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Baltic Sea Region



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ENERGY TRANSITION

Climate-4-CAST

Introduction to the Climate Action Decision Support (CADS) Tool

UBC Talks Webinar | 2 December 2025

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Overview

Introduction to the CADS Tool

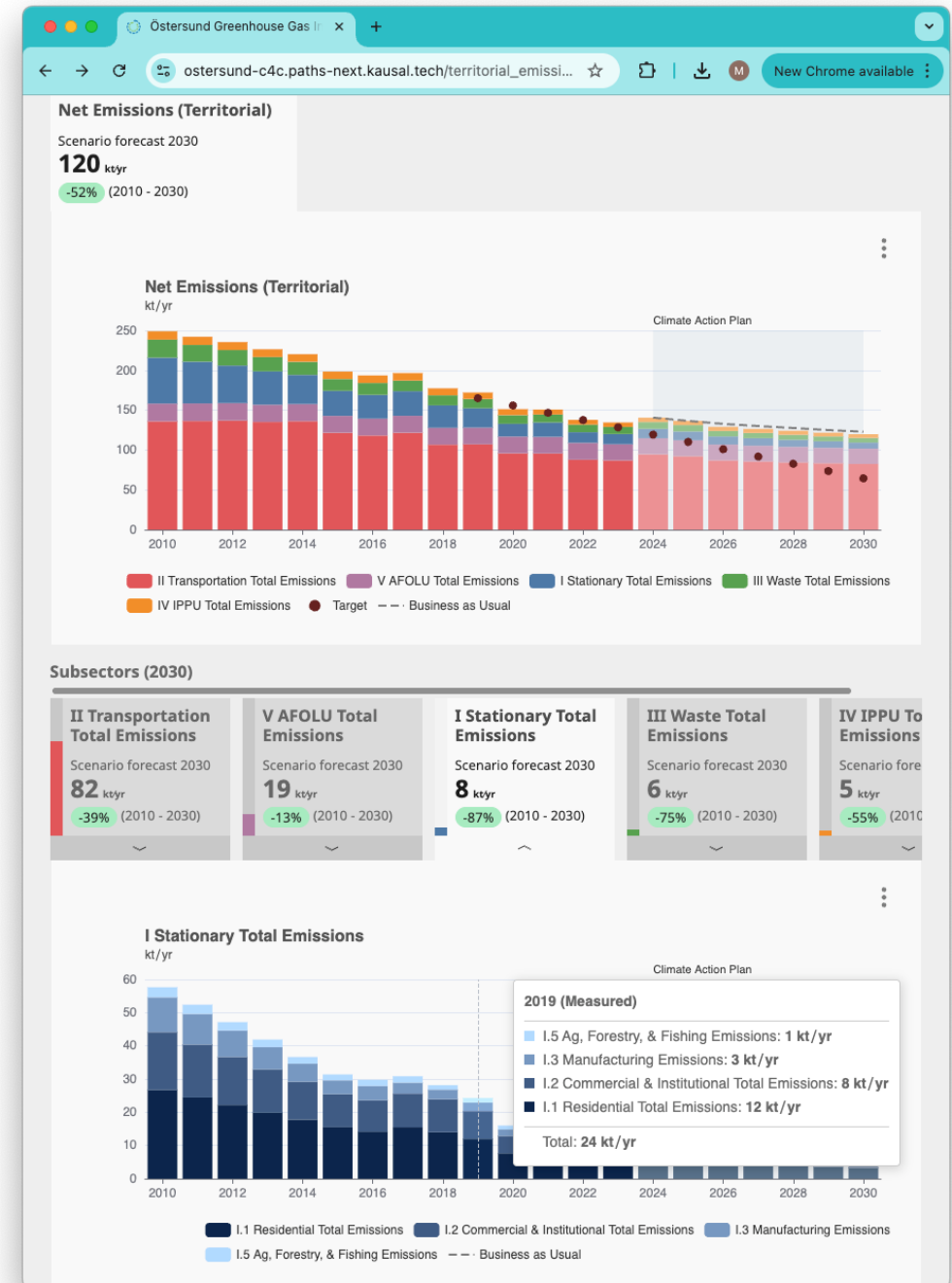
A decision support, communication, and calculation tool.

CADS Tool Demo

Demo of the public website and admin portal.

Tool Requirements and Examples

Using and understanding the CADS tool.



