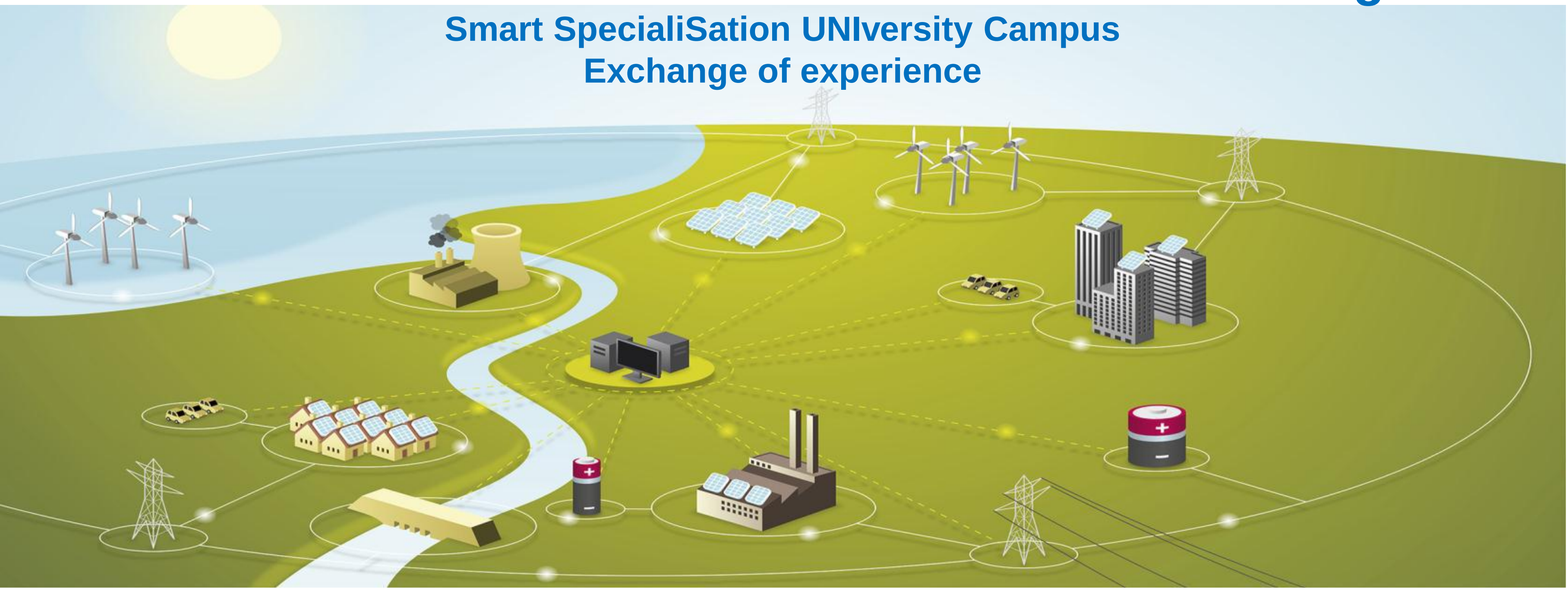
Local added value from international networking

Smart SpecialiSation UNIversity Campus
Exchange of experience



Matteo Mazzolini
Director
Energy Management Agency of Friuli Venezia Giulia

INTERNATIONAL COOPERATION

APE FVG participates actively in international networks since this approach allows to discover and transfer the best ideas, instruments and initiatives already in place in other European Countries, avoiding to reinvent the wheel many times…

In this process, a lot of know-how and synergies come along with best practices as a european added value.

