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ENERGY TRANSITION

**Climate-4-CAST**

# Climate Action Decision Support (CADS) Tool: Actions, Scenarios, & Visualizations

Climate Budget Training Course Module 4 | 7 May 2026  
Michael Mechenich, Kausal Ltd.



# Climate Action Decision Support (CADS) Tool

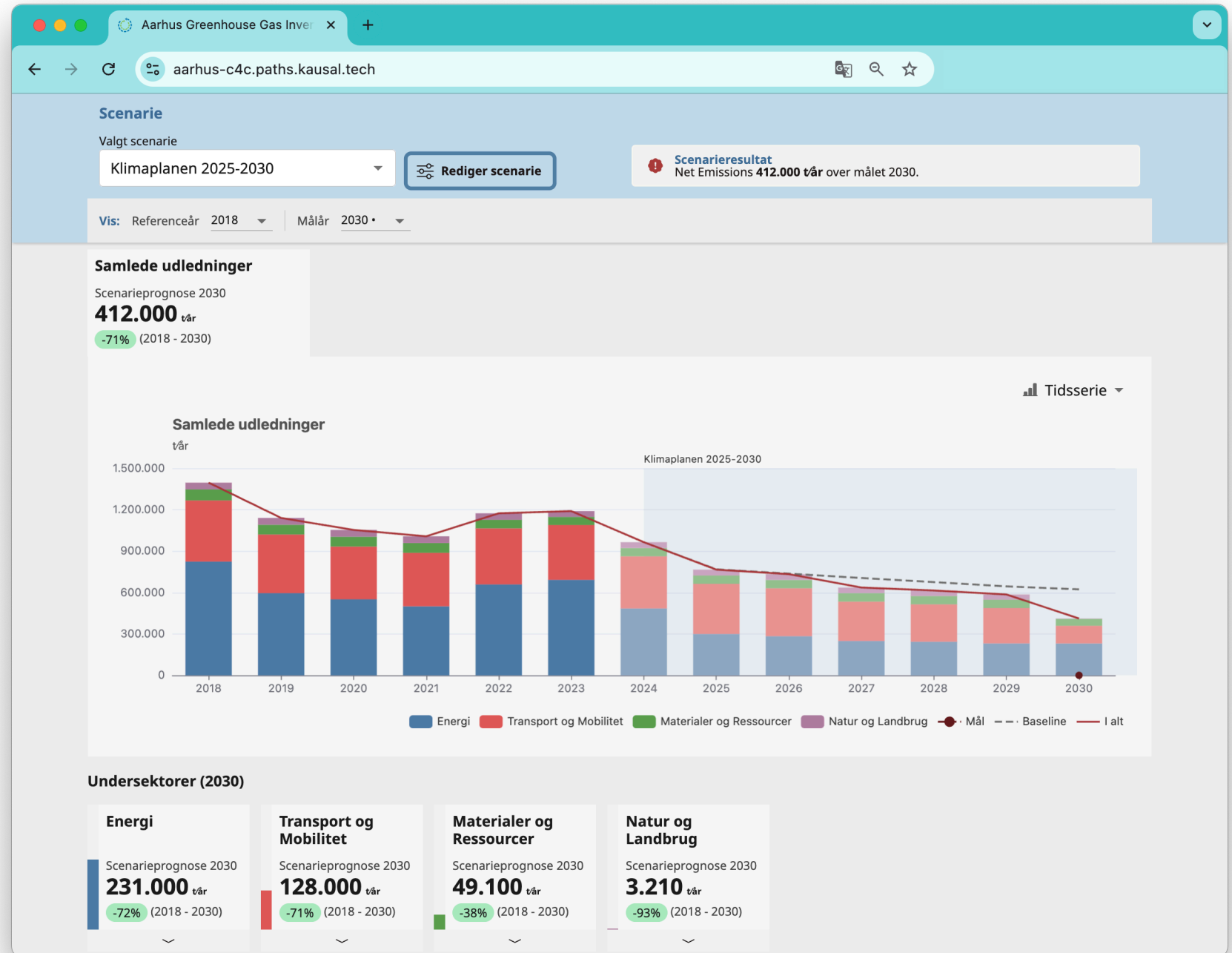
## Actions, Scenarios, & Visualizations

- **Action Impact Modeling:** Simple vs. detailed approach, single trajectories vs. ranges of possible impacts
- **Visualizations of Results:** Action list, detailed action pages, cost efficiency and cost-benefit analysis visualizations
- **Scenarios:** Predefined and custom scenarios

# CADS Tool

## User Interface

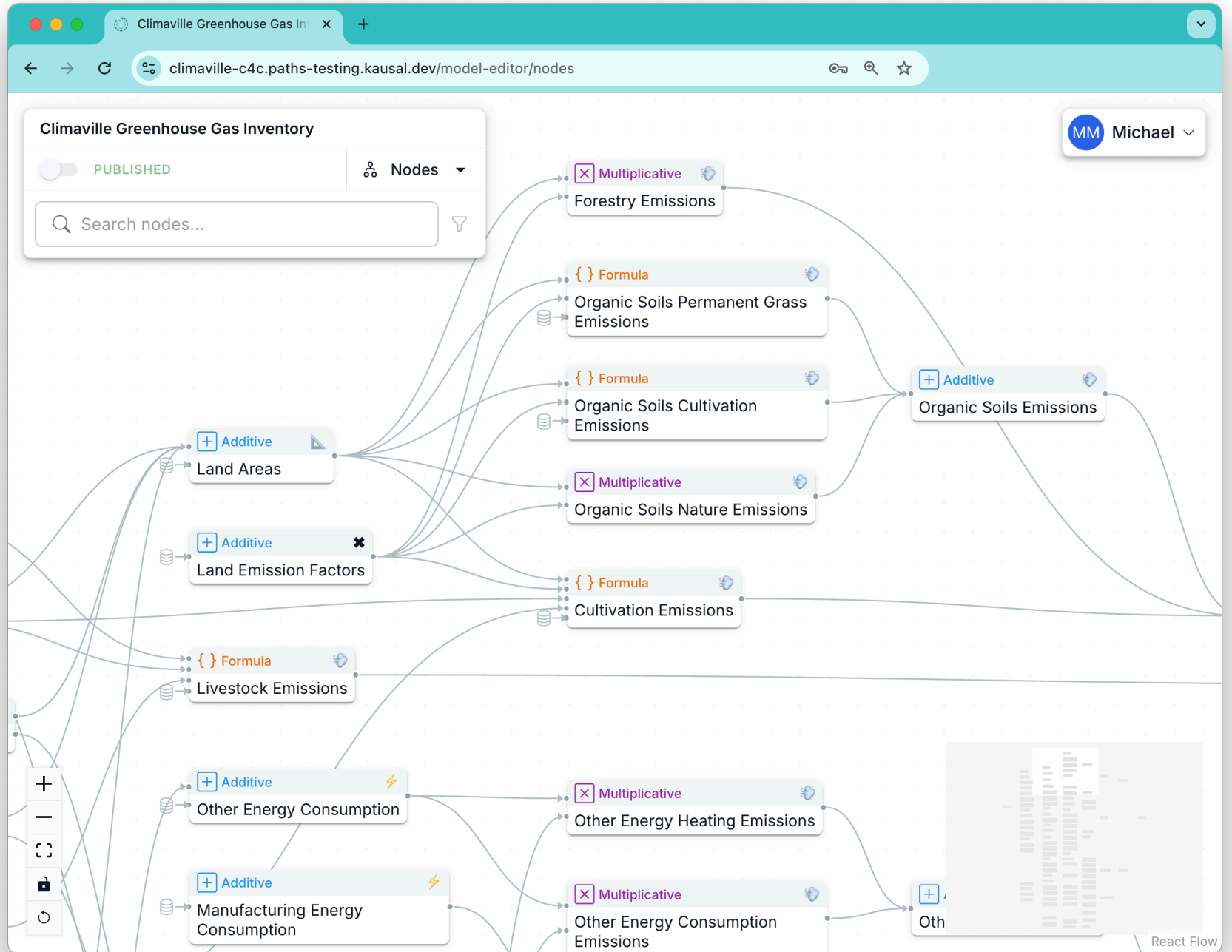
The CADS tool allows users to explore a city's emissions inventory and forecast visually, and reports key summary statistics.



