



Agenzia nazionale per le nuove tecnologie,
l'energia e lo sviluppo economico sostenibile

The road map of ENEA on Renewable Energy Communities

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A digital framework supporting RECs

1. ENEA's infrastructure to support REC: the LEC platform

- Recon
- Dhomus
- Cruise
- In itinere

2. Interoperability platforms (SCP)

3. Supporting the creation of new REC in Italy:

- North Italy
- Centre Italy
- South Italy

PNRR – an opportunity for energy communities



QUADRO DELLE MISURE E RISORSE (MILIARDI DI EURO):

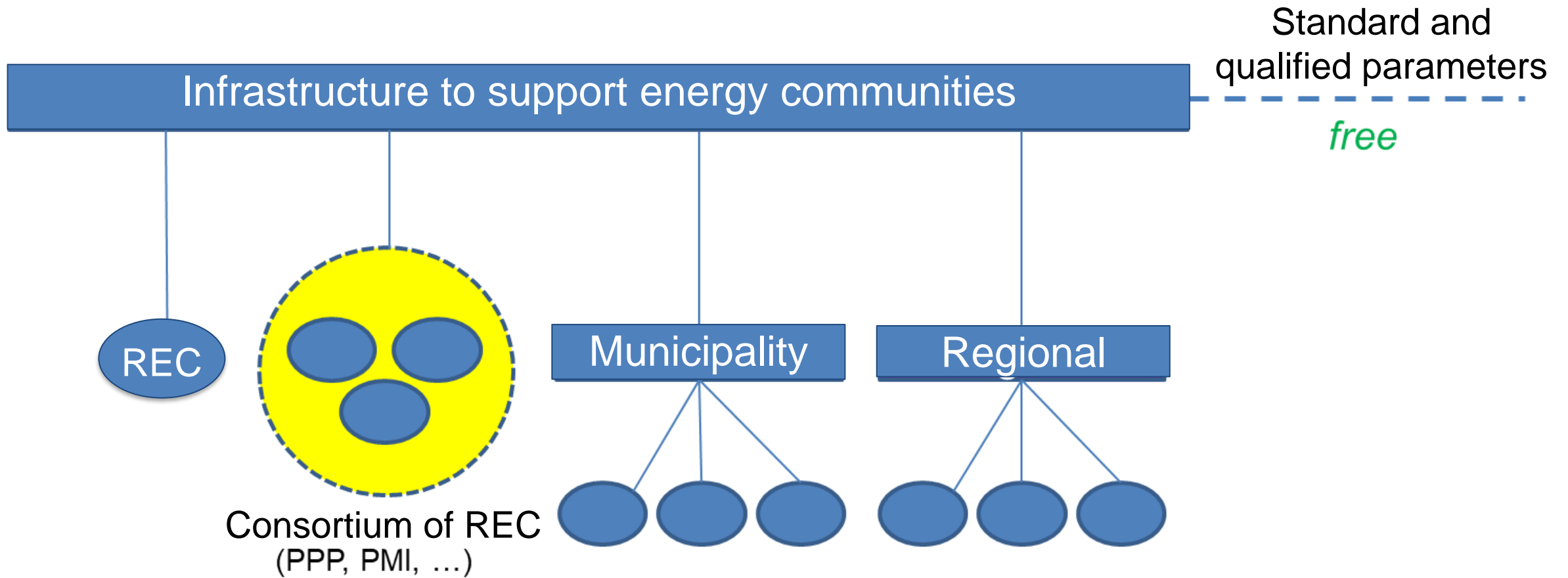
M2C2 - ENERGIA RINNOVABILE, IDROGENO, RETE E MOBILITA' SOSTENIBILE

Ambiti di intervento/Misure	Totale
1. Incrementare la quota di energia prodotta da fonti di energia rinnovabile	5,90
Investimento 1.1: Sviluppo agro-voltaico	1,10
Investimento 1.2: Promozione rinnovabili per le comunità energetiche e l'auto-consumo	2,20
Investimento 1.3: Promozione impianti innovativi (incluso <i>off-shore</i>)	0,68
Investimento 1.4: Sviluppo biometano	1,92
Riforma 1.1: Semplificazione delle procedure di autorizzazione per gli impianti rinnovabili <i>onshore</i> e <i>offshore</i> , nuovo quadro giuridico per sostenere la produzione da fonti rinnovabili e proroga dei tempi e dell'ammissibilità degli attuali regimi di sostegno	-
Riforma 1.2: Nuova normativa per la promozione della produzione e del consumo di gas rinnovabile	-

