Cross sector integration from TSO perspective

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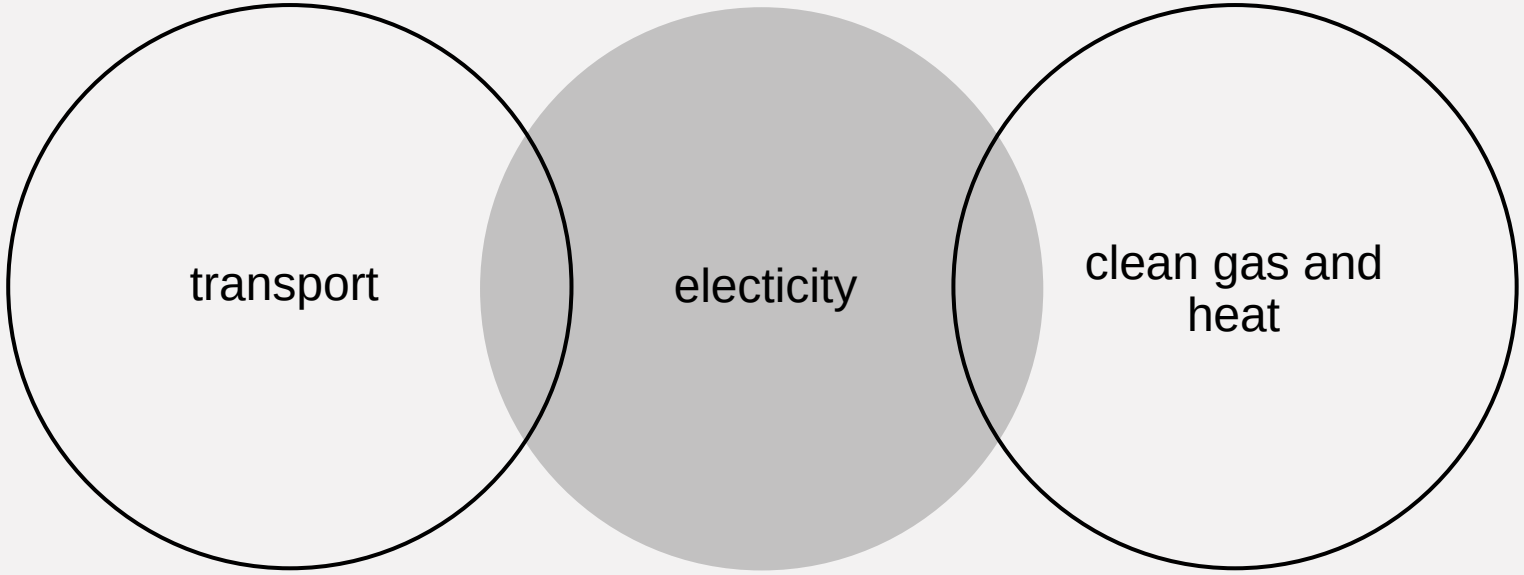
ELES

Cross Sector Integration

European Commission

EU strategy
for Cross Sector
Integration of the
energy system



- coordinated design and operation of the energy system
- active integration of the consumers

