How to implement a larger environmental tax reform (in Finland)? Potential instruments and impacts

Tax seminar of the Estonian parliament

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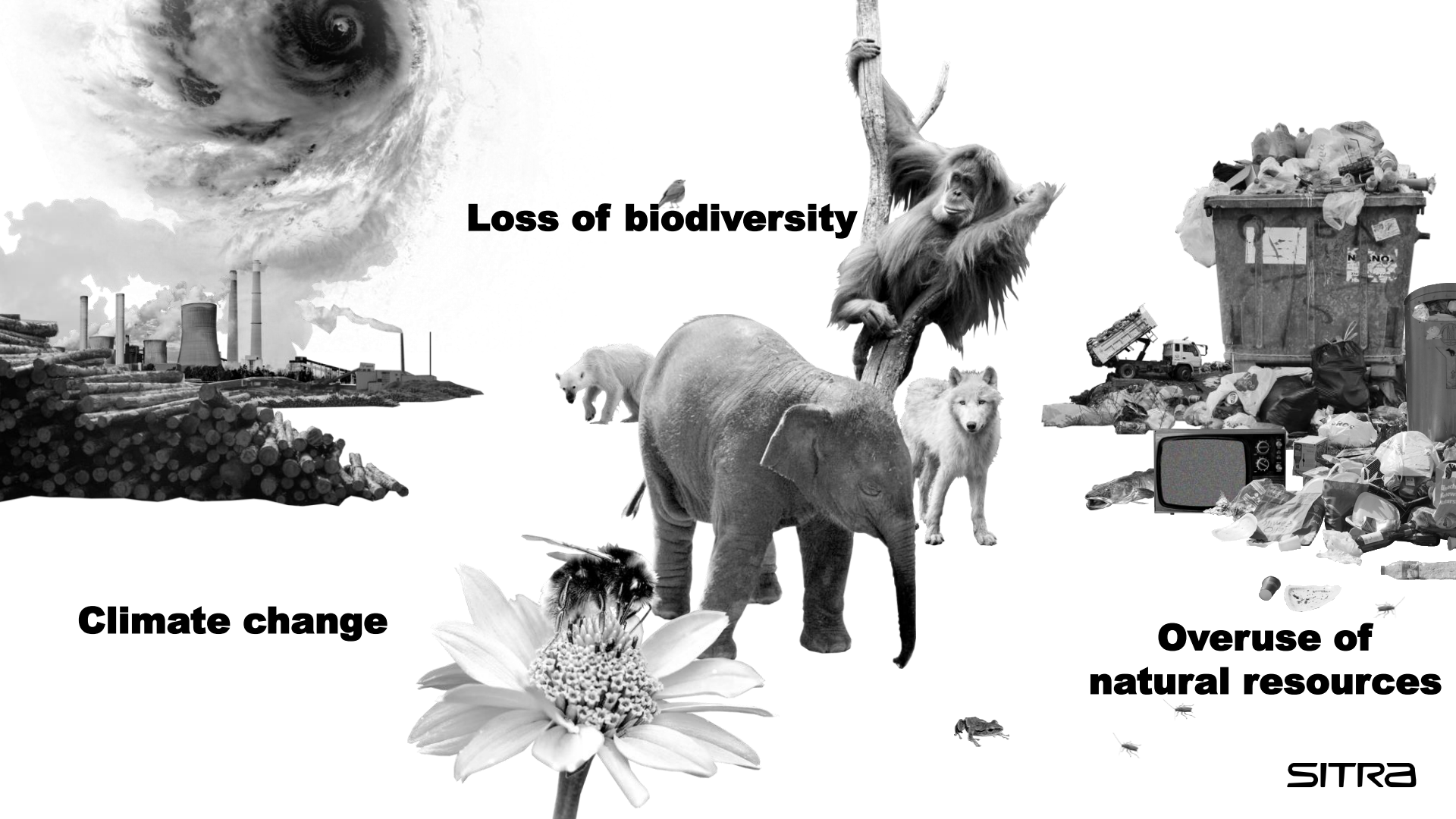
Loss of biodiversity
Climate change
Overuse of natural resources
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The ecological crises require urgent and effective policy actions

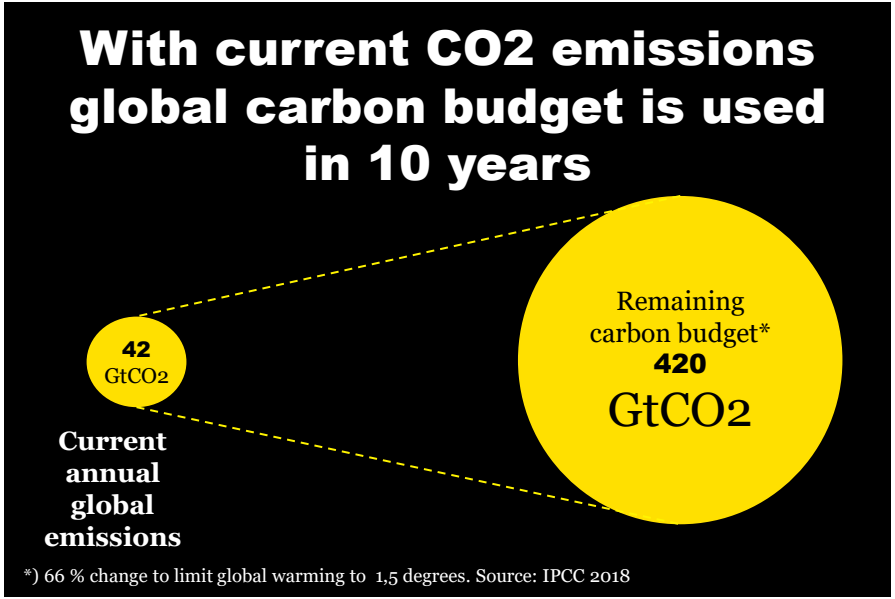
We are in a hurry to cut down emissions and to protect biodiversity.

