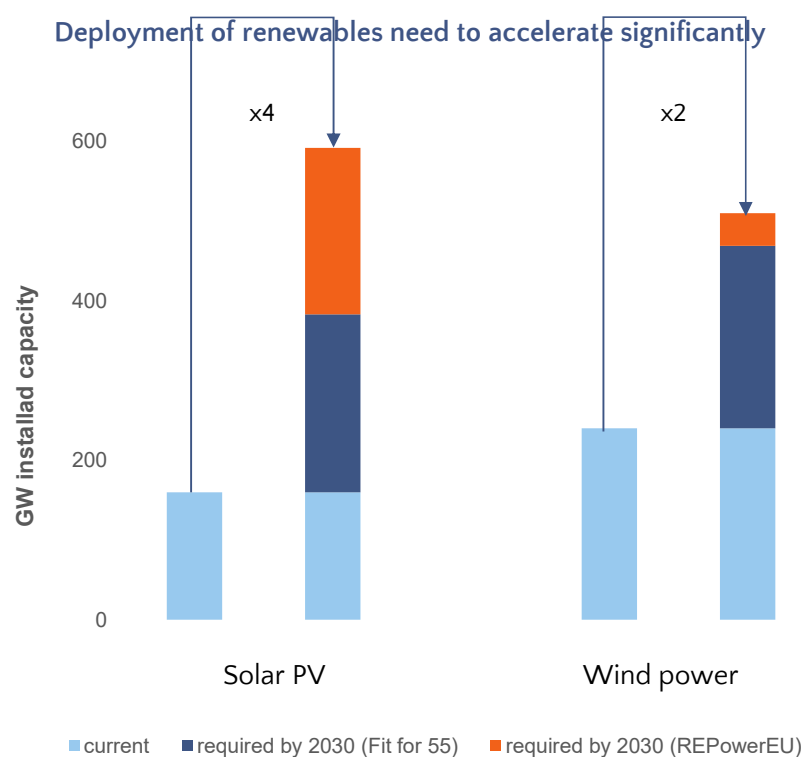
❓ Adopt **ambitious revision** of the Energy Taxation Directive

❓ **Conclude** legislative process on other **pending initiatives**

Negotiations to be resumed

Adopted in June

I.c Provide stable investment outlooks for renewable energy

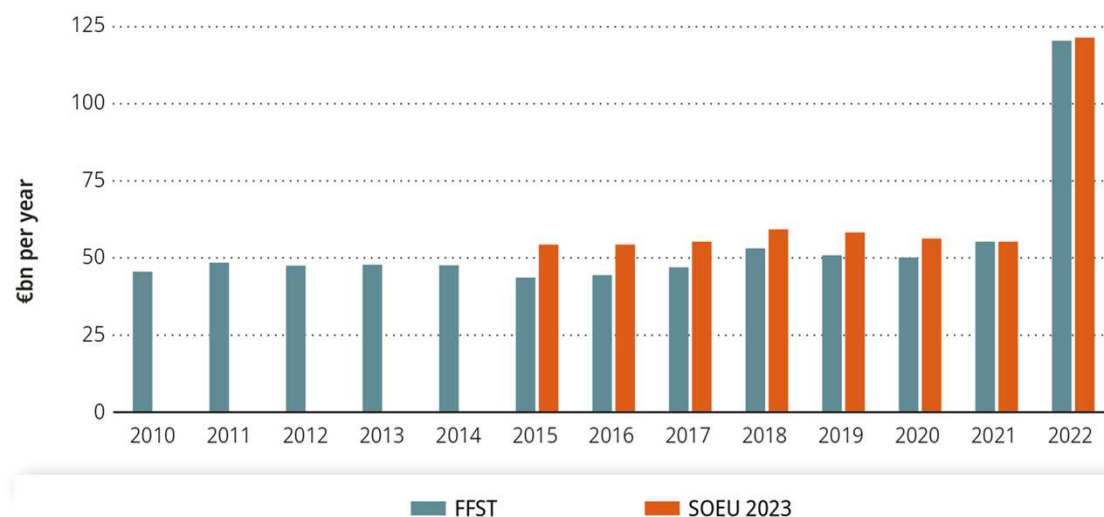


Source: Eurostat, Fit for 55 and REPowerEU scenarios

- Several **bottlenecks** hinder deployment of renewables (e.g. permits, supply chains, grid)
 - ❓ Adopt **pending legislation** (Net Zero Industry Act, electricity market reform) (*cf. previous recom.*)
 - ❓ Rapidly implement **recent legislation** (RED III, REPowerEU, EU Action plan for grids)
 - ❓ Provide **stable support mechanisms** for renewables, offer a long-term **market outlook**, and find a **balance between least-cost solutions and technological innovation**