Best practices from international cooperation projects:

CE-HEAT → **Comprehensive model of waste heat utilization in CE regions (2016 → 2019)**
OBJ: waste heat recovery
BP: waste heat potential map + DSS to facilitate investments + Regional strategy to exploit WH

PROSPECT2030 → **PROmoting regional Sustainable Policies on Energy and Climate change mitigation Towards 2030 (2019 → 2021)**
OBJ: Smart Specialization Strategy (S3) enabling European Structural Funds to make the best out of sustainable energy transition
BP: Regional Energy Action Plan + Energy transition scenarios + Indications for EFRD and ESF

CITYCIRCLE → **Circular economy hubs in peripheral urban centres in Central Europe (2019 → 2022)**
OBJ: developing and support first circular economy loops in small urban contexts
BP: industrial symbosis pilot project to recover WH and use it in a DHCN

TUNE → **Energy skills without borders (2016 → 2019)**
OBJ: crossborder harmonization of KPI and benchmarks for Municipalities in the energy sector
BP: common set of indicators and benchmarks from data of local energy cadastres

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Interreg CENTRAL EUROPE
European Union European Regional Development Fund
CE-HEAT

S3UNICA
Interreg Europe

BEST PRACTICE N.1

CE-HEAT PROJECT
www.waste-heat.eu

TOOLS

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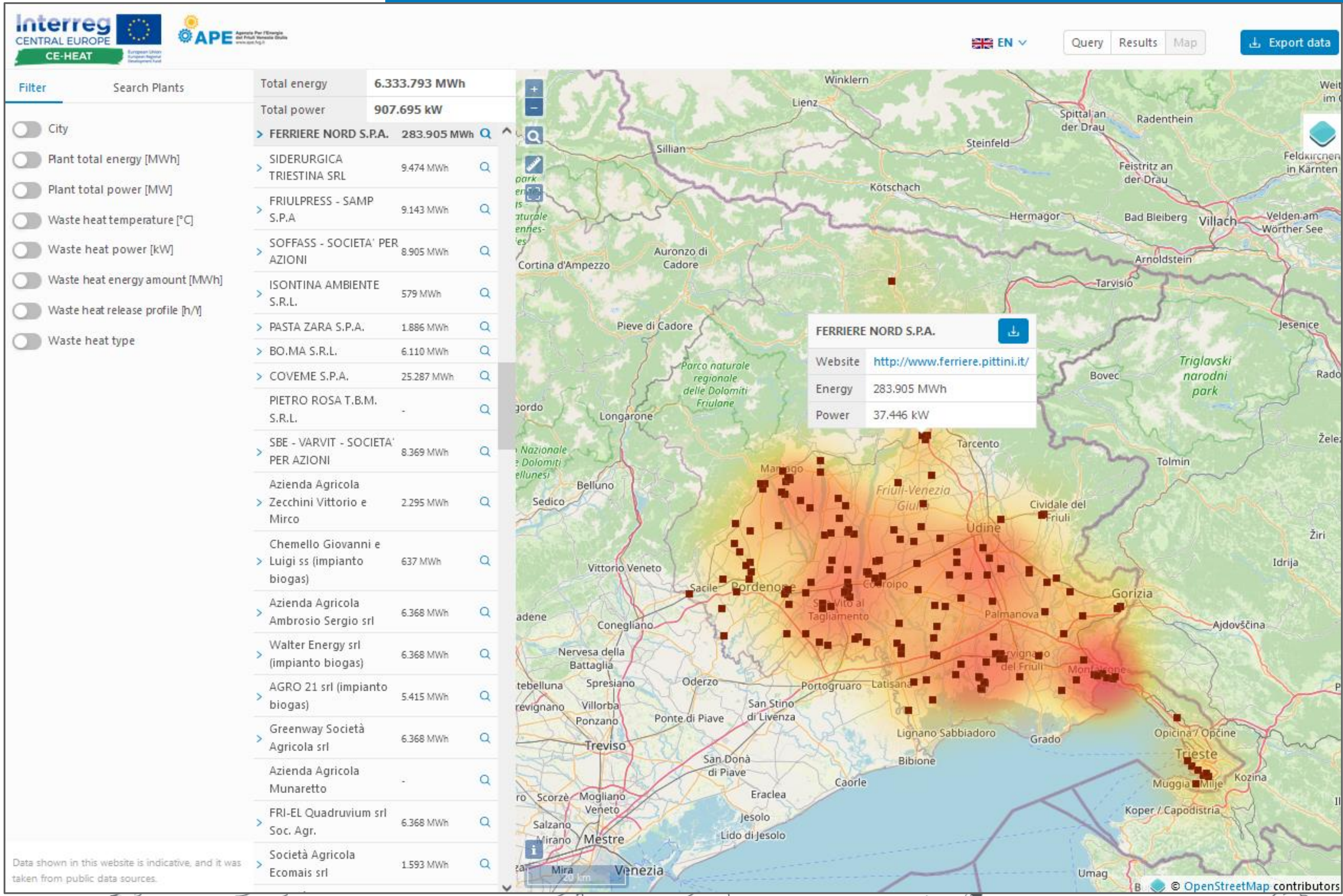
MAPS To see potentials