Cross Sector Integration

2050 | One system of integrated systems

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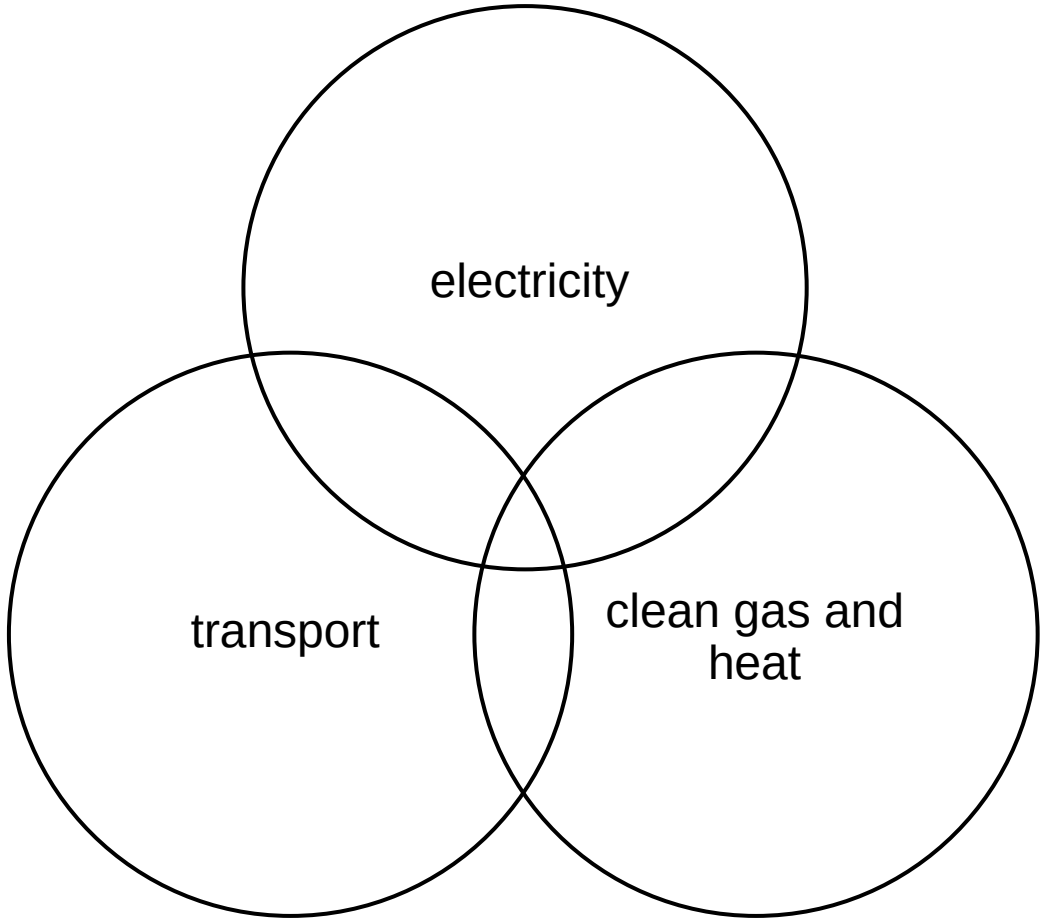
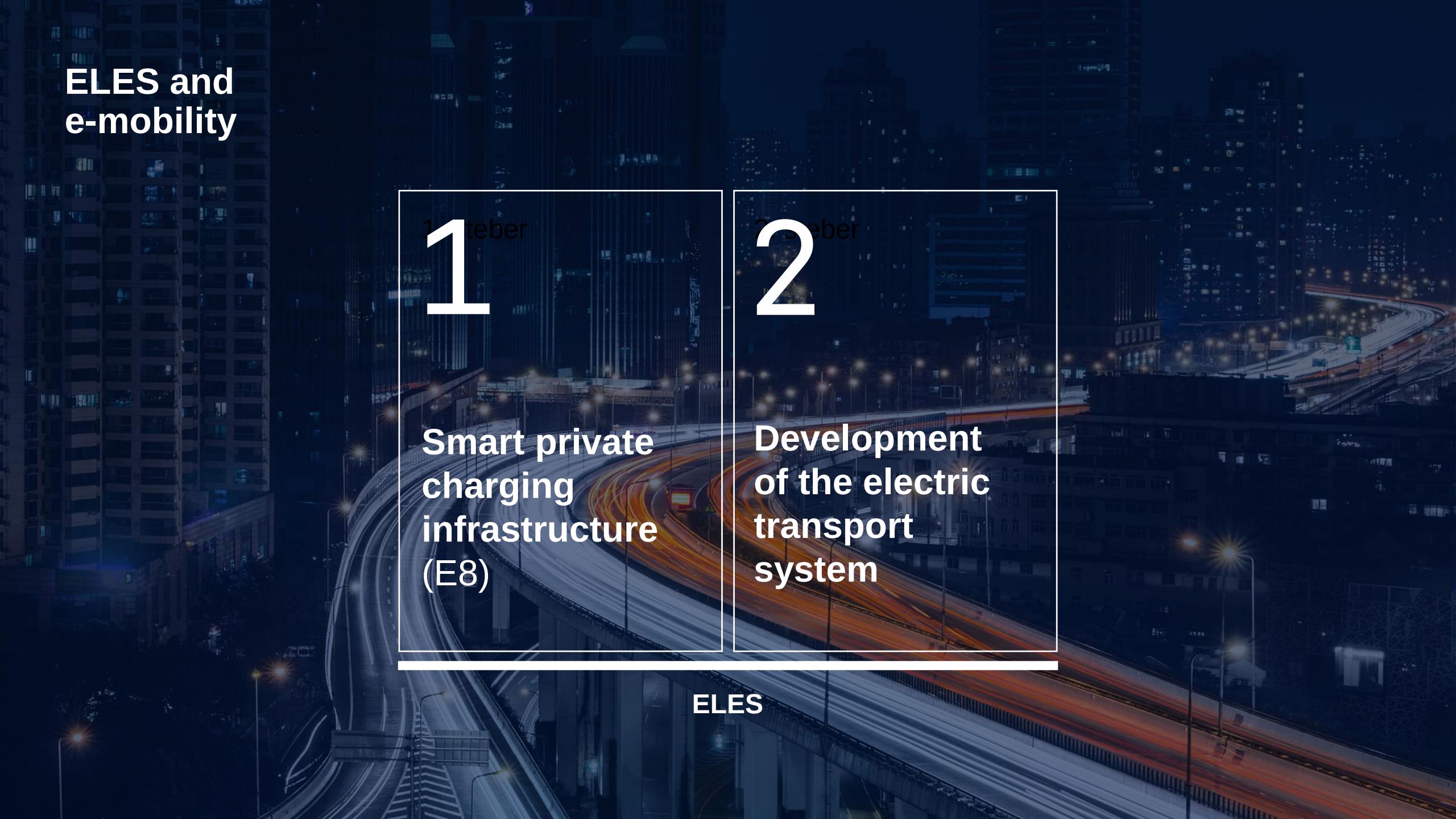


ELES and e-mobility



1

Smart private charging infrastructure (E8)

2

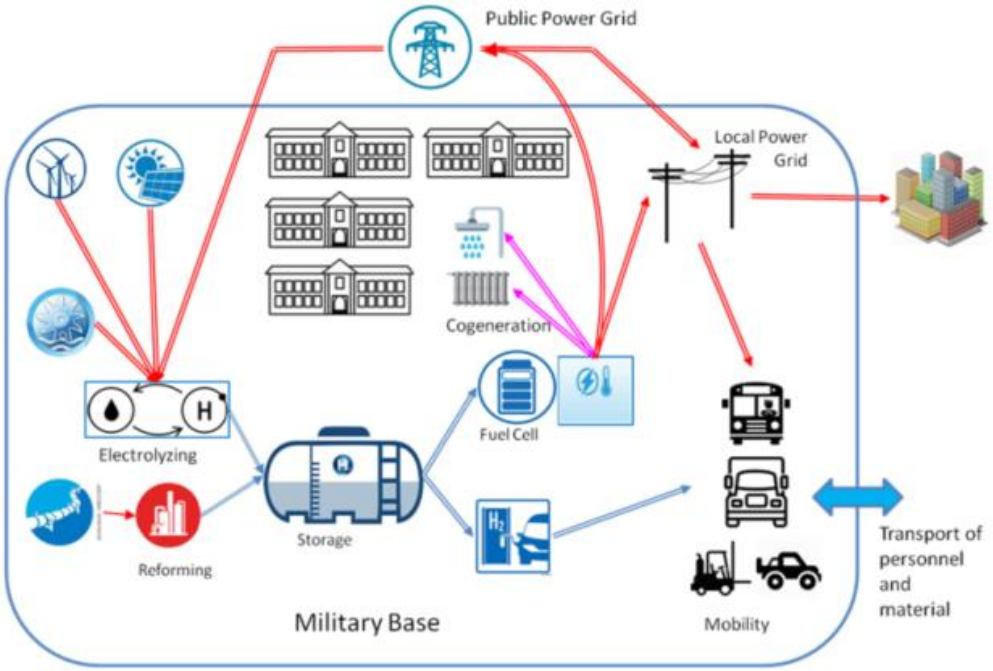
Development of the electric transport system

