

Carbon neutral Finland 2035 - impact assessments of national policies and measures

**Tiina Koljonen & Antti Lehtilä, VTT
Summer 2022 semi-annual ETSAP
meeting, 24th May 2022**

24/05/2022 VTT – beyond the obvious

Above 90% of Finns consider climate change as a serious problem

- Launch of the IPCC AR6 WG3 report on 4th May 2022 received high interest by the Finnish media
- Ambitious climate policy was a key question in Finland's last parliament elections in 2019

IPCC report on the mitigation of climate change VTT

- National launch organised by VTT and Ministry of the Environment 4-5th April
- 32 media hits with VTT
- National radio & tv
 - Yle uutiset interviewed **Antti Arasto**
 - Radio Suomen päivä interviewed **Laura Sokka**
 - MTV uutiset at 19pm & 22pm interviewed **Tiina Koljonen**

Onko maailman päästöjen puolittaminen vuoteen 2030 mahdollista? "Tämä on realismia, jos halutaan"



25/04/2022

Event at Tiedekulma, livestream had 385 viewers and the event was streamed also at Yle Areena



Älä jää pois! tule mukaan [#vtt/ilmasto](#)



Programme of Prime Minister Sanna Marin's Government 10 December 2019

- Carbon neutral Finland that protects biodiversity
 - Finland will achieve **carbon neutrality by 2035**
 - Finland aims to be the world's first **fossil-free welfare society**
 - **Strengthening of carbon sinks and stocks** in the short and long-term
- Tax reform for sustainable development
 - **Reform of energy taxation**
 - **Reform of transport taxation**
- Strengthening Finland's role as a leader in the circular economy