I.d Urgently and fully phase out fossil fuel subsidies, in line with existing commitments

Fossil fuel subsidies persisted since 2010 and surged in 2022



Source: OECD fossil fuel subsidy tracker, European Commission state of the energy union (2023)

- Member States should set **clear plans** to urgently and fully phase out fossil fuel subsidies – as they **committed** to do
- Subsidies for **vulnerable households** should be redirected towards **well-targeted interventions** that do not undermine the incentive to reduce emissions
- EU state aid rules** should be made consistent with the EU climate goals

Reflections

- Substantial changes are underway.
They need to be supported, pursued further, implemented well.
- Lot's of detailed legislation and regulation is needed.
- Speed of policy making has accelerated substantially.
- Conflict with Status Quo

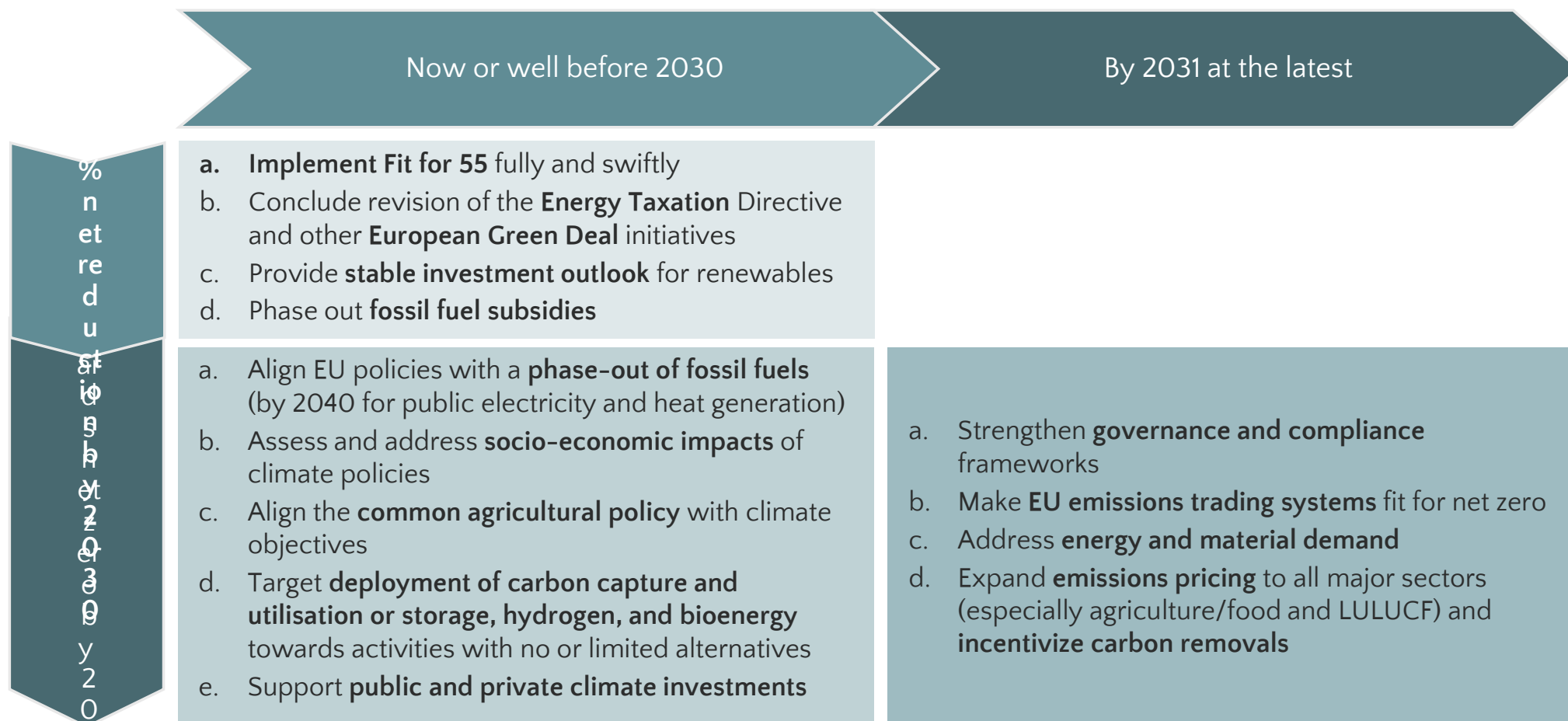
EU's climate policy

- Unique institutional setting furthers the use of science to justify and advance policy making
- Contestation and progress
- Political rationale for policy making comes not so much from science but citizens' movements, economic interests, and political programs
- The principal entry of science is in the ECs development of legal proposals
- Board has given science an independent voice being able to form a cohesive position
- Impact analysis needs further strengthening

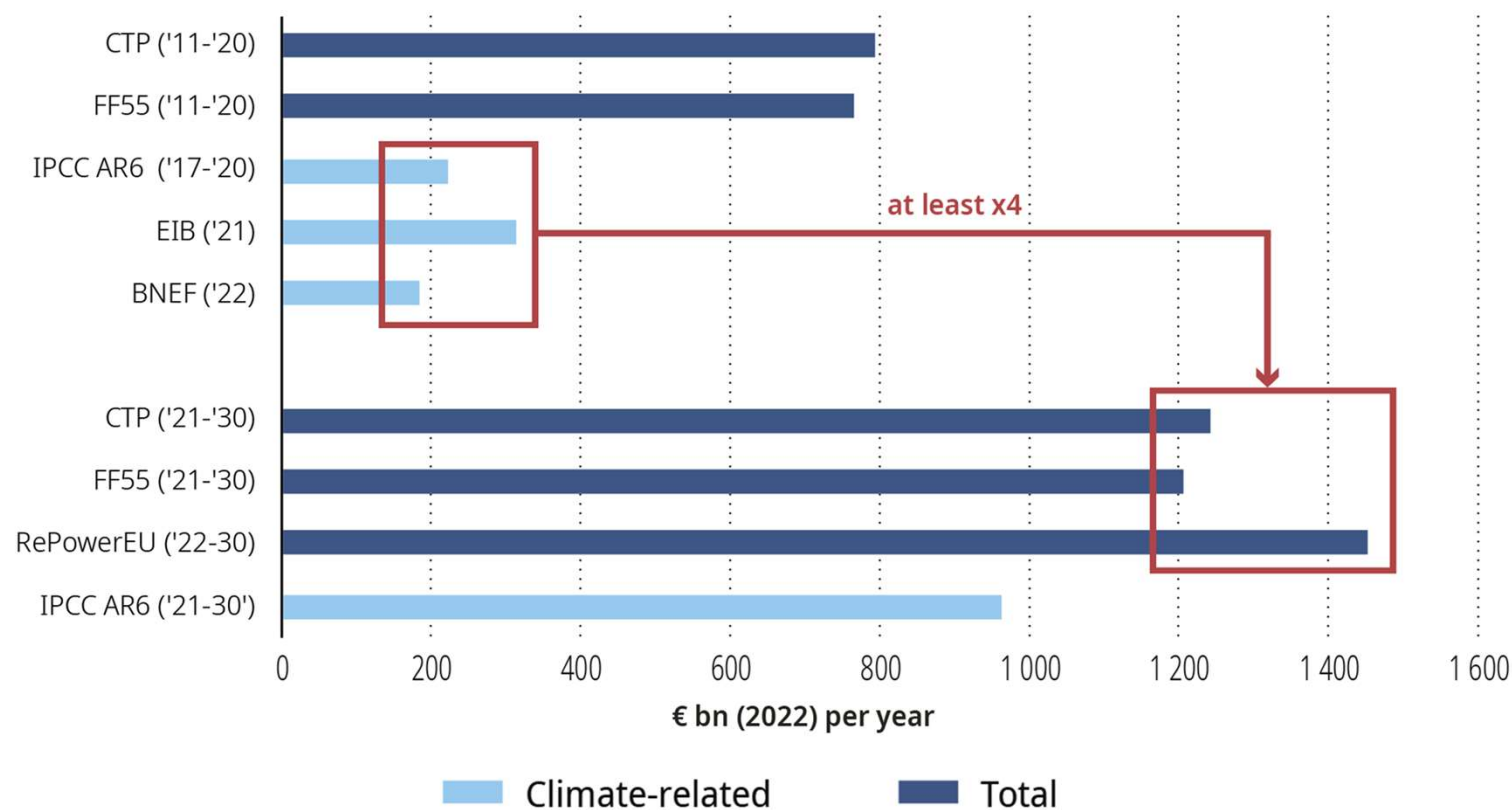
Thank you for listening!