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CE-HEAT PROJECT
www.waste-heat.eu

DSS
Decision Support System
To facilitate investments

Comparison between viable solutions to recover a **continuous** waste heat from **fumes** taking in to consideration the following economic parameters:

- thermal energy cost: 0.05 €/kWh
- electricity cost: 0.1 €/kWh
- grant: 0.2 %
- incentive for saved TOE (Tonne Oil Equivalent): 100 €/TOE
- technical life time: 15 years
- oper and maint cost: 20 %
- interest rate (for NPV calculation) : 4 %
- NPV period: 30 years
- inflation rate: 1.2 %

Technology	Power Installed [kW]	Power Recovered [kW]	Mass Flow Rate [kg/s]	Temp. [°C]	District Length [km]	Payback [years]	DSCR	IRR [%]	NPV [€]	CO2 [t/year]	PES [TOE]
district	2100	2100	7	400	2.5	**3.0**	**5.08**	**33.8**	6186555	2037	861
he	2820	2820	10	400	-	3.6	4.19	27.9	**6369271**	**2350**	**993**
orc	500	2600	9	400	-	3.2	4.65	30.9	5217351	1668	739
abs	1800	1800	6	400	-	4.2	3.60	23.9	3958281	1028	456
match	ORC: 300 DISTRICT: 100	1660	14	400	2.5	8.4	1.79	11.5	1872751	1098	485

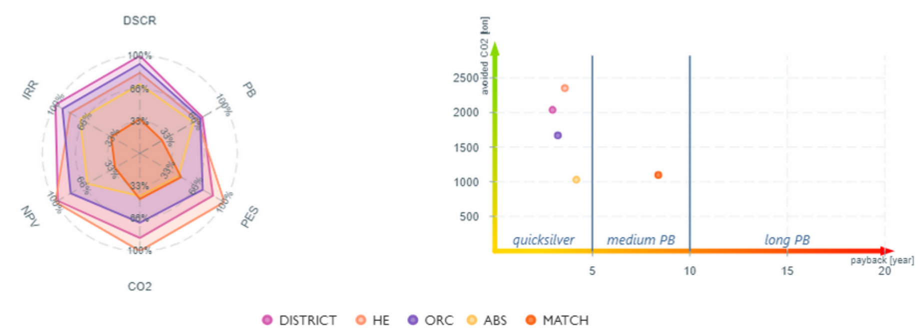

Figure 1 DSS output

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hic sunt futura

&

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S3 – Smart Specialization Strategy of FVG

Circular economy + Sustainable Buildings + Maximum energy efficiency systems for industry + Smart Grids