Support for the Government in 2021-2022 with TIMES-VTT

New climate and energy strategy

New medium term climate policy plan

Update of Finland's bioeconomy strategy

Update of Finland's climate act

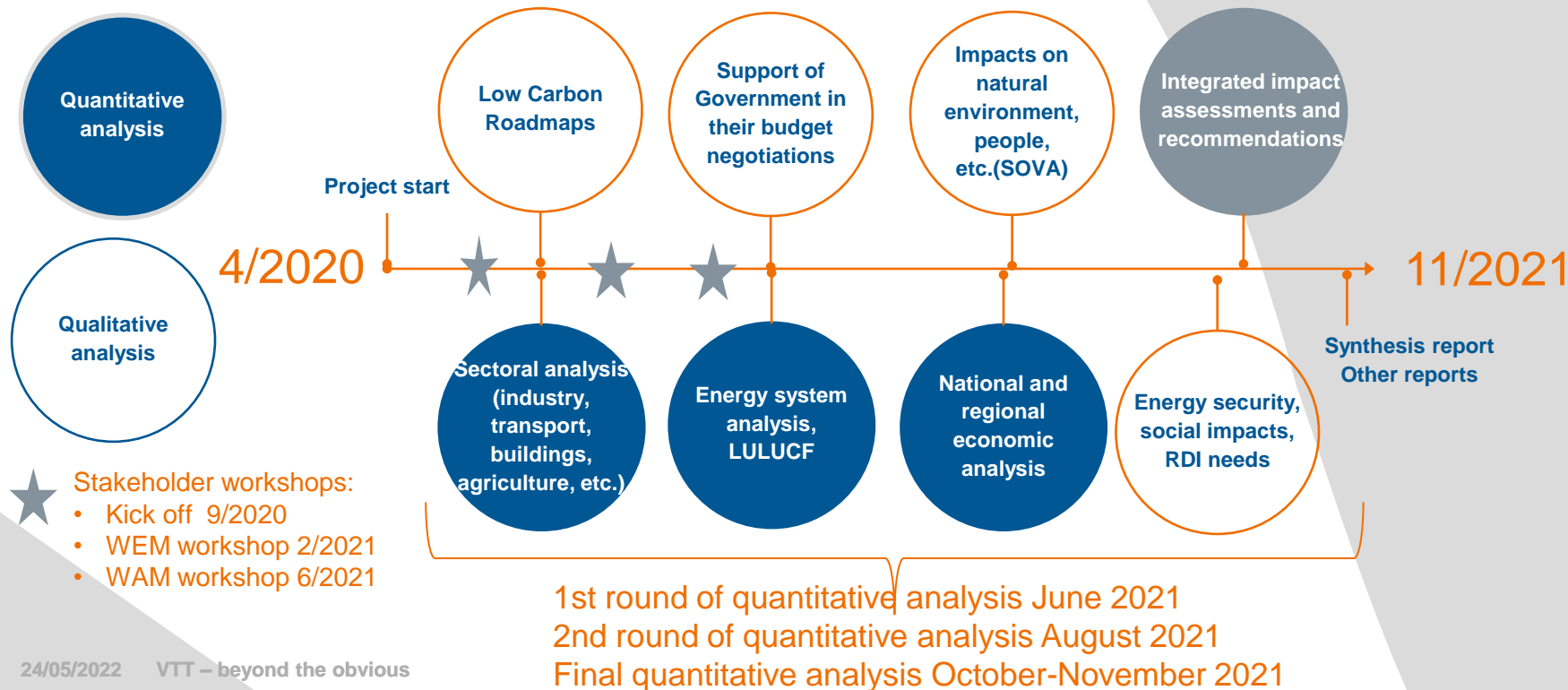
Roadmap for energy tax reform

EU's FitFor55 proposal and its impacts for Finland

EU's new climate and energy targets by 2030-2050 defined in the FitFor55 package

- The **Fit for 55 package**: EU legislation to cut EU's net greenhouse gas emissions by at least 55% by 2030 compared to 1990.
- **Key areas of action and these have been considered in national assessments**
 - greenhouse gas emissions from all economic sectors => quantitative
 - greenhouse gas removals by carbon sinks such as forests => quantitative
 - funding for a just transition => qualitative based on low carbon roadmaps
 - renewable energy => quantitative
 - energy efficiency => quantitative
 - more alternative fuels and more charging stations for electric vehicles
 - energy taxation => quantitative & qualitative
 - a carbon border adjustment for certain imports => qualitative

Climate Neutral Finland 2035 – Impact assessments of climate and energy policies



Summary of the selected low carbon roadmaps by national industrial federations

Federation	Mitigation potentials and reduction targets	Reported challenges and policies required	Fair transition
Energy industries	Green	Yellow	Red
Technology industries	Green	Light Green	Light Red
Chemical industries	Green	Yellow	Red
Forest industries	Green	Light Green	Light Red
Sawn industries	Green	Yellow	Red
Bioenergy industries	Yellow	Green	Light Green
Construction industries	Green	Light Green	Red
Transport and logistics	Green	Green	Red
Agriculture	Green	Light Green	Light Red
Food industries	Green	Light Green	Red
Commerce	Green	Yellow	Red