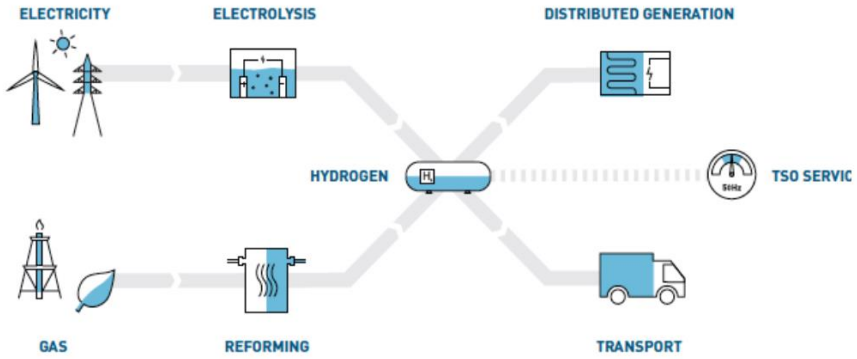
ELES

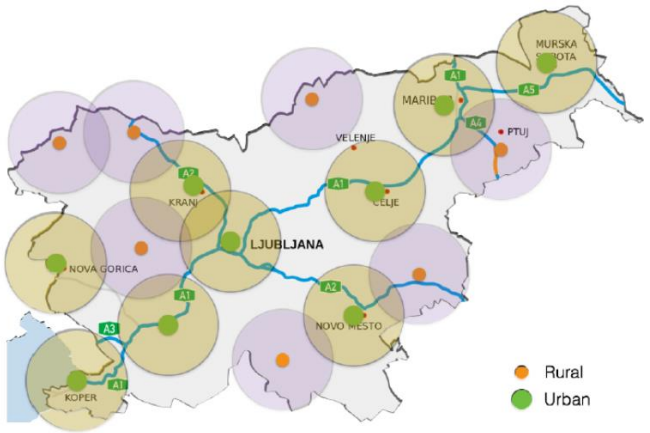
Clean gas – interests of ELES

- Flexibility from electrolysis
- Storage
- Resilience
- Congestion management (P2G)

Clean gas – interests of ELES







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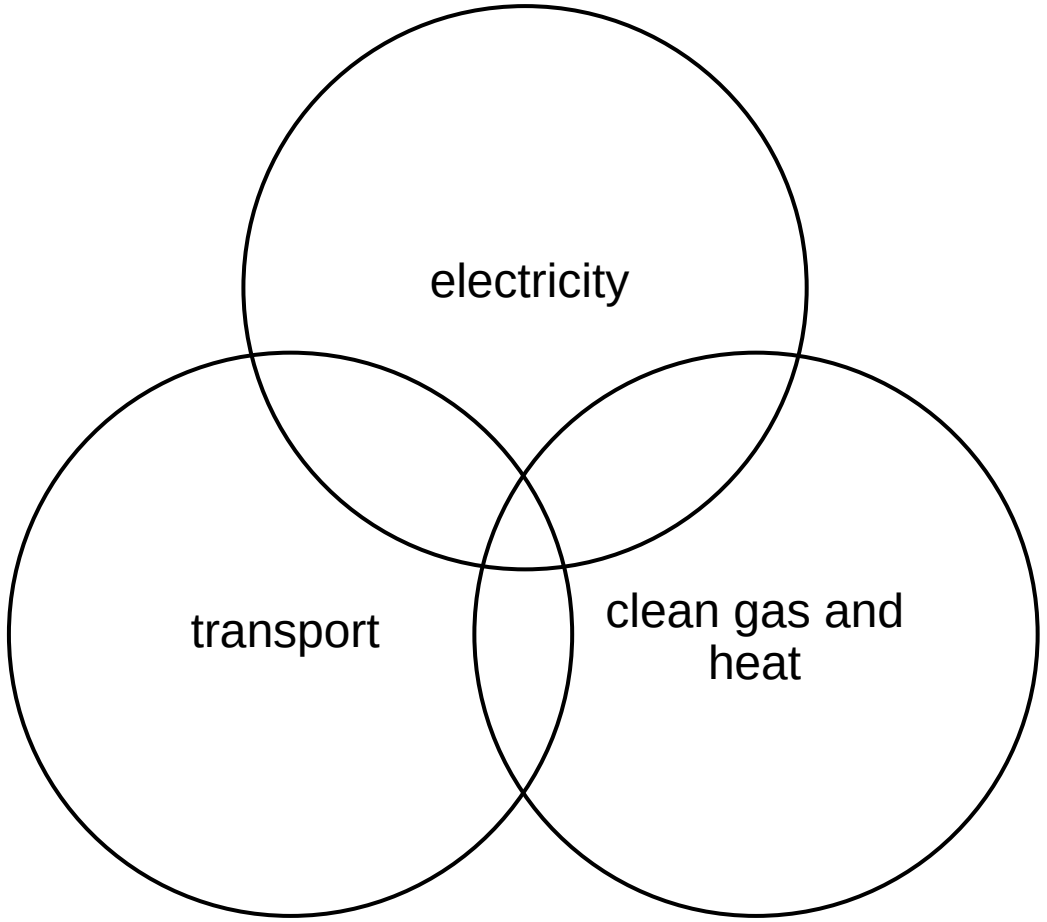

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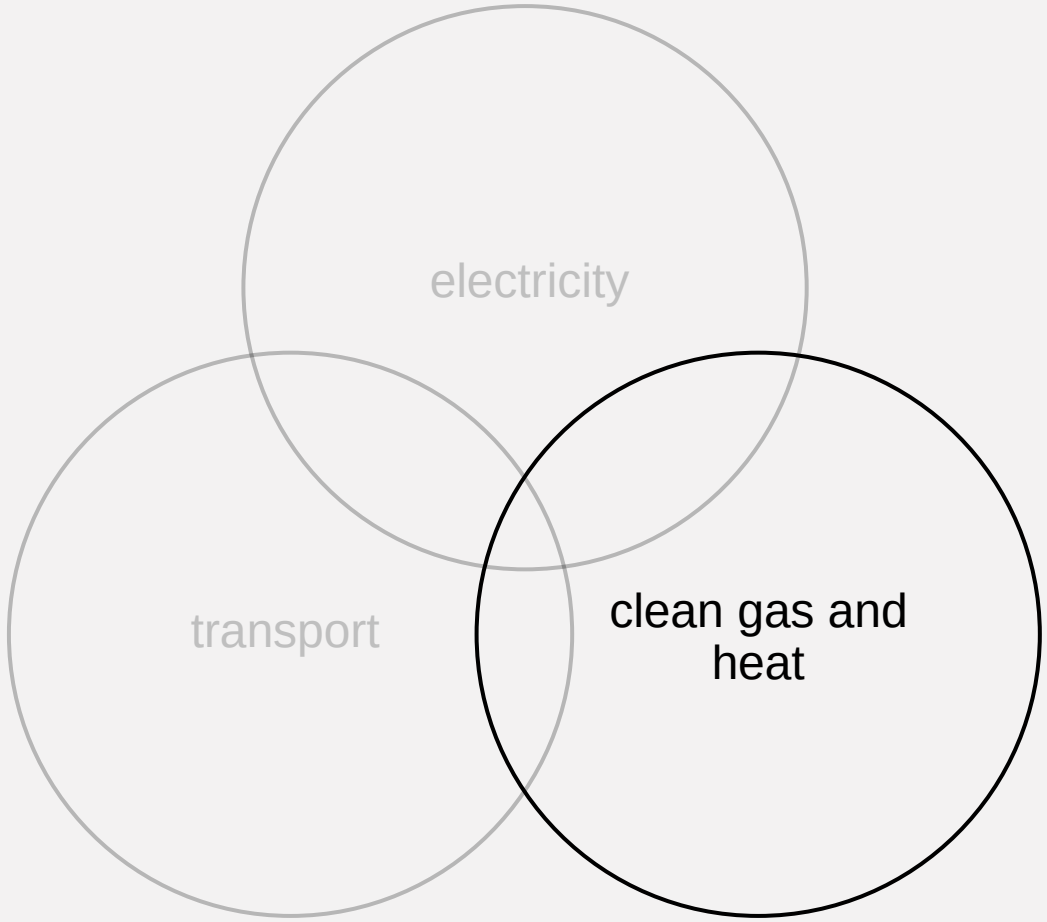