Large industry & Clusters of SMEs

1. Home, Wood & furniture
2. Metalmechanics & Mechathronics
3. Agrifood & Bioeconomy

1. Develop innovation from research
2. Implement energy sustainability
3. Be part of european value chains

Universities & Technology Parks

1. University of Udine
2. University of Trieste
3. Regional system of technology Parks

1. Setting up demonstrators
2. Provide high specialization skills
3. Be part of european value chains

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Interreg CENTRAL EUROPE — PROSPECT2030
S3UNICA Interreg Europe

BEST PRACTICE N.2

Table of contents

PROSPECT2030

Regional Energy Action Plan

OBJ: climate neutrality by 2045

Open questions:

- Where should FVG be in 2030?
- Where does the money come from?
- Make the best out of public money?
- S3 strategy?
- Where does RE come from?
- Energy intensive industry?
- Transport sector & future mobility?
- Infrastructures?
- How to maximise impacts?
- Monitoring progress?

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PROSPECT2030
Energy scenarios modelling

LEAP

Long-range Energy Alternatives Planning System

- **Widely-used software tool for energy policy analysis, used at many different scales ranging from cities and states to national, regional and global applications;**
- **Scenario-based, can track energy consumption, production, resource extraction and GHG emissions within all economy sectors;**
- **Simulation and optimization for modelling electric generation and capacity expansion planning, with least-cost approach under user-input constraints;**
- **Medium to long term planning tool: calculations on an annual time-step, but allows to input profiles up to an hourly resolution;**
- **User-friendly graph visualization, Sankey diagrams and energy balance tables, with various sector and fuel type resolution.**

BEST PRACTICE N.3

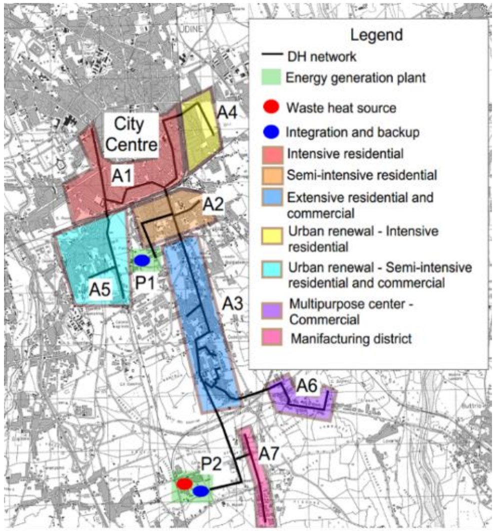
INDUSTRIAL URBAN SYMBIOSIS

WHY HERE?

Because urban areas are often among the most favourable contexts where circular economy loops can be developed.

Suitable conditions for industrial symbiosis here:

- high density of economic activities;
- easier match-making between suppliers and users of waste heat;
- well established and good relationships among actors (Municipality of Udine has represented the *trait d'union*)



POINTS OF STRENGHTS

- Availability of additional waste heat from the construction and enlargement of the organic waste treatment plant
- Presence in the area of two "service plants“ (waste water treatment and organic waste treatment)
- A nearby industrial area (wholesale market – BtB)

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CAFC & NET + UDINE MERCATI industrial symbiosis

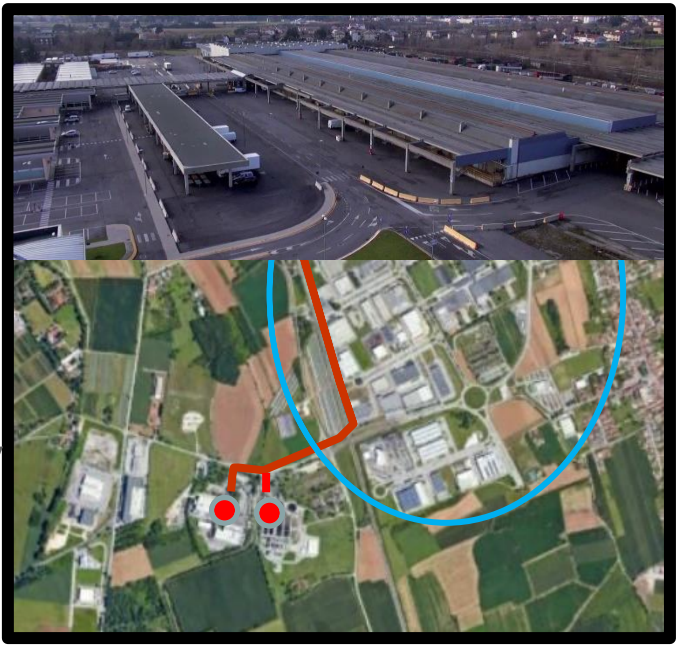
NET SUPPLIER: NET (waste heat into a local DHN)