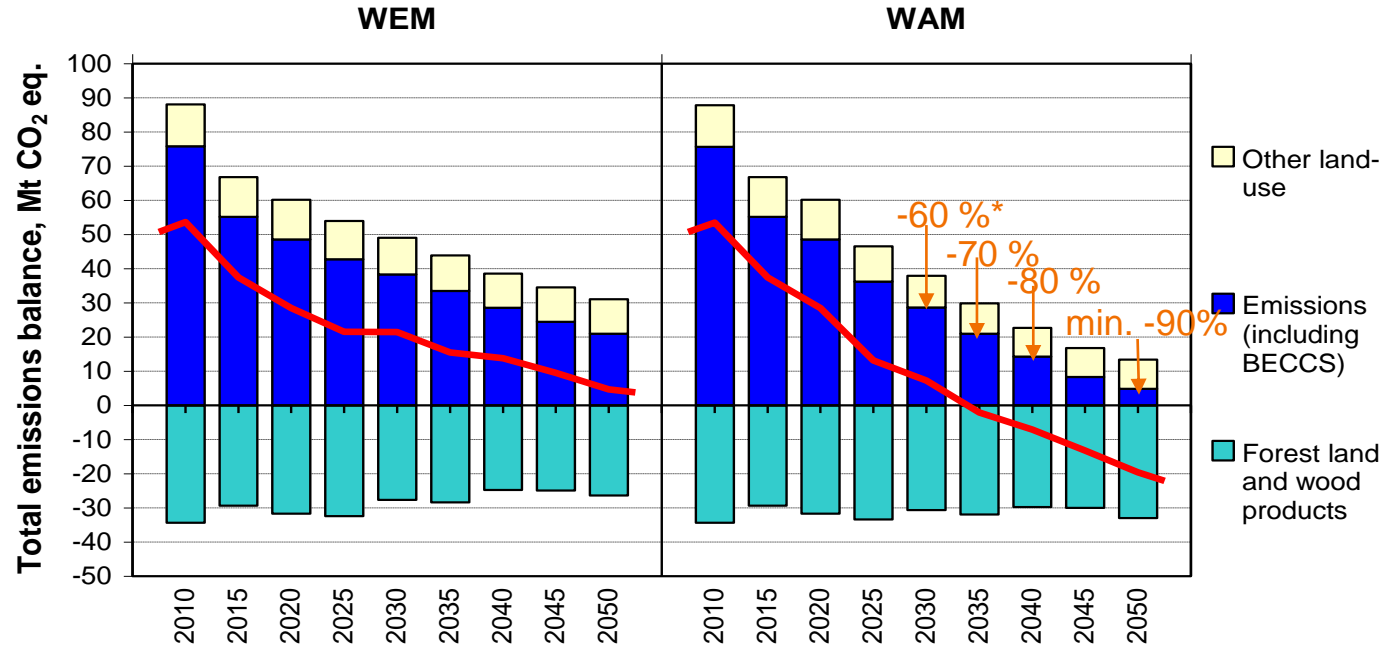
Inputs to the quantitative analysis



Inputs to the qualitative analysis



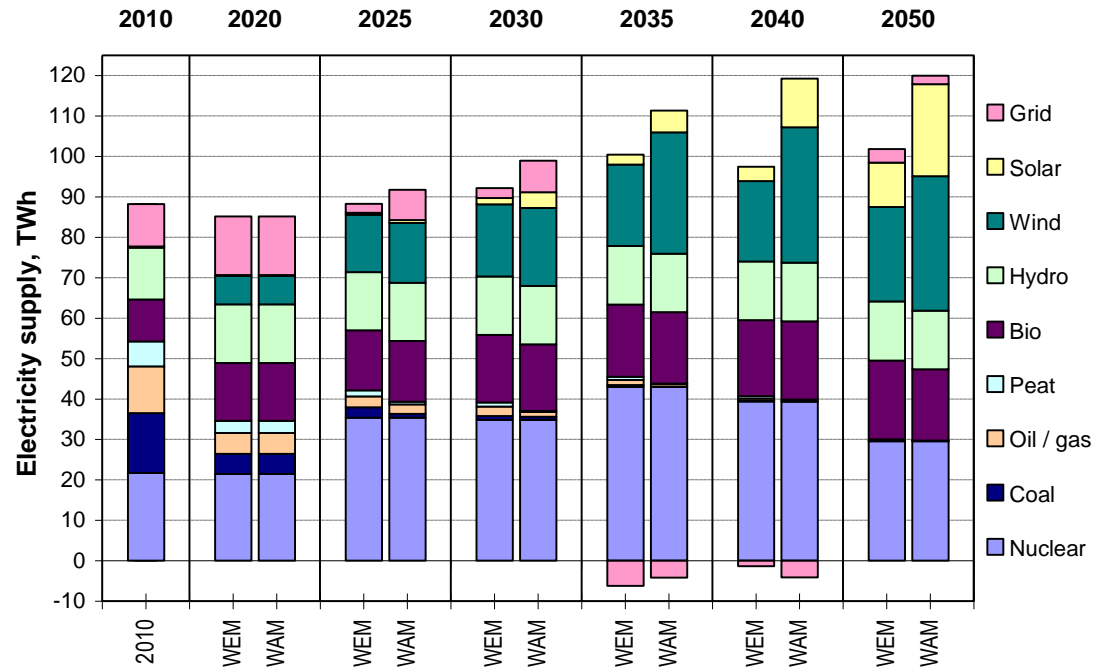
Greenhouse gas mitigation pathways With Existing Measures (WEM) and With Additional Measures (WAM)



* GHG mitigation targets in 2030, 2035, 2040 and 2050 (compared with 1990 levels) are set in the new climate act of Finland

