Interreg Baltic Sea Region

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ENERGY TRANSITION
Climate-4-CAST

Economic analyses in the City of Tampere's CADS Tool

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Overview

Action-specific visualisations in the CADS tool:

Direct costs

Costs and benefits

Cost-effectiveness

Regional impacts

Separate assessment for transportation in the tool:

Cost-benefit calculation for the modal shift target

Extra features in the tool:

Parameter sliders

Annuity

Tampere's Climate Budget and CADS tool

Purpose of the tool:

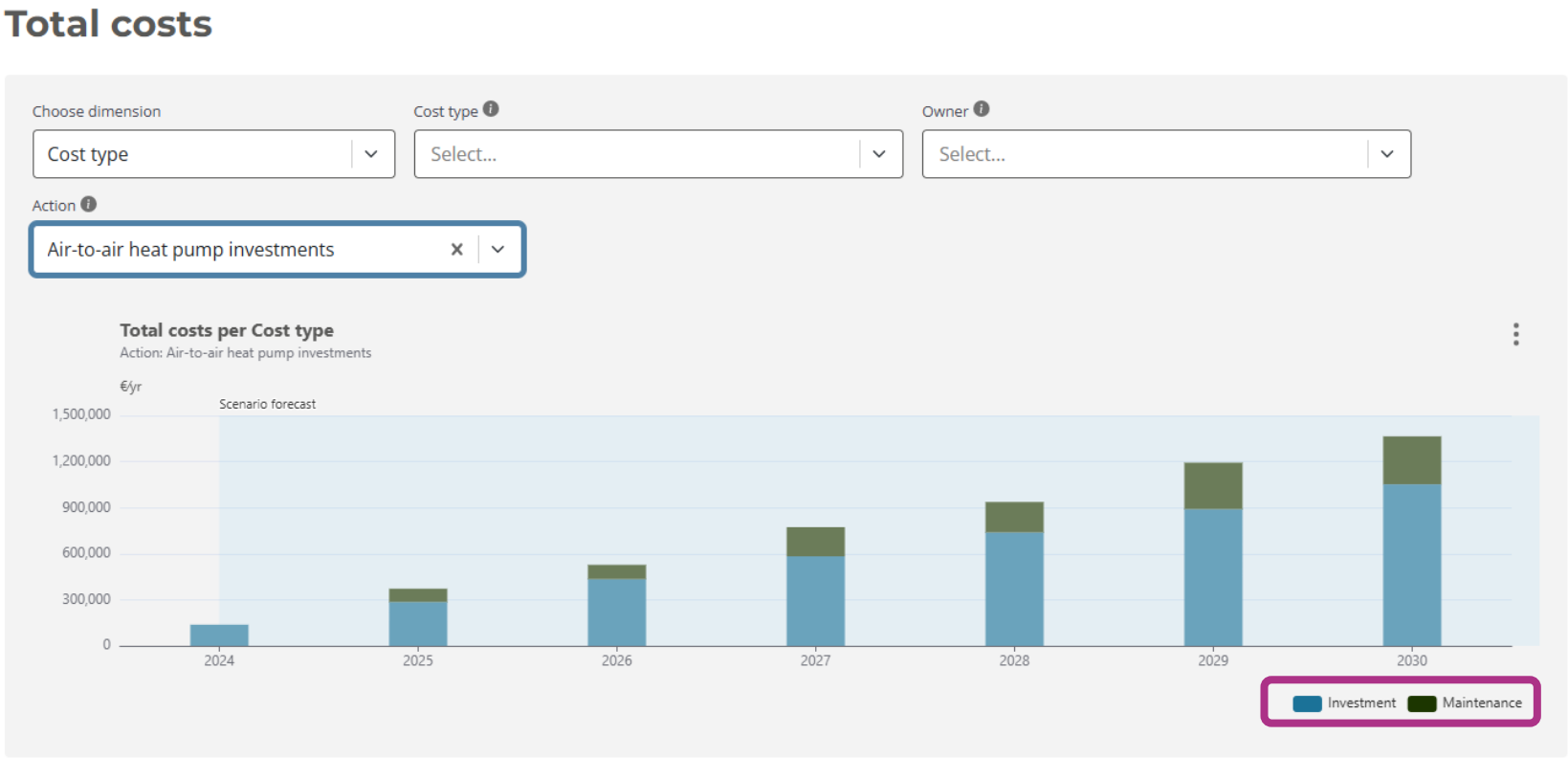
- Tampere's **Climate Budget** is a governance model designed to ensure sufficient funding for city organization's climate action and to report on the amount of money spent on those actions.
- **The CADS tool is not directly linked to our climate budget,** but it allows us to illustrate some of the climate budget's measures and, ideally, **provide important information when negotiating funding within our budget planning process**.
- However, Tampere's CADS tool also includes actions implemented by private sector (households, companies etc.).

