



Modelling Sustainable and Resource Efficient Cities

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SURECITY

SUSTAINABLE AND RESOURCE EFFICIENT CITIES



Judenburg

Befolkning
Total: 9 191
Density:
700/km²

ALMADA



Almada

Befolkning
Total: 174 030
Density:
2,500/km²



City of Malmö

Malmö

Befolkning
Tot: 280 415
Density:
3,651/km²

Holistic simulation and optimization for smart cities

ERA-NET Co-fund SCC,

Total budget 1,7 M€ (Fund: 1.3 M€)

8 Partners from the EU (Project Leader: AIT)

April 2016 – March 2019



SURECITY

SUSTAINABLE AND RESOURCE EFFICIENT CITIES

Holistic simulation and optimization for smart cities.

SURECITY's overall purpose is to support the development of sustainable and resource-efficient cities.

SURECITY consists of researchers and experts with experience in national analysis that now will be applied locally.

SURECITY will support municipalities, authorities and citizens in identifying sustainable energy&transport strategies BY developing a city-level modelling framework.

The SURECITY modelling framework aims at facilitating the identification of cost-effective strategies and measures to reduce the municipality's CO₂-emissions without decreasing the ability to achieve other sustainability targets (e.g. air quality, external environmental impacts).

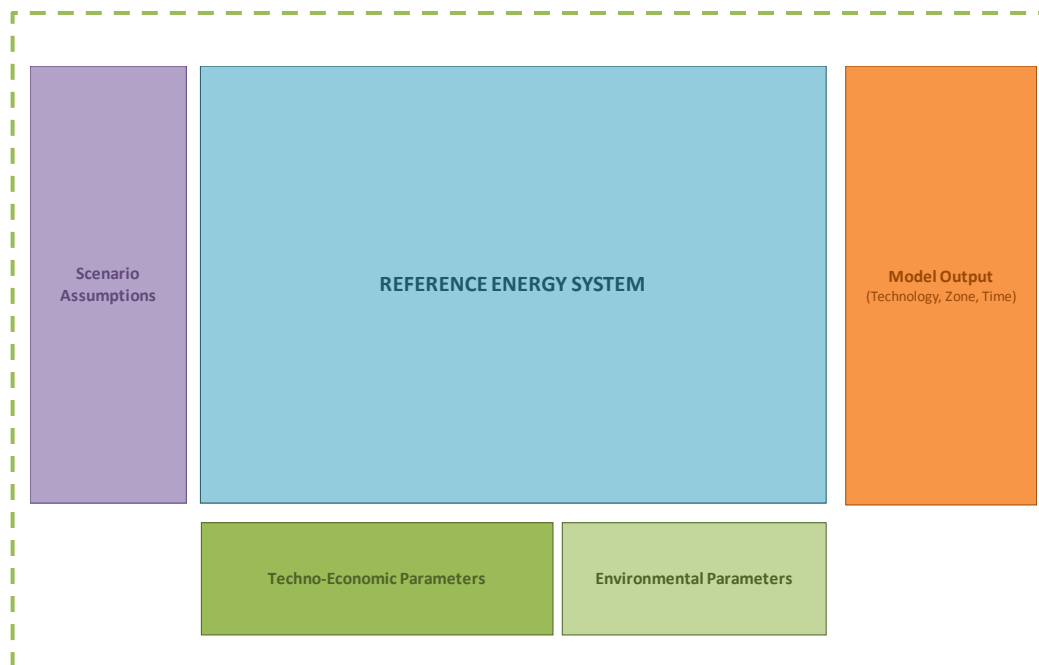
The SURECITY model tool will include various options for meeting future needs of energy related goods and services, such as heating/cooling of buildings and mobility services (including bicycles).

Model requirements

Identified in Stakeholder workshops

- What are the cities needs?
- What can the cities steer?
- What kind of environmental impacts should be included?
- What kind of indicators is useful for the cities?