# CADS Tool

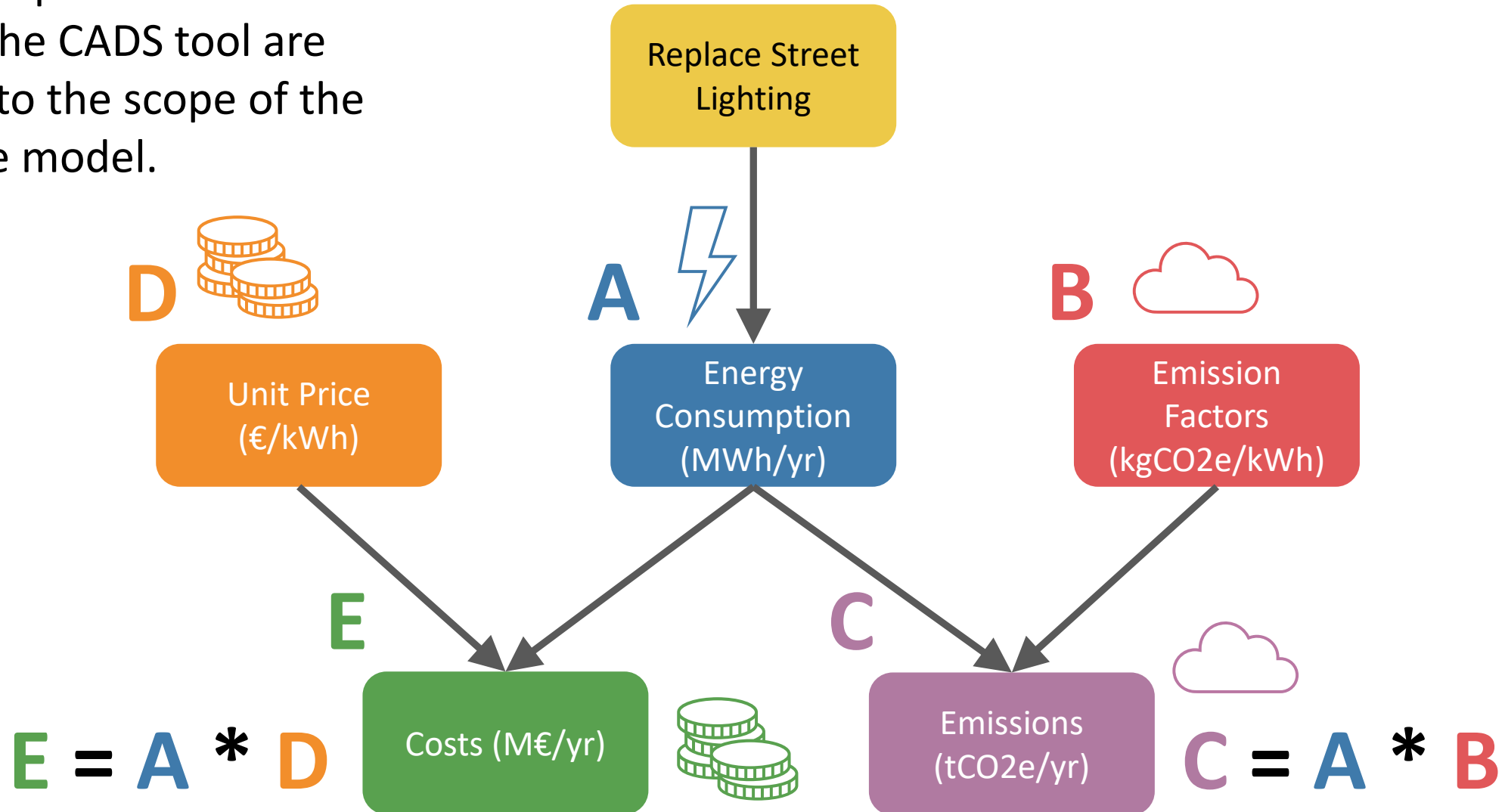
## Model Editor

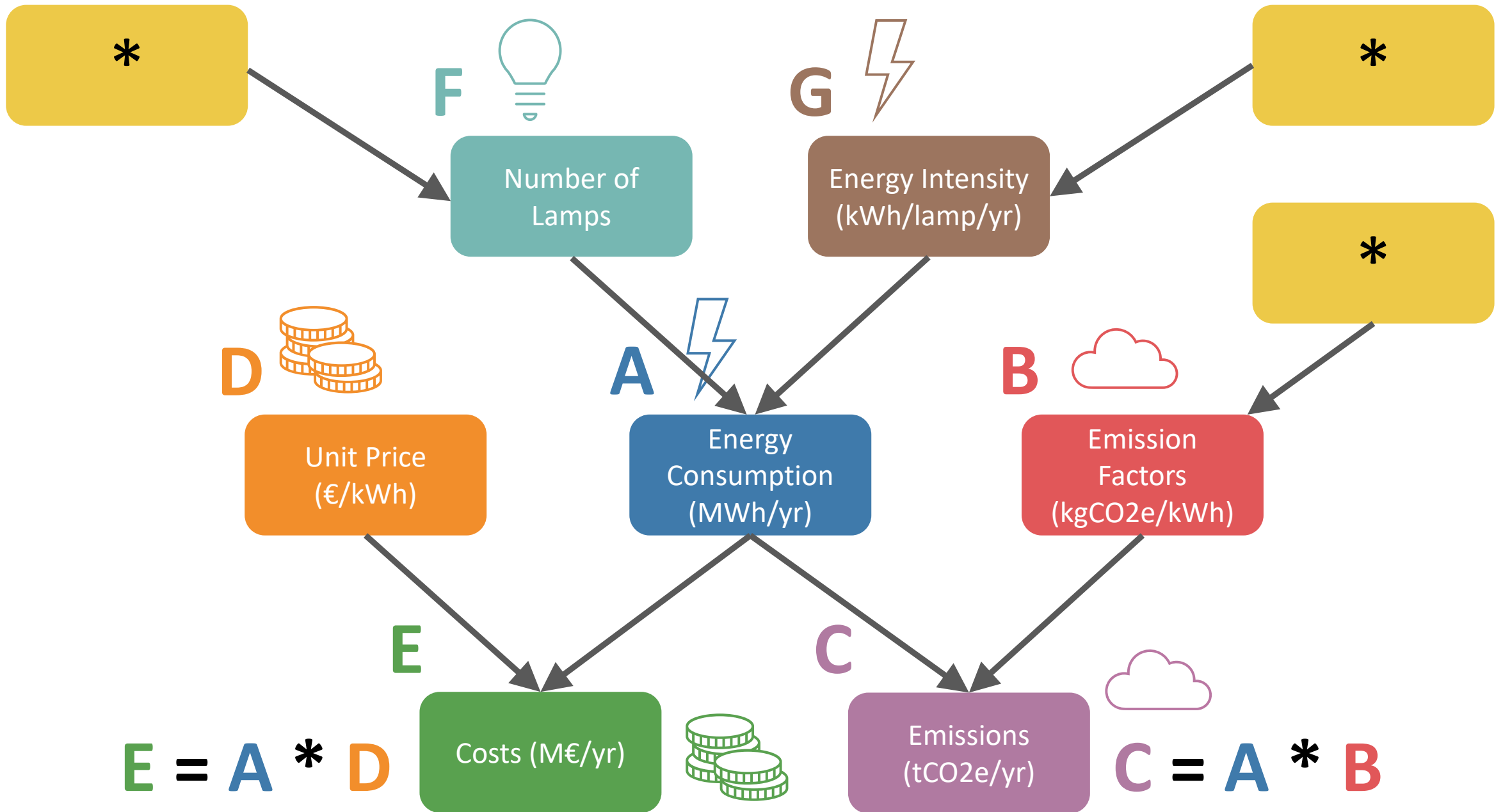
Behind the scenes, a user-defined, data-driven, structured model calculates baseline quantities and action impacts.



