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LEVITATE
Policy Support Tool

Event: Levitate Final Review
Location: Brussels and Online
Date: 27/06/2022

LEVITATE has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 824361.

LEVITATE PST

- The LEVITATE PST is an **open access, web-based system** that provides access to results obtained by LEVITATE methodologies.
- The LEVITATE PST is the go-to, one-stop-shop for **decision support** on CCAM-related interventions. It is expected to be used by city authorities, transport planners and engineers, transport researchers and interested citizens and NGOs.
- Its detailed design takes into account the specific **needs of the key stakeholders** and provides access to related bibliography, project results, documentation of tools and methods, excerpts from CCAM guidelines, as well as a PST with forecasting, backcasting and CBA capabilities.

LEVITATE PST Components

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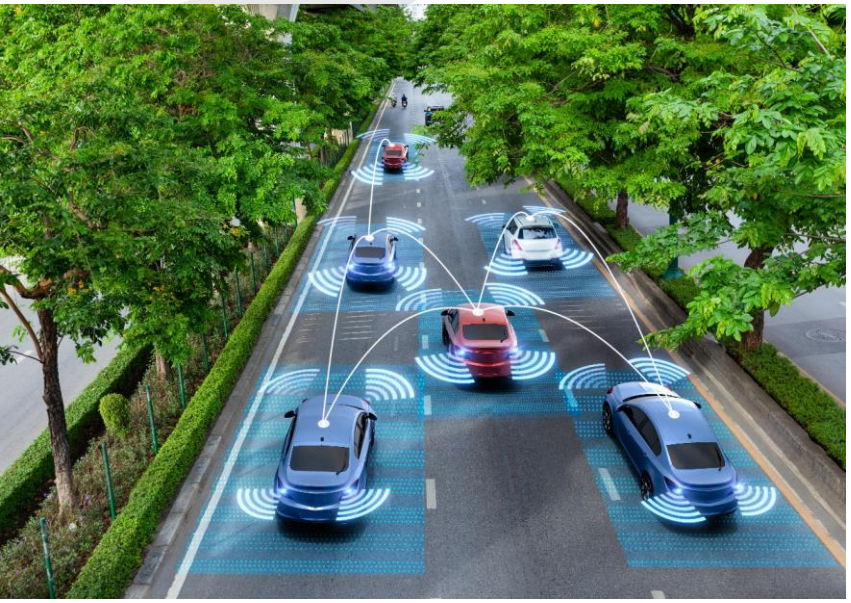
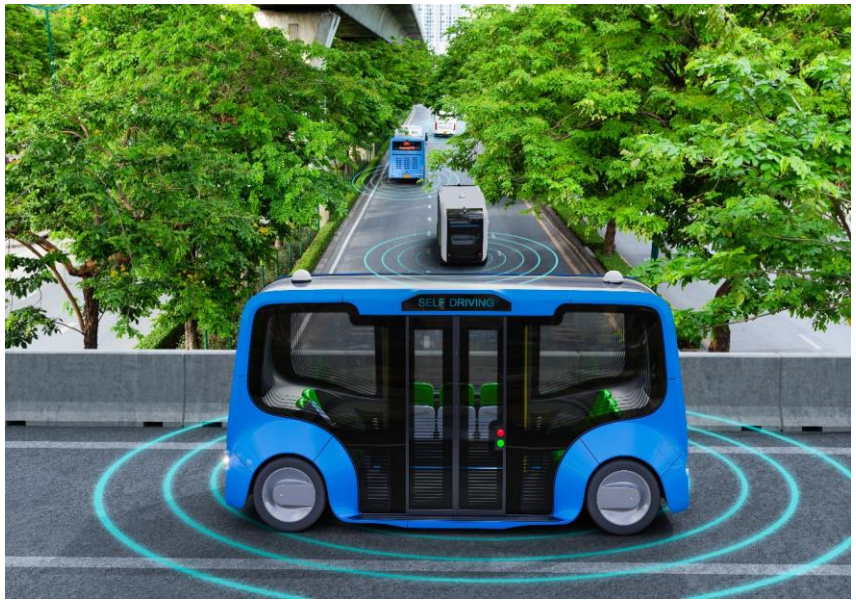
Use Cases

Three automation use cases are considered:

Passenger cars



Urban transport



Freight transport

as well as specific sub use-cases are investigated for each domain.

