



Ecologic Institute
Science and Policy
for a Sustainable World



Öko-Institut e.V.
Institut für angewandte Ökologie
Institute for Applied Ecology

Funded by



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for Economic Affairs
and Climate Action

Implementing the EU 2040 Climate Target: Building blocks and measures

07 November 2024 | 10:00 – 12:30



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Implementing the EU 2040 Climate Target

Building blocks and policies

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The project: Activities and objectives

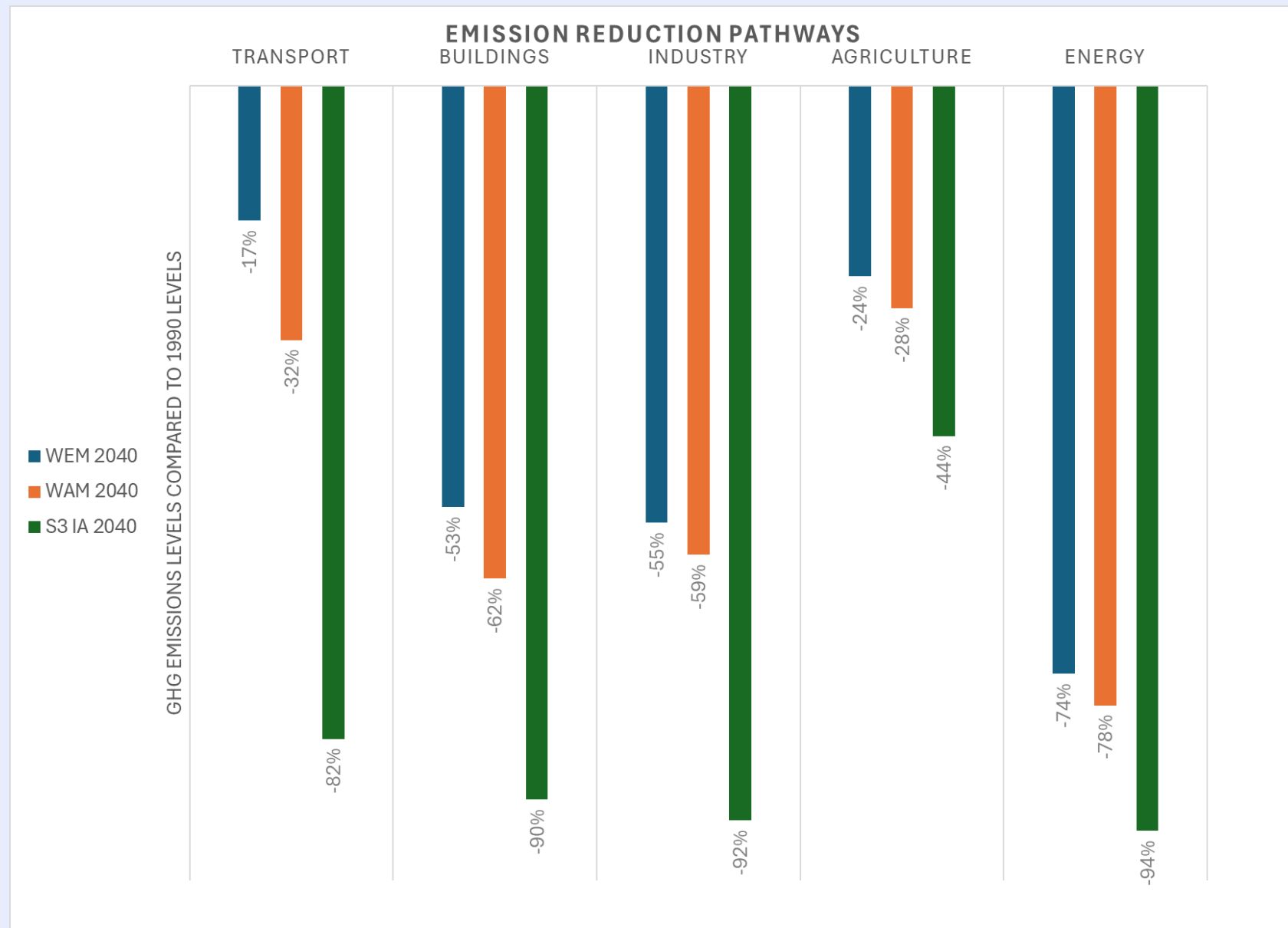
- **The project**

- The team: Ecologic Institute, Öko-Institut, AMO and 300 Gospordarka
- Papers on sector contributions, climate architecture and carbon removals
- Funded by the German Federal Ministry of Economy and Climate Action