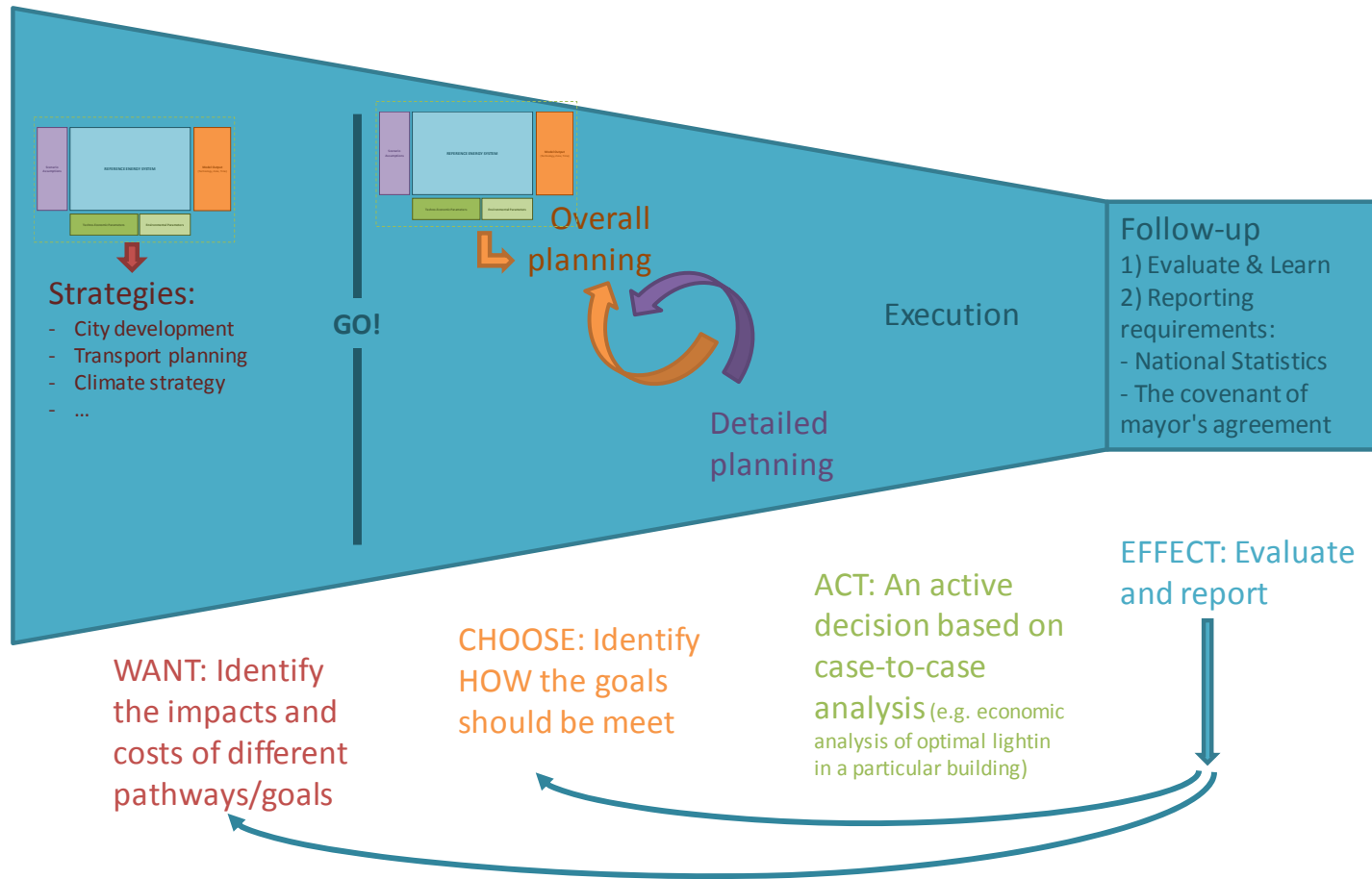
TIMESCITY_{model}



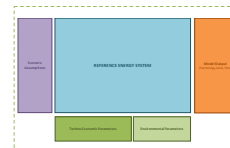
What should the model do?

WHAT ARE THE CITIES' NEEDS?

Want Choose Act Effect



TIMESCITYmodel



May support different steps in cities' planning

What should the model do?

WHAT CAN THE CITIES STEER?

What cities can 'control'/'steer'

Differ significant from a national perspective

- Direct: can steer the activities of the municipality.
HEATING/COOLING & TRANSPORTS
- Indirect: May steer the behaviour of citizens, private services/commercial and small industries.
TRANSPORTS!
- Difficult to steer large industries, and non-public energy companies (**PART of EU-ETS**).