Edgar Hertwich, IIASA and NTNU

Summary overview of the Advisory Board's key recommendations



II.e Better drive the required increase in public and private investments in climate mitigation [1/2]

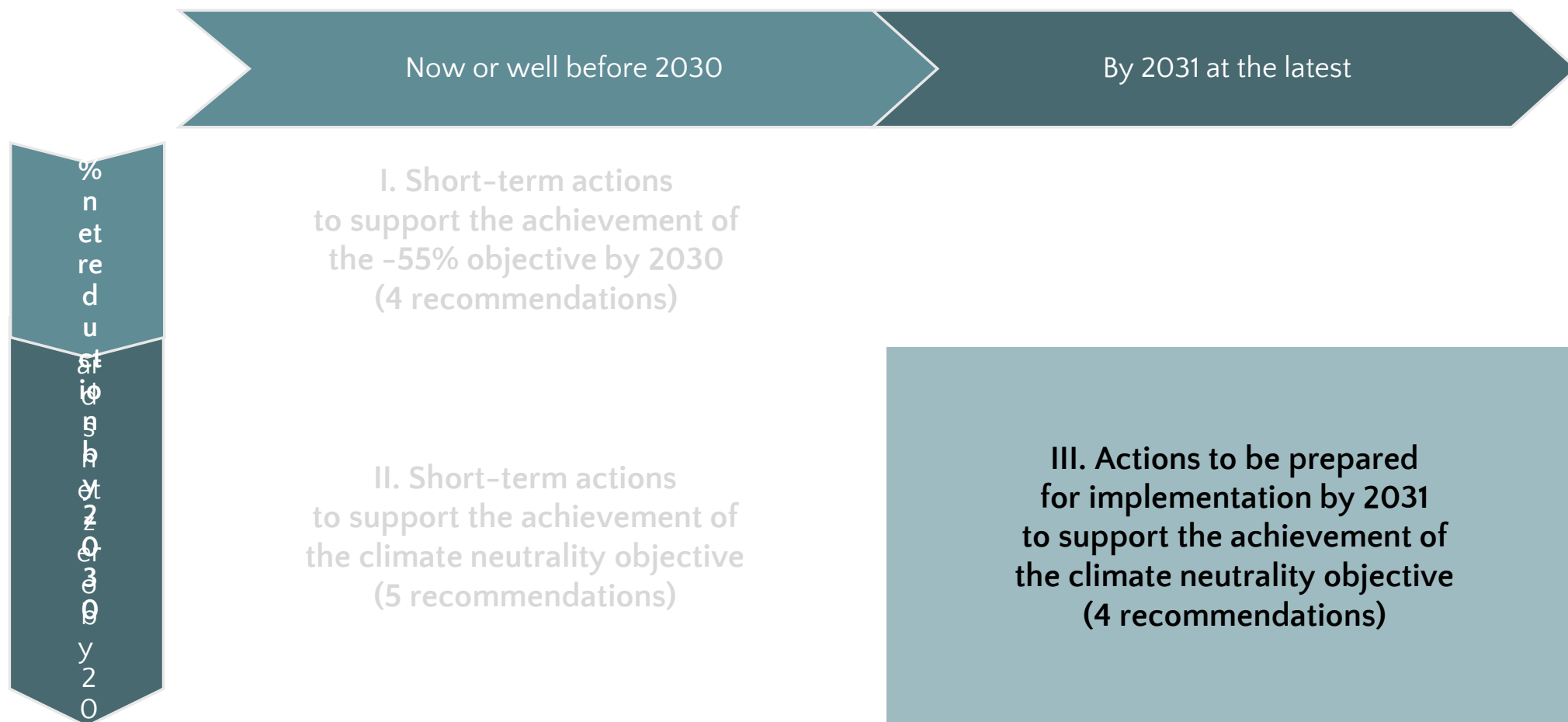