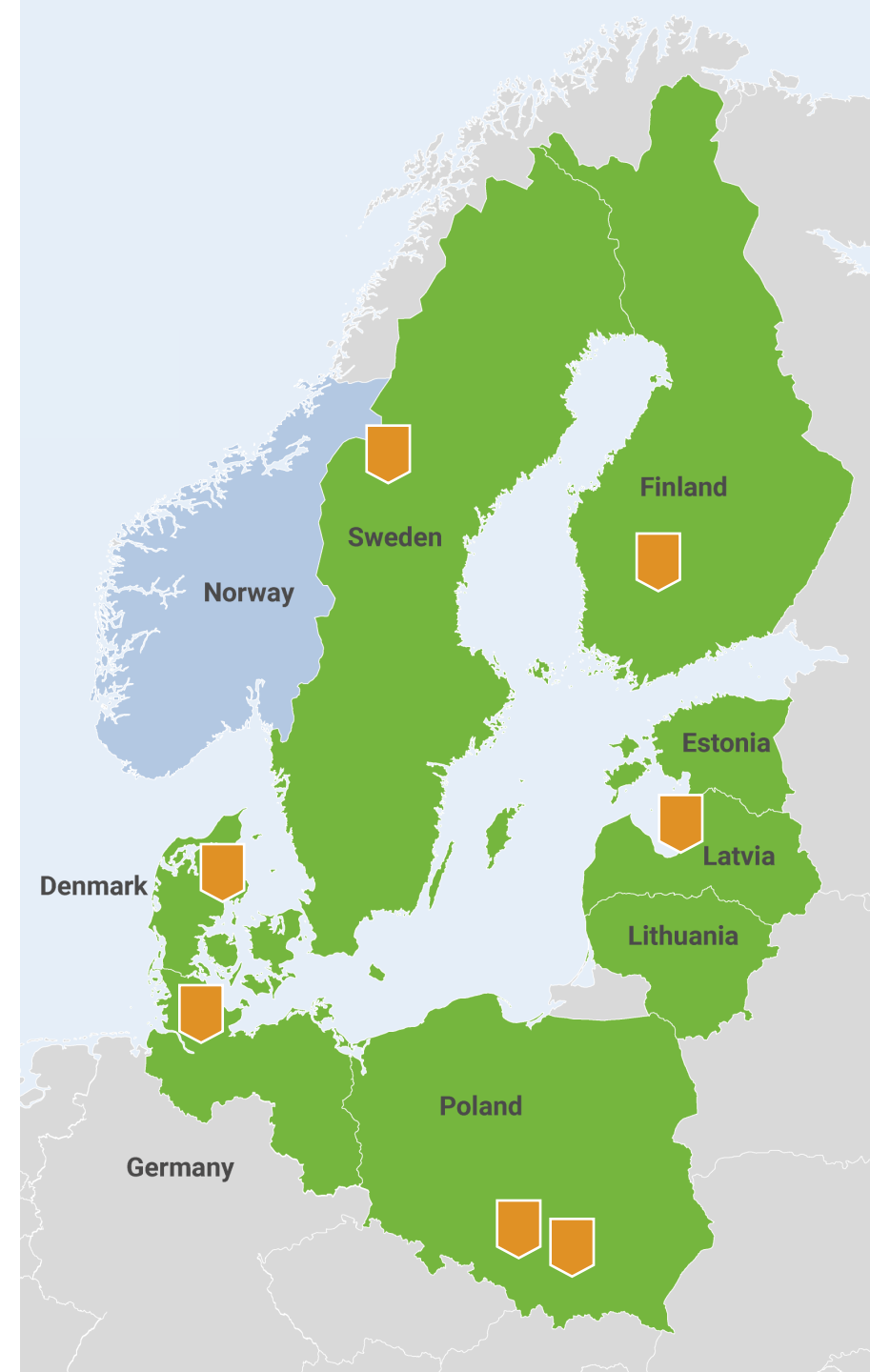
The CADS Tool in Numbers

Tools online for **7** cities, in **6** countries, covering a total city population of **2.3M** residents.

123 actions included, resulting in...

...a total emissions reduction of **8.7M** tonnes CO₂e, from baseline to target year.

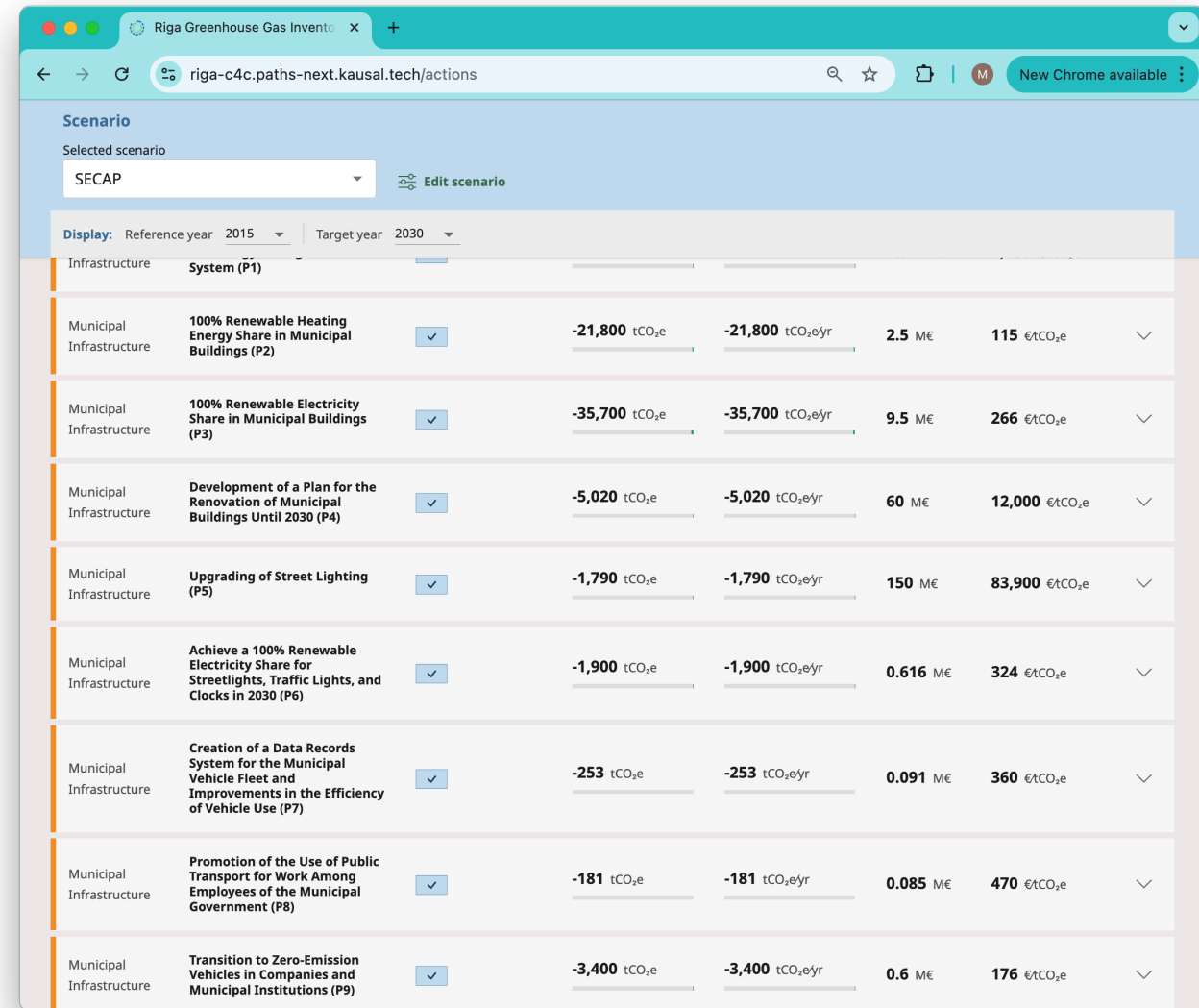
...total costs of **5.2B** and benefits of **179M** EUR, in three currencies (EUR, SEK, PLN).