Action required in all sectors. Non-ETS sectors and increase of carbon sinks require national policies.

Circular economy models required to lower the use of natural resources.

Domestic policy options:

- Regulations, standards, information guidance
- Increase of environmental taxes or subsidies
- Environmental tax reform



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Environmental tax reform (ETR)

- Refers to (temporary) **shift in taxation towards environmental taxes in a budget neutral way**
- In example, when carbon taxes are increased, at the same time labour or other distortionary taxes are lowered and social transfers to low income households increase
- **ETRs can speed up emissions reduction, support employment and a just transition towards a carbon neutral society**
- Tightening of environmental regulations and/or taxes alone doesn't provide a similar opportunity
- Based on some 30 years of research on carbon taxation, ETRs considered the best way to introduce them (Timilsinas, 2018). Also WB, OECD and EC recommend them.

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Our research

With 2 separate teams of economist in 2019, we:

1. Analysed how carbon and natural resource taxes could be increased in practice in Finland and listed docens of different options;

2. Modelled 3 different types of ETR packages and their expected economic and emission impacts with 2 separate economic models.

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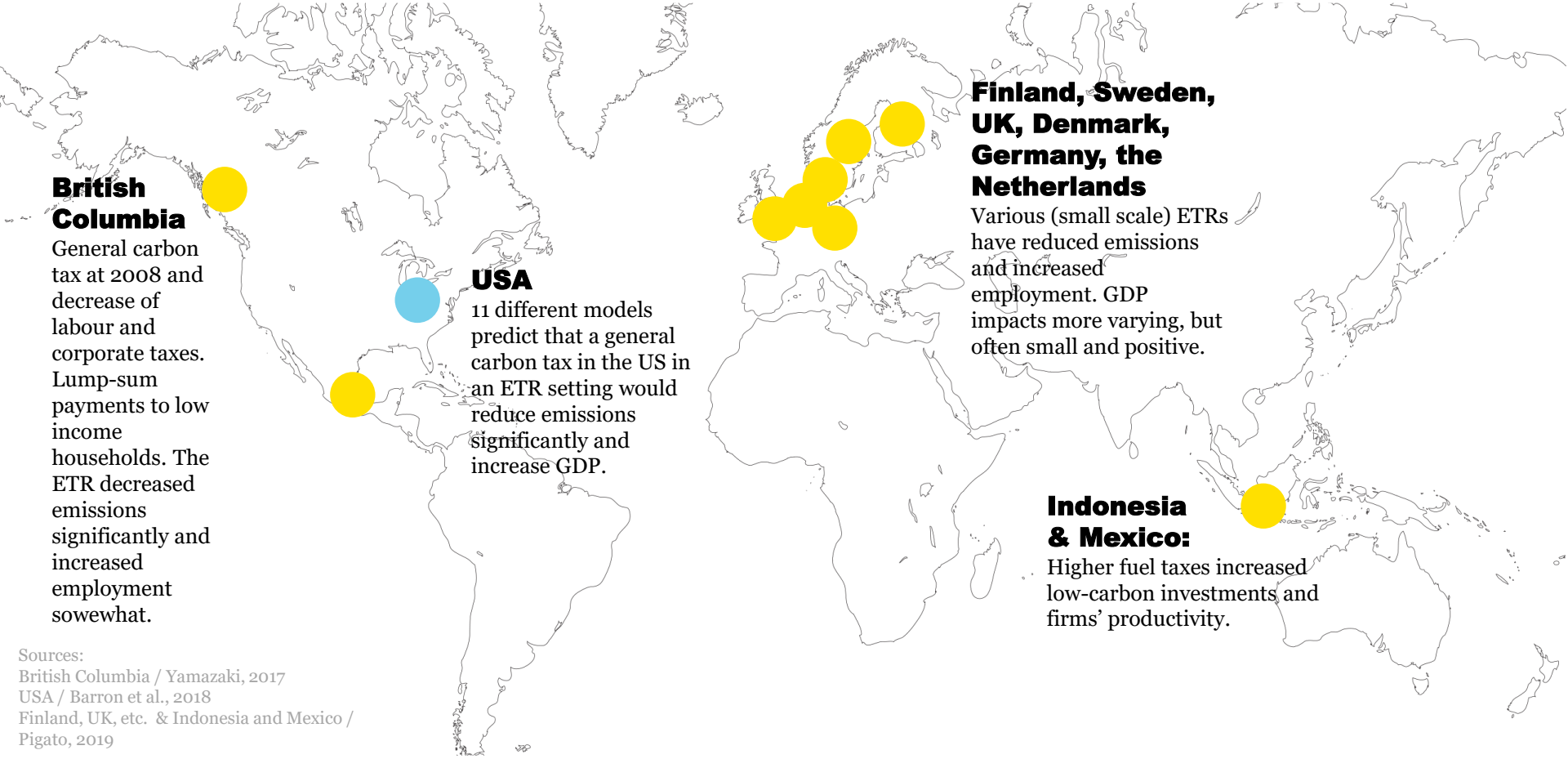
SOME PREVIOUS EXPERIENCES FROM ETRs



British Columbia
General carbon tax at 2008 and decrease of labour and corporate taxes. Lump-sum payments to low income households. The ETR decreased emissions significantly and increased employment sowewhat.