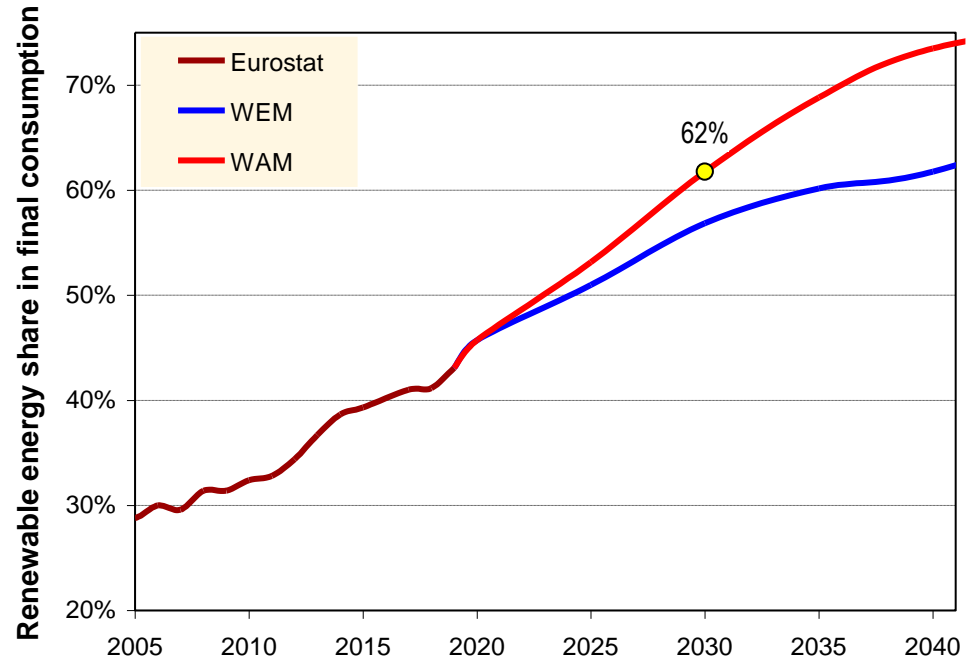
Electricity supply will be nearby fossil free after 2030 but ...

- The new nuclear Fennovoima project with Rosatom has been cancelled.
- Russia has cut off the electricity and gas exports to Finland.
- A lot of speculation on electricity demand, growth of wind power, ...



The share of renewables from final energy consumption*

- It has been estimated that the FitFor55 renewable target for Finland would be around 60 % in 2030
- WEM includes phase out of coal by 2029 and 30 % renewables in road transport
- In WAM, also phase out of oil in heating by 2030 and electrification of all the sectors