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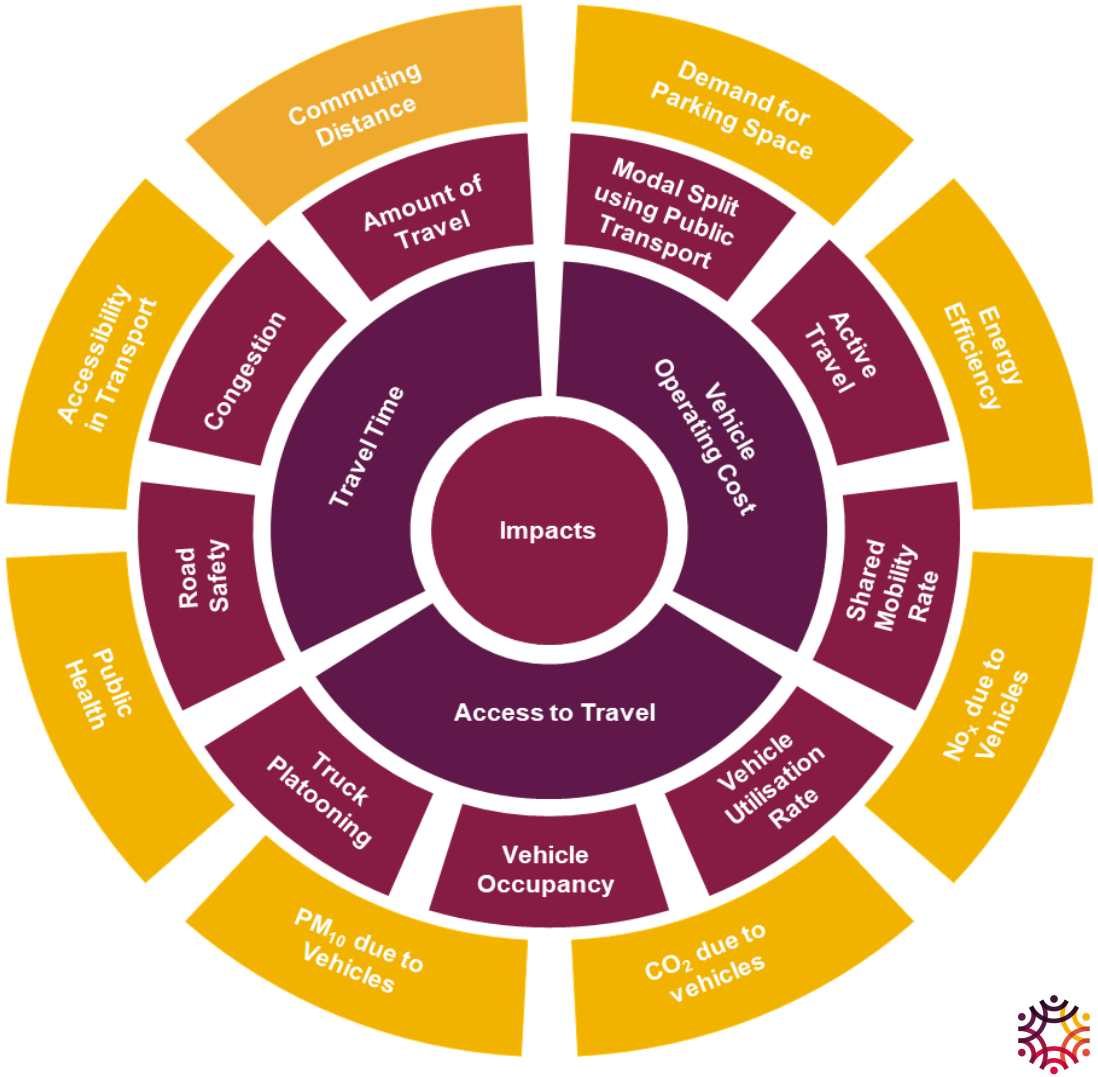
Dimensions of CCAM impacts

Twenty-three distinct impacts are examined, classified into three distinct categories:

- ❑ **Direct impacts (inner circle)**
- ❑ **Systemic impacts (middle circle)**
- ❑ **Wider impacts (outer circle)**

... as well as three road safety impacts: unmotorized VRU crash rates, motorized road crashes and total road safety effect.