# Action Impact Assessment

Action impact calculations within the CADS tool are limited to the scope of the baseline model.





# CADS Tool Use Cases

## Top-Down

Energy Efficiency Measures: Reduce Electricity Consumption by X% in 2030



Streetlight Electricity Consumption (MWh/yr)



## Bottom-Up

Switch X Streetlights in Y City District from HPS to LED Lamps in 2027



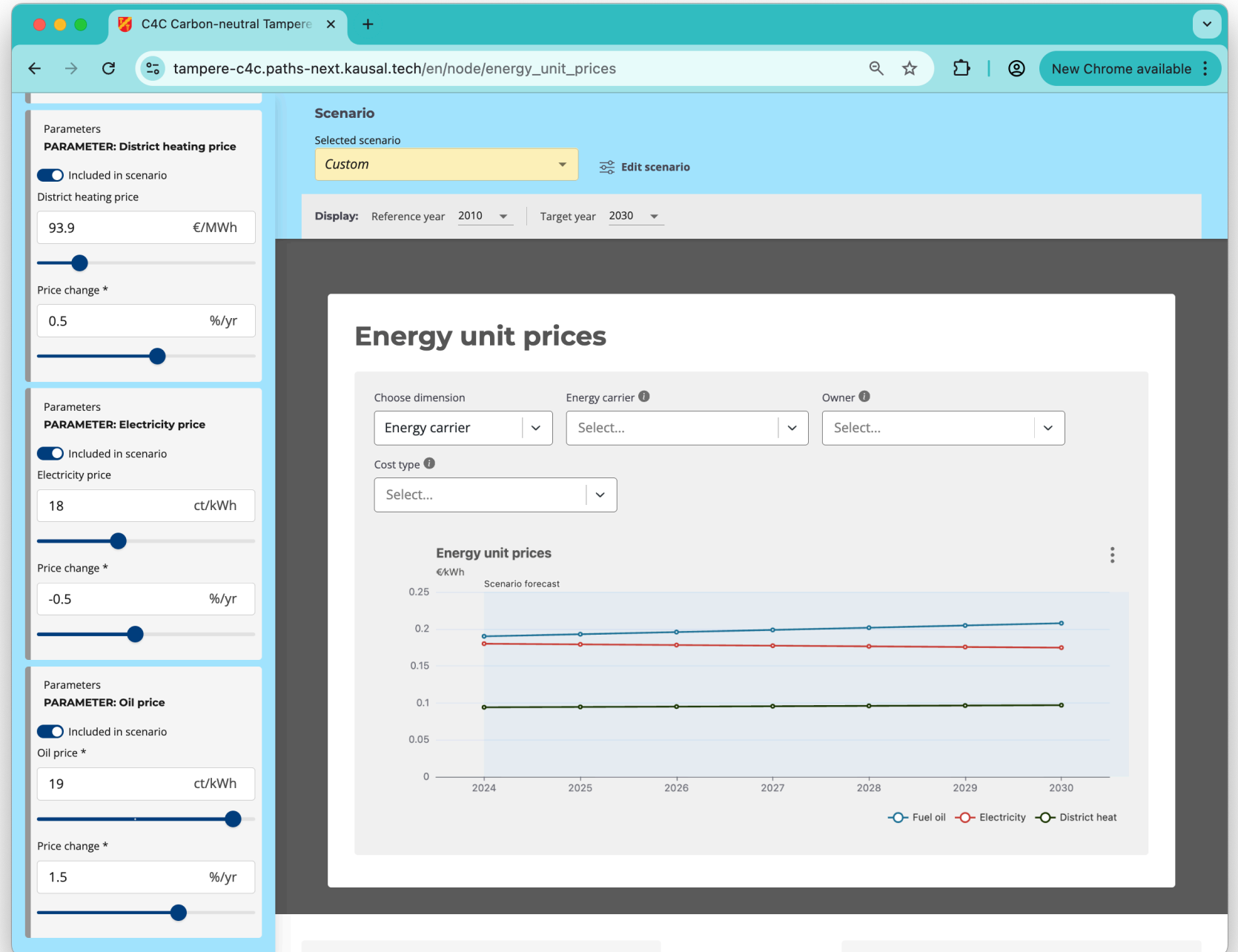
Number of Streetlights by Lamp Type



# CADS Tool

## Parameter Sliders

Baseline quantities and action impacts can be represented via adjustable parameters, rather than single time-series.