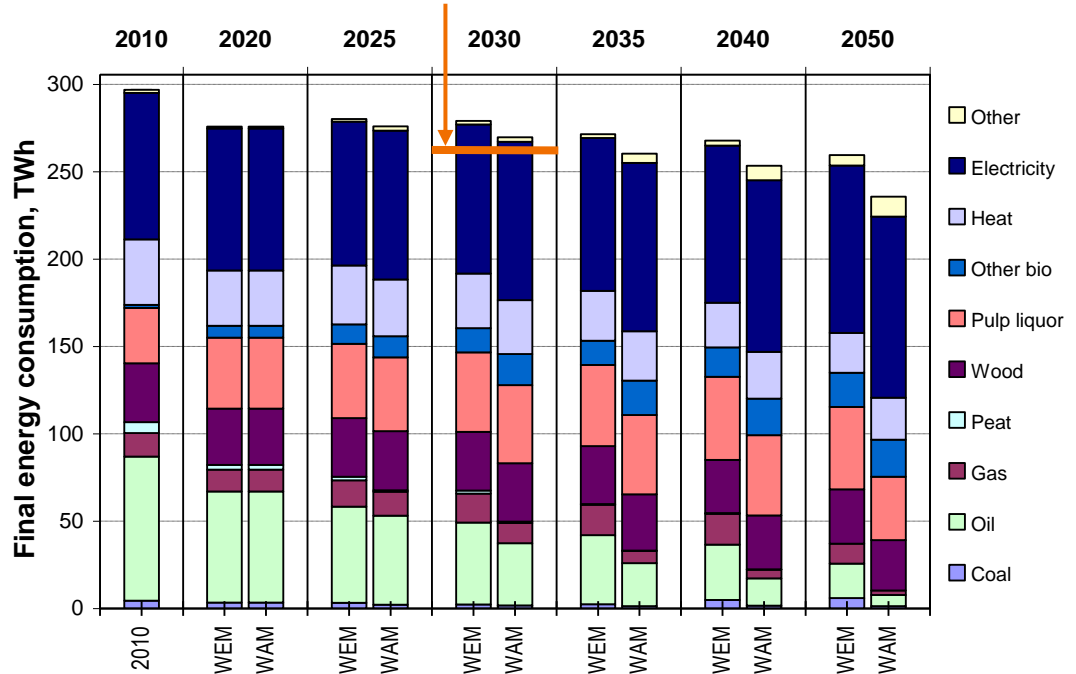


*Based on the EC's calculation rules

Final energy consumption

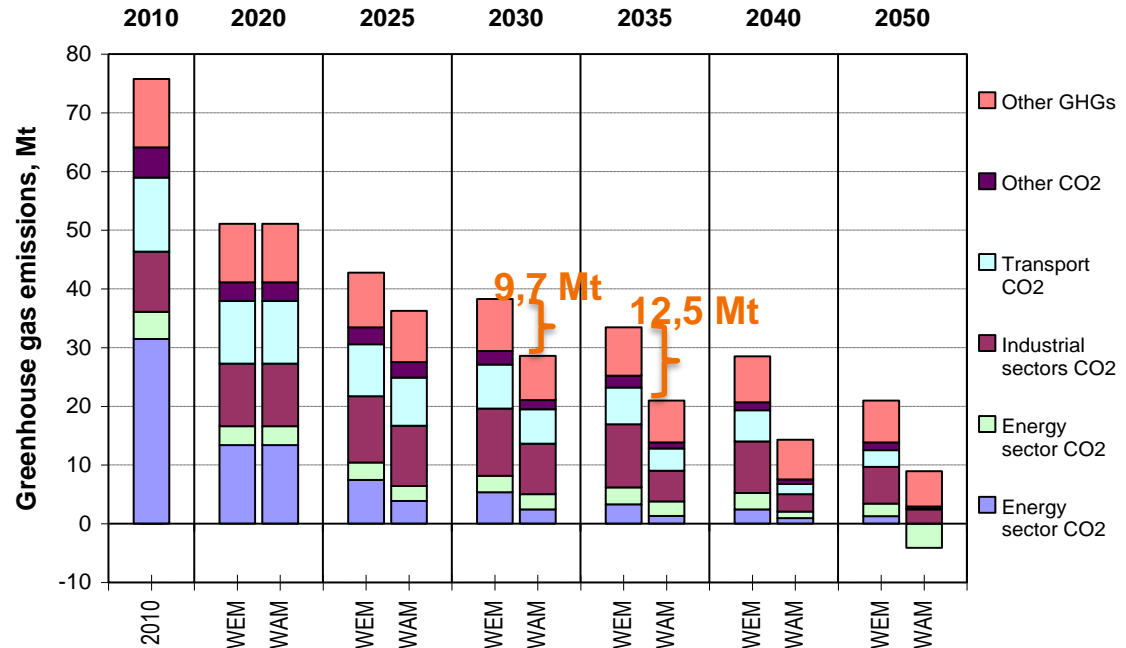
- Estimated FitFor55 energy efficiency target (by EED) 255 TWh in 2030 will be a challenge
- In WAM, investments in fossil free steel (SSAB) as well as in blue and green hydrogen in oil refining (Neste) have been considered.

Below final energy consumption doesn't include international aviation, which is included in the EED