USA
11 different models predict that a general carbon tax in the US in an ETR setting would reduce emissions significantly and increase GDP.

Finland, Sweden, UK, Denmark, Germany, the Netherlands
Various (small scale) ETRs have reduced emissions and increased employment. GDP impacts more varying, but often small and positive.

Indonesia & Mexico:
Higher fuel taxes increased low-carbon investments and firms' productivity.

Sources:
British Columbia / Yamazaki, 2017
USA / Barron et al., 2018
Finland, UK, etc. & Indonesia and Mexico / Pigato, 2019

Objectives for the ETR

1. Emissions down.
2. Support to employment.
3. Just transition to low-carbon society.
4. Support for circular economy models.
5. Prevention of other environmental problems as well.
6. Support to low-carbon investments and innovations.

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Main side-effects of environmental taxes can be mitigated in an ETR.

Taxes are cost-effective in reducing GHG emissions and supporting sustainable use of natural resources.

But often concerns over their impact on:

1. The global competitiveness of energy-intensive, trade-exposed firms

2. The real incomes and wellbeing of low-income households

We stressed these two concerns in our scenarios 1 and 2. Scenario 3 concentrated on potential fiscal measures to support circular economy models.

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Our ETR scenarios

Tax increases	1. scenario	2. scenario	3. scenanio
Price floor for ETS allowances	√		√
Strenghtening CO2 component of current fuel taxes	√	√	
Emission-based flight tax for passengers		√	√
Emission-based flight tax for air freight		√	√
New consumption tax based on product's global GHG emissions (from 2025 onwards)		√	
Removal of the energy tax refund for energy intensive firms	√		√
Removal of the lower energy tax on peat	√	√	√
Removal of the lower energy tax on coal in CHP use	√	√	
Removal of the lower energy tax on diesel	√		√
Removal of the lower energy tax on light fuel oil	√	√	√
New resource use taxes (e.g. on non-metallic minerals and mining)			√
Tax on waste incineration			√
Tax on pesticides			√

Decreases in taxes and increases in subsidies	1. scenario	2. scenario	3. scenanio
Decrease in income taxation	√	√	√
Decrease in employers' social security payment	(√)	(√)	√
Increase in social security payment	√	√	
Removal of car tax on low-emission vehicles and motive power tax (currently in use for all non-gasoline vehicles)	√	√	
Decrease in electricity taxation for industrial users	√		
Increase in R&D and investment support for low-emission technologies			√
Decrease in corporate taxes	(√)	(√)	

(√)= Alternative tax income recycling method, not in the main results

All tax increases modelled gradually

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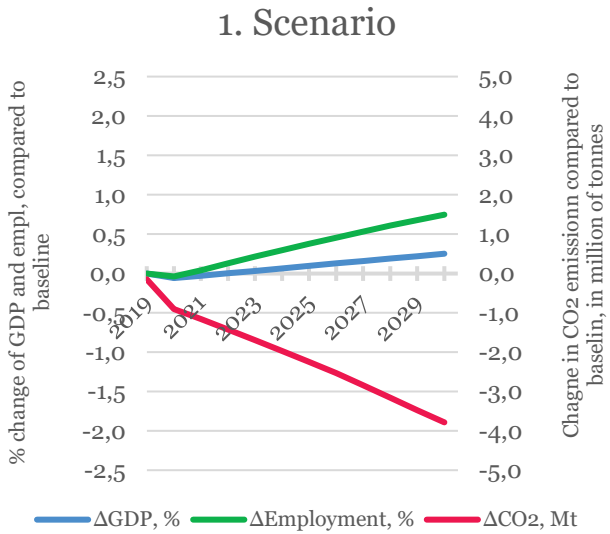
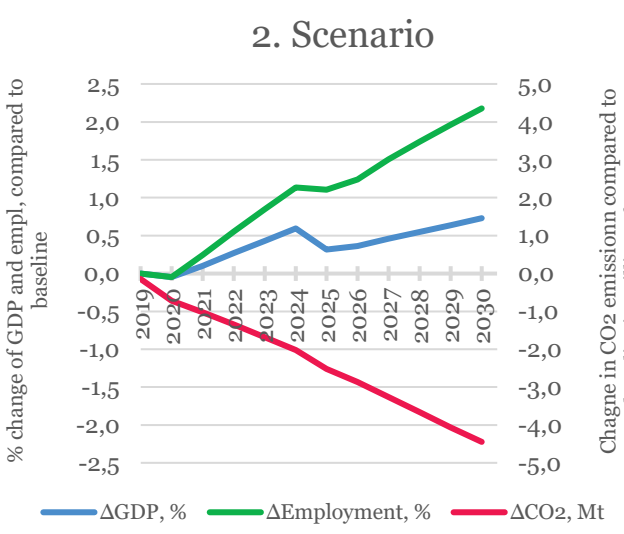
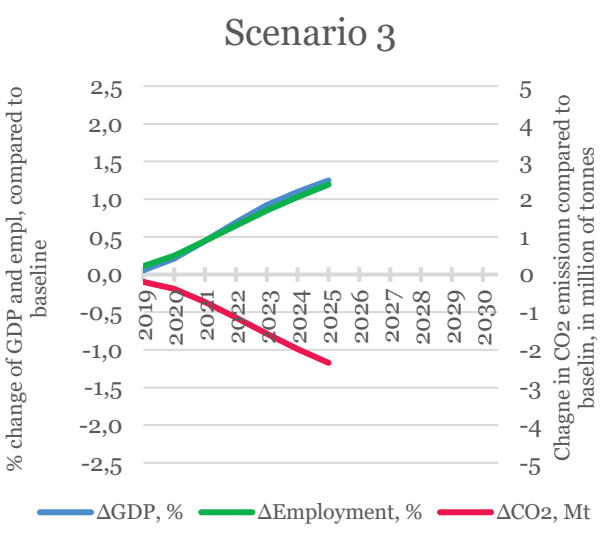
All scenarios decrease emissions and increase employment