Key functions of the tool:

- Illustrate the different impacts of climate measures, that can be used in decision-making and planning.
  - The impact calculations performed primarily outside the tool.
- Visualise the most cost-effective and impactful climate measures to reduce emissions.
- Show other monetary benefits that result from implementing climate measures.

Direct costs

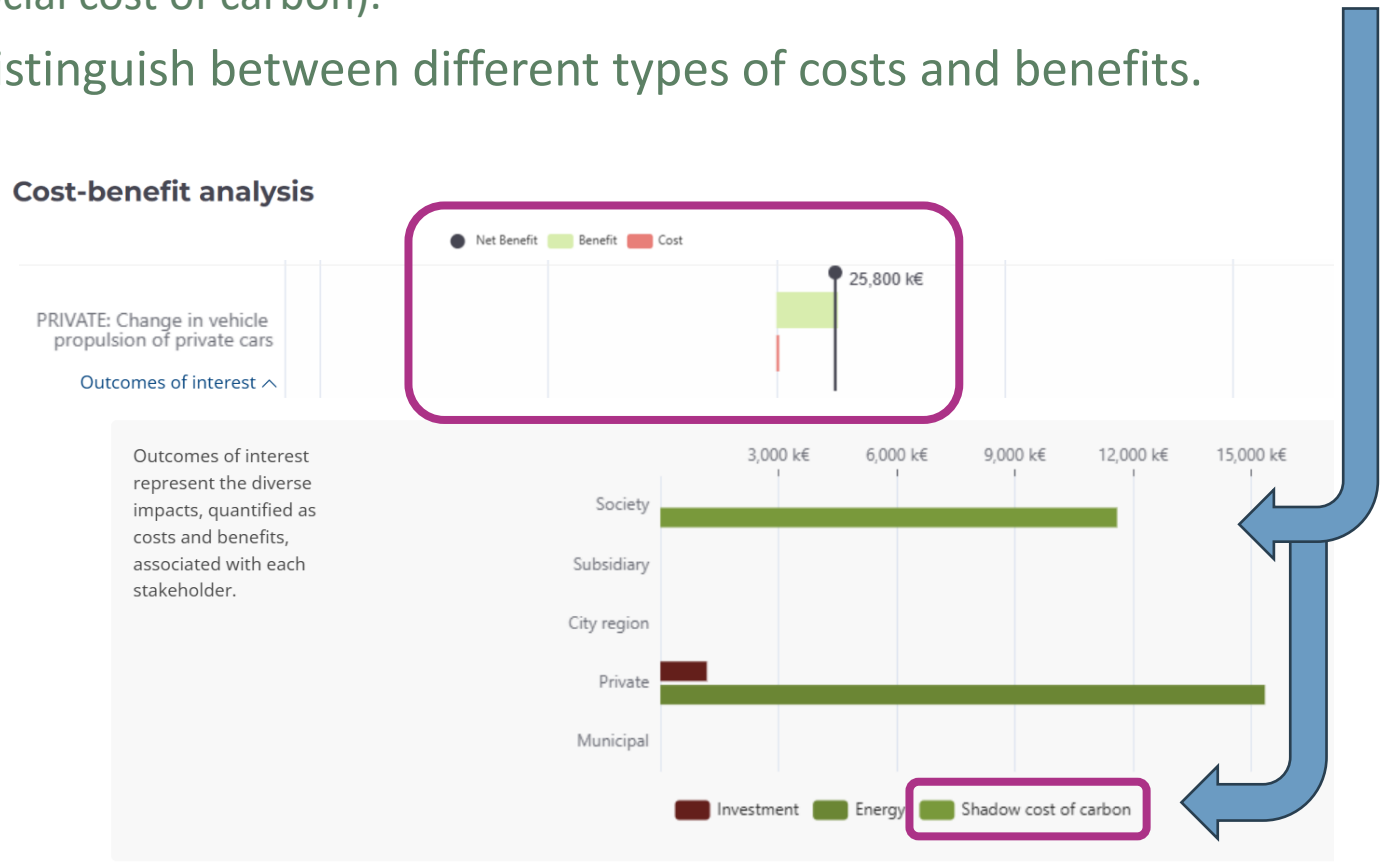
- The simplest way is to present the annual direct investment and operating costs of the measure compared to the baseline scenario.
- However, it is important to include other benefits expressed in euros in the analysis to obtain a more accurate overall picture of the action's impact…