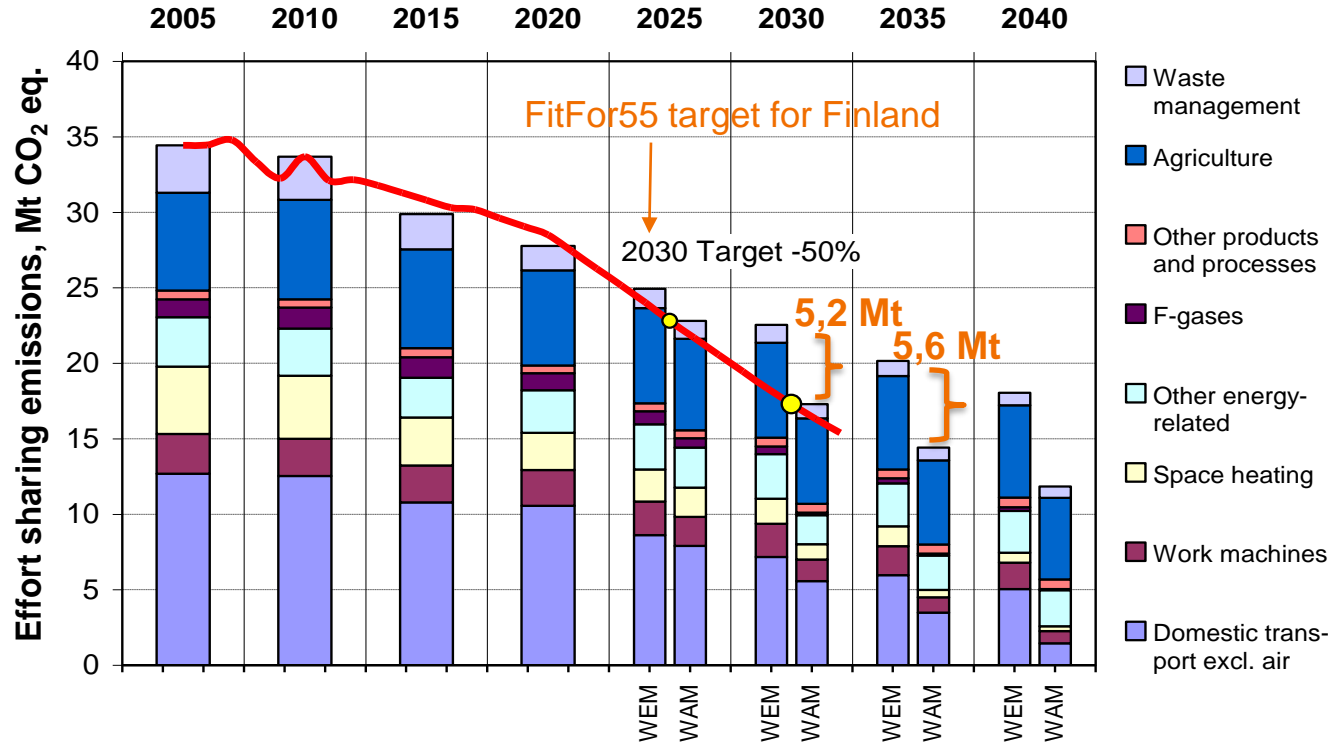
GHG mitigation in WEM and WAM

- Exogenous fossil fuel and CO₂ prices
- In WAM, GHG mitigation targets are set while in WEM, investments are optimised "market based"



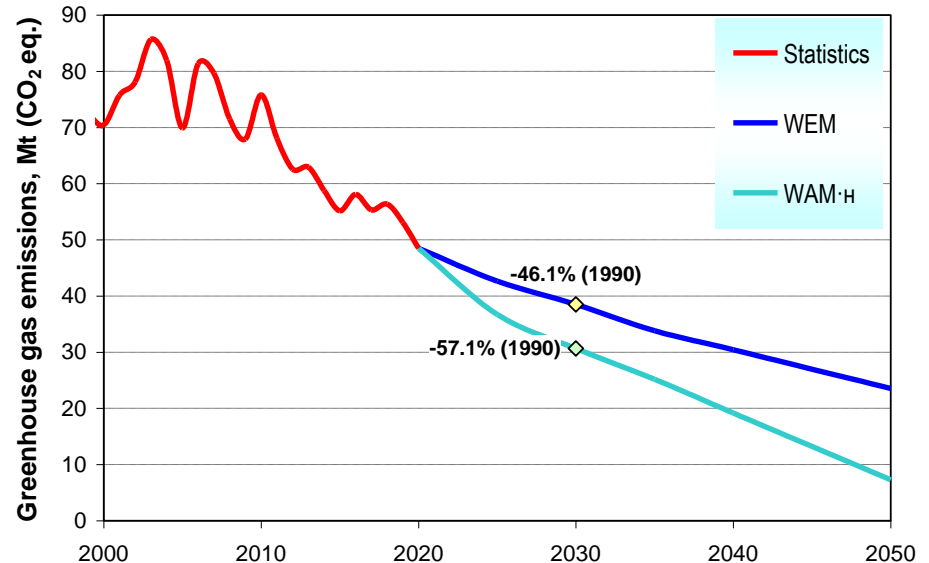
GHG emissions of the effort sharing sector

Transport sector has a domestic target of -50 % GHG reduction (compared with 2005 level) by 2030, which is fulfilled in WAM