Objectives of the project

- Contributions to 2040 debate – in the EU but also in MS, in particular D, CZ and PL
- Identify key building blocks and key measures particularly relevant for cutting the EUs emissions by net 90 % in 2040.
- Identify priorities for 2040 implementation

Where we need to go to





The big building blocks

The big building blocks (1)



- **Meeting 2030 target: WEM 43 %, WAM 48% (EEA projections 2023)**
- **Green electricity**
 - Electricity generation to rise from 2,905 TWh in 2021 to 5,210 TWh in 2040 (S3)
 - RE to cover 81% to 87% of total electricity supply by 2040, up from around 40% in 2021
 - Installed RE capacity to increase by a factor of four to five between 2020 and 2040 if compared to 2011 – 2020 but recent deployment rates have accelerated.
 - Low electricity prices should drive electrification
- **Biomass**
 - 30% increase S2 and S3 vs. today, representing 9 Exajoules or 20% of the Gross Available Energy (GAE) in 2040.
 - Many different demand scenarios for biomass, possibly increasing demand in EU to 20 EJ or more in 2050.
 - Biodiversity objectives plus impacts of climate change on sinks.
 - Problem of zero emission rating of biomass burning

The big building blocks (2)



- **Green hydrogen**
 - Hydrogen consumption scales up to 95 Mtoe in S3 – from practically zero in 2023
 - Limited sourcing in EU, imports uncertain, infrastructure
- **Carbon removals**
 - S3: 317 Mt LULUCF, 75 Mt BioCCS and DACSS in 2040, plus: 169 Mt fossil CCS
 - LULUCF removals declined on average by 14 Mt CO₂e per year between 2016-2022. Industrial removals aspiration 5 Mt in 2030
 - Equivalence problem
- **Funding and investment**
 - Estimating the funding needs is challenging
 - Trends in financing decarbonization heading in wrong direction.
 - Funding key and so is phasing out fossil fuel subsidies.
- **Demand side indispensable – a hidden but relevant key IA findings**

**The big(gest)
building
blocks (3):
Majorities,
democratic
transition,
national
responsibility
and ownership**



Decarbonization is a deeply political project requiring many different choices.

Citizens must understand and support these choices, must be able to hold (national) politicians to account.

Many players in EU climate policy, but none is as important as Member States: politically, economically, legally. It is also where citizens engage most.

As the EU accelerates reductions, it should maintain national responsibility and strengthen its climate governance, not weaken it.

Continuation of legally binding reduction targets for Member States

Contra

- **Redundant because ETS 1 and 2 will cover about 80% of EU emissions from 2027 onwards**
- **ETS 2 has a more robust compliance regime than ESR**
- **Costs?**

Pro

- **Obligation on most important player = Member States**
- **Voters must understand climate policies. Unlike other instruments, national targets are easily understood.**
- **ECL establishes collective targets for the EU. Collective responsibility = collective irresponsibility?**
- **ETS and national targets support each other. National targets help if ETS 2 fails (e.g. due to high carbon prices).**

How to design national responsibility: Selected options



- **Option 1: Continuation of the current ESR / CARE: Scope and distribution formula remains largely the same.**
- **Option 2: Economy-wide, legally binding national targets for emission reductions and removals in the ECL enshrined in an Annex**
- **Option 3: Economy-wide national targets for emission reductions and removals in the ECL via an obligation on MS to enshrine national targets in national law.**
- **Option 4: Economy-wide national targets in the NECP or LTS, required by amended Governance Regulation**



Sector contributions: building blocks and measures

Energy supply



- **Key building blocks**

- Expansion of renewable energy in power generation and heat supply
- Infrastructure development: Electricity and heat grids, variety of storage capacities incl. demand side
- Nuclear power unlikely to reliably contribute to decarbonizing: construction costs, lead times of 15 years and delays in nuclear projects.