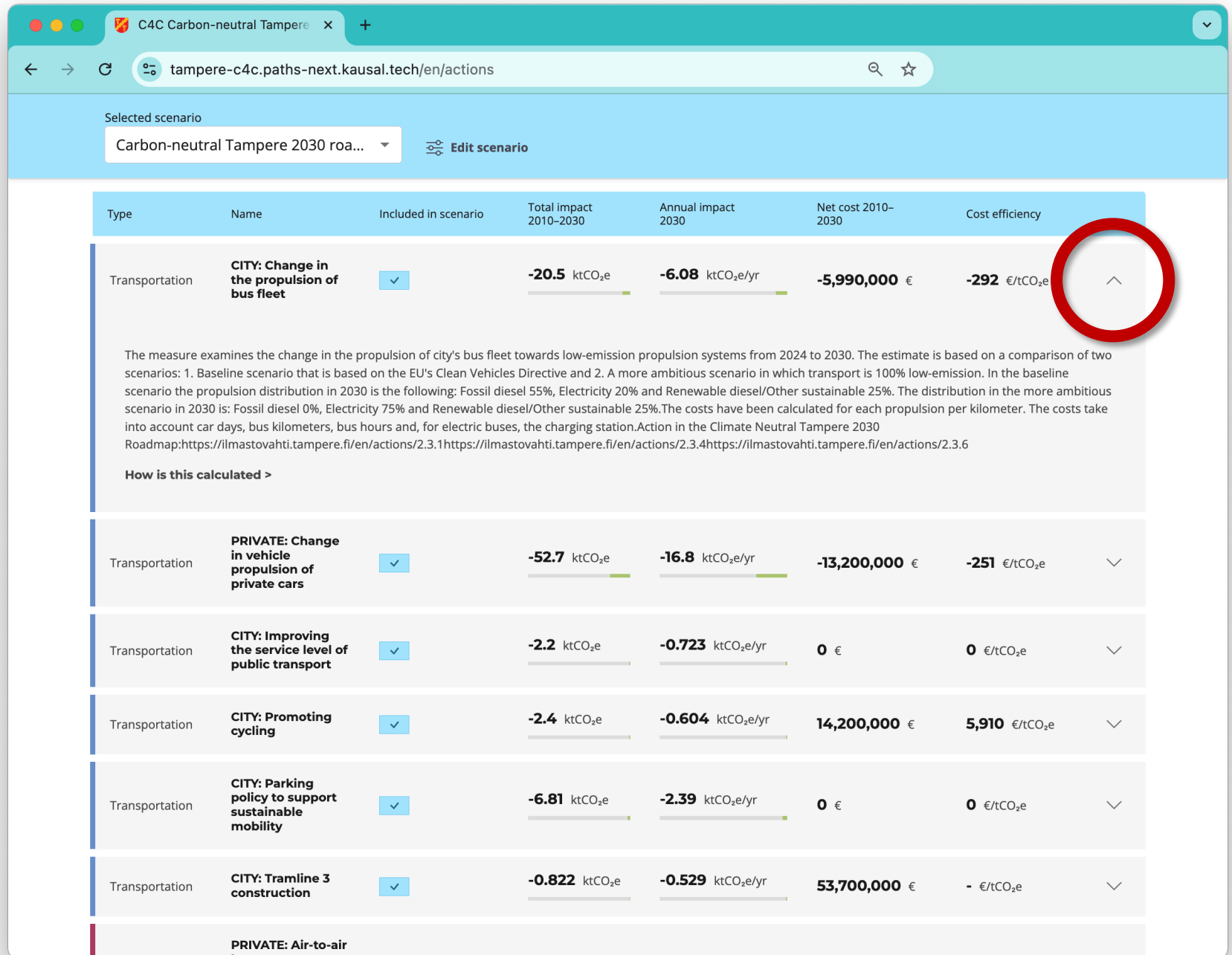


# CADS Tool

## Action List Page

Four impact KPIs shown for actions affecting emissions and financial costs/benefits.

Action cards may be opened for additional details.



The screenshot shows a web browser window displaying the CADS Tool interface. The page title is "C4C Carbon-neutral Tampere" and the URL is "tampere-c4c.paths-next.kausai.tech/en/actions". The selected scenario is "Carbon-neutral Tampere 2030 roa...". The page features a table of actions with the following columns: Type, Name, Included in scenario, Total impact 2010-2030, Annual impact 2030, Net cost 2010-2030, and Cost efficiency. A red circle highlights an upward arrow icon in the first row's details area.

Type	Name	Included in scenario	Total impact 2010-2030	Annual impact 2030	Net cost 2010-2030	Cost efficiency
Transportation	<b>CITY: Change in the propulsion of bus fleet</b>	<input checked="" type="checkbox"/>	-20.5 ktCO <sub>2</sub> e	-6.08 ktCO <sub>2</sub> e/yr	-5,990,000 €	-292 €/tCO <sub>2</sub> e
Transportation	<b>PRIVATE: Change in vehicle propulsion of private cars</b>	<input checked="" type="checkbox"/>	-52.7 ktCO <sub>2</sub> e	-16.8 ktCO <sub>2</sub> e/yr	-13,200,000 €	-251 €/tCO <sub>2</sub> e
Transportation	<b>CITY: Improving the service level of public transport</b>	<input checked="" type="checkbox"/>	-2.2 ktCO <sub>2</sub> e	-0.723 ktCO <sub>2</sub> e/yr	0 €	0 €/tCO <sub>2</sub> e
Transportation	<b>CITY: Promoting cycling</b>	<input checked="" type="checkbox"/>	-2.4 ktCO <sub>2</sub> e	-0.604 ktCO <sub>2</sub> e/yr	14,200,000 €	5,910 €/tCO <sub>2</sub> e
Transportation	<b>CITY: Parking policy to support sustainable mobility</b>	<input checked="" type="checkbox"/>	-6.81 ktCO <sub>2</sub> e	-2.39 ktCO <sub>2</sub> e/yr	0 €	0 €/tCO <sub>2</sub> e
Transportation	<b>CITY: Tramline 3 construction</b>	<input checked="" type="checkbox"/>	-0.822 ktCO <sub>2</sub> e	-0.529 ktCO <sub>2</sub> e/yr	53,700,000 €	- €/tCO <sub>2</sub> e
	<b>PRIVATE: Air-to-air heat pump</b>					

The measure examines the change in the propulsion of city's bus fleet towards low-emission propulsion systems from 2024 to 2030. The estimate is based on a comparison of two scenarios: 1. Baseline scenario that is based on the EU's Clean Vehicles Directive and 2. A more ambitious scenario in which transport is 100% low-emission. In the baseline scenario the propulsion distribution in 2030 is the following: Fossil diesel 55%, Electricity 20% and Renewable diesel/Other sustainable 25%. The distribution in the more ambitious scenario in 2030 is: Fossil diesel 0%, Electricity 75% and Renewable diesel/Other sustainable 25%. The costs have been calculated for each propulsion per kilometer. The costs take into account car days, bus kilometers, bus hours and, for electric buses, the charging station. Action in the Climate Neutral Tampere 2030 Roadmap: <https://ilmastovahti.tampere.fi/en/actions/2.3.1> <https://ilmastovahti.tampere.fi/en/actions/2.3.4> <https://ilmastovahti.tampere.fi/en/actions/2.3.6>

How is this calculated >

# CADS Tool

## Action Details Page

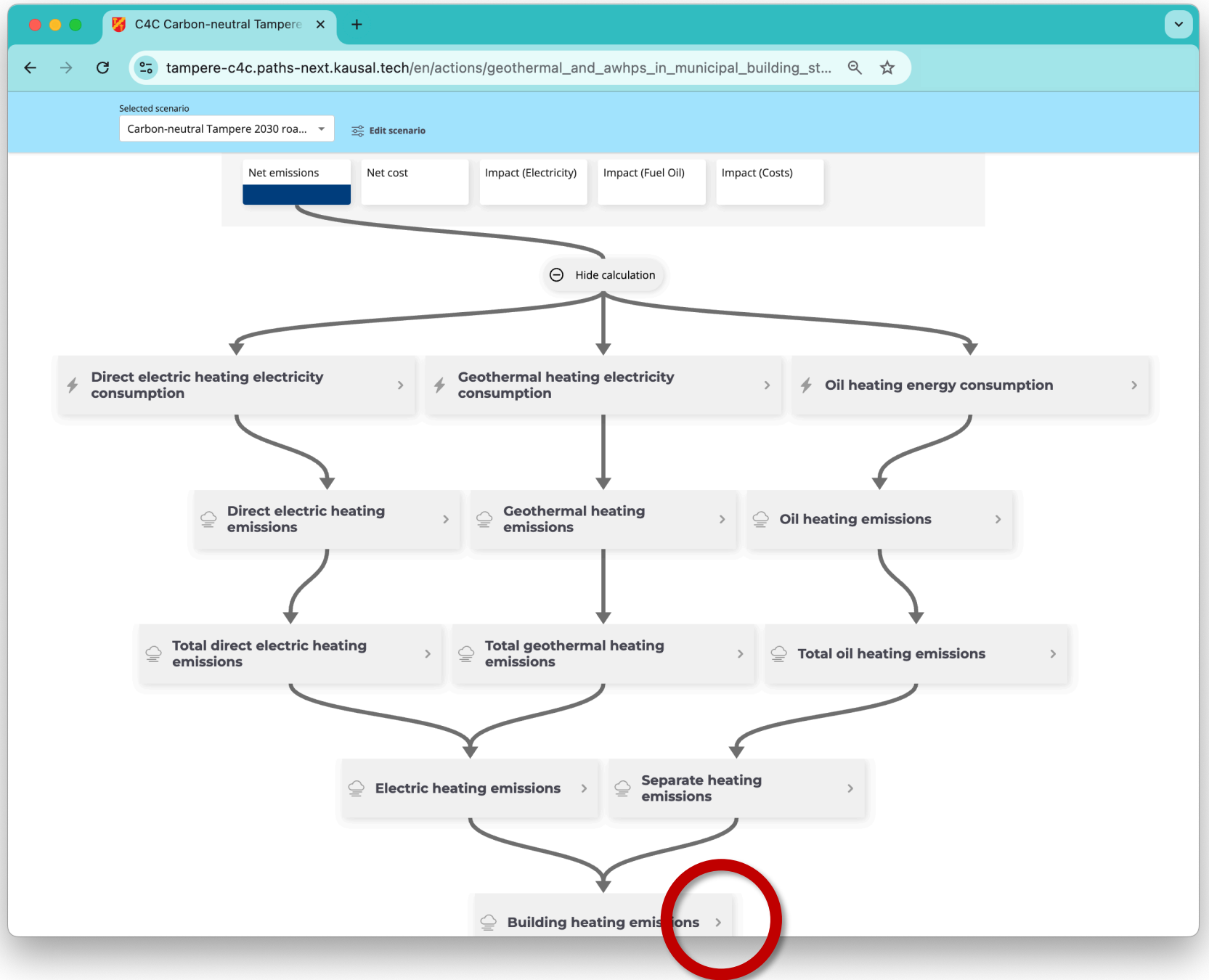
Action outcomes are shown across the bottom of each action's details page.