C4C Carbon-neutral Tampere 2030 | Total costs

…thats why: Costs and benefits

- Cost-benefit analysis compares the total expected costs of a climate action with the total expected monetised benefits (e.g., energy cost savings, health benefits or benefits from reduced emissions). This helps cities understand the broader economic value of actions.
    - The monetary benefit of emission reductions for society can be included in the analysis using e.g. the shadow cost of carbon (or a better metric to be used when assessing societal benefits: the social cost of carbon).
- Possible to distinguish between different types of costs and benefits.



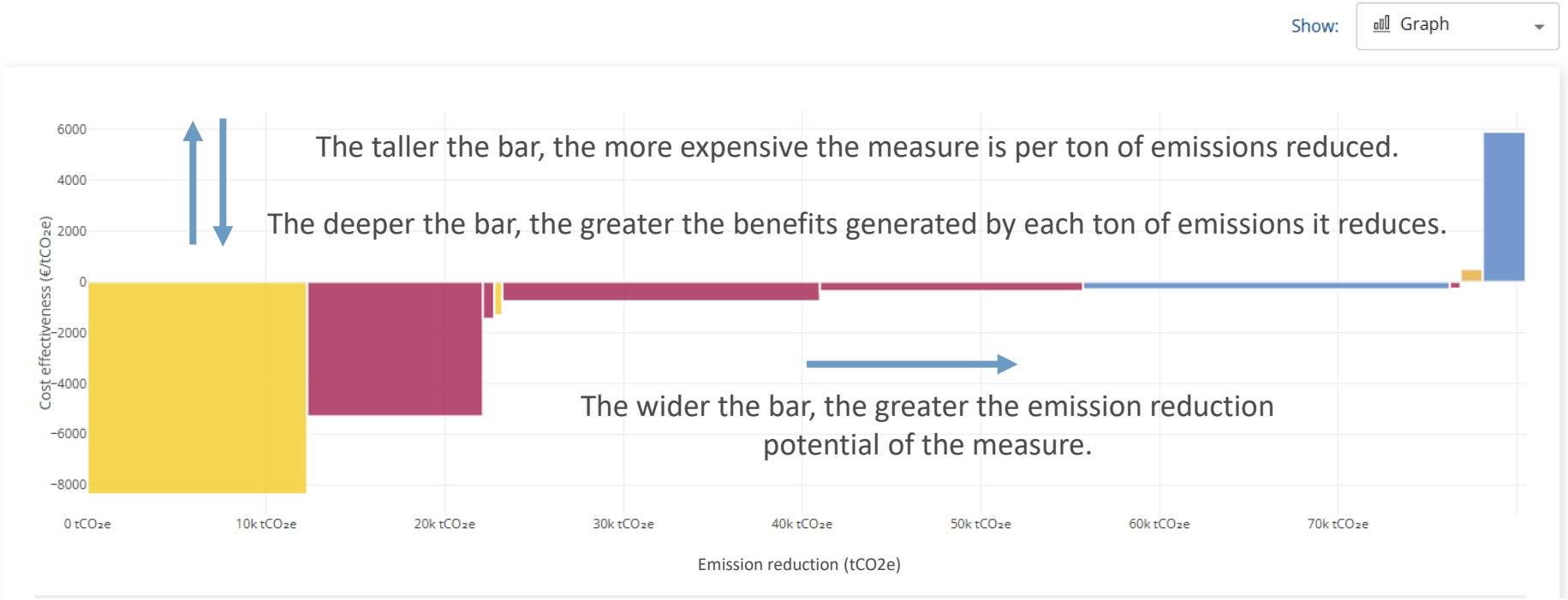
Cost-effectiveness

Marginal Abatement Cost Curve (MACC)

- One of the most important analyses is to determine the cost-effectiveness of a measure, that is, how much it costs to achieve one ton of emissions reductions through that measure.