Use of the energy sources for heating
Current situation in Slovenia

Heat = 80 %
of the energy
for households

Energy demand for heating 2018 **Slovenia [GWh]**

Electricity
(GWh)

909

Gas
(GWh)

1.205

Wood
(GWh)

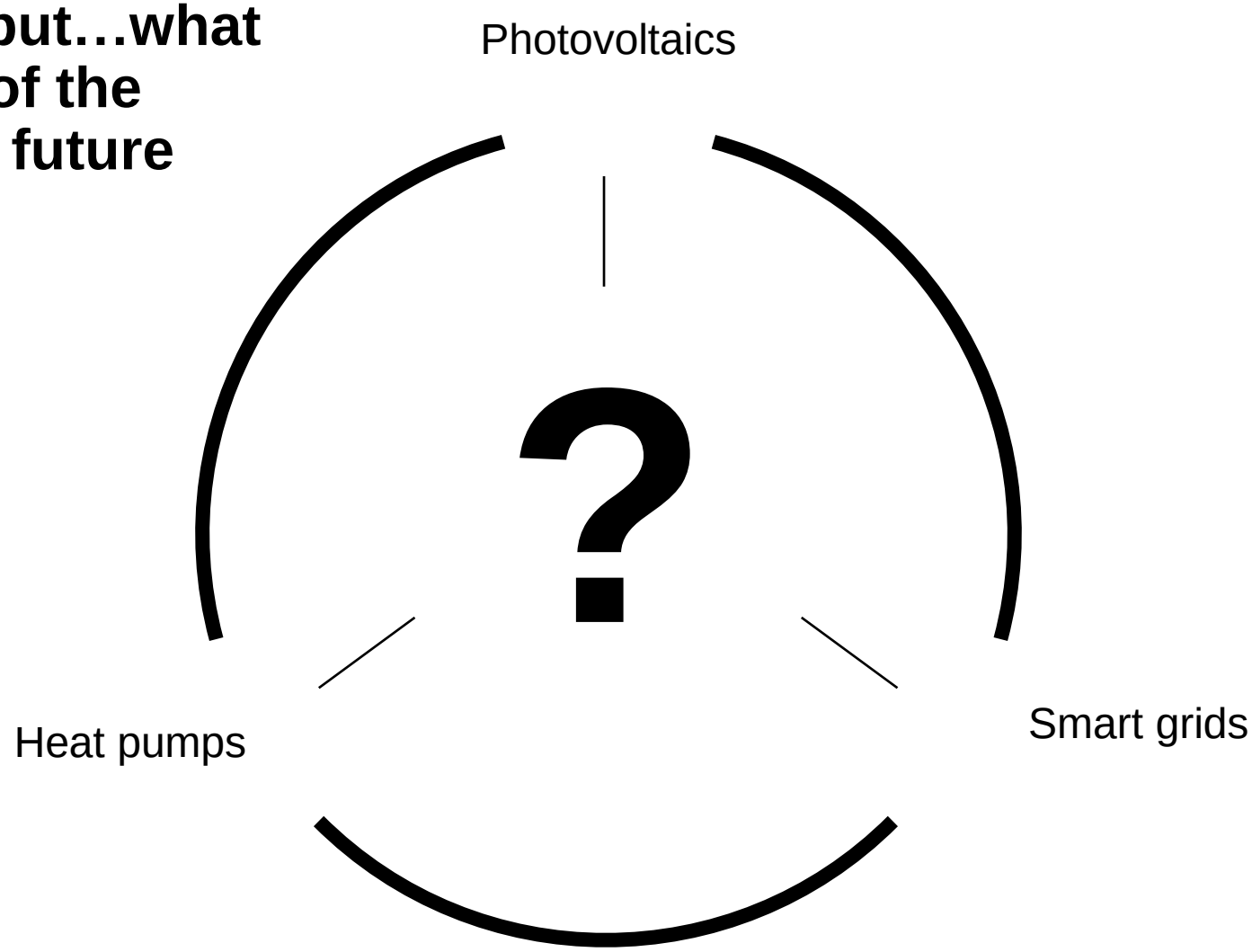
4.818

Oil
(GWh)

1.118

Source: SURS (2018)

Promotion of the heat pumps is great but…what about the <u>price</u> of the electricity in the future (2050)?



Technologies

Deep geothermal

Combination of geothermal and biomass reduces fuel price risks, and impacts on electric grid.