What Is the CADS Tool?

A Decision Support Tool

- Bring all relevant information together
- Present the economic impact of climate actions alongside the mitigation impact
- Bring climate actions, and climate considerations, into city budgeting processes



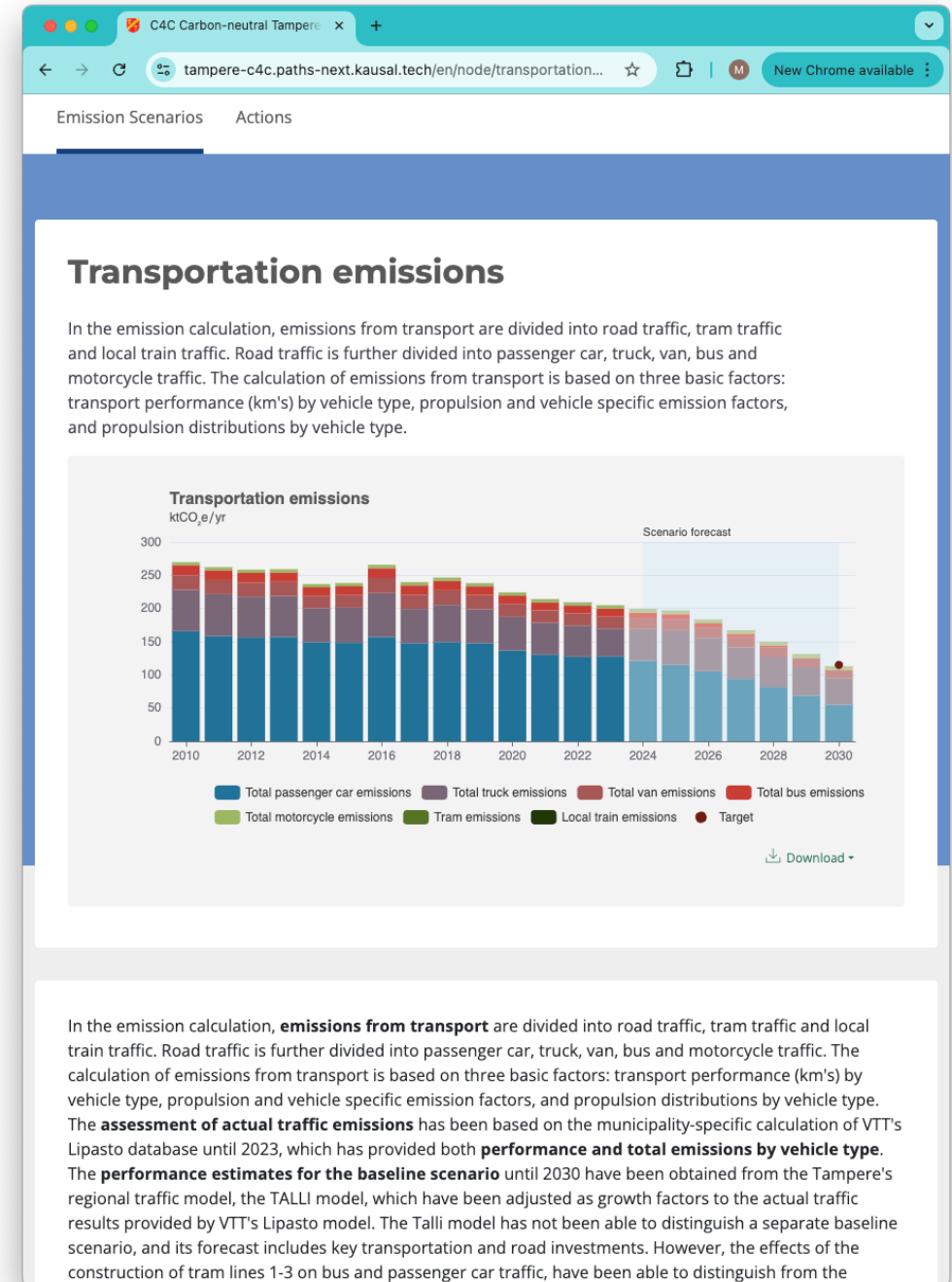
The screenshot displays the CADS Tool interface for the 'Riga Greenhouse Gas Invento' scenario. The selected scenario is 'SECAP'. The interface shows a table of climate actions with columns for 'Infrastructure', 'System', 'Reference year', 'Target year', 'Mitigation impact (tCO₂e)', 'Annual mitigation impact (tCO₂e/yr)', 'Cost (M€)', and 'Cost per tCO₂e (€/tCO₂e)'. The table lists nine actions, including '100% Renewable Heating Energy Share in Municipal Buildings (P2)', '100% Renewable Electricity Share in Municipal Buildings (P3)', and 'Transition to Zero-Emission Vehicles in Companies and Municipal Institutions (P9)'. Each action has a dropdown menu to its right.

Infrastructure	System	Reference year	Target year	Mitigation impact (tCO ₂ e)	Annual mitigation impact (tCO ₂ e/yr)	Cost (M€)	Cost per tCO ₂ e (€/tCO ₂ e)
Municipal Infrastructure	100% Renewable Heating Energy Share in Municipal Buildings (P2)	2015	2030	-21,800	-21,800	2.5	115
Municipal Infrastructure	100% Renewable Electricity Share in Municipal Buildings (P3)	2015	2030	-35,700	-35,700	9.5	266
Municipal Infrastructure	Development of a Plan for the Renovation of Municipal Buildings Until 2030 (P4)	2015	2030	-5,020	-5,020	60	12,000
Municipal Infrastructure	Upgrading of Street Lighting (P5)	2015	2030	-1,790	-1,790	150	83,900
Municipal Infrastructure	Achieve a 100% Renewable Electricity Share for Streetlights, Traffic Lights, and Clocks in 2030 (P6)	2015	2030	-1,900	-1,900	0.616	324
Municipal Infrastructure	Creation of a Data Records System for the Municipal Vehicle Fleet and Improvements in the Efficiency of Vehicle Use (P7)	2015	2030	-253	-253	0.091	360
Municipal Infrastructure	Promotion of the Use of Public Transport for Work Among Employees of the Municipal Government (P8)	2015	2030	-181	-181	0.085	470
Municipal Infrastructure	Transition to Zero-Emission Vehicles in Companies and Municipal Institutions (P9)	2015	2030	-3,400	-3,400	0.6	176

What Is the CADS Tool?