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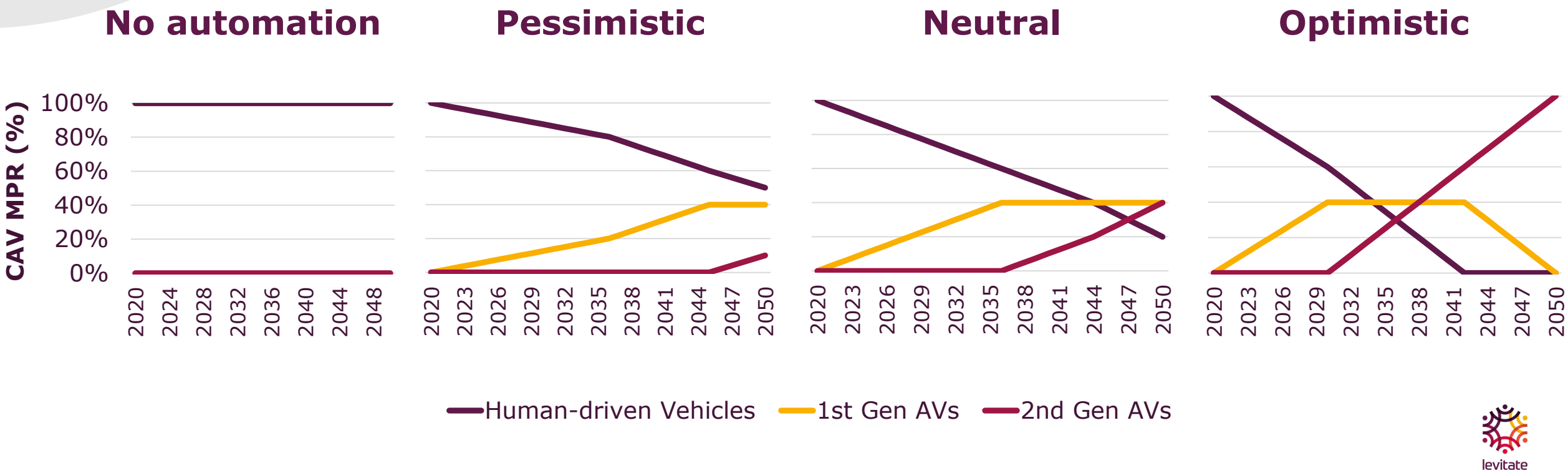
Base scenarios

Four predefined base scenarios are also established, concerning the temporal distribution of the market penetration rates (MPRs) of CAVs throughout the study period (from 2020 to 2050) and are the following:



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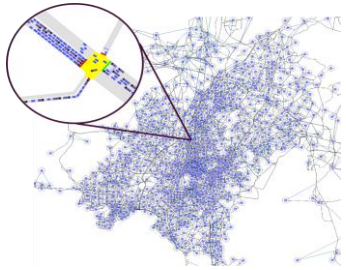
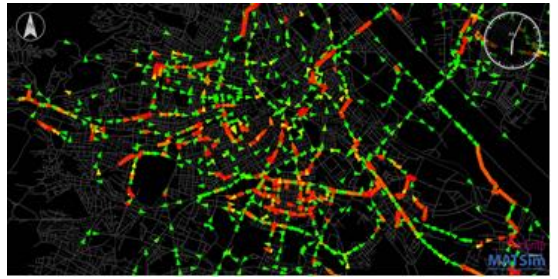
Impact assessment methodologies

Five different methods are used in order to provide and forecast the examined impacts, which are:

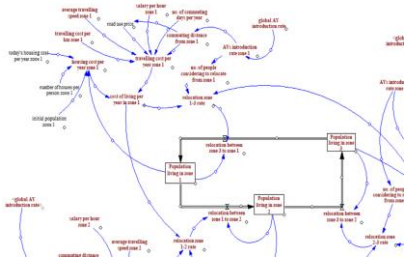
- **Microscopic simulation**



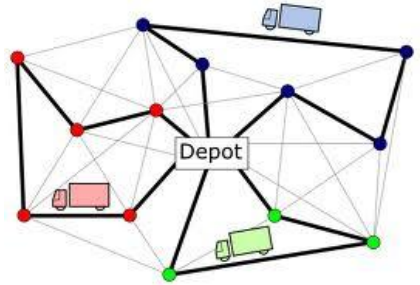
- **Mesoscopic simulation**



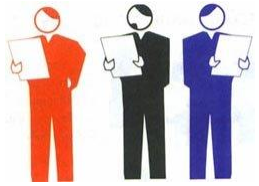
- **System dynamics**



- **Operations research**



- **Delphi method**



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Design of the Levitate Policy Support Tool

Overview of the LEVITATE PST

FORECASTING

The forecasting module provides quantified and/or monetized output on the expected impacts of automation and CCAM related policies, featuring customizability of parameter quantities.