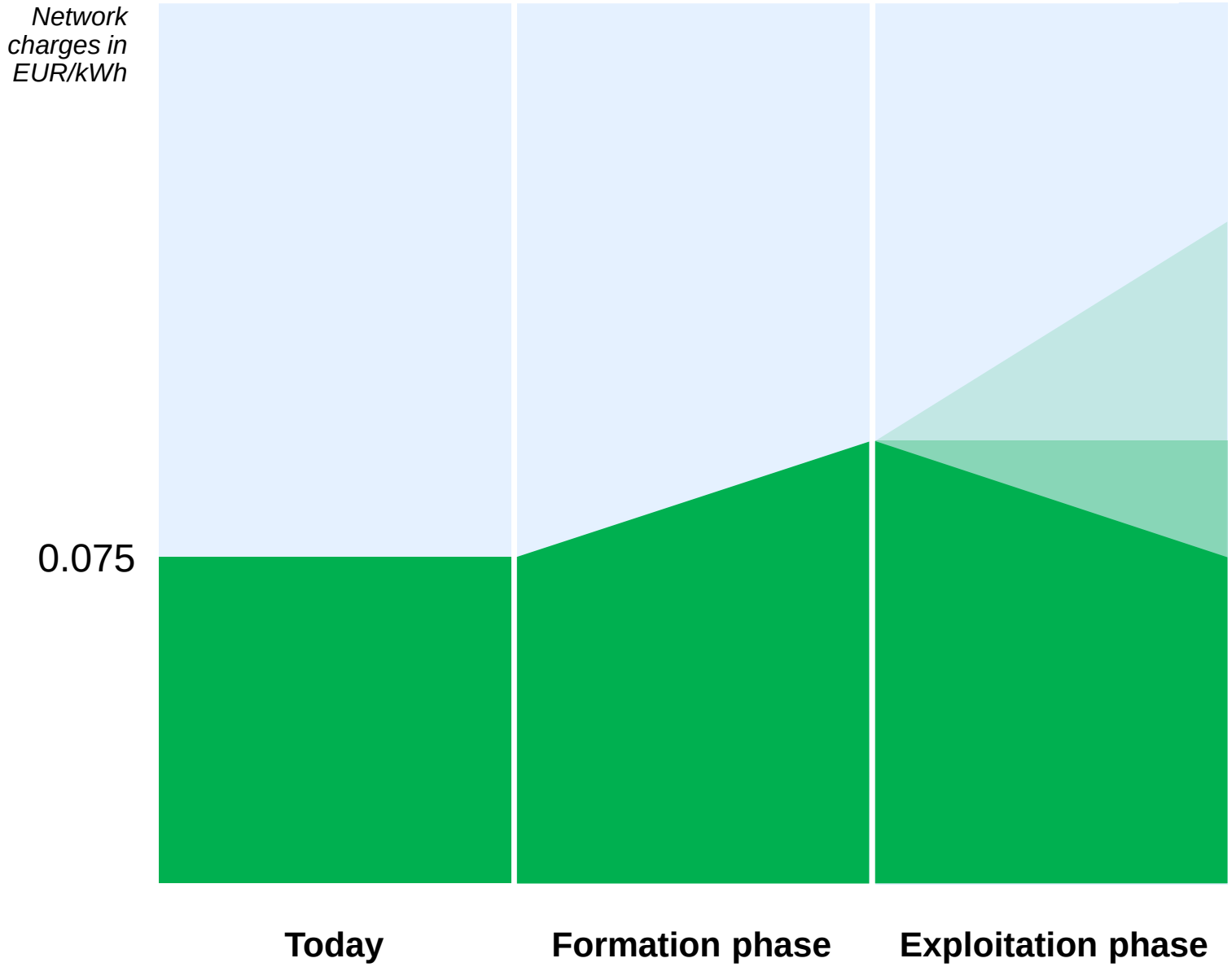
Biomass

Calculate required area to cover biomass consumption. Evaluate regional economic impact of biomass use

