

What does the 1.5°C goal require from EU climate policy?

4i TRACTION Consortium

Dr. Tina Aboumahboub, Dr. Neil Grant



Project outcomes

 1.5°C compatible scenarios for the EU27 and seven selected member states

- Germany, Finland, France, Belgium, the Netherlands, Poland, Spain
- Assessing the implications for total GHG emissions, the power sector and end-use sectors

Summarised in three key reports

Accessible at
 <u>https://www.4i-traction.eu/outputs</u>





Key findings

• More action is required to align with 1.5°C

- EU27 should be aiming for 65% cut by 2030, relative to 1990 levels
- All seven member states should be aiming for at least 50% cuts by 2030 (relative to 1990 levels)
- Clean power in the 2030s is central to the 1.5°C transition
- Electrify, electrify, electrify
 - Electricity provides 61-71% of final energy in 2050 in the EU27
- Reduce energy demand
 - Via electrification, energy efficiency and reduced demand for polluting goods



Scenario assessment methodology



• Illustrative pathways chosen for in-depth assessment:

Representing the "highest plausible ambition" for the EU27: technically and economically feasible pathway with steepest GHG emissions reductions out to 2030, while not violating sustainability criteria

- i. REMIND-MAgPIE 2.1-4.2|DeepElec_SSP2_HighRE_Budg900 : <u>HighRE'</u>
- ii. REMIND-MAgPIE 2.1-4.2|SusDev_SDP-PkBudg1000: <u>SusDev</u>





What does the EU27 need to do to align with 1.5°C?



- 1.5°C compatible range (relative to 1990, excl. LULUCF): 64-67%
- EU27's 2030 target of 54% below 1990 (excl. LULUCF) is above the selected 1.5°C compatible range
- REPowerEU plan would increase the 2030 emissions target, but only to 57-58% (excl. LULUF) – and is still incompatible with 1.5°C
- With existing measures, emissions in 2030 are projected to reach 35% below 1990 levels





Are EU member states aligned with 1.5°C?

- Range of ambition for current 2030 emissions reduction targets: -65% (Germany) to -23% (Belgium/Spain).
- 1.5°C compatible range (rel. to 1990, excl. LULUCF): -50% (Belgium) to -77% (Germany).
- None of the seven member states has a 2030 target aligned with globally costeffective 1.5°C compatible pathways.

Emissions reductions relative to 1990 (%)



Note: Error bars show the range of emissions reductions between the two illustrative pathways considered.

*The Netherlands' current 2030 target of a 49% reduction is not 1.5°C compatible. The coalition has recently proposed increasing this to 55%. This would align with illustrative pathways, but remains below the Netherlands' fair share contribution to global mitigation



A clean EU27 power sector in the 2030s



- A future power system dominated by non-biomass renewables
- Coal is phased out before **2030** and **gas by mid-2030s***.
- No new nuclear is installed post-2019, and nuclear is phased out by 2050
- Hydrogen plays a limited but key role in system balancing
- EU can achieve close to **100%** clean power by 2035 (97-99%).
- Demand side action can strongly reduce overall electricity demand



1.5°C compatible electricity generation for EU27



*In the SusDev scenario, there is continued gas generation post-2035. However, gas contributes only 3% of electricity generation, acting mainly as a "peaking technology". This small share may be entirely replaced with hydrogen.

A clean power sector in the 2030s: member states

- Coal-fired electricity effectively phased out by 2030
- Germany, Finland, Spain and the Netherlands with existing/proposed coal phase out plans by 2030 → should aim to accelerate this to the early- to mid 2020s
- Poland's plan for continued coal generation post-2030 is not compatible with 1.5°C.
- Fossil gas phases out over 2028-2041 in all seven countries (HighRE Pathway)
- 100% renewables achieved between 2038-2049



Note: the graph shows earliest date by which the pathways achieve the milestone.





What does the future EU27 energy system look like?



- Final energy demand falls
 18% by 2030 and 33 50% by 2050 relative to
 2019 levels.
- Electricity provides 61-71% of final energy in 2050 (23% today)
- Renewables provide 41-48% of final energy demand by 2030 and 89-92% by 2050.



1.5°C compatible final energy mix for EU27



The role of electrification and energy efficiency

- In illustrative pathways electricity share of final energy rises to 52-73% in 2050
- Electrification explodes post-2030
- Final energy can fall 30-50% in 2050 in individual member states
- Greatest potential for demand reduction in Germany: 19% reduction by 2030 (rel. to 2019).
- Lowest in Finland where the potential has been mostly exploited.

Electrification and demand reduction in 1.5°C compatible power sector transitions



Note: Chart shows the average level of electrification and demand reduction (from 2019 levels) across both illustrative pathways in 2030 and 2050.



Conclusions

- All countries need to do more to align with 1.5°C.
 - Individual member states: minimum 50% target by 2030
 - EU27 as a whole: 65% target by 2030

What is needed to achieve this transformation?

- Strong reductions in final energy demand.
 - Efficiency, electrification and targeted behaviour change can achieve this without compromising well-being.
- A clean power sector in the 2030s.
 - Achieving 100% clean power by mid-2030s should become a policy focus, underpinned by massive expansion of wind and solar.
- Widespread electrification.
- Fossil fuel phase-outs
 - Coal phased out by 2030, fossil gas by 2050, remaining oil concentrated in aviation and non-energy use







Contact

Tina Aboumahboub

Climate Analytics gGmbH



tina.aboumahboub@climateanalytics.org

0049 30 25 92 29 520

Neil Grant Climate Analytics gGmbH



neil.grant@climateanalytics.org 0049 30 25 92 29 520

4 I-traction.eu







This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement **No. 101003884**.