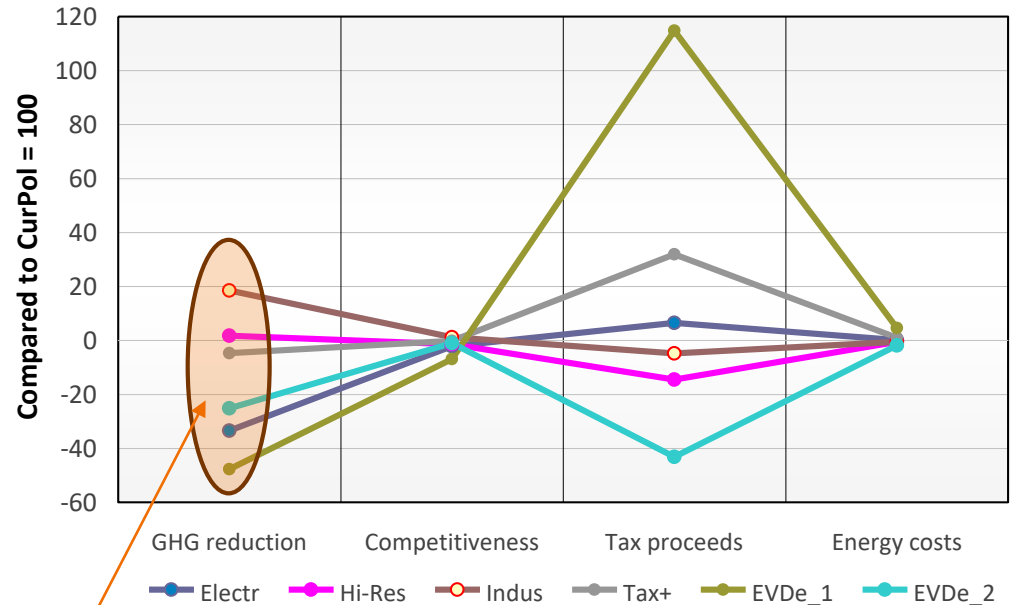
Evolution of total GHG emissions with Government's decisions (WAM-H) (excl. LULUCF)

- In February 2022, the national research institutes and Finland's Climate Panel were asked to make a statement of the Government's policies.
- All the statements (including VTT's) made a conclusion that additional policies are required.



Energy tax roadmap: Comparison of energy tax models with 4 criteria

- Realisation of the EU's energy tax directive would have major impact for Finland (EVDe_1 & EVDe_2)
 - Includes bioenergy tax
 - Single energy tax level for energy consumption
 - Tax level based on energy content and sustainability of fuels (today we have also CO₂-tax component)

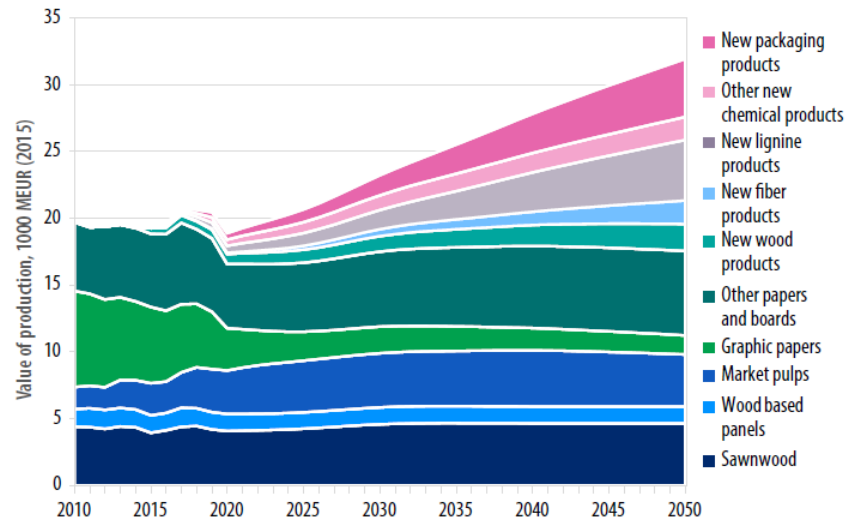


Different scale for GHG emissions

Next steps: better modelling and analysis of carbon neutral circular economy

- The aim is to double the value added of the use of natural resources compared with 2015 level.
- In addition, Circular Material Use (CMU) rate should be doubled by 2035 (it was 7% in 2018).
- Most of the modelling is done with input-output model but new data is created for the other approaches as well.

Example of bioeconomy scenarios aiming at increasing value added of Finland's bioeconomy



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the obvious

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