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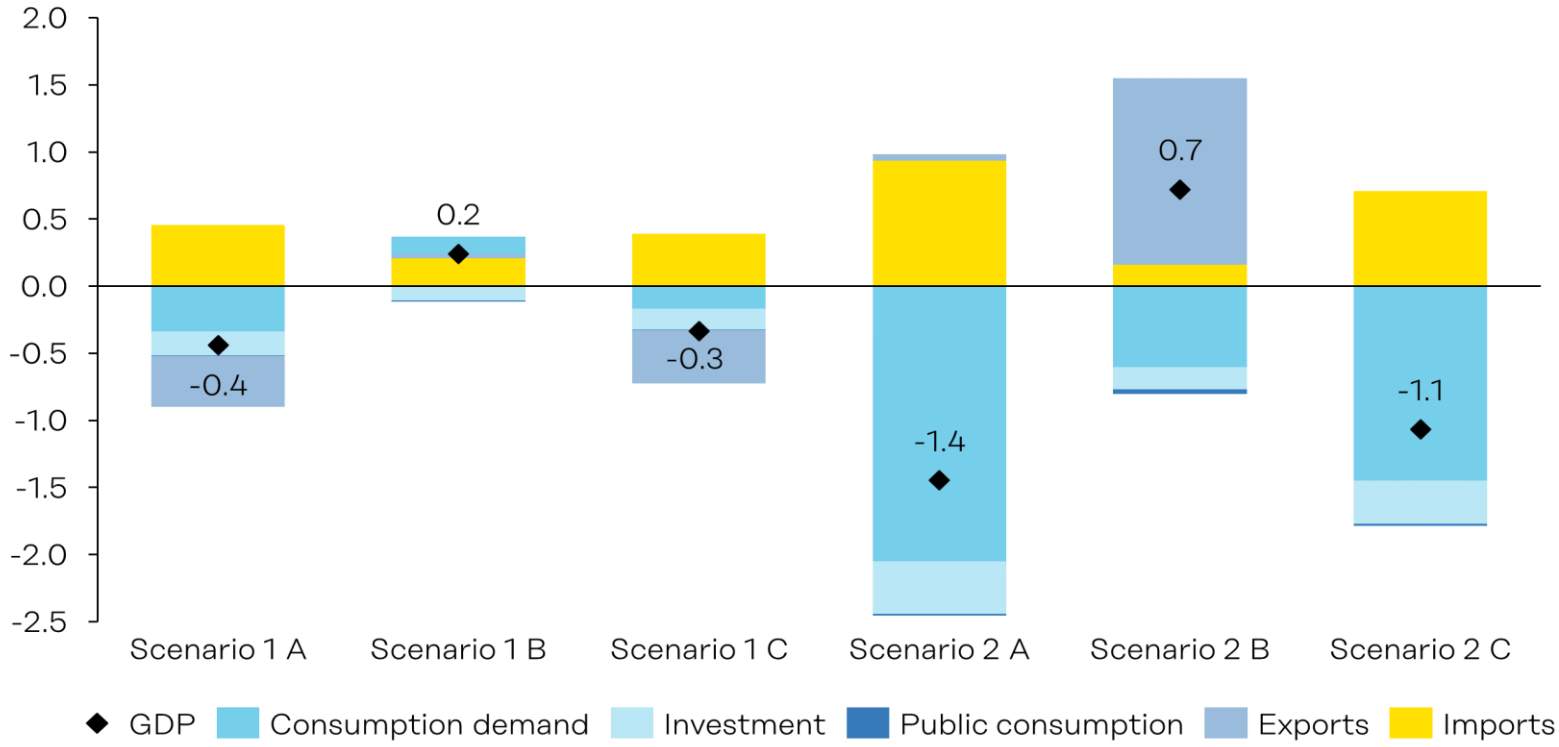
Positive impact on GDP and employment obtained only when labour taxes reduced (B options)

Contribution of expenditure aggregates to GDP in 2030, deviation from baseline (percentage points)



Increase of income inequality can be avoided with good planning in an ETR

The effects of environmental taxes on income inequality depend on on details, what taxes are raised and how much, for example:

- Fuel taxes are not regressive in Finland expect for low-income households in rural areas
- Flight taxes and general GHG taxes on consumption hit high-income households the most
- Lower tax rate for new low-emission vehicles benefits high-income households

Part of the tax revenue can be used to **compensate for low-income households** significant losses in wellbeing.

World Bank, 2019: max 12% of the tax revenue needed to compensate the worst effects for poorest households.

The potential social impacts of an ETR should be carefully analysed before implementation.