Source: CTP Impact Assessment, REPowerEU Staff Working Document, BNEF, IPCC AR6

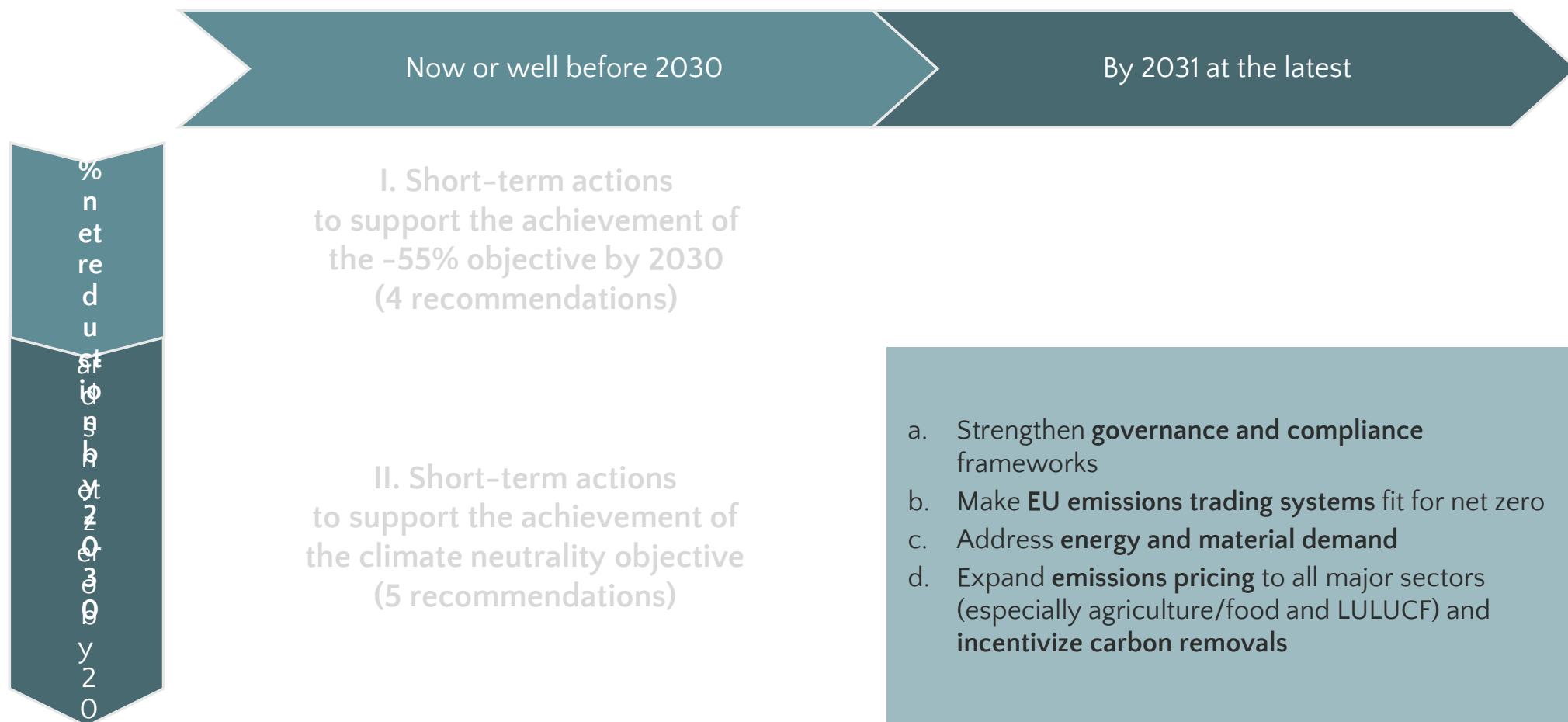
II.d Better target the deployment of carbon capture and use (CCU), carbon capture and storage (CCS), hydrogen, and bioenergy