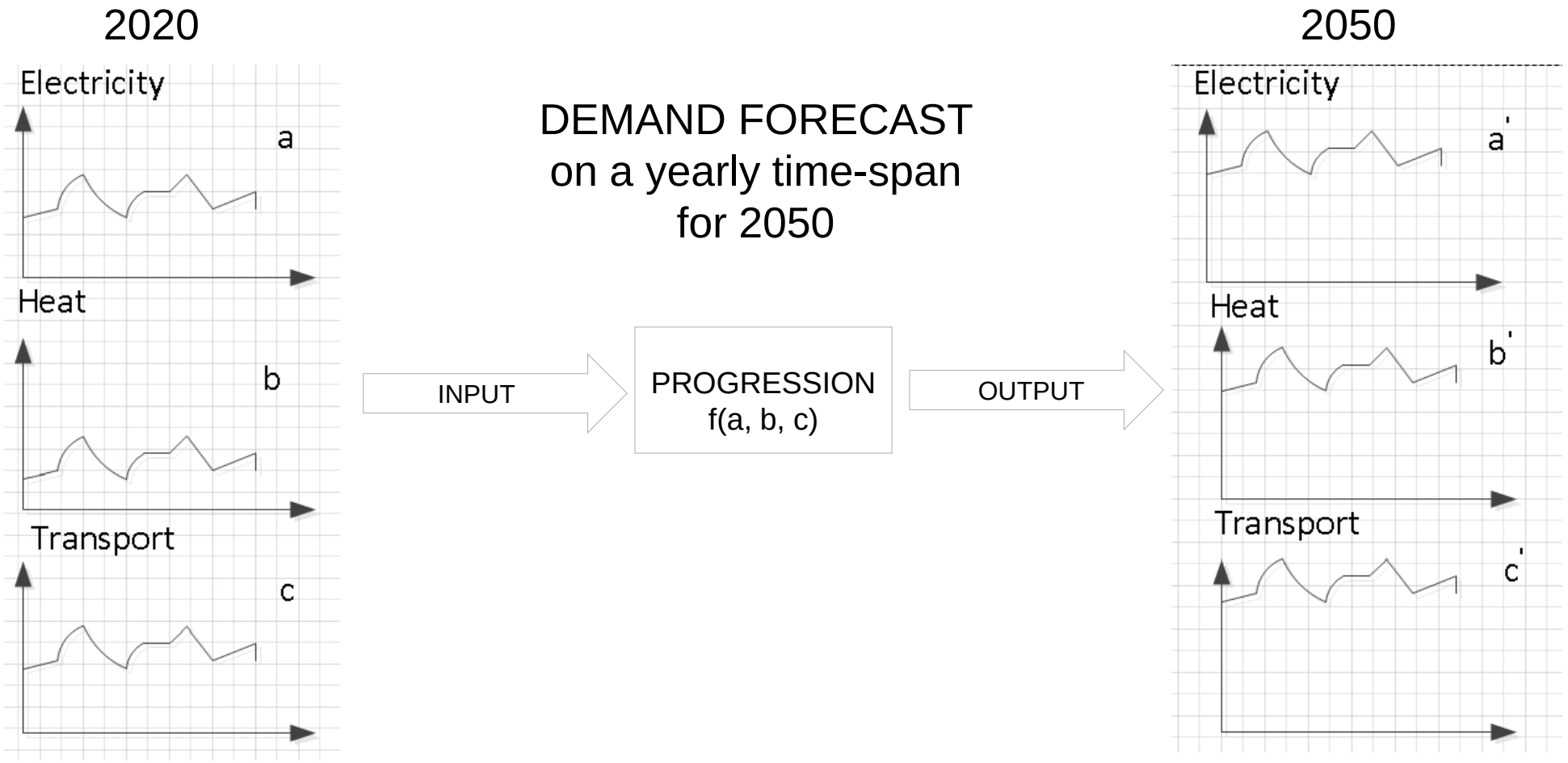
Solar thermal

The cleanest source that reduces overall fuel consumption and acts as hedge against energy price risks.

The cross-sector coupling will be the key to keeping the energy prices low in the long-run

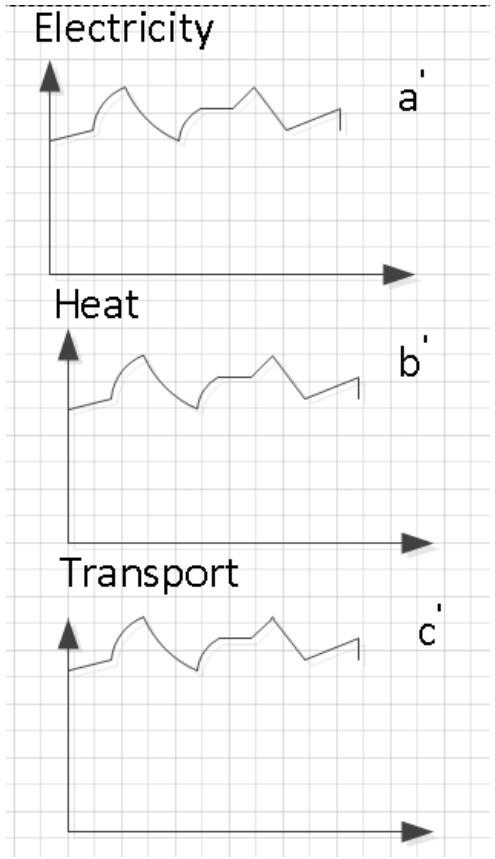


Joint development of **cross-sector digital twins**



Joint development of **cross-sector digital twins**

DEMAND 2050



DEMAND

INFRASTRUCTURE PLANNING
on a yearly time-span
FOR 2050

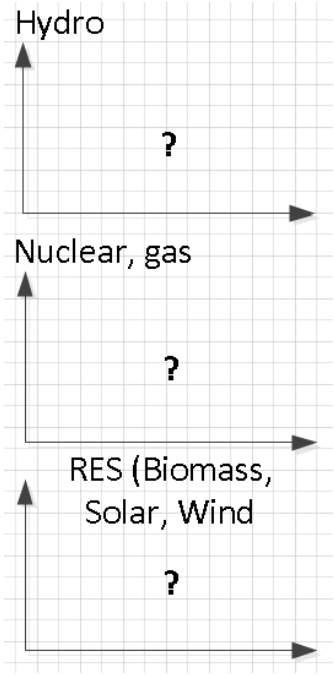
PROGRESSION

g(a, b, c)