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Environmental taxes can be raised without negative effects on global competitiveness.

Vast economic research shows that firms' global competitiveness mostly depends on other factors than taxes or even their costs.

Based on our model results

- In nearly all industries output and employment increased even with the substantial increases in energy taxes for energy intensive sectors (scenario 1)
- Total exports increased in all scenarios
- Especially labour-intensive sectors benefit from reductions in labour taxation (circular eonomy models are also often labour intensive)
- Among energy-intensive sectors, e.g. paper industry (biggest exporter in Finland) benefited from the tax changes in scenario 1

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What to remember?

1. An ETR is the **best way to tighten environmental policies from a social and economic perspective.**

2. Selection of measures to include in an ETR are political desicions. **The impacts depend on the ”package of changes” and their details.** Environmental taxes should be increased gradually.

3. Increase of environmental taxes **doesn’t mean regulations wouldn’t be needed anymore.** There is no single environmental policy that can fix everything.

4. Current Finnish government has been implementing a larger ETR since 2019.

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More information:

How to implement a larger environmental tax reform in Finland? Potential instruments and impacts. Technical Report, Sitra (2019).

Aligning Fiscal Policy with the Circular Economy Roadmap in Finland. Green Budget Europe, The Ex'tax Project, Institute for European Environmental Policy, Cambridge Econometrics (2018).

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Our CGE models.

We used 2 different types of CGE models

Scenarios 1 and 2 are modelled with national, dynamic resursive **FINAGE** model. The model is excellent in analysing public sector. Also new transport extension in use to analyse the impact of fuel taxes on demand for different types of vehicles.

Scenario 3 modelled with global **E3ME** model that models whole world economy and energy systems in detail. The model is less detailed in modelling Finnish public sector, but widely used e.g. by the European Commission.

Both models compare new policies' impacts to the **baseline of likely economic development with current policies**.

Good to know: *In the FINAGE baseline the Finnish economy is expected to grow by around 38% in real term by 2030 compared to now.*

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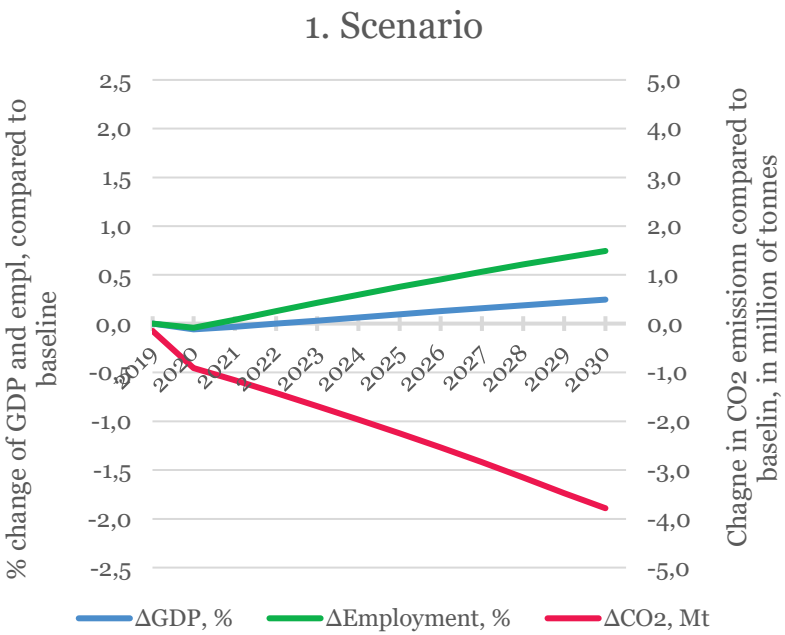
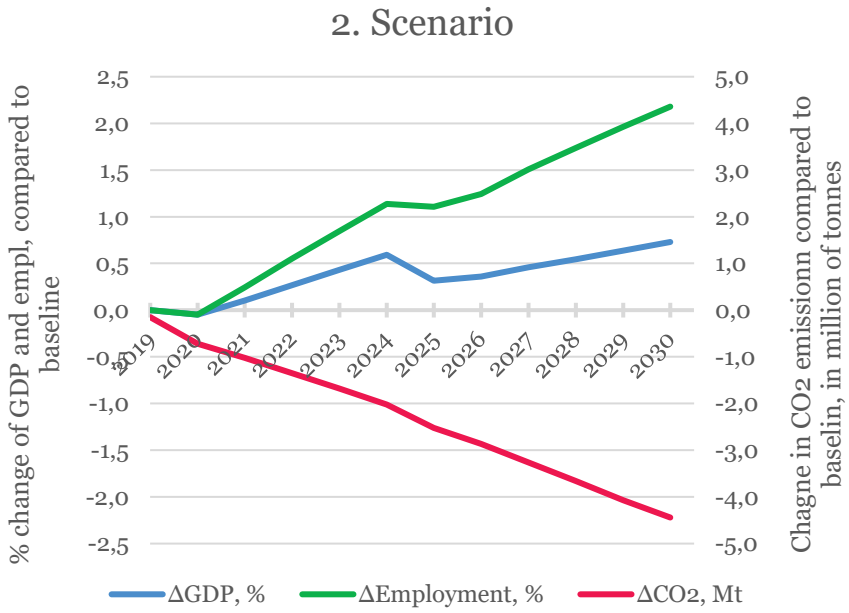
1. SCENARIO: PRODUCTION TAXES