A Communications Tool

- Visualize outcomes of interest - emissions, financial balances - for a given scenario
- Create financial visuals: cost efficiency, cost-benefit, and return on investment
- When hosted online, an interactive public website is available for all

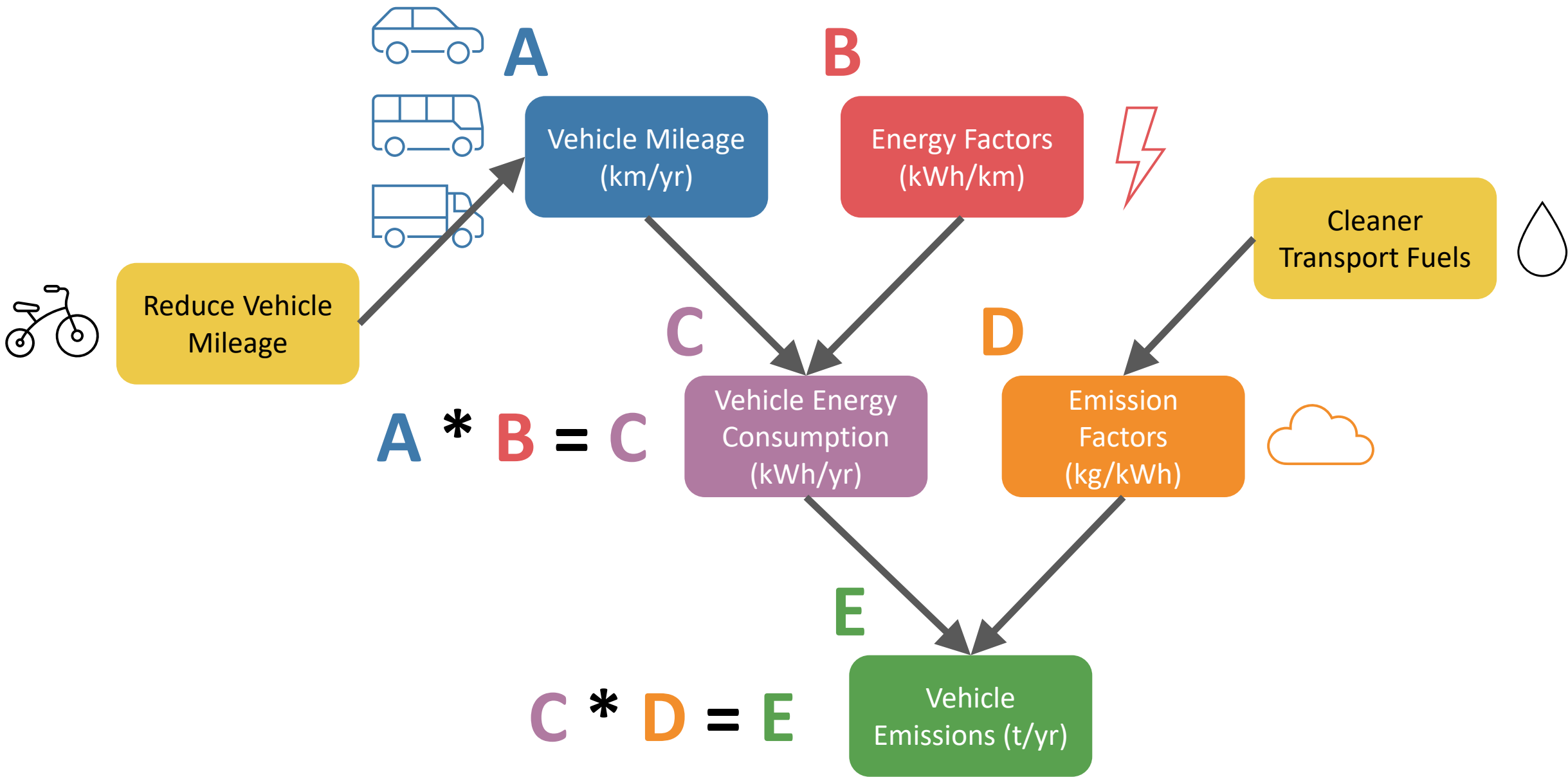


What Is the CADS Tool?

Behind-the-Scenes: A Calculation Tool

Calculations incorporate causal relationships, which allows:

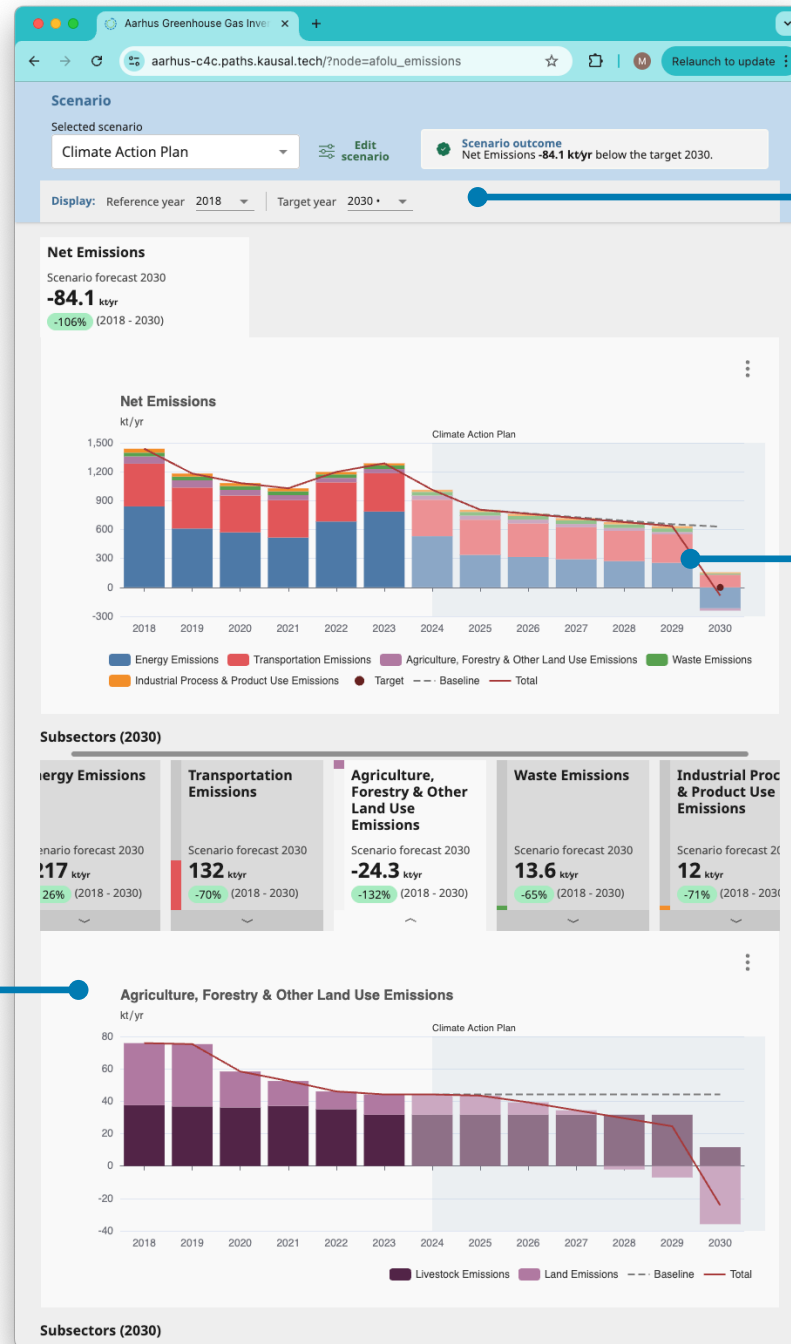
- Complex scenario-building
- Interventions at multiple steps in emissions-generating processes
- Interactions between climate actions: synergies and dampening effects



CADS Tool Demo: Public Site & Admin Portal

When hosted online, the CADS tool is accessible via an interactive public website.

Outcome pages allow users to “drill down” from summary to more detailed results - emissions, energy, and/or financial.

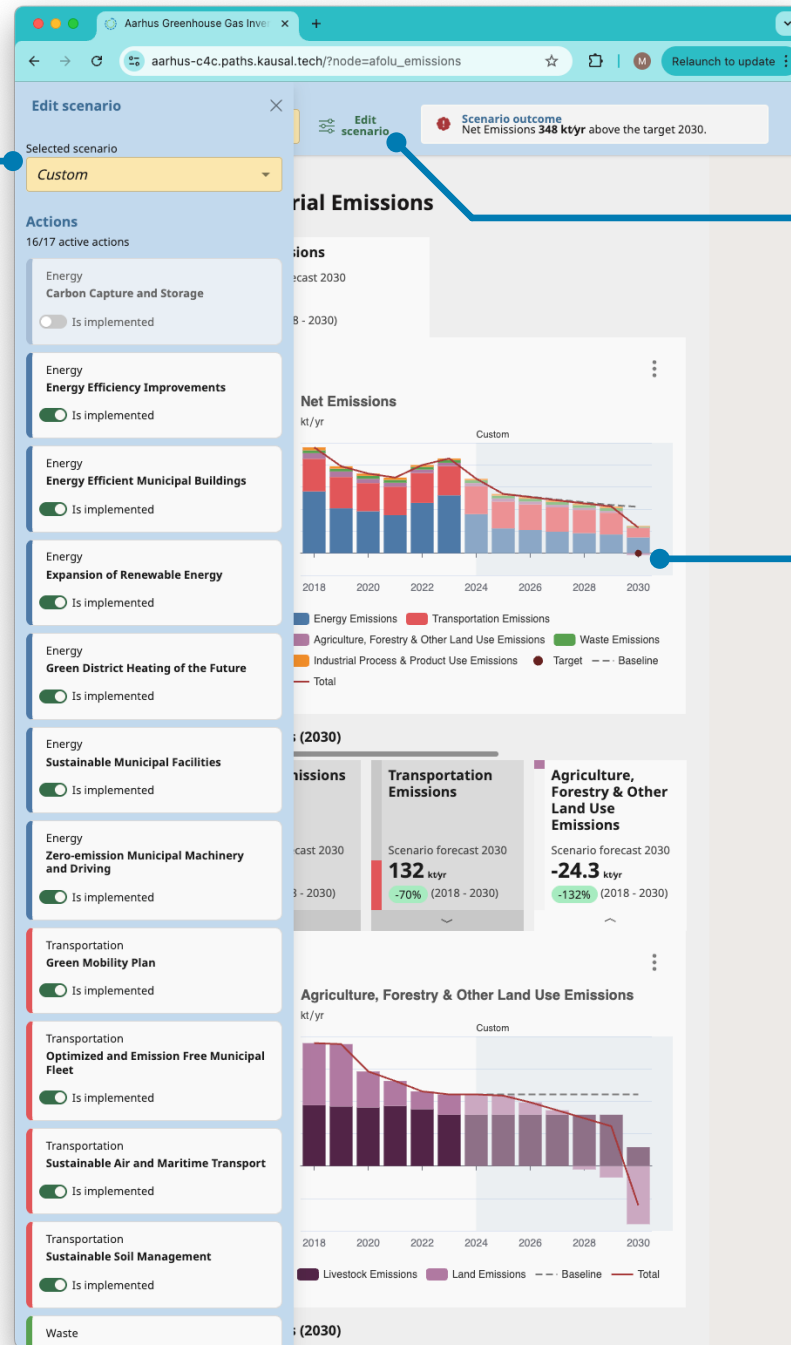


Use the scenario and year selectors to update all the tool's calculations and visualizations dynamically.

See the baseline (business as usual), targets, and the annual total line for reference.