- Cost-effectiveness is calculated by dividing the action's net costs by its total emission reduction impact. This allows cities to compare actions on a consistent €/tCO2e basis and helps identify the most economically efficient emission reduction options.

Start by implementing the measures listed on the left! Those are the most cost-effective!

→ This information can be used when negotiating funding as part of our budget planning process.



The impact of changes in a price parameter on the cost-effectiveness of the measure

The result with initial assumptions:

Type	Name	Included in scenario	Total impact 2010–2030	Annual impact 2030	Net cost 2010–2030	Cost efficiency
Building heating	**PRIVATE: Replacing oil heating across the municipal building stock**	✓	**-14.7** $ktCO_2e$	**-3.69** $ktCO_2e/yr$	**-5,360,000** €	**-364** €/tCO_2e

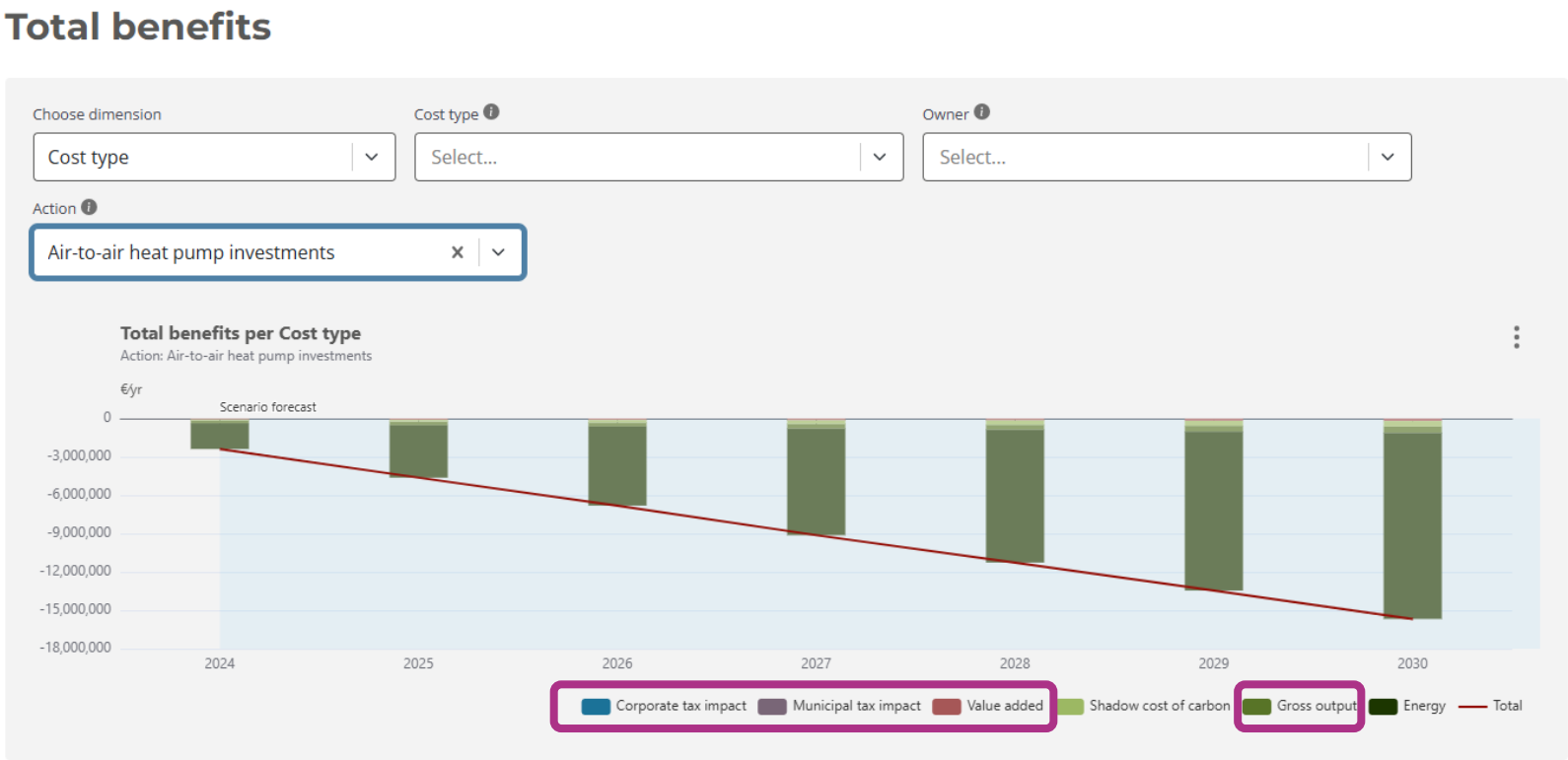
The result if <u>oil price increases</u>:

Type	Name	Included in scenario	Total impact 2010–2030	Annual impact 2030	Net cost 2010–2030	Cost efficiency
Building heating	**PRIVATE: Replacing oil heating across the municipal building stock**	✓	**-14.7** $ktCO_2e$	**-3.69** $ktCO_2e/yr$	**-8,820,000** €	**-599** €/tCO_2e

The measure becomes more profitable = more cost-effective as oil price increases.

Regional impacts

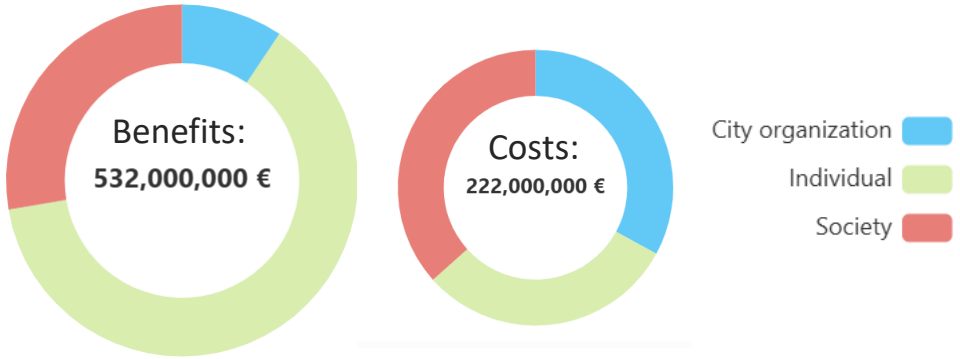
- Tampere piloted the integration of regional impacts into the CADS tool for three climate measures. The impacts of the pilot measures are all benefits.
- The regional economic impacts included in the tool were corporate taxes, municipal taxes, value added and gross output.