The screenshot shows a web browser window with the URL `tampere-c4c.paths-next.kausal.tech/en/actions/geothermal_and_awhps_in_municipal_building_st...`. The page is titled "Scenario" and shows the selected scenario as "Carbon-neutral Tampere 2030 roa...". Below this, there are dropdown menus for "Reference year" (set to 2010) and "Target year" (set to 2030). The main heading is "Actions / Building heating / PRIVATE: Replacing oil heating across the municipal building stock". A description states: "The action assesses the phase-out of oil heating in residential and service buildings across the entire city area. Oil heating in these buildings will be replaced with geothermal heating and air to water heat pumps." There is a toggle switch labeled "Included in scenario" which is currently turned on. Below the description, there are two links: <https://ilmastovahti.tampere.fi/en/actions/4.4.1> and <https://ilmastovahti.tampere.fi/en/actions/4.4.2>, followed by a "Read more" link with a right arrow. At the bottom, there is an "Outcomes" section with five buttons: "Net emissions", "Net cost", "Impact (Electricity)", "Impact (Fuel Oil)", and "Impact (Costs)". The "Net emissions" button is highlighted with a dark blue bar. A red arrow points to a "Show calculation" button with a plus icon, which is located below the "Net emissions" button. A grey arrow points from the "Net emissions" button to the "Show calculation" button.

# CADS Tool

## Action Details Page

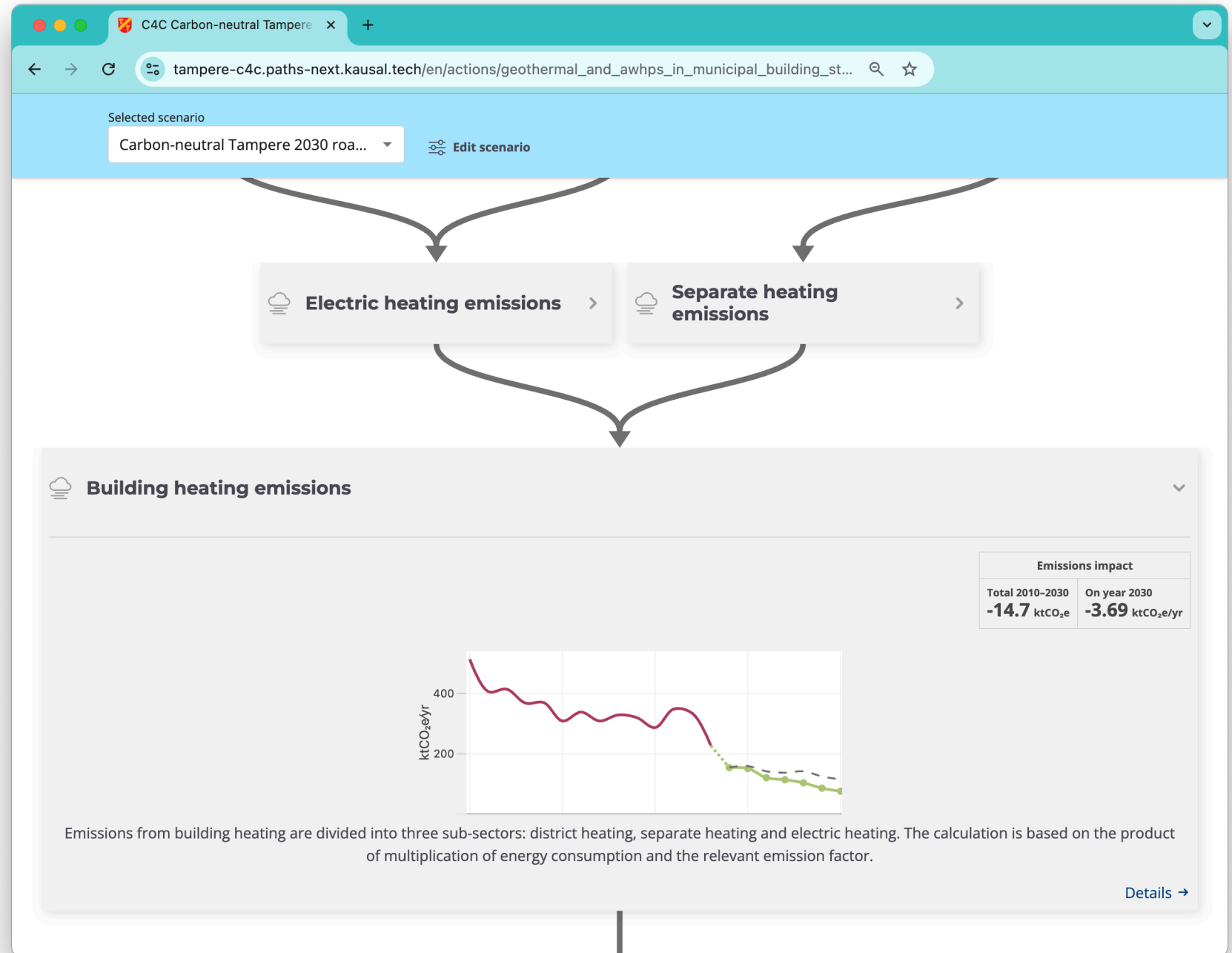
The “show calculation” button reveals the causal chain or network from intervention to outcome.



# CADS Tool

## Action Details Page

Nodes in the graph may be opened to examine the action's impact at each step along the way.