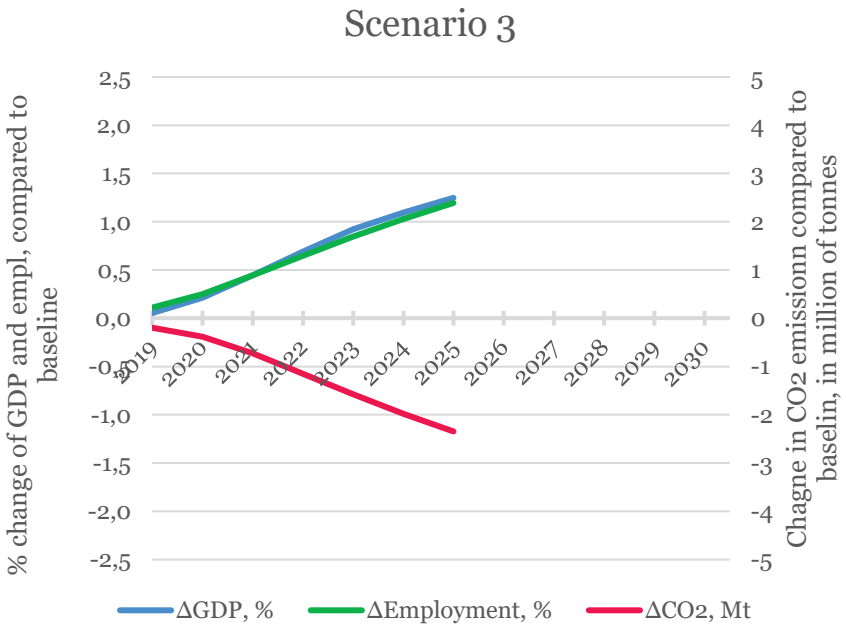
- Increase in production taxes to energy intensive sectors. Tax increases could affect cost competiveness without compensations.
- Tax increases and equal tax reductions (and increases in subsidies) over 2 billion eur by 2030. Total Finnish government budget around 50 billion eur.
- GDP increase of 0.2 % and employment increase of 0.7 % compared to baseline, total exports increase minimally.
- Only in oil refinery and mining employment increases less than in the baseline, other industries grow faster.
- GHG emissions decline by atleast around 4 MtCO2 (or around 10%) more than in the baseline by 2030.

2. SCENARIO: CONSUMPTION TAXES



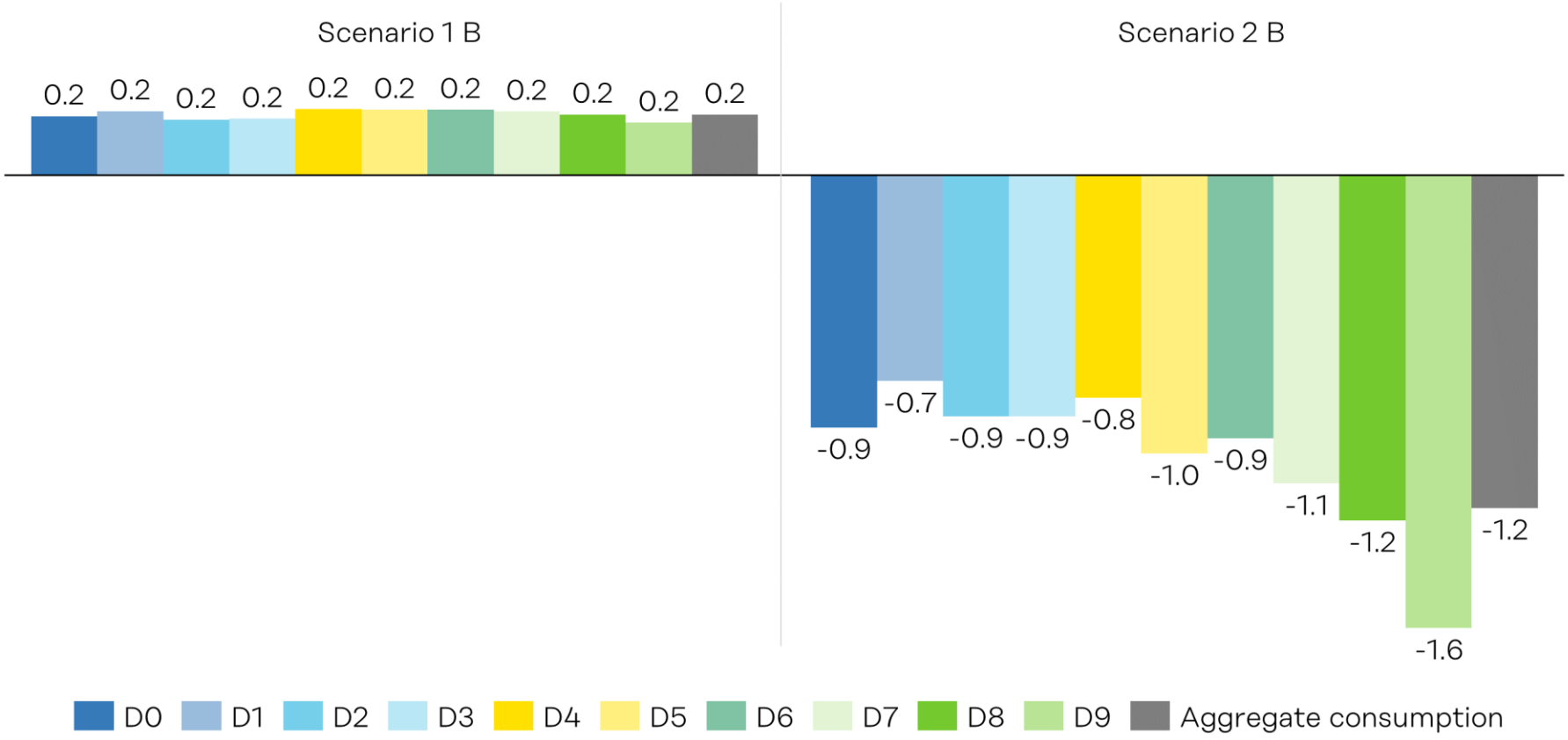
- Increase in fuel taxes, flight tax and introduction of a new tax based on the global GHG emissions of the product at 2025. Tax increases feared to increase income inequality without compensations.
- Tax increases and equal tax reductions (and increases in subsidies) over 7 billion eur by 2030. Total Finnish government budget around 50 billion eur.
- GDP increase of 0.7 % and employment increase of 2.2 % compared to baseline. Exports increase.
- Tax increases alone affect the consumption of high income households the most, i.e. they are regressive.
- GHG emissions decline by atleast around 4.4 MtCO2 (or more than 10%) more than in the baseline by 2030.