Use the scenario editor to create custom scenarios

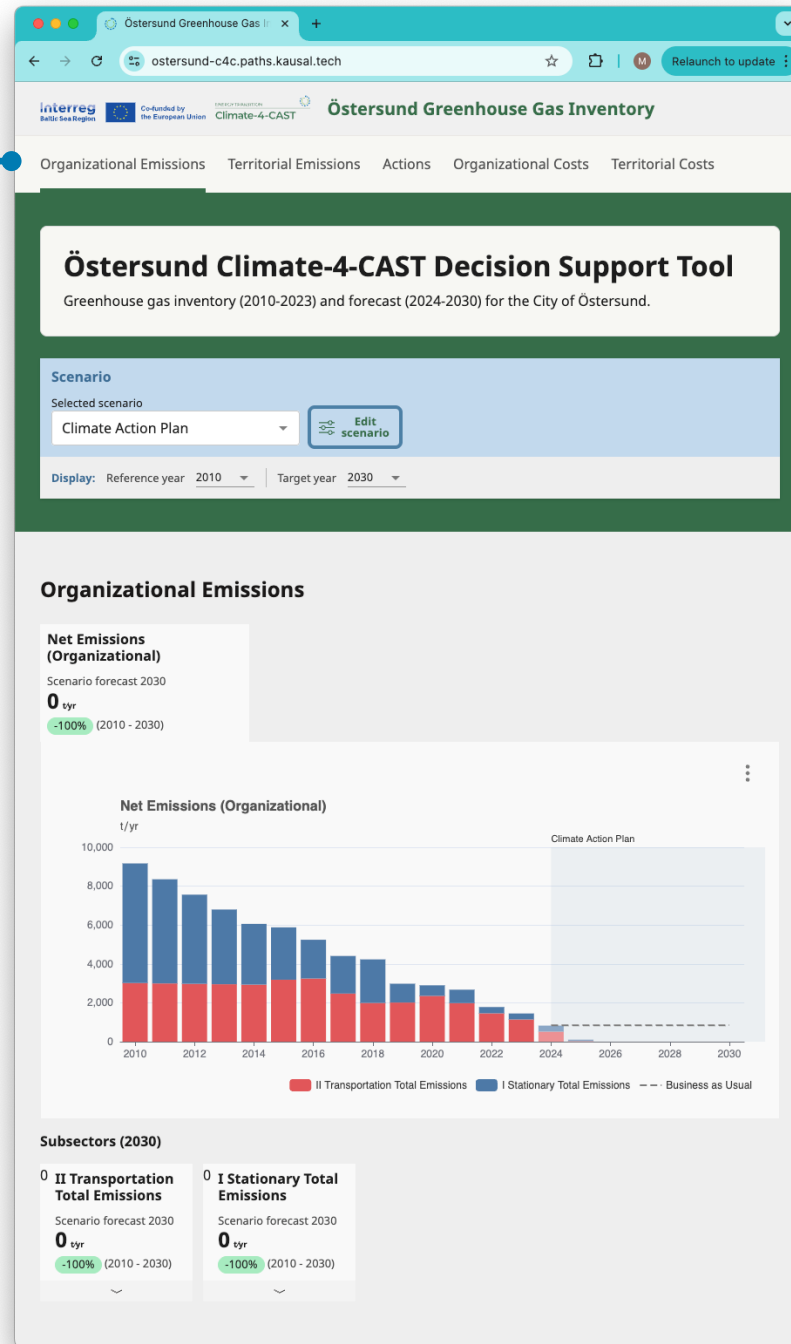
- turn actions on/off, and adjust action parameter sliders.



The “edit scenario” button is available on all the tool’s pages, and opens the editor panel.

The tool’s calculations and visualizations update dynamically.

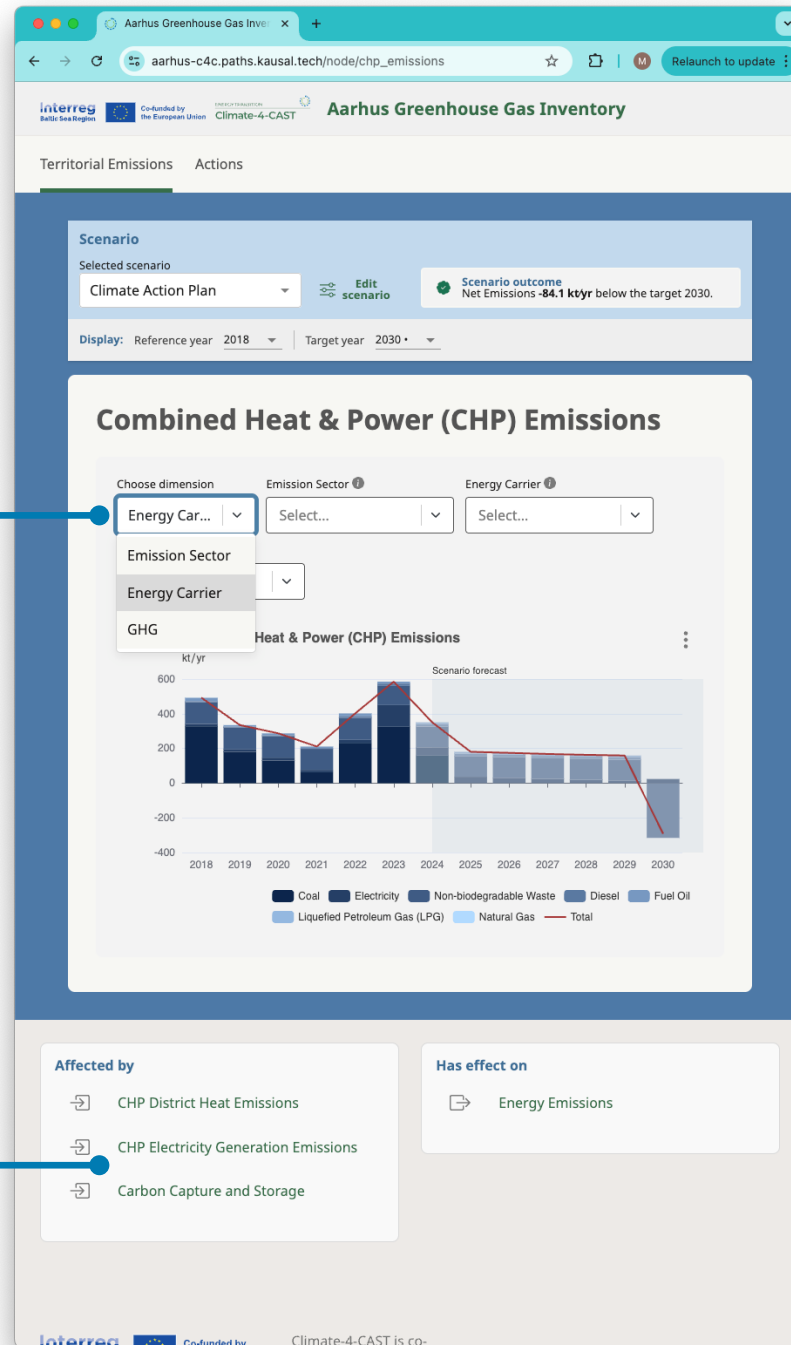
Include multiple outcomes of interest, user guide pages, etc. in the tool's header.