SUPPLIER & FINAL USER: CAFC (can provide WH or use WH from NET > drying of sewage sludge)

FINAL USER: UDINE MERCATI Wholesale Market (heat for offices during winter and cold for the fridges during summer)

DEMAND (for cooling): current 400 kW_e (+200 kW_e after enlargement of the premises)

SOLUTION n°1: electric Chiller (supplied directly by a new PV plant) > electricity surplus can be converted in cold energy
SOLUTION n°2: absorption Chiller > heat surplus can be converted in cold energy



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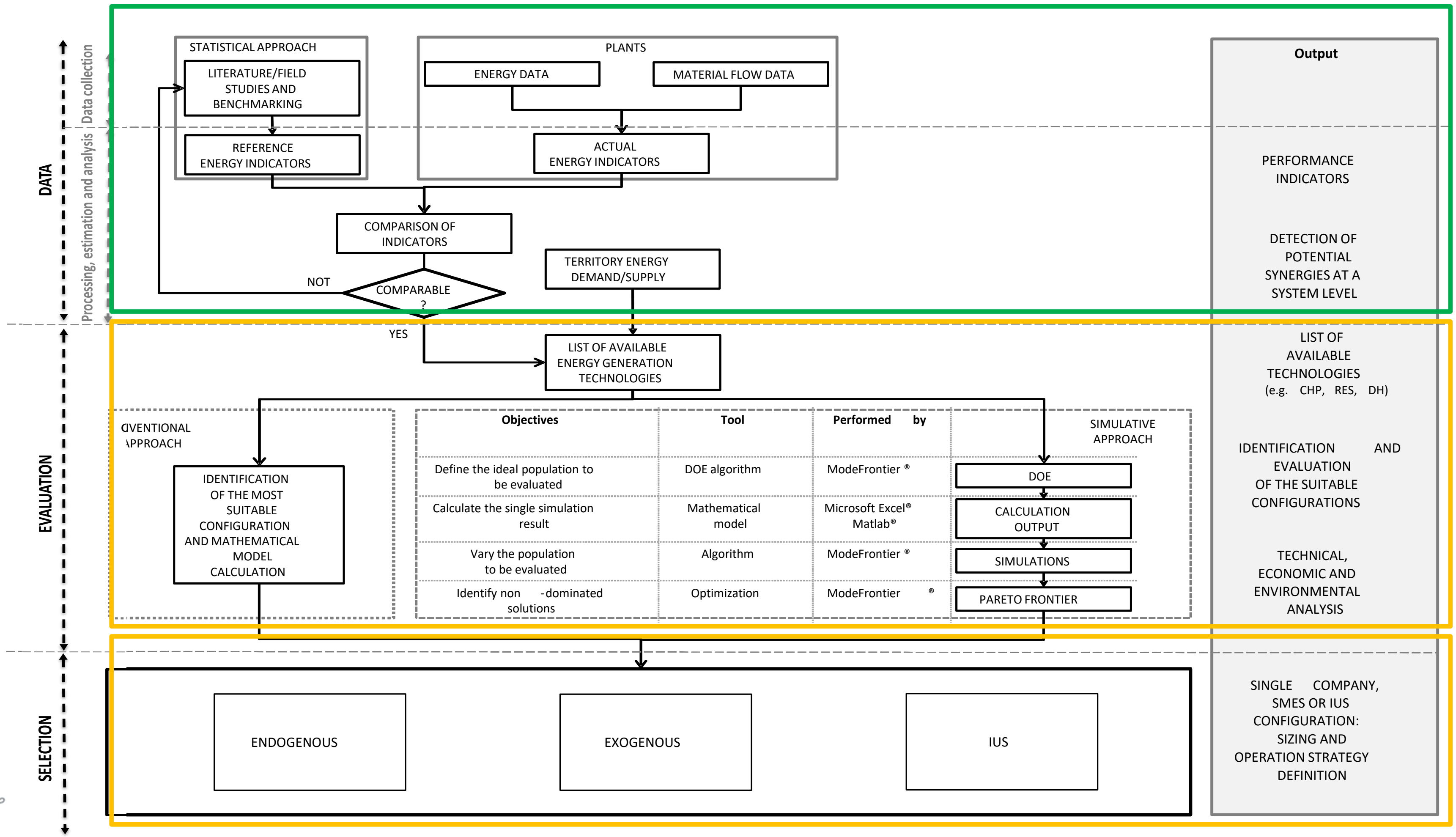