3. SCENARIO: CIRCULAR ECONOMY

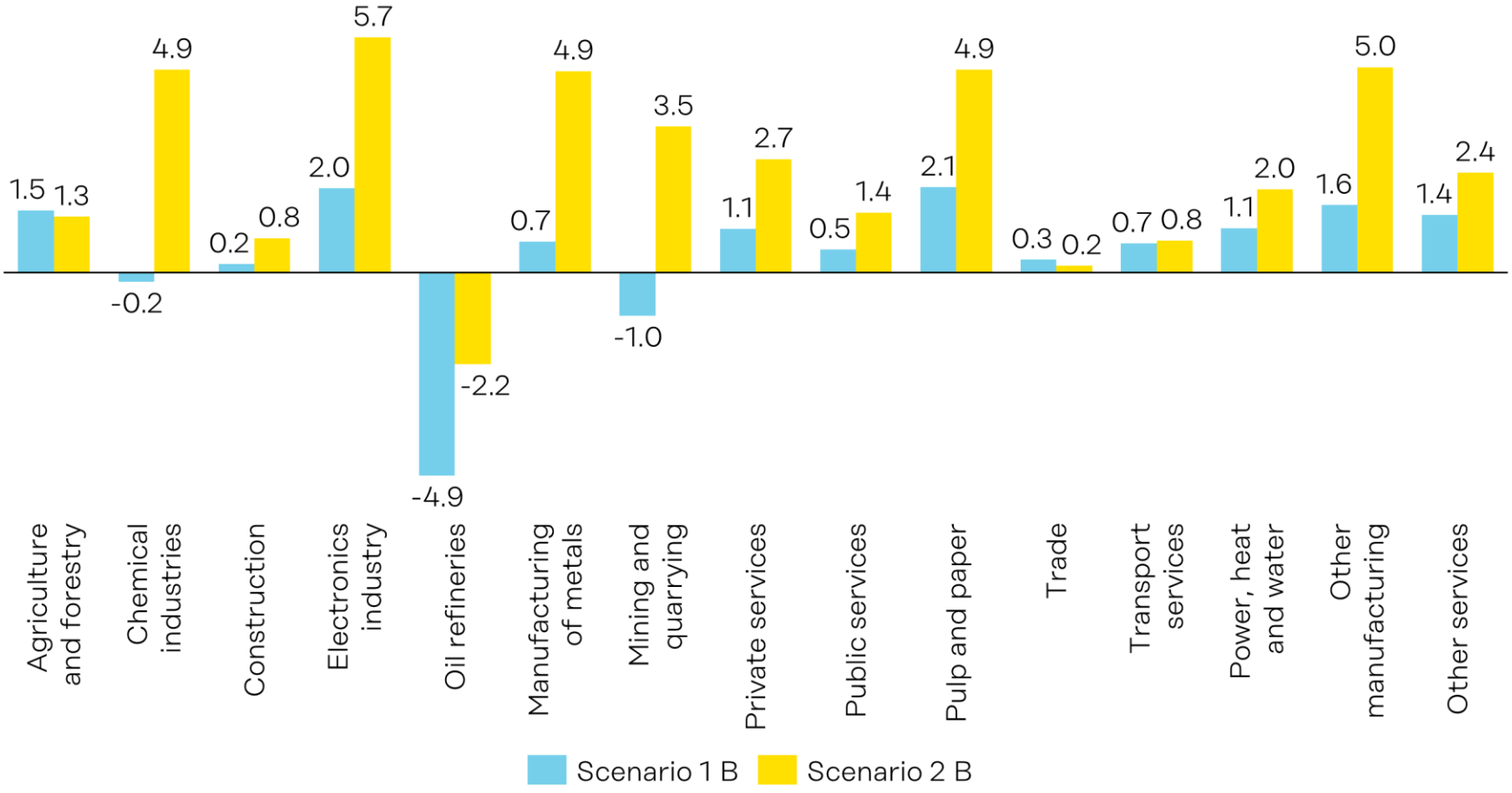


- An analysis on fiscal measures that could boost circular economy models.
- Tax increases and equal tax reductions (and increases in subsidies) over 3,5 billion eur by 2030. Total Finnish government budget around 50 billion eur.
- GDP and employment increase of 1.2 % compared to baseline by 2025.
- Material use and energy consumption expected to decline due to the new energy and natural resource taxes.
- GHG emissions decline by around 2.3 MtCO2 (or about 6%) more than in the baseline by 2025.