BACKCASTING

The backcasting module enables users to identify the sequences of CCAM measures that are expected to result in their desired policy objectives and monetize their implementation.

KNOWLEDGE

The knowledge module contains the repository and recommendations of the LEVITATE project, including documentation of the project toolbox, results of the various methods, relevant literature from CCAM guidelines.

Forecasting

- The main purpose of the forecasting sub-system is to provide **quantitative estimates** to users about the future impacts of policy interventions.
- In the forecasting sub-system, the user is able to select a **policy intervention**, define the required **CCAM factors** and the module provides quantified and/or monetized output on the expected impacts.
- In the sub-system, the capability of an **intervention combination** is also made based on a methodological basis drawn from the Crash Modification Factor (CMF) approach highlighted in the Highway Safety Manual and the respective CMF clearinghouse repository of the US Federal Highway Administration.

Policy intervention combination

The following methods used for creation of Impact Modification Factors (IMFs) and their combinations in pairs drawing from the US FHWA HSM philosophy for CMFs

- **Additive method**: $IMF_c = 1-[(1-IMF_1) + (1-IMF_2)]$
- **Multiplicative method**: $IMF_c = IMF_1 * IMF_2$
- **Dominant effect method**: $IMF_c = min(IMF_1, IMF_2)$
- **Dominant common residuals method**: $IMF_c = (IMF_1 * IMF_2)^{min(IMF1, IMF2)}$
- **Amplificatory method (not existing in FWHA)**: $IMF_c = [IMF_1 * IMF_2]^2$

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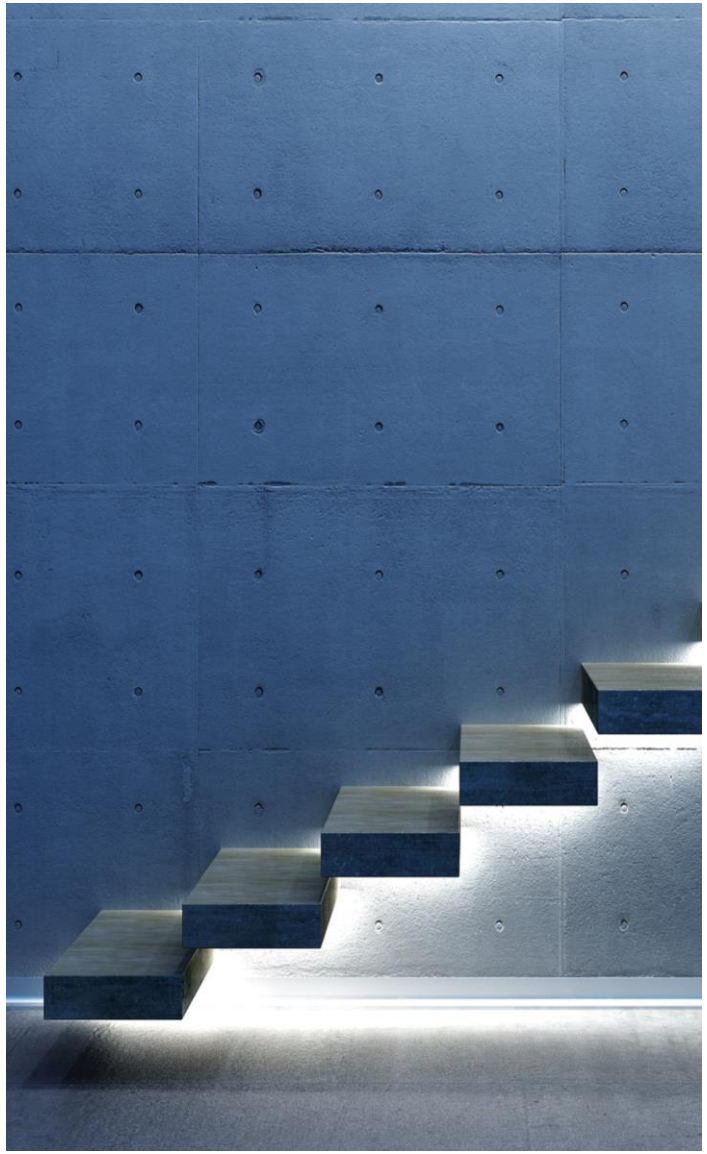
Steps of the forecasting analysis