- **CCU/CCS:** not yet proven at scale, expensive and risks to lock in fossil fuels
 - **Hydrogen:** inefficient (green hydrogen) or dependant on fossil fuels + CCS (blue hydrogen)
 - **Bioenergy:** raising sustainability concerns (e.g. decreasing carbon sink and biodiversity)
- ❓ EU policies in support of CCU/CCS, bioenergy and hydrogen should better **target applications with no, or very limited, other mitigation options**

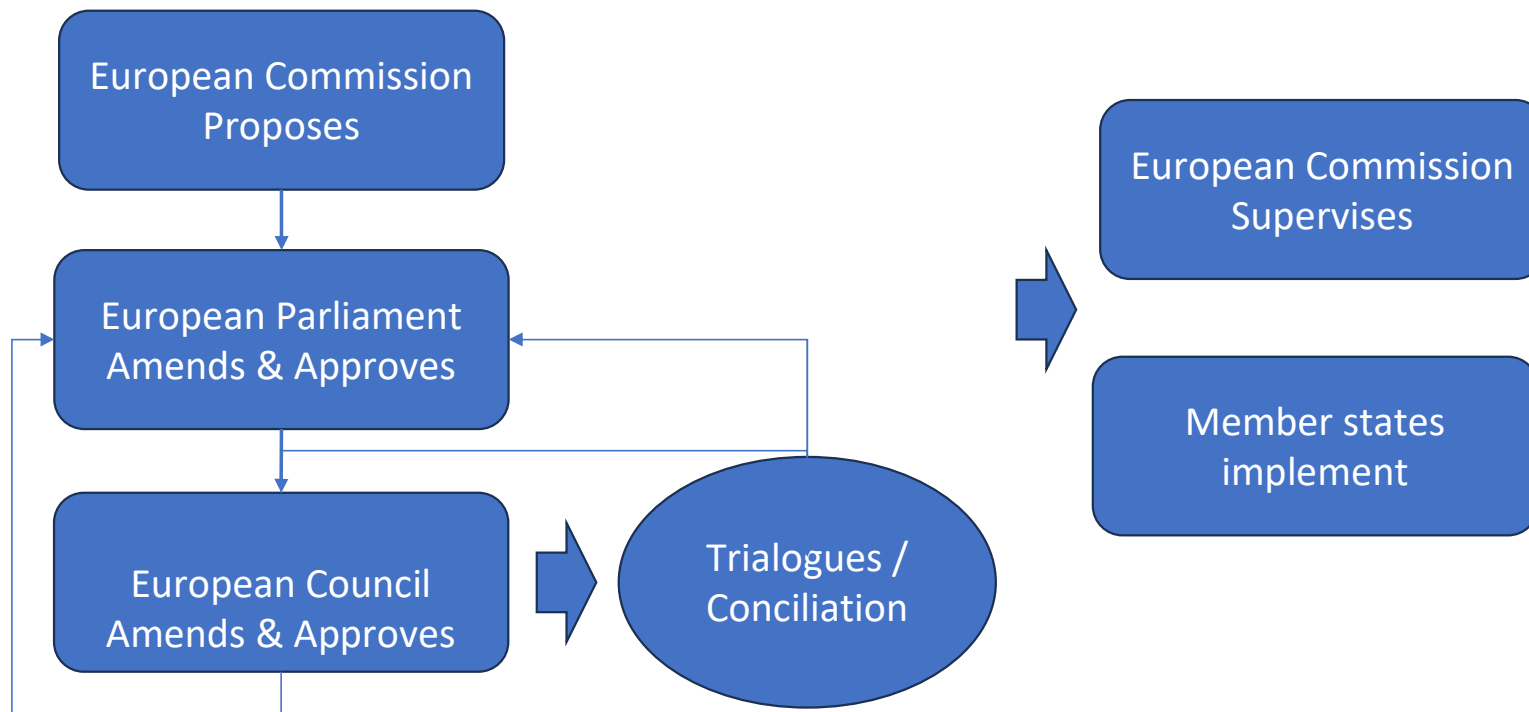
III. Actions to prepare for implementation by 2031