Details pages allow users to explore graphs in more detail.

Choose which attribute to visualize, and filter by other attributes.

Follow the causal chain - see which links in the chain directly affect this graph, and which links this graph affects in turn.



Depending on the data provided, the chain may lead back to activity data - energy consumed, kilometers driven, etc. - and emission factors.

The actions page lists all actions, with emissions reductions, net costs, and cost efficiencies.

Add descriptions, and link to detailed action impact calculations.

The screenshot shows a web browser window with the URL 'aarhus-c4c.paths.kausal.tech/actions'. The interface includes a scenario selection dropdown set to 'Climate Action Plan', an 'Edit scenario' button, and a 'Scenario outcome' box indicating 'Net Emissions -84.1 kt/yr below the target 2030'. Below this, there are filters for 'Impact on' (set to 'Cost Efficiency'), 'Type' (set to 'All'), 'Sort by' (set to 'Default'), and 'Sort direction'. A 'Showing 17 actions' indicator is present. A 'Show: List' dropdown is also visible. The main table lists 11 actions with columns for Type, Name, Included in scenario, Total impact 2018-2030, Annual impact 2030, Net cost 2018-2030, and Cost efficiency.

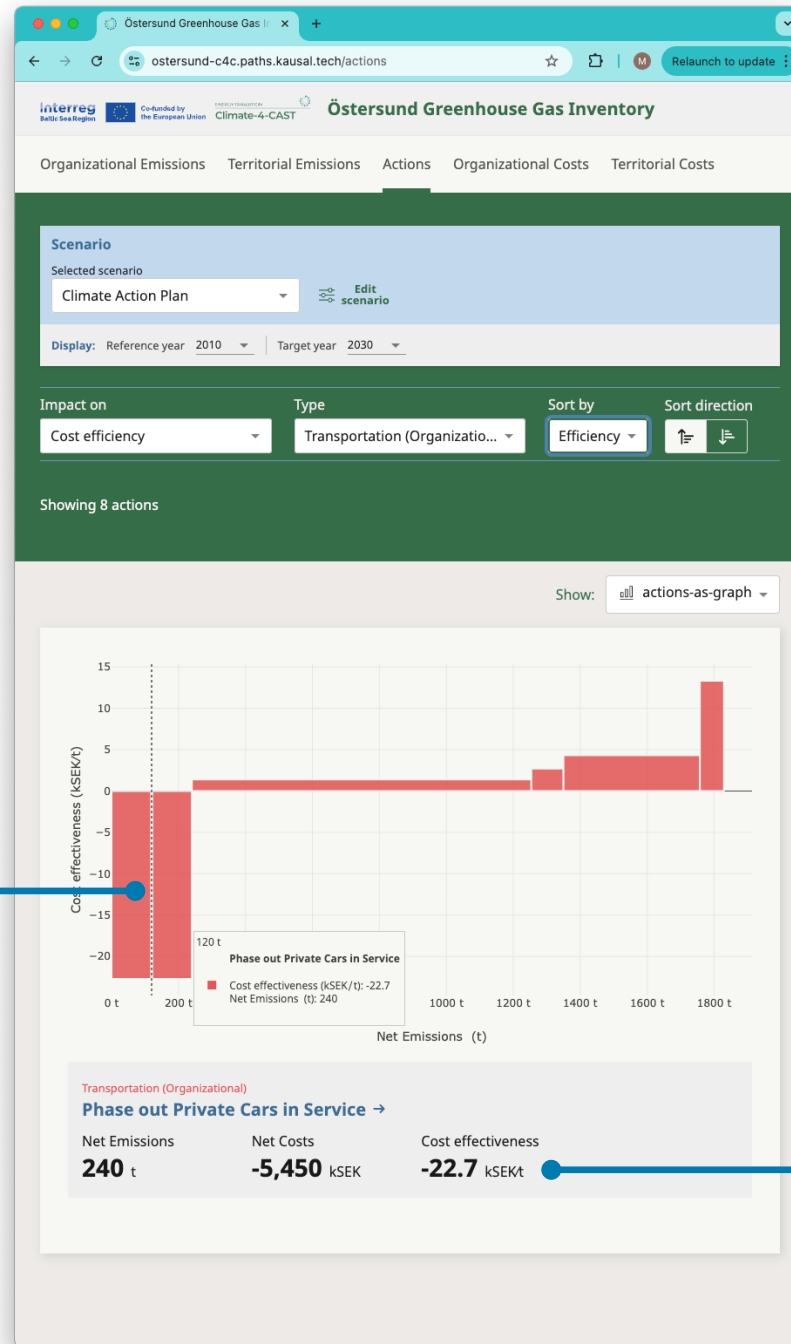
Type	Name	Included in scenario	Total im- pact 2018 - 2030	Annual impact 2030	Net cost 2018- 2030	Cost efficiency
Energy	Carbon Capture and Storage	<input checked="" type="checkbox"/>	-432 kt	-432 kt/yr	1,500,000 DKK	3.47 DKK/kt
Energy	Energy Efficiency Improvements	<input checked="" type="checkbox"/>	-5.46 kt	-5.46 kt/yr	5,000,000 DKK	916 DKK/kt
Energy	Energy Efficient Municipal Buildings	<input checked="" type="checkbox"/>	-1.79 kt	-1.79 kt/yr	7,500,000 DKK	4,180 DKK/kt
Energy	Expansion of Renewable Energy	<input checked="" type="checkbox"/>	-28.1 kt	-28.1 kt/yr	42,500,000 DKK	1,510 DKK/kt
Energy	Green District Heating of the Future	<input checked="" type="checkbox"/>	2.74 kt	2.74 kt/yr	6,000,000 DKK	2,190 DKK/kt
Energy	Sustainable Municipal Facilities	<input checked="" type="checkbox"/>	-1 kt	-1 kt/yr	4,500,000 DKK	4,500 DKK/kt
Energy	Zero-emission Municipal Machinery and Driving	<input checked="" type="checkbox"/>	-0.5 kt	-0.5 kt/yr	0 DKK	0 DKK/kt
Transportation	Green Mobility Plan	<input checked="" type="checkbox"/>	-109 kt	-109 kt/yr	0 DKK	0 DKK/kt
Transportation	Optimized and Emission Free Municipal Fleet	<input checked="" type="checkbox"/>	-1.5 kt	-1.5 kt/yr	4,500,000 DKK	3,000 DKK/kt
Transportation	Sustainable Air and Maritime Transport	<input checked="" type="checkbox"/>	-31.4 kt	-31.4 kt/yr	2,250,000 DKK	71.5 DKK/kt