1. Select one or two **policy interventions**
2. Select the CCAM **deployment scenario**
3. Define the **policy intensity and policy effectiveness** through the years 2020-2050
4. Adjust the **initial PST values** of the parameters and impacts
5. Provide input in terms of **temporal implementation of the measure**(s) for the system to take into account by adjusting the response curves of the impacts
6. Receive the **results**, in form of table with analytical results and curves presenting both results for the baseline scenario (no intervention) and for the selected policy intervention(s)

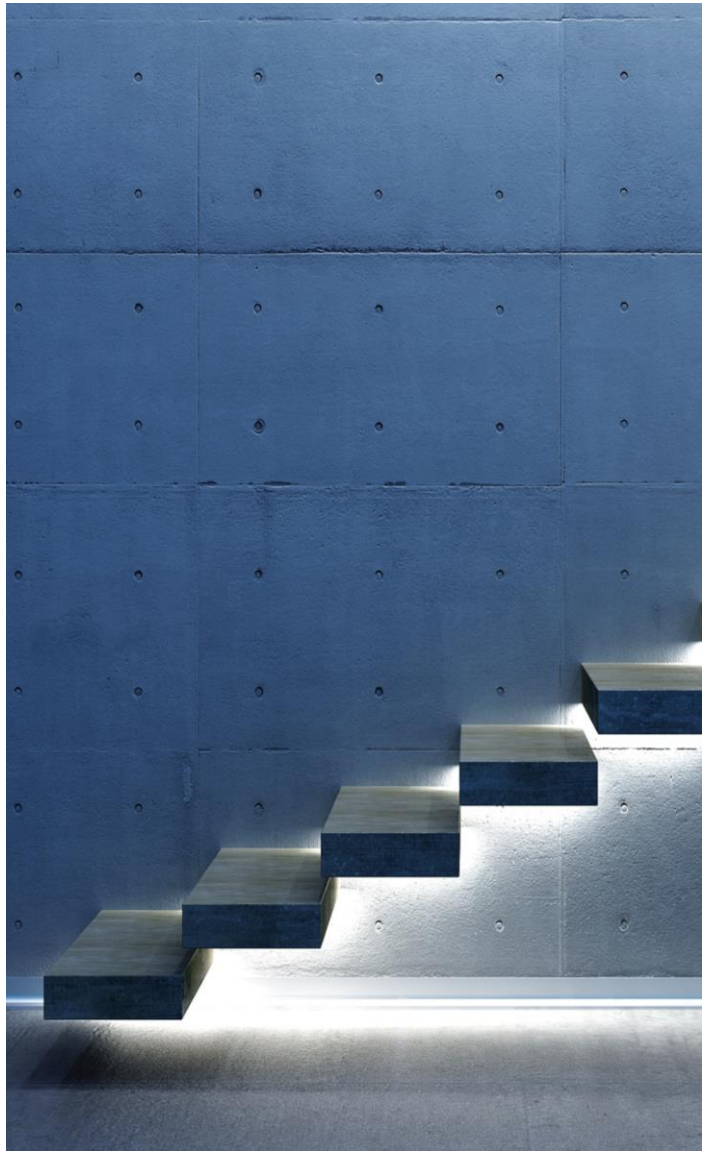


Backcasting

- The main purpose of the backasting sub-system is to provide a conclusion from a defined vision (set of policy goals) to **the most promising policy interventions**, given that all these relationships and impacts have been quantitatively assessed.
- A primary goal of the backasting sub-system is to **estimate the impacts of CCAM** for various impact dimensions.
- Coming from the opposite direction, a **strategic "vision"** of a city/region can also be broken down into quantified targets belonging to various dimensions in the backasting sub-system.

Steps of the backcasting analysis

1. Selection of **target year** between 2020-2050
2. Selection of CCAM **deployment scenario**
3. Definition of the **desired policy vision** described in terms of desired values in 1 (minimum) to 5 (maximum) impacts as well as the desired values for each of the selected impacts
4. Adjust the **initial PST values** of the parameters and impacts
5. Receive the **results**, in form of table where all policy interventions are presented with the characterization “true” or “false”, based on the potential to reach the desired policy vision



Knowledge

- The PST Knowledge module aims to provide a **searchable static repository** through fully detailed and flexible concise reports.
- The **concise reports** aim to inform the user in the most essential and summarizing way, offering the necessary information.
- The reports differ in the **documentation categories** that essentially are the contents of the module.

Documentation categories

Project-level documentation

Use case bibliography documentation

SUC-level documentation

Method-level documentation

Impact-level documentation

Case study documentation

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Test the LEVITATE PST hands-on!

The online PST can be found in the following link
https://www.ccam-impacts.eu/

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