BEST PRACTICE N.4

Harmonization of energy comsumption indicators (FVG + Veneto + South Tirol + Kärnten)

1. **Collection of all indicators calculated by different energy accounting systems that are used in the regions participating to the project (48 indicators)**
2. **Selection of the indicators that are considered both necessary and interesting out of all those that were collected (28 indicators) and breakdown per sector and category**
3. **Identification of a packet of indicators that will be useful and significant for a transnational comparative benchmark**

BEST PRACTICE N.4

Harmonization of energy comsumption indicators (FVG + Veneto + South Tirol + Kärnten)

PUBLIC HOUSING	Total field consumption	Total annual CO2 emissions per inhabitant	t_{CO2}/inhabitant*y
	Consumption of communal buildings (applies to single building or total data)	Annual heat energy consumption per unit of surface	kWh/mq*y
		Annual electricity consumption per unit of surface	kWh/mq*y
		Annual water consumption per unit of surface	l/mq*y
	Further indicators for schools	Annual heat energy consumption by number of student	kWh/student*y
		Annual consumption of electricity by number of student	kWh/student*y
		Annual water consumption by number of student	l/student*y
	Further indicators for hospitals, nursing homes and homes for the elderly	Annual heat energy consumption for beds	kWh/bed*y
		Annual consumption of electricity for beds	kWh/bed*y
		Annual consumption of water for beds	l/bed*y
	Administrative office/buildings	Annual heat energy consumption per occupant	kWh/occ*y
		Annual consumption of electricity per occupant	kWh/occ*y
		Annual consumption of water per occupant	l/occ*y
PUBLIC LIGHTING		Annual consumption per inhabitant	kWh/inhabitant*y
		Annual consumption per km of road network	kWh/km*y
		Total annual CO2 emissions per inhabitant	t_{CO2}/inhabitant*y
TRANSPORT AND MACHINERY	Municipal vehicles and machinery	Total annual CO2 emissions per inhabitant	t_{CO2}/inhabitant*y
	Municipal vehicles	Annual fuel consumption per 100 km	kWh/100 km*y
	Machinery (agricultural machinery, construction, winter services, ...)	Annual fuel consumption per hour of use	kWh/h*y
ENERGY PRODUCTION PLANTS	Production of heat energy from renewable sources	Annual production of heat energy per inhabitant	kWh/inhabitant*y
	Production of electricity from renewable sources	Annual production of electricity per inhabitant	kWh/inhabitant*y

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Interreg Italia-Österreich TUNE
European Regional Development Fund