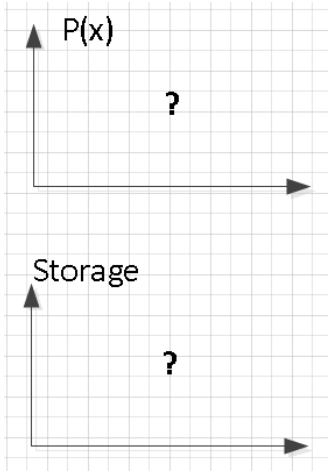
OPTIMIZATION

INFRASTRUCTURE

GENERATION 2050

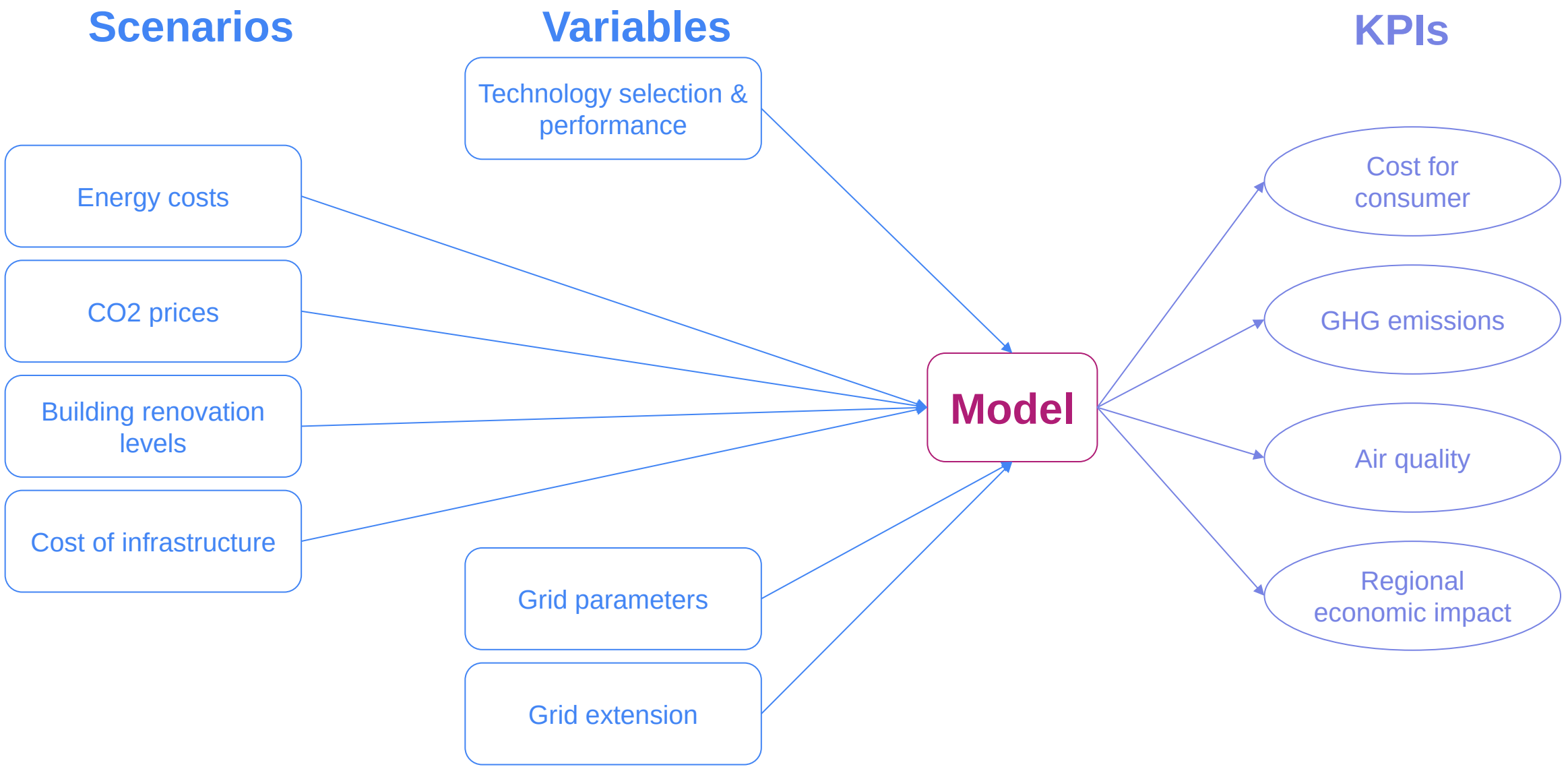


NETWORKS AND STORAGE 2050



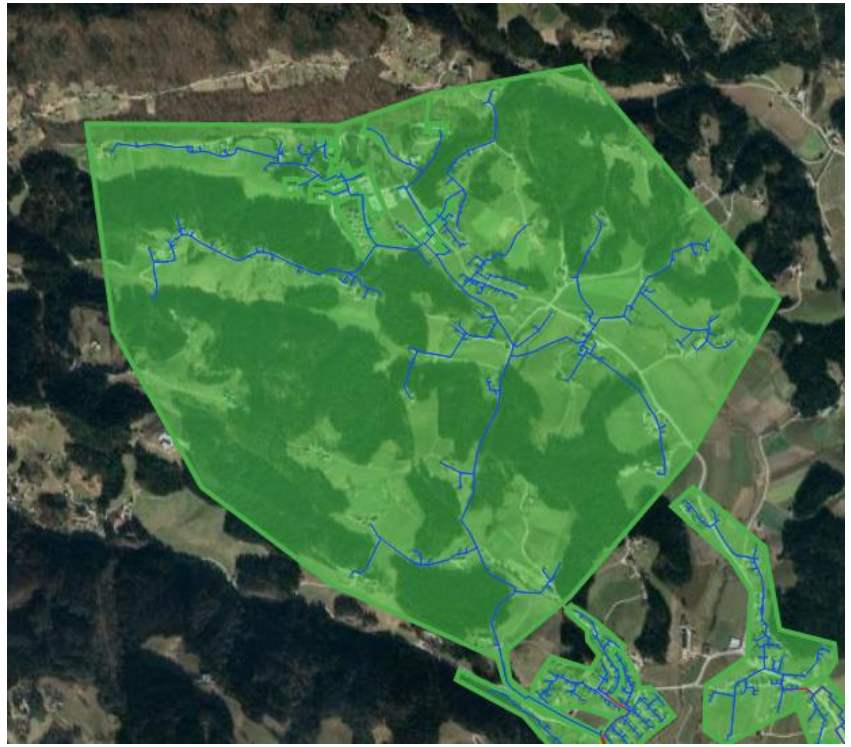
Purpose of modelling

1. Explore possible sustainable heating strategies in urban environments
2. Highlight technical, environmental, direct and indirect economic impacts of heating technologies


Scenarios
Variables
KPIs
Technology selection & performance
Energy costs
CO2 prices
Building renovation levels
Cost of infrastructure
Grid parameters
Grid extension
Model
Cost for consumer
GHG emissions
Air quality
Regional economic impact

Case study: Topolšica

Number of buildings	157
Yearly heat consumption	4.226 GWh
Length of district heating grid	16150* m
Thermal losses	27%
Generator capacity	cca. 2 MW
Solar collector field size	2100 m
Share of solar energy	20%