What cities can 'control'/'steer'

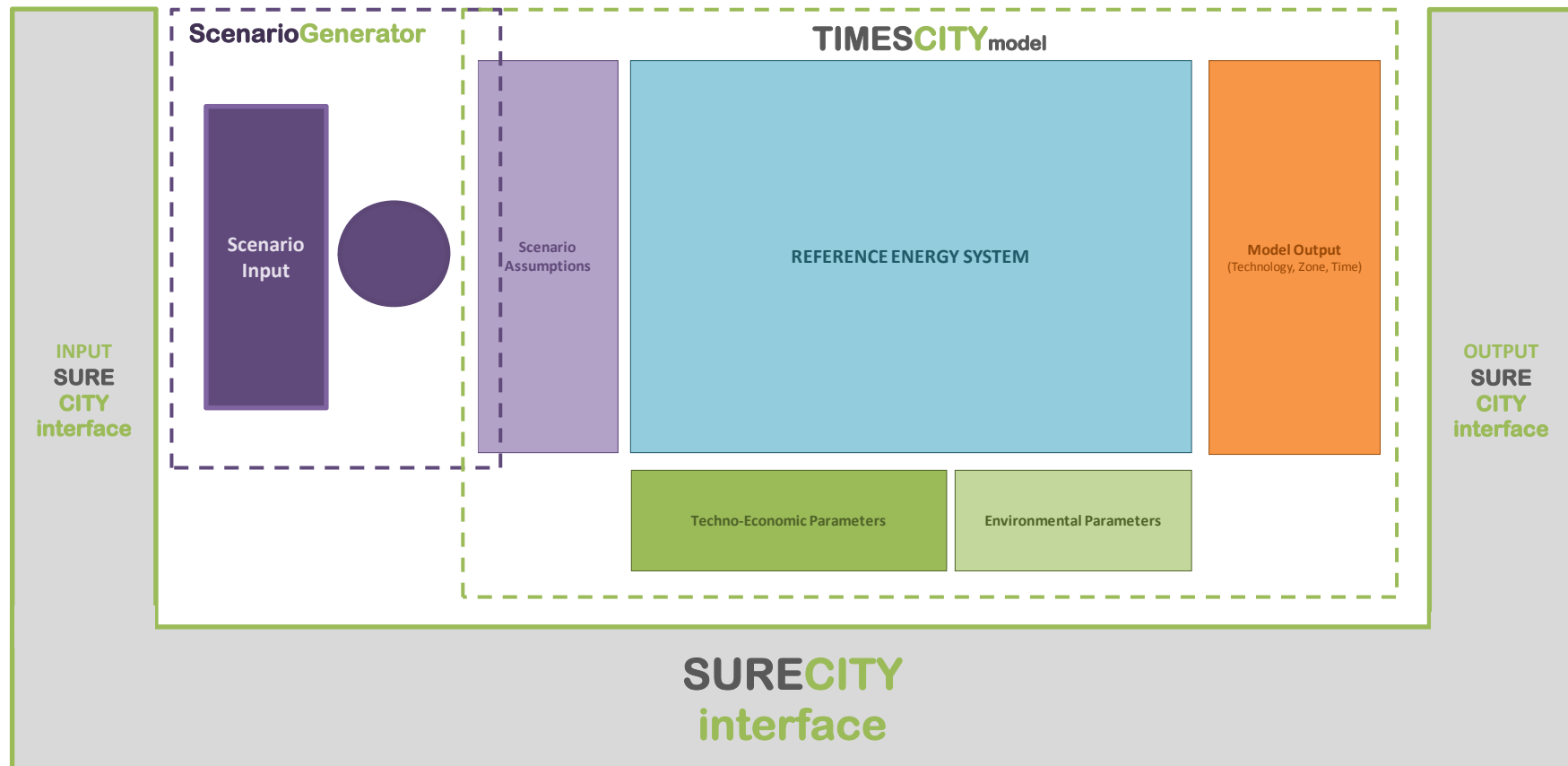
Differ significant from a national perspective

Environmental impact from Transports can be changed by:

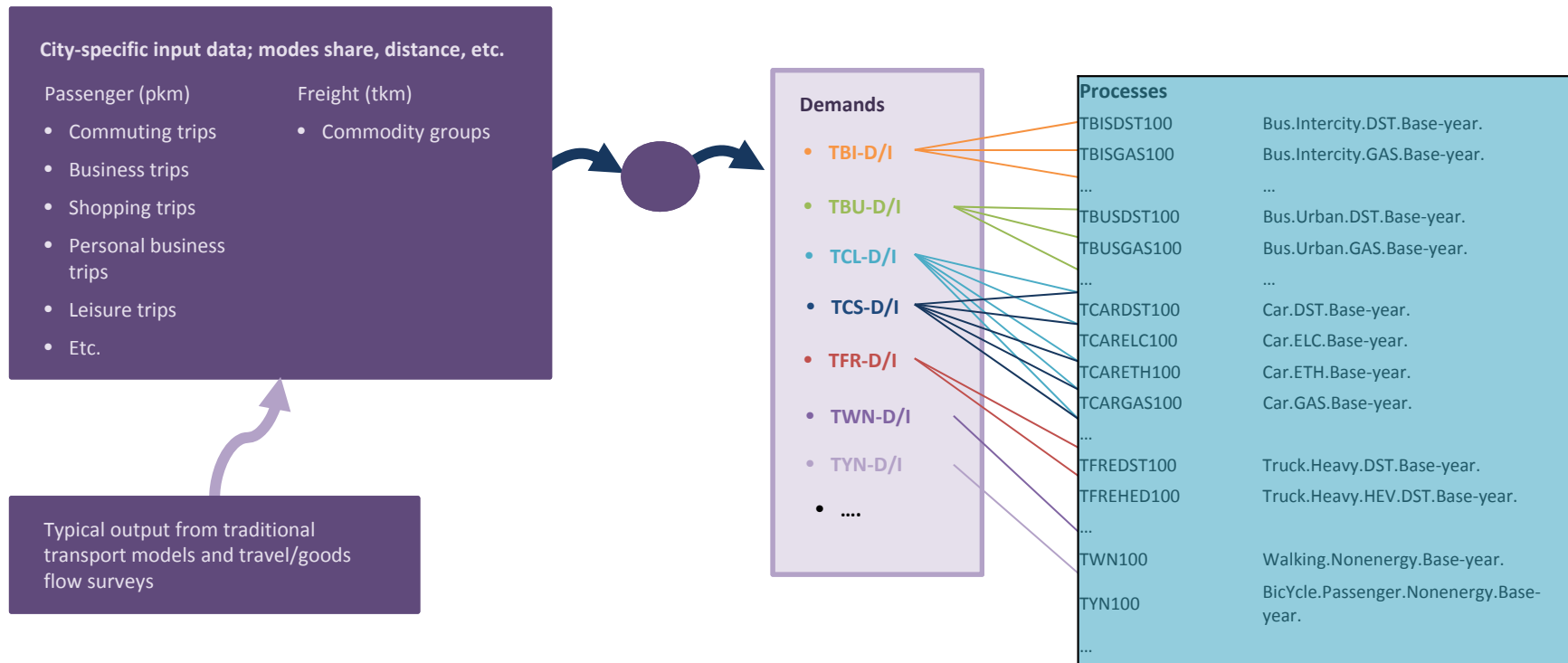
- Fuel switch (diesel -> biofuels)
- Technology switch (more efficient and/or electric)
- Behaviour change

TIMES models are good at assessing fuel and technology switch, but have difficulties to capture behaviour change. At the same time this is what the cities would like to 'assess'/'test'.

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Modelling transports in TIMES-City



What should the model do?

**WHAT KIND OF ENVIRONMENTAL
IMPACTS SHOULD BE INCLUDED?**

Environmental Impacts

WHICH and HOW

WHICH

- CO₂
- Air pollutants
- Land-use: But...
- Water-use: But ...
- Biodiversity(?)

HOW

- By “emission-factors” on activities/fuel-use
- By defining ‘footprints’ on imports/exports

(import to the city)

Import of Electricity

Technology	WD	WN	WP	RD	RN	RP	SD	SN	SP
National Mix											
European Mix											
Green Mix											
...											

Footprint	WD	WN	WP	RD	RN	RP	SD	SN	SP
National Mix											
European Mix											
Green Mix											
...											

Price/MWh	WD	WN	WP	RD	RN	RP	SD	SN	SP
National Mix											
European Mix											
Green Mix											
...											

Defined for each TS

Defined for each "Environmental Impact" and for each TS

Calculated using LCOE Defined for each TS

Import of Biofuels

The footprint will depend on:

Type of biofuel	Input	Process	Country
Ethanol	Straw	Fermentation	Sweden
Ethanol	Woody biomass	Fermentation	Sweden
...
DME
...
...
Methanol
...
...
(and several other biofuel options)

What should the model do?

**WHAT KIND OF INDICATORS IS
USEFUL FOR THE CITIES?**

To be finalized
We are here to learn

To be continued ...

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City of Malmö