Sort and filter the action list.

Cost efficiency indicates the price paid (in EUR, etc.) per tonne of CO₂e reduced. Negative values indicate savings per reduction.

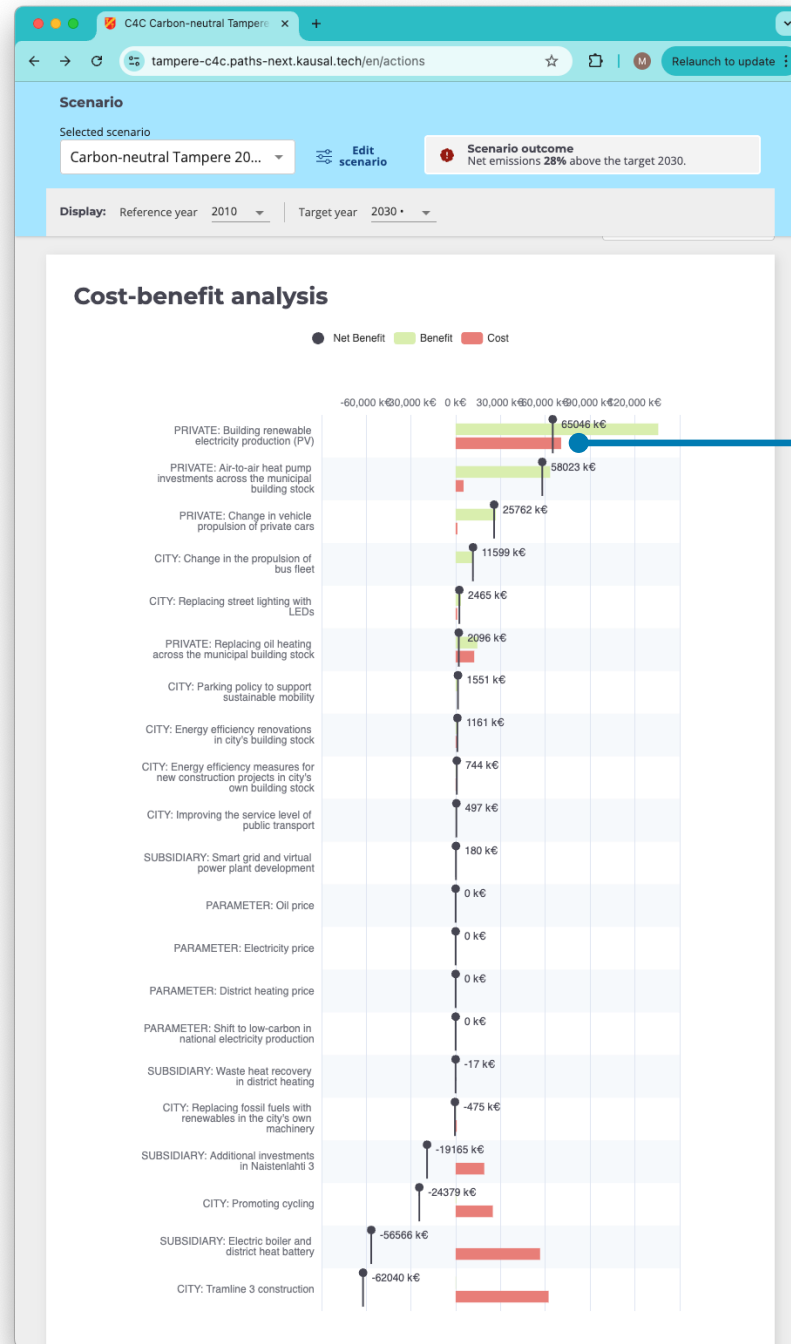
The cost efficiency (MAC) visualization shows the price paid per tonne of CO₂e reduced, versus the cumulative reduction.

Actions are more efficient as the action's bar is more negative, and more impactful as the bar is wider.



Negative values indicate savings. This action saves 23,000 SEK for every tonne of CO₂e reduced.

The cost-benefit visualization shows the financial costs and savings of each action.




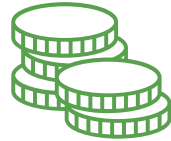

The black bars indicate the cumulative net benefit of each action - savings (in green) minus costs (in red).

Benefits can include operational savings, energy cost savings, and the shadow price of emissions reductions.

What's needed to use the CADS Tool?

Types of Data to Gather



- **Emissions-generating activities** within the city: electricity usage, vehicle mileage, ...
- **Emission factors**: greenhouse gases released per kWh, vehicle mile, ... 
- **Unit prices**: costs per kWh, vehicle mile, ... 
- **Action impacts**: activity or emissions reductions, investment costs, ... 

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Questions?

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