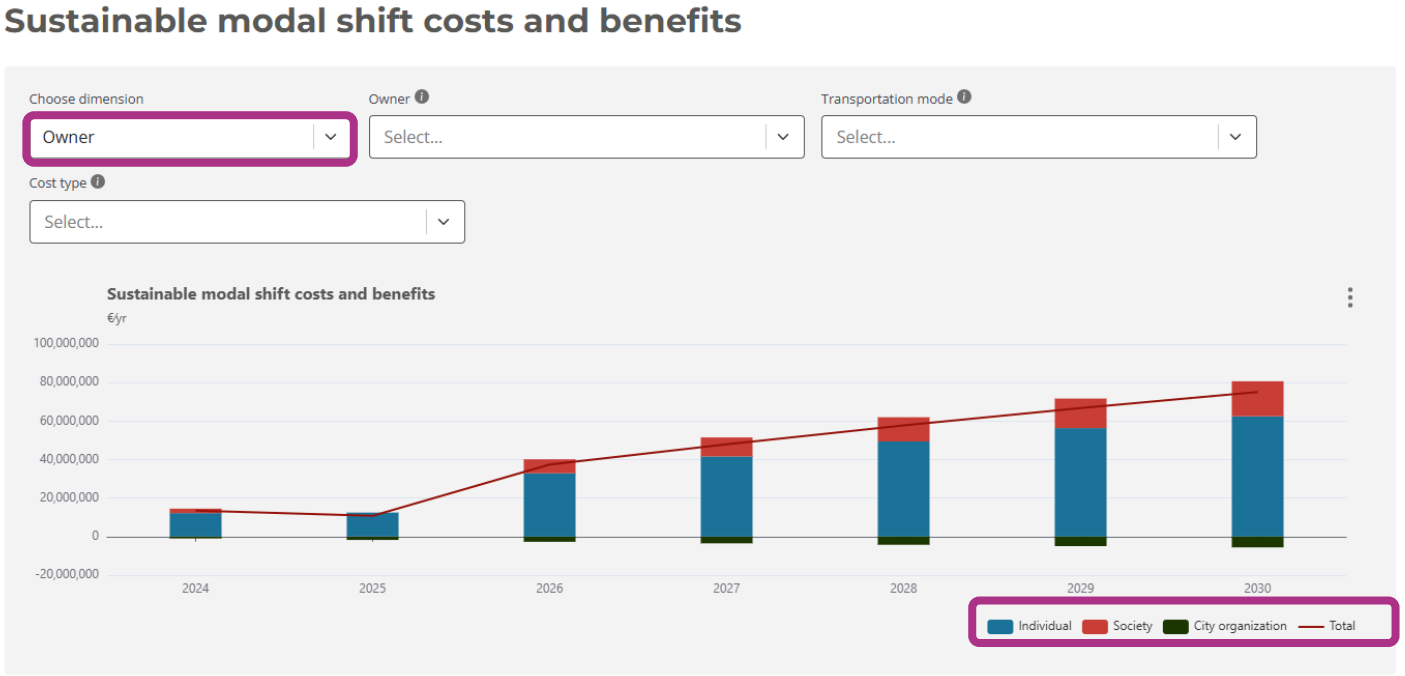
C4C Carbon-neutral Tampere 2030 | Total benefits

Sustainable modal shift costs and benefits

- What are the economic impacts if the share of sustainable modes of transport in Tampere increased 62% → 69% by 2030?
- Total benefits 532 M€ - Total costs 222 M€ = Net benefits 310 M€ .



- The impacts were assessed separately for the city organization, citizens/individual, and society.



[C4C Carbon-neutral Tampere 2030 | Sustainable Mobility]