III. Actions to prepare for implementation by 2031



EU Legislative Process



https://www.europarl.europa.eu/infographic/legislative-procedure/index_en.html

III.a Strengthen the EU frameworks on climate governance and compliance

EU Regulation on the Governance of climate action:

- ☐ Establish a **review process for national long-term strategies**, similar to National Energy and Climate Plans (NECPs)
- ☐ Strengthen **consistency** between NECPs and long-term strategies
- ☐ Strengthen requirements for **permanent multi-level energy and climate dialogues**

European Climate Law:

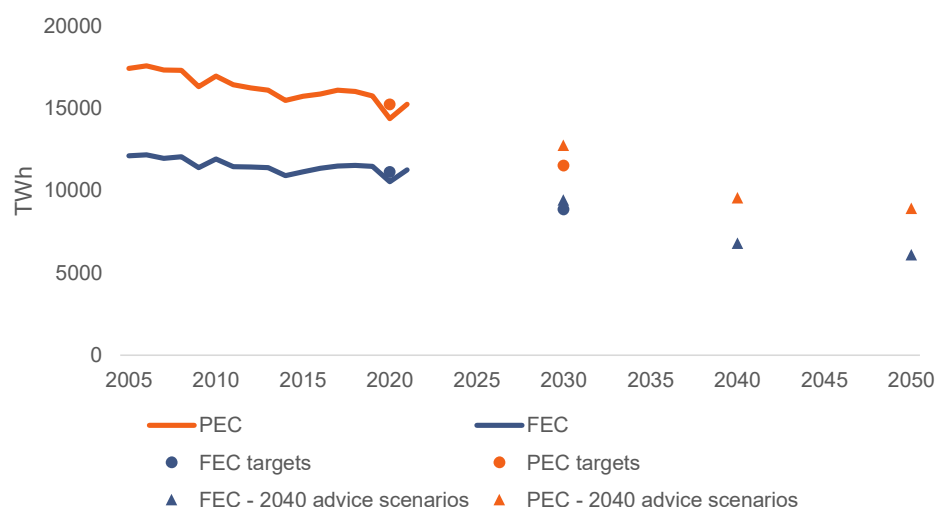
- ☐ Make establishment of **national climate advisory bodies** mandatory (only optional today)

Compliance framework:

- ☐ Strengthen **compliance mechanisms** for sectors under the Effort Sharing and LULUCF Regulations

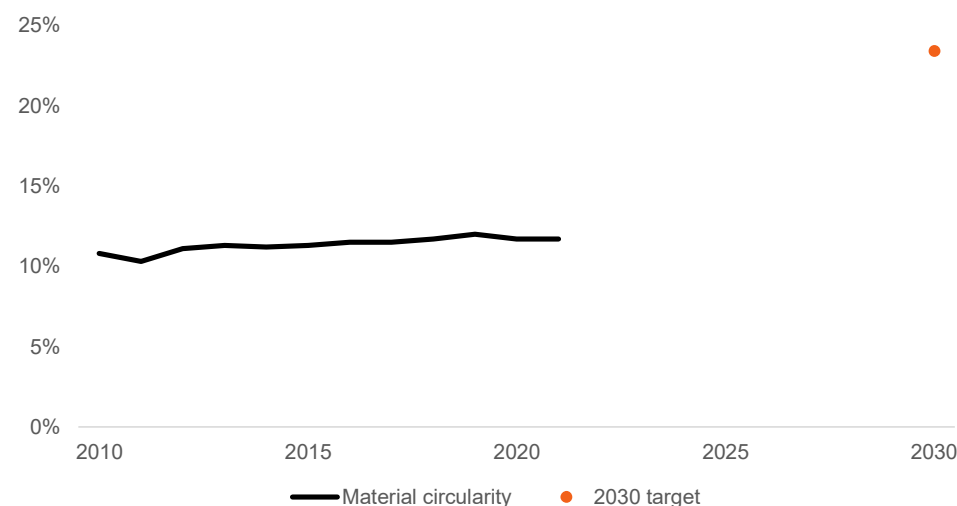
III.c Pursue more ambitious reductions in energy and material demand through new and strengthened policies

Insufficient progress in reducing energy demand



Source: Advisory Board based on Eurostat energy balances, the Energy Efficiency Directive, and the Advisory Board advice for a 2040 reduction target