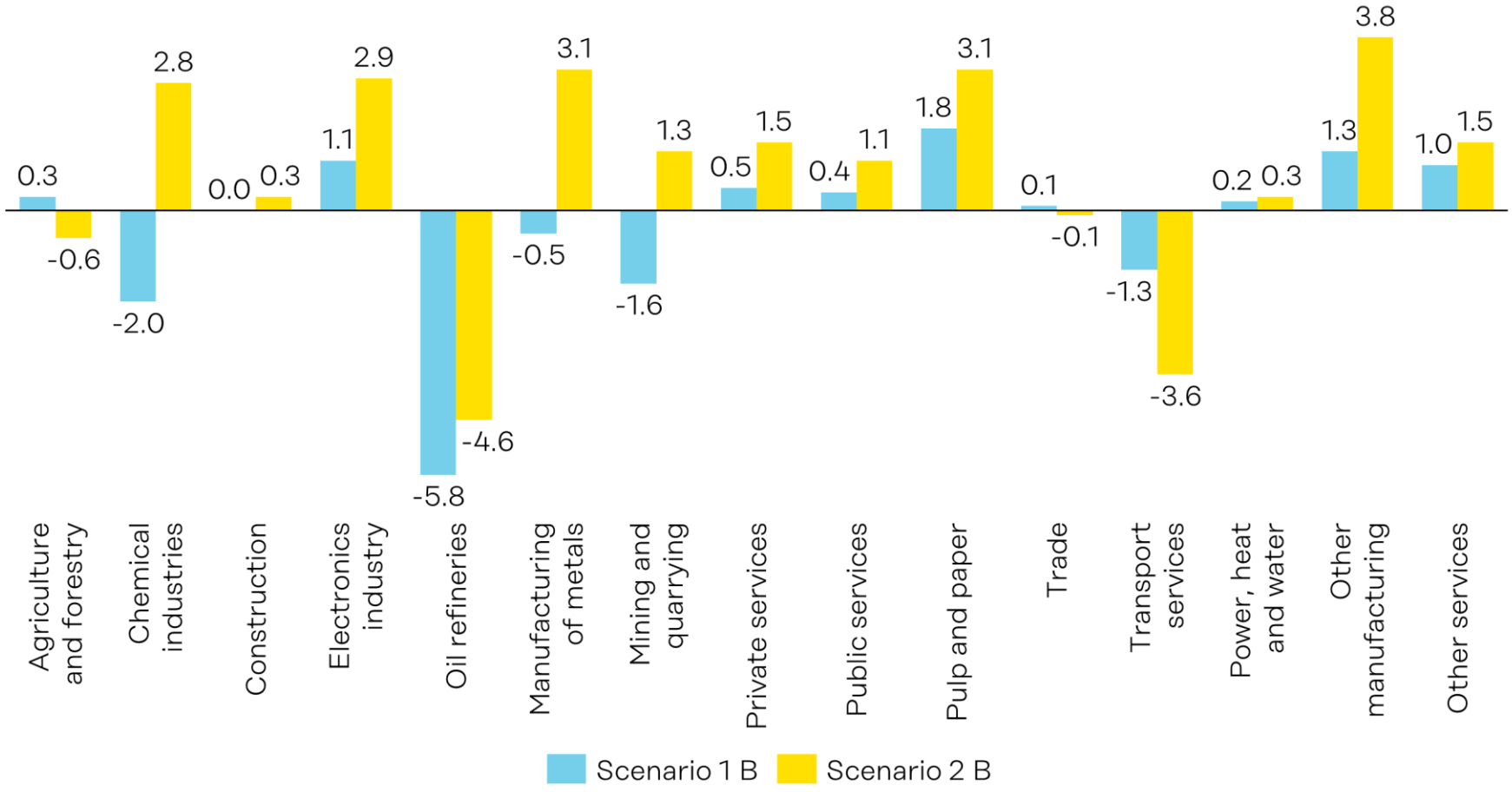
Household consumption per income decile in 2030, deviation from baseline (%)



Employment by cluster in 2030, deviation from baseline (%)



Output by cluster in 2030, deviation from baseline (%)



3. Scenario results in detail

	Change compared to baseline (%)	Change compared to baseline (absolute)
Economic indicators		
GDP	1.2	3.5 billion eur
Employment	1.2	30 600 employees
Exports	0.01	
Imports	0.2	
Energy imports	–6.1	
Household consumption	1.7	
Consumer prices	0.8	
Social indicators		
Change in real income, lowest quintile	2.0	
Change in real income, highest quintile	1.4	
Environmental indicators		
CO_2 emissions	–6.0	–2,348,500 tCO_2
Construction materials use	–0.6	
Non-ferrous minerals	–0.8	
Iron	–0.7	
Energy use	–2.6	23,369,900 toe

Output (change to baseline)	At year 2025 (%)	At year 2025 (million euros)
Metal production, electronics and machinery	1.5	989
Other services	1.5	705
Retail and wholesale services	1.0	484
Private business services	1.0	1,375
Basic industries	0.8	722
Transport and communications	0.8	338
Agriculture	0.4	46
Public services	0.3	203
Construction services	0.3	123
Energy production, hear and water	–1.0	–295

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