- **Key measures**

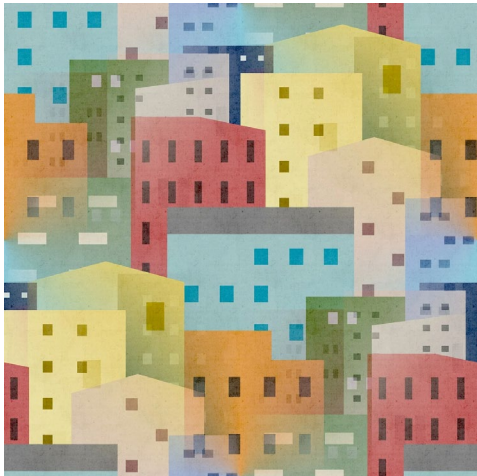
- EU legislation decarbonizing the energy supply sector is largely in place
- If fully implemented, the ETS 1 and 2 reduces emissions by 95 % in 2040 (compared to 2005).
- Essential to maintain the current ETS and its caps.
- BUT: ETS alone does not automatically guarantee reductions.
- Complementary measures necessary, e.g. legally binding renewable targets beyond 2030 and new designs for electricity markets.

Transport



- **Key building blocks**
 - Electrification of road transport: uptake of battery passenger cars from 1,7 % (2023) to 58 % (2040) needed, lifetime of cars to be considered.
 - Modal shift necessary: wrong direction as road infrastructure grows, rail shrinks. Restructuring progress of cities for bike and pedestrians slow.
 - Sustainable fuels: scarcity of sustainable biomass, green electricity, and hydrogen.
- **Key measures**
 - Road: Reducing road transport volumes, ending sales of ICV in 2035, accelerate car fleet turn over, energy efficiency of EVs, urban designs
 - Rail: upgrade infrastructure, pricing, booking platforms
 - Aviation: reduce air travel (infrastructure, landing slots, noise protection), include in 2040 climate target.
 - (Socially and politically acceptable) ETS 2 alone will not deliver necessary cuts in transport emissions.

Buildings



- **Key building blocks**
 - Halving building emissions by 2030
 - Energy efficiency: Renovation rate from 0.9% in 2020 to 2.2% in 2030, after 2030, 1.9% in 2040.
 - Fuel switch and electrification: 80 million heat pumps in 2040, 60 million in 2030, with current installation rate = 45 million in 2030.
 - Expand green district heat.
- **Key measures**
 - Minimum Energy Performance Standards (MEPS) for residential buildings
 - Ecodesign for phasing out of fossil boilers
 - Raise annual increase in renewable energy of 1.1% in 2026 to 2030 to an annual increase of 3.4% for the period 2030 to 2050,
 - More efficient uses of existing building stock
 - Economically and politically very challenging: investment, need to build affordable housing, important policies revised recently

Industry



- **Key building blocks**

- Electrification, green hydrogen, energy efficiency
- Circular economy
- CCS and CCU

- **Key measures**

- Cap in ETS 1: current progress very slow as energy supply has lower emission reduction costs
- Funding for net zero technologies, e.g. innovation fund, contracts for difference
- Improve circularity: Ecodesign directive, Sustainable Products Regulation and the revision of the Construction Products Regulation

Agriculture



- **Key building blocks**
 - 2/3 of agriculture emissions from livestock
 - Reducing livestock is indispensable for required emission cuts but also for lower food prices, nature conservation and land use.
 - Limited technical reduction potential
 - Diet changes
- **Key measures**
 - Quota for livestock
 - Regulation on animal welfare and fertilizer
 - CAP reform with strong climate elements
 - Price setting on climate harmful nutrition (taxation or ETS 3)
 - Support for farmers in the transition

Conclusions (1)

- **Failing to meet 2030 targets is probably a deal breaker.**
- **Target designs**
 - Separate targets for reductions and removals, separately for temporary and permanent storage
 - National responsibility and ownership essential: Legally binding targets for MS to continue
- **ETS complements other policies, only one important instrument out of many others**
- **Coherence of instruments, e.g. avoid double counting of removals, reduced biomass use**

Conclusions (2)

- **Putting all building blocks in place by 2040 is a significant challenge.**
- **Considerable risk that they will not be available in time.**
- **IA demonstrates that demand-side measures outlined in LIFE variant can help mitigate risks:**
 - LIFE reduces demand in biomass, green electricity, green hydrogen, carbon removals and investment needs.
 - Considerable reductions in agriculture emissions and increases of LULUCF sink.
- **Economically, emissions from agriculture and urban transport “easier” to reduce than other sectors, notably industry.**



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Thank you!

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Images: <https://pixabay.com/>

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