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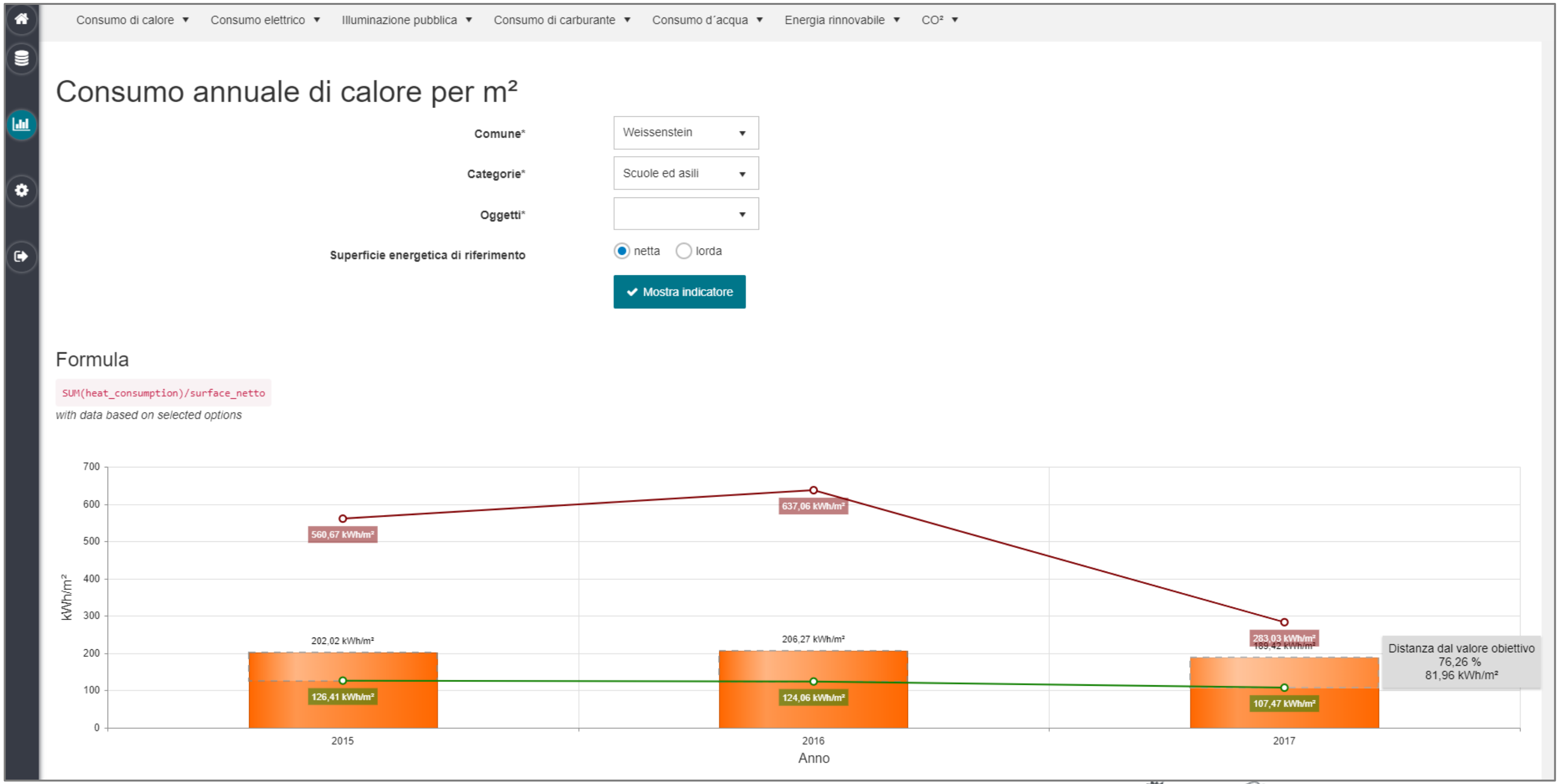
BEST PRACTICE N.4