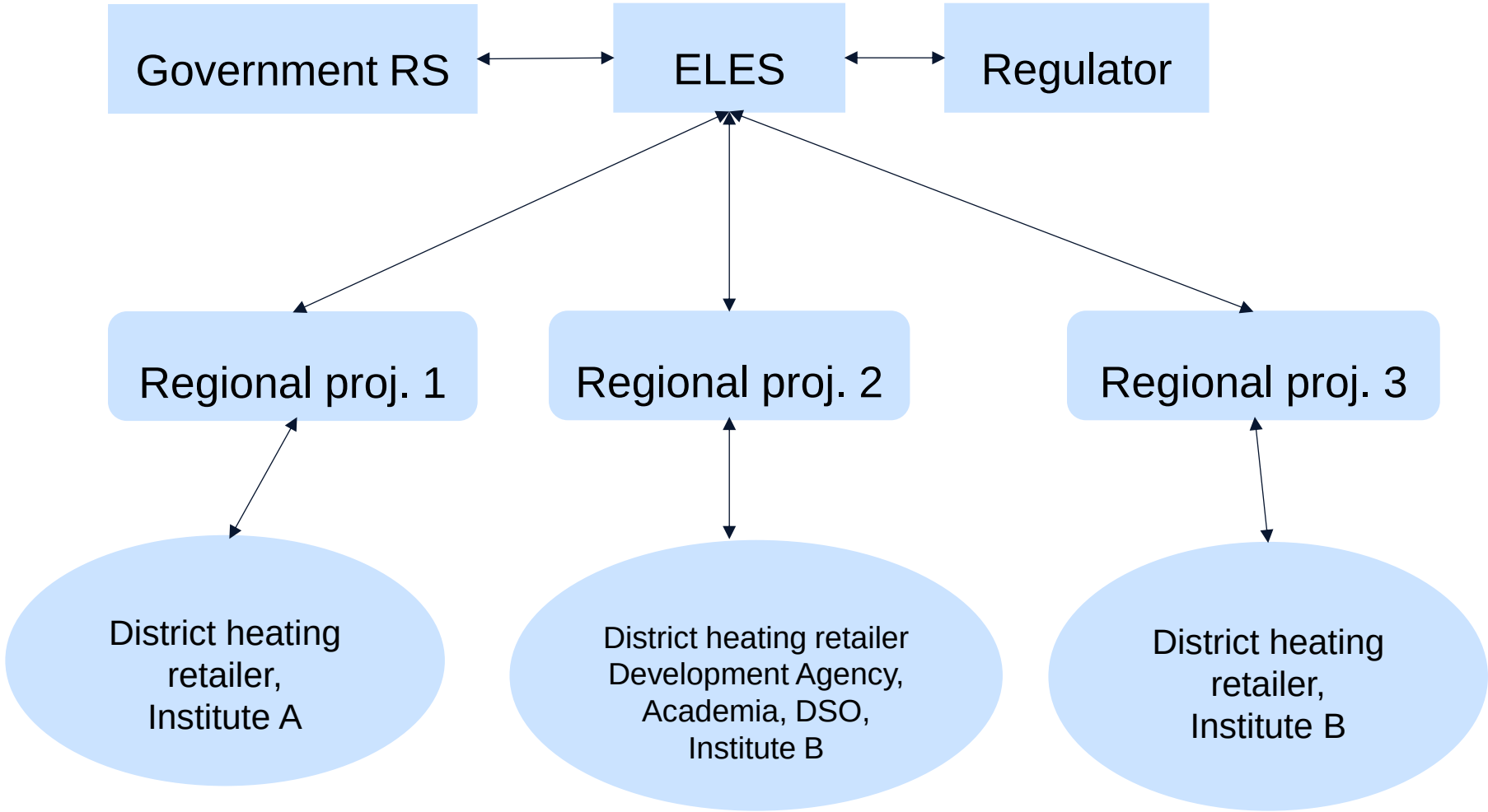
Net economic impact of heat supply

	CHP biomass				Heat pump			
Electric energy price [EUR/MWh]	**50**	**100**	**150**	**200**	**50**	**100**	**150**	**200**
LCOH [EUR/MWh]	157	140	122	105	77	91	105	119
Added value [kEUR/GWh]	163	222	256	340	93	59	13	-49
Earnings [kEUR/GWh]	51	63	68	85	15	8	0	-11
Jobs	5	6	6	7	1	0	0	-1

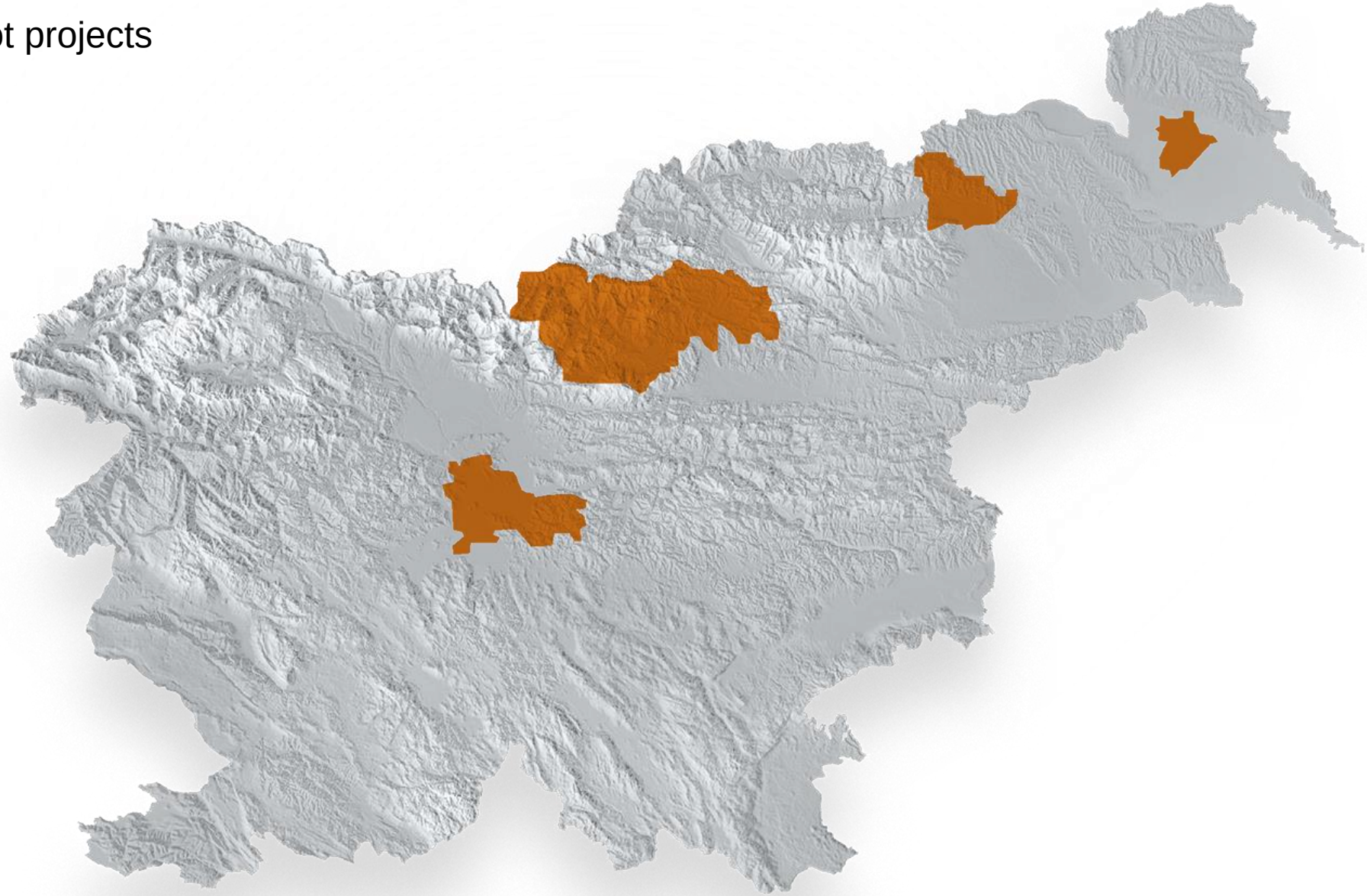
Each GWh generated with biomass:

- ➢ contributes 222.000 EUR to GDP
- ➢ increases profits by 63.000 EUR
- ➢ generates 6 jobs.

Cross sector projects – bottom up approach



3 regions for pilot projects



Thank you.