Sustainable modal shift costs and benefits

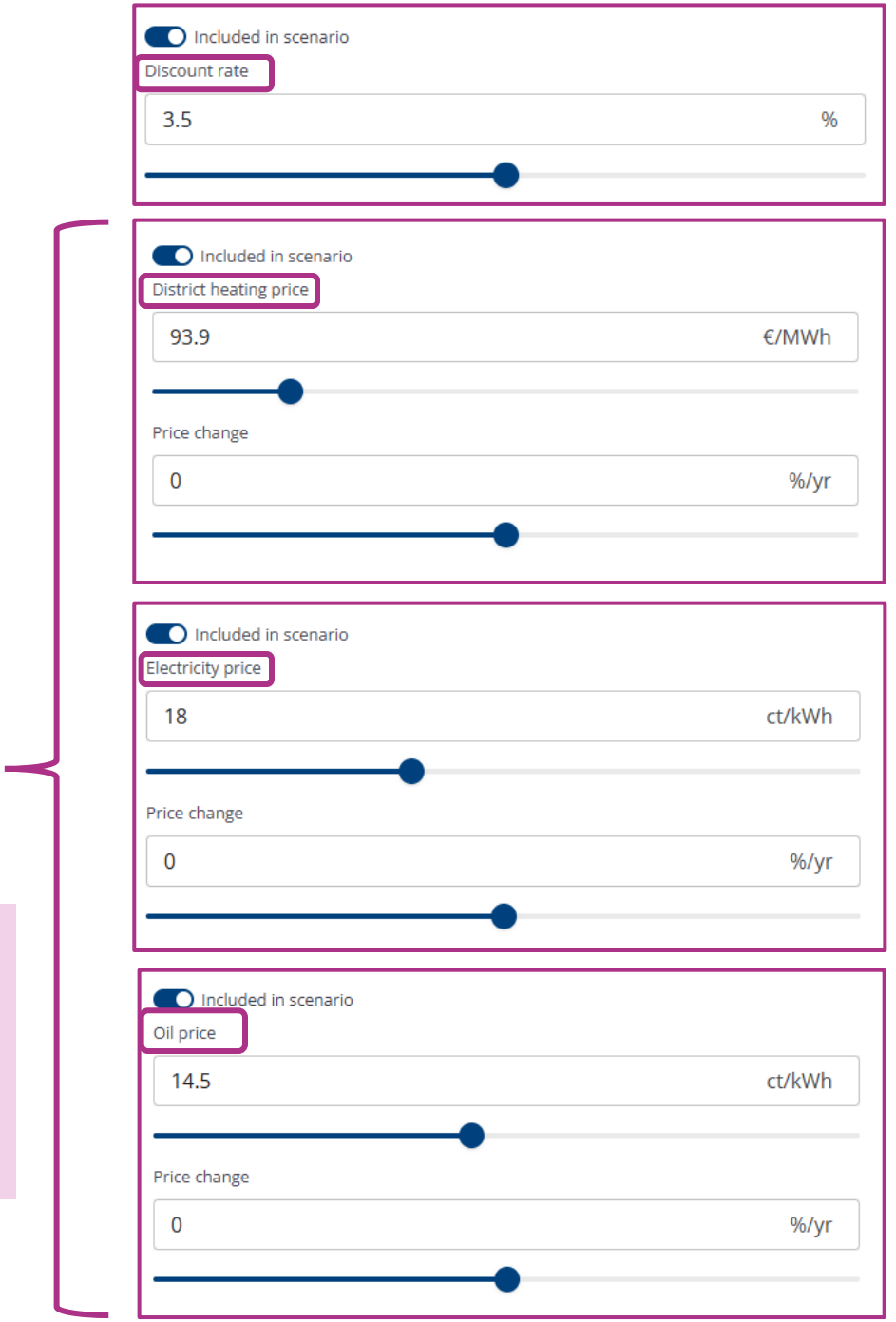
- In addition to owner, results can be sorted by mode of transport or cost type.
- Transportation modes: Car, cycling, bus, walking and tram.

- Cost types: Health, vehicle use, ticket revenue, accident, climate change, noise, air pollution, infrastructure maintenance, ticket cost, tax and operations.

Extra: Parameter sliders

- The tool allows for parameter sliders through which users can change some key parameters such as unit prices or emission factors. This allows better sensitivity analysis and flexibility to forecasting the different impacts of climate actions.
- Tampere's tool includes four economic parameters whose values can be adjusted, and which affect the results.
  - Discount rate
  - District heating price
  - Electricity price
  - Oil price

Price parameters:
Each slider allows the user to set both the initial value of the parameter and the annual change in price (%).



Extra: Annuity of investments

- The investment costs can be converted into annuities, i.e., the total cost of the investment is divided into equal annual payments over the economic lifetime of the investment. This was done in Tampere's cost-effectiveness calculations.
- The annuities make long-term investments comparable with annual costs and savings. **This makes it possible to compare investments with different lifespans**.
- The size of the annuity depends on the investment cost, the time value of money (interest rate) used and the economic life of the investment.

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Kiitos! Thank you!

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