Web platform to calculate harmonized benchmarks
https://benchmark.tune-energy.eu



BEST PRACTICE N.4

N.3 joint training courses with austrian and italian civil servants

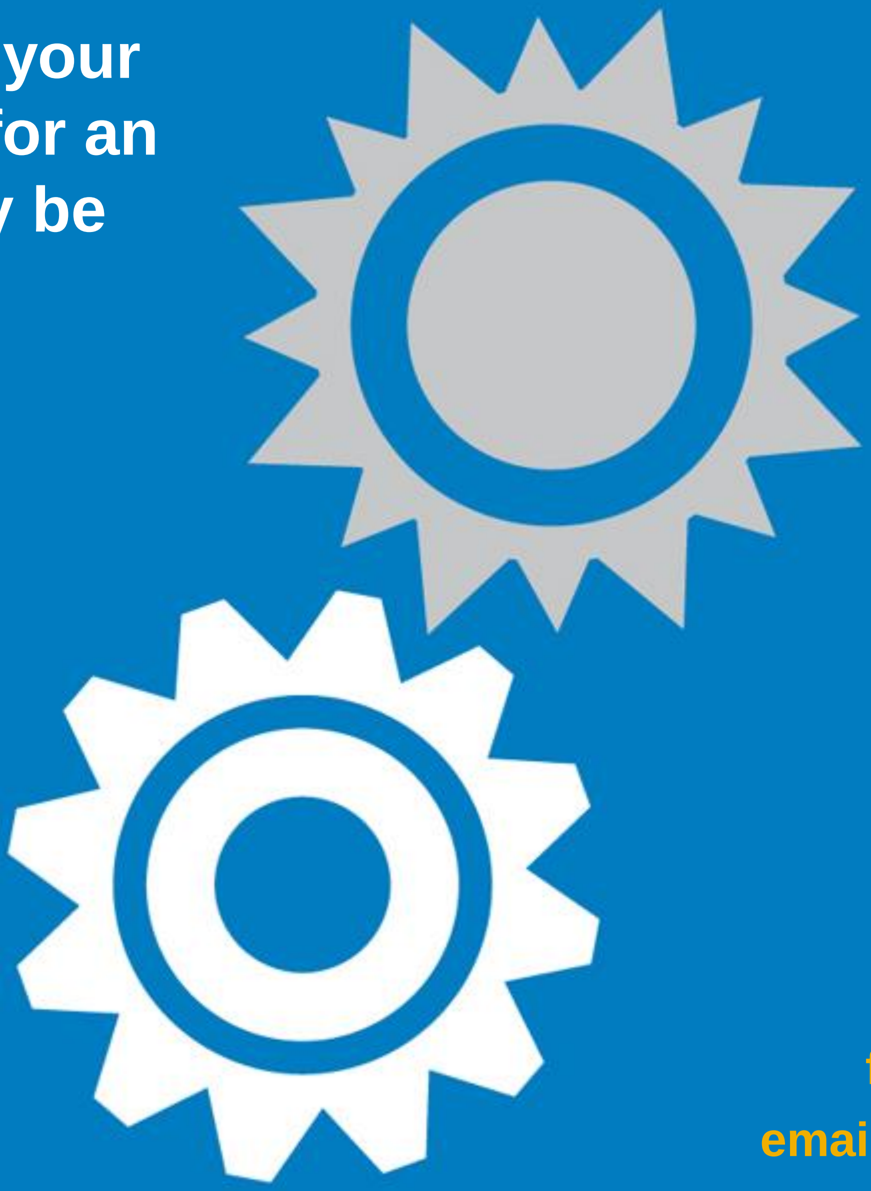
13-14 Nov 2018
Bolzano

22-23 Jan 2019
Udine

26-27 Mar 2019
Villach

Do not waste your time looking for an obstacle: may be there is none.

Franz Kafka



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