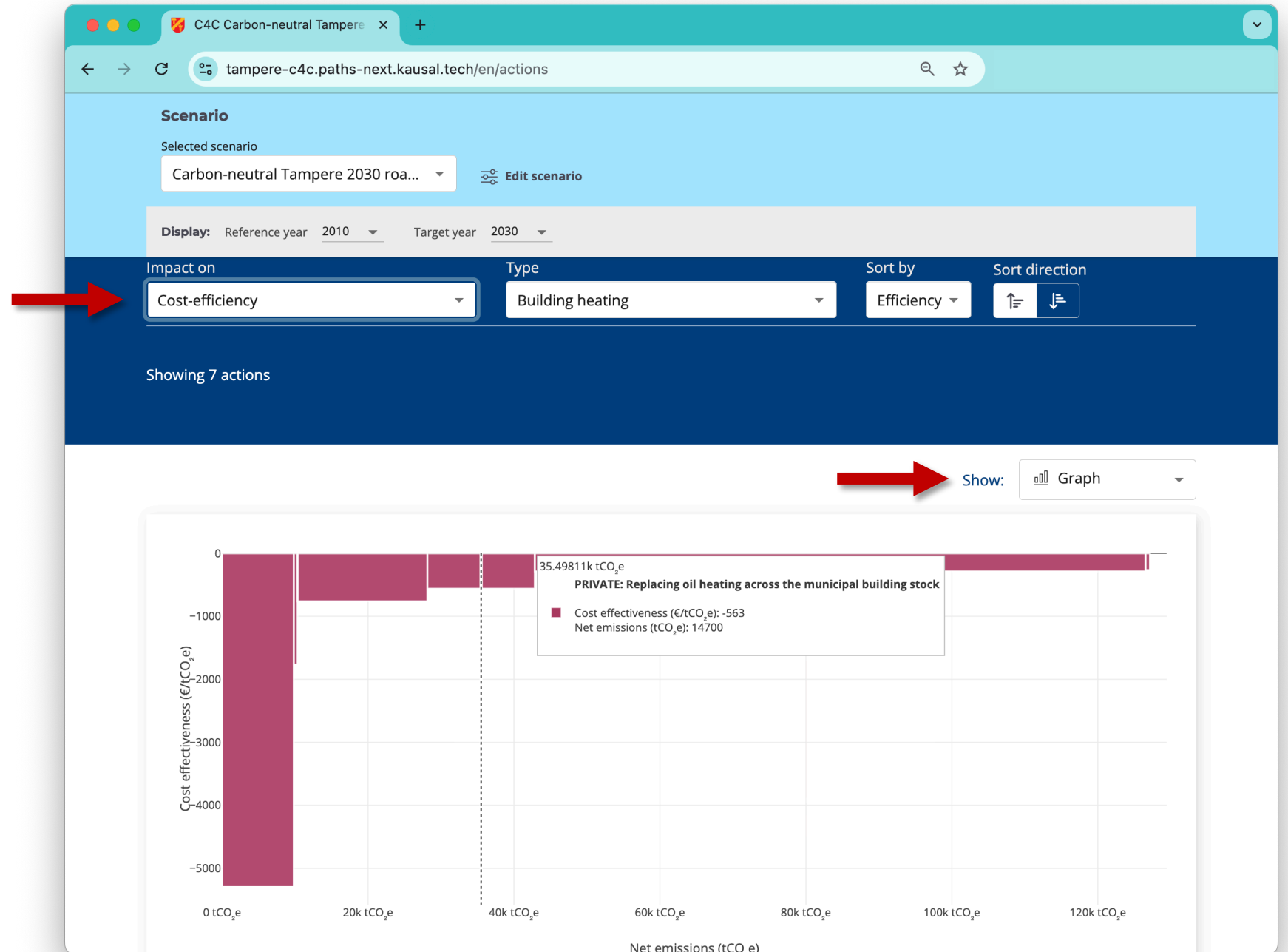


# CADS Tool

## Cost Efficiency

The cost efficiency graph, or MAC curve, visualizes actions by efficiency and total emissions impact.

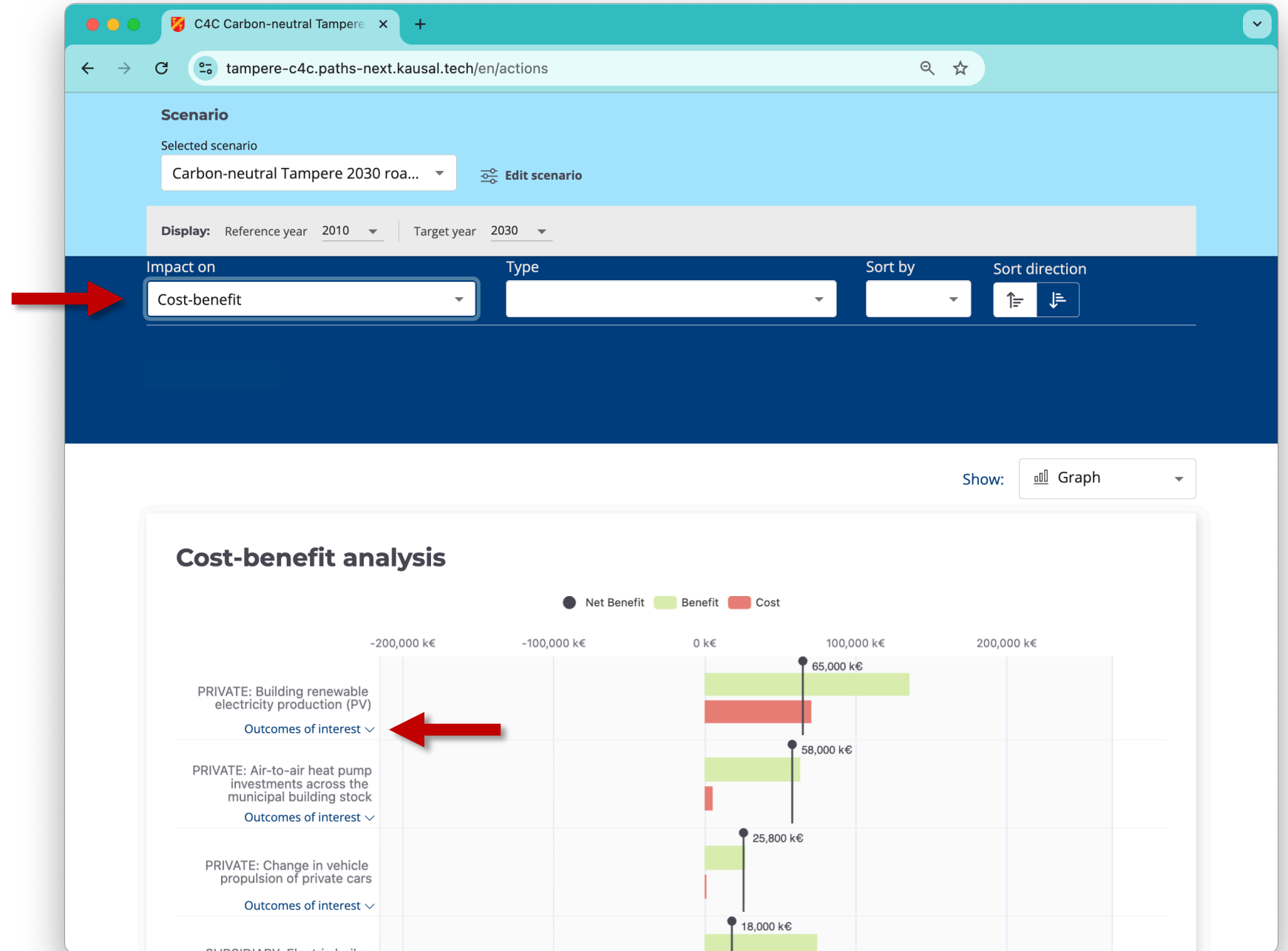
The more negative the bar, the more efficient the action; the wider the bar, the more impactful.