Very slow progress towards a circular economy

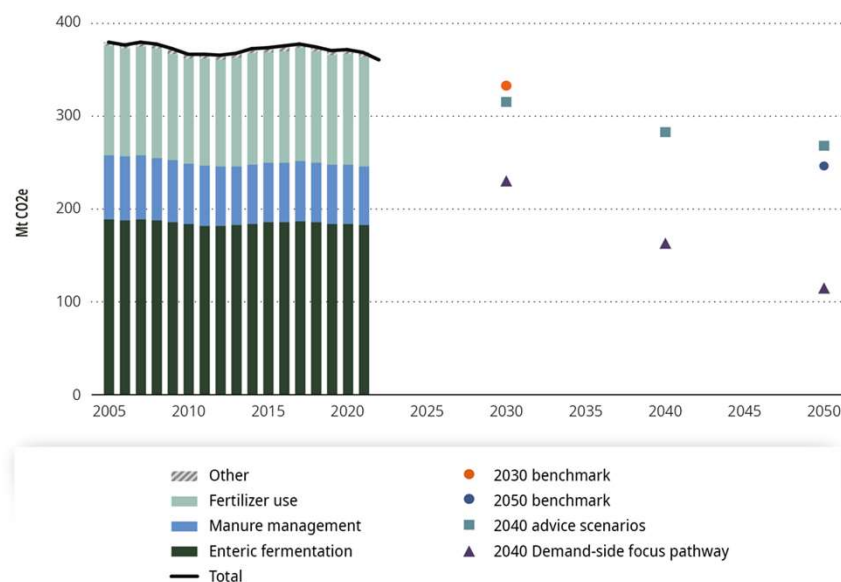


Source: Advisory Board based on EEA data and the 8th Environment Action Programme

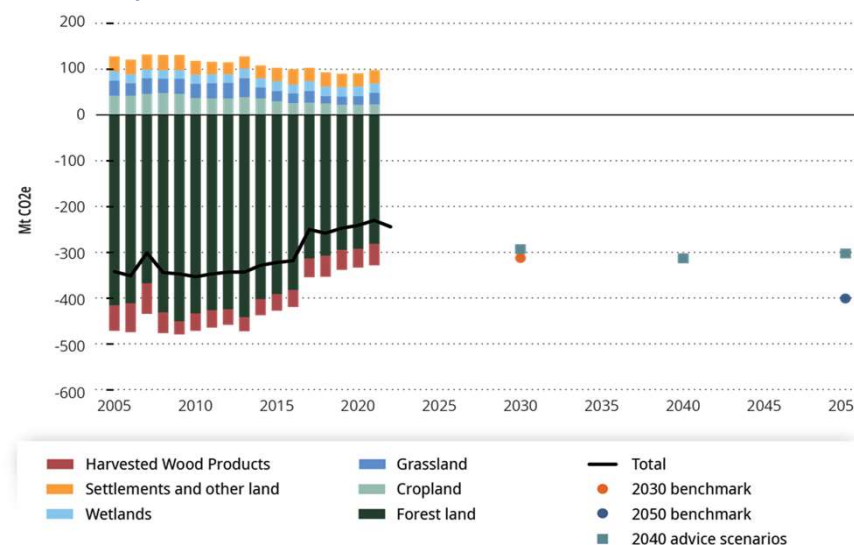
- **Demand-side measures** vs “supply-side only”: faster reductions, higher co-benefits, lower trade-offs
- EU demand-side measures have been **lacking or ineffective**
 - ❓ Stronger policies needed to **reduce energy and material demand**, through efficiency and behavioural changes

III.d Expand GHG pricing to all major sectors and provide incentives for carbon removals

No structural GHG reductions in agriculture since 2005



Rapid decline of the EU's net carbon sink since 2010



Source: Advisory Board based on GHG inventories, European Commission scenarios and Advisory Board advice for a 2040 reduction target

- Insufficient incentives for climate action in these sectors:
 - Agriculture and LULUCF:** consider **pricing emissions and rewarding removals**, considering these sectors' specificities (e.g. monitoring challenges, permanent vs. non-permanent carbon removals)
 - Fossil fuel industries:** consider expanding EU ETS and CBAM to **fugitive CH₄ emissions**