# CADS Tool

## Cost-Benefit

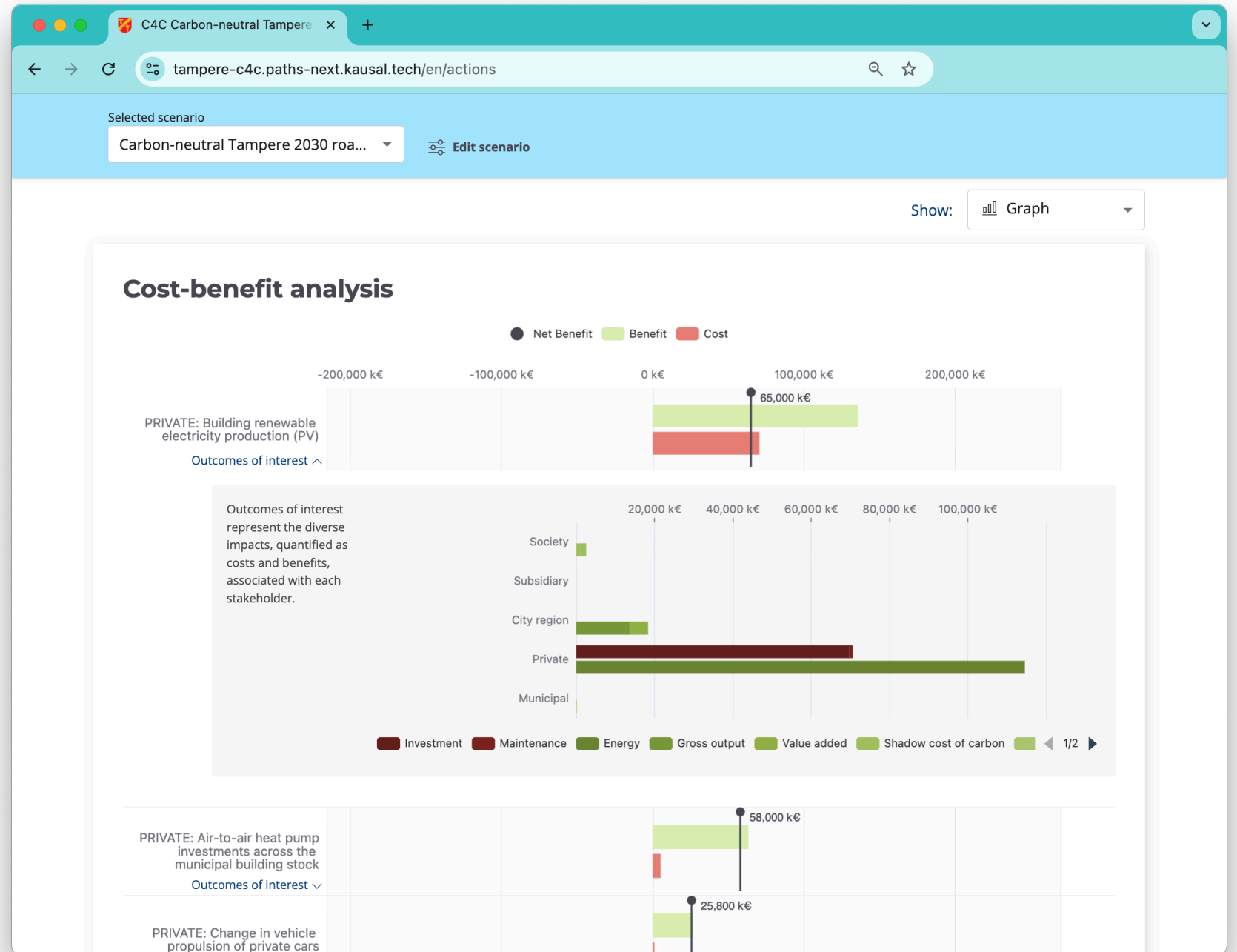
In the cost-benefit analysis graph, actions' total costs and benefits are shown side by side.



# CADS Tool

## Cost-Benefit

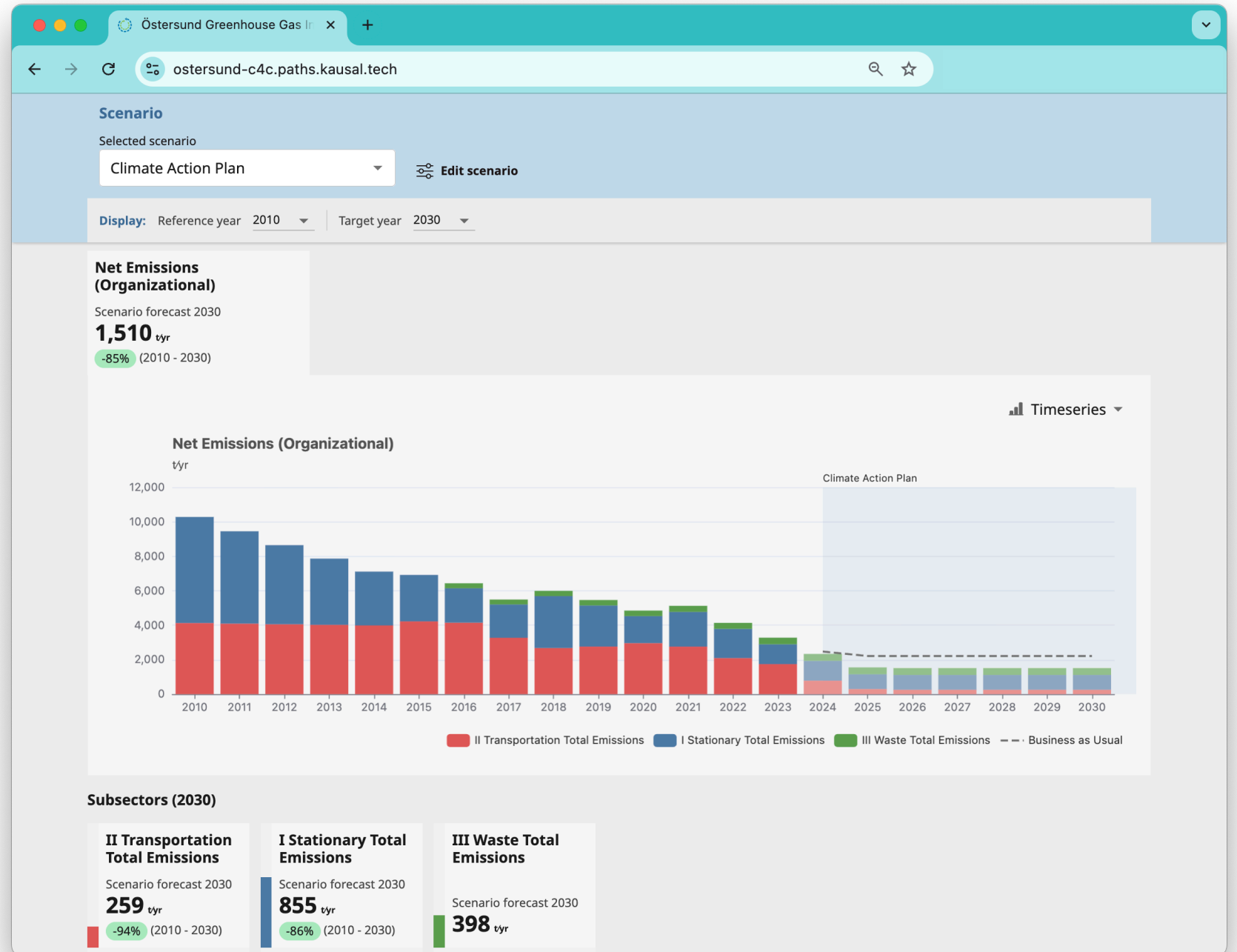
If tracked within the tool, the costs and benefits may be visualized by stakeholder and cost type.



# CADS Tool

## Scenario Toolbar

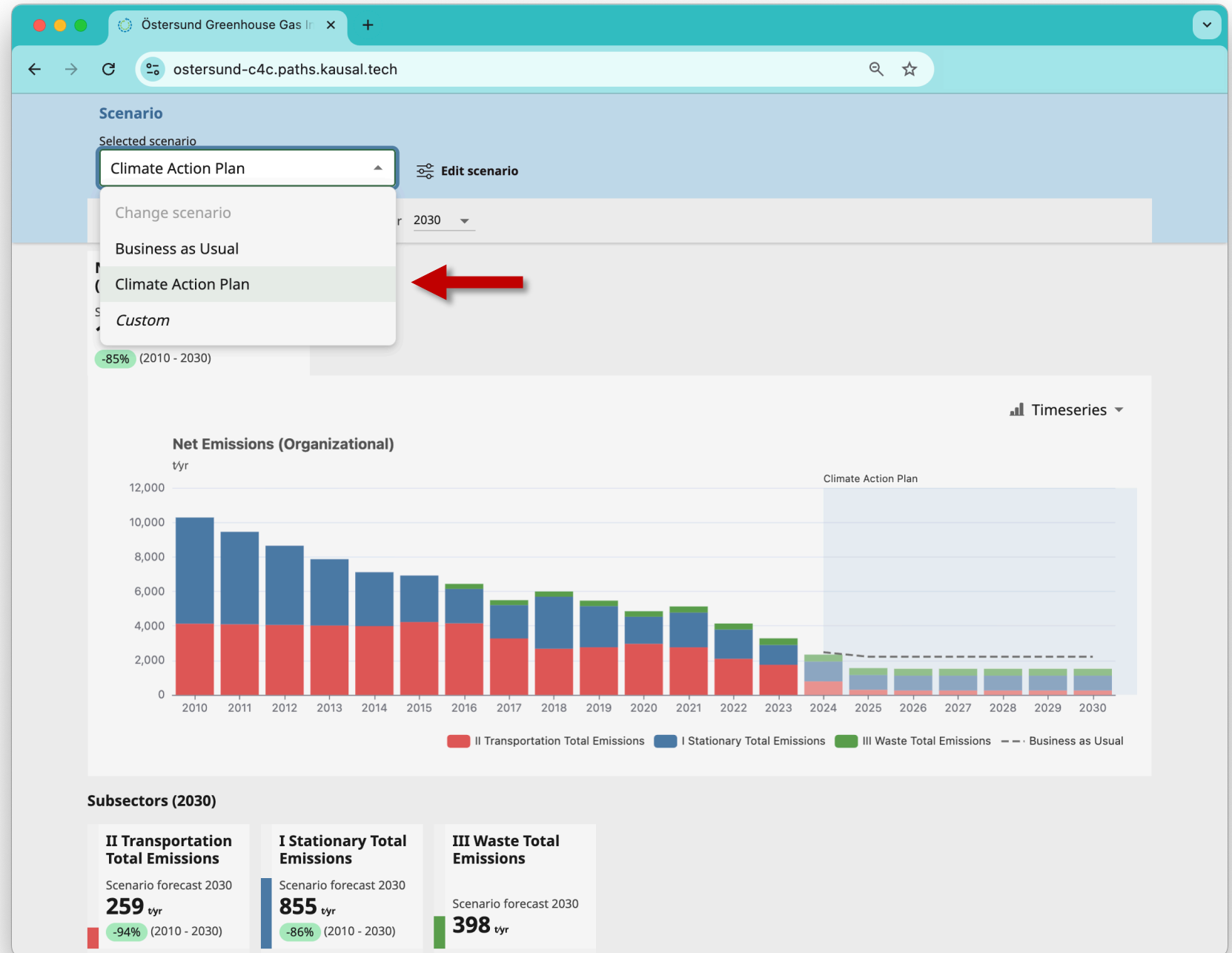
The scenario toolbar is available on most tool pages, and controls all graphs and KPIs.



# CADS Tool

## Scenario Toolbar

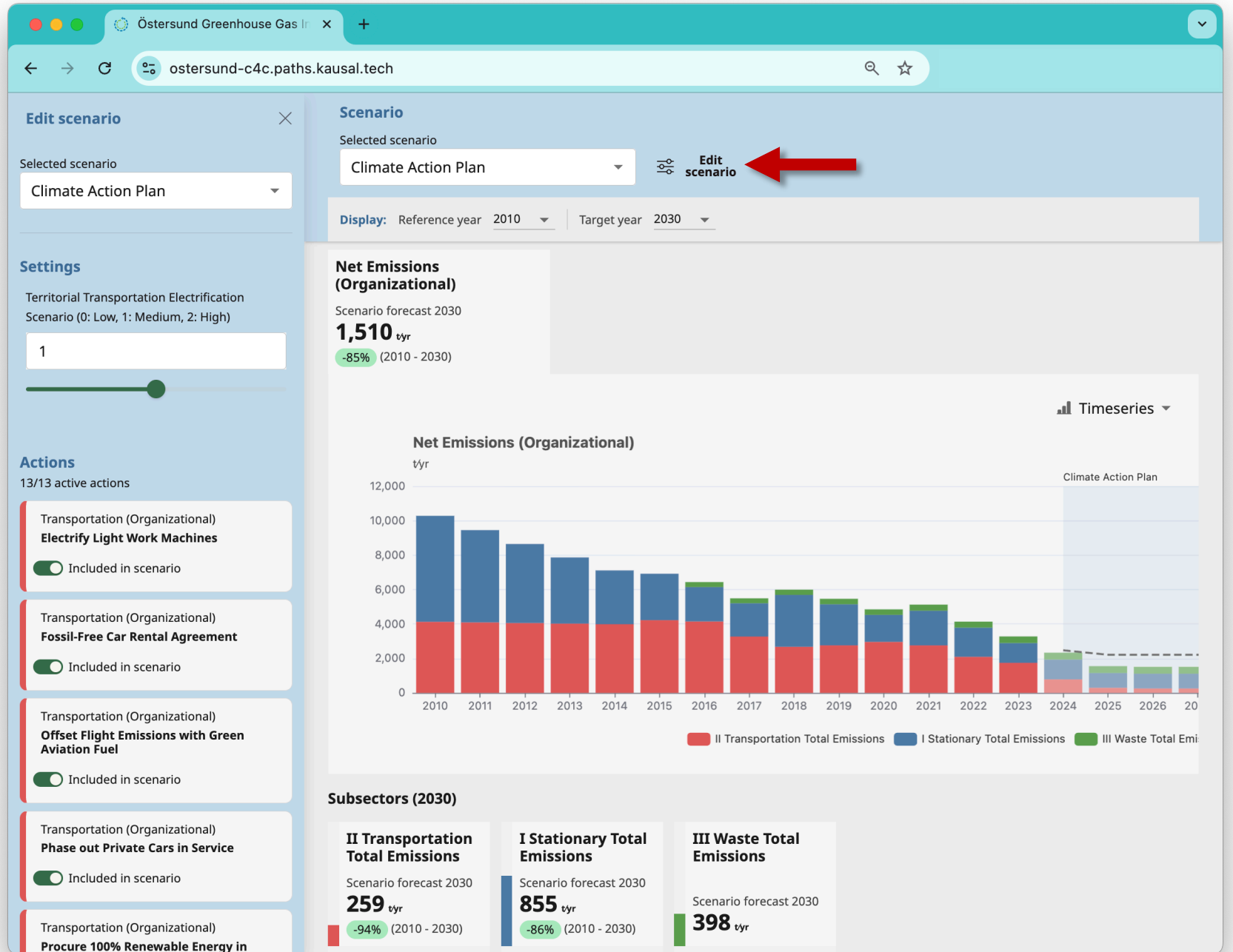
The scenario selector is used to switch between pre-defined scenarios.



# CADS Tool

## Scenario Editor

The scenario editor is used to build custom scenarios: actions may be turned on or off, and parameters adjusted individually.



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