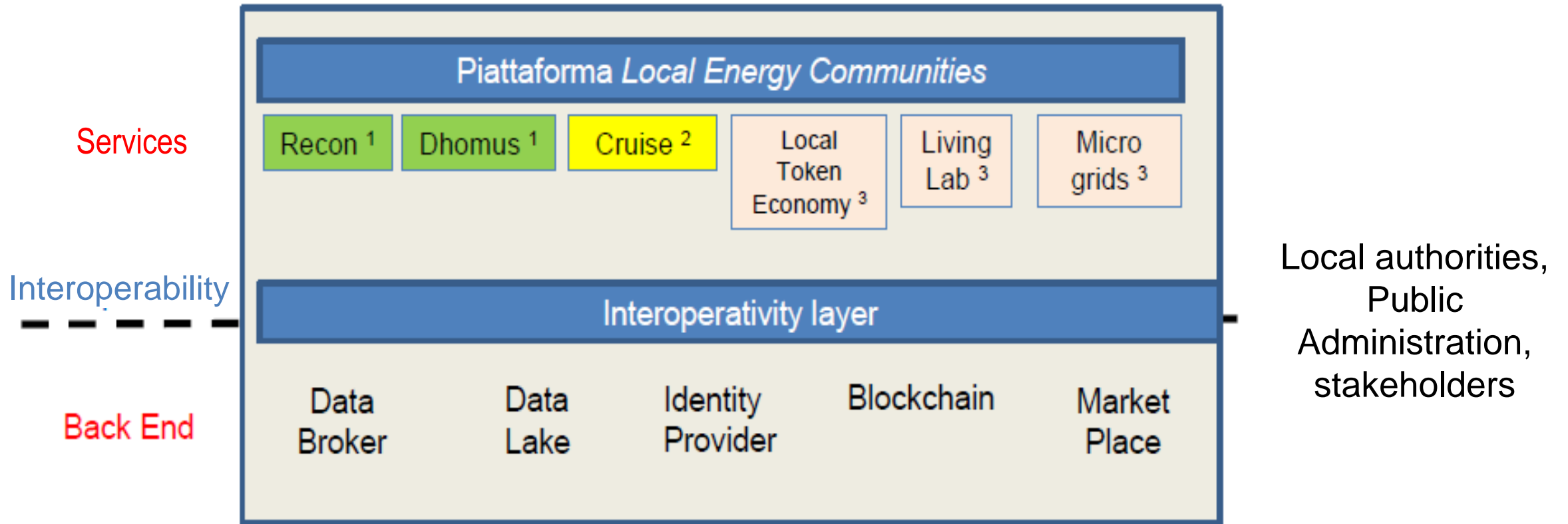
23,78 Mld
Totale

- Target: small municipalities with less than 5000 inhabitants
- Interest-free loans up to 100% of eligible costs (L.D. 199/2021 for the definitive transposition of the REDII Directive)

A digital framework supporting REC



A digital framework supporting REC



The REC roadmap

Step I

Designing the community

- Definition of architecture, stakeholders, roles
- **Technical-economic simulation**
- Legal model and REC registration

Step II

Realization

- Production plants
- **Monitoring devices**
- **IoT Platform**
- **Citizen engagement**

Step III

Management

- **Data analysis and optimization**
- **Economic incentives**
- **Open data**

REC

Step IV

REC Cluster performance comparison

- Comparative analysis of Regional RECs Performance Indicators
- Best Practices/Models identification
- Interoperability with National platform (GSE)

Consortia
CER network
Municipalities

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Renewable Energy Communities ecONomic simulator



RECON: Comunità di energia rinnovabile ecONomic simulatore

1



Starting from simple data that is easy to collect: information on housing clusters, electricity consumption from bills, characteristics of the photovoltaic system and incentives that you want to take into account

2



Carries out a self-assessment of self-consumption and energy sharing

3

4



You can make a preliminary assessment of the economic and financial convenience to create a renewable energy community or become collective self-consumers from renewables

5

<https://recon.smartenergycommunity.enea.it/>

RECON

1. It is an **energy, economic and financial assessment tool** to support the birth of the configurations of:
 - Renewable Energy Community (REC)
 - Self-consumers of renewable energy acting collectively (AC)based on Art. 42 bis – L.D. 162/2019 – converted into N.L. 8/2020
2. With RECON, ENEA intends to:
 - **Support Local Authorities and stakeholders** ring the legislative and regulatory framework
 - Promote the **involvement of citizens** in the energy transition and their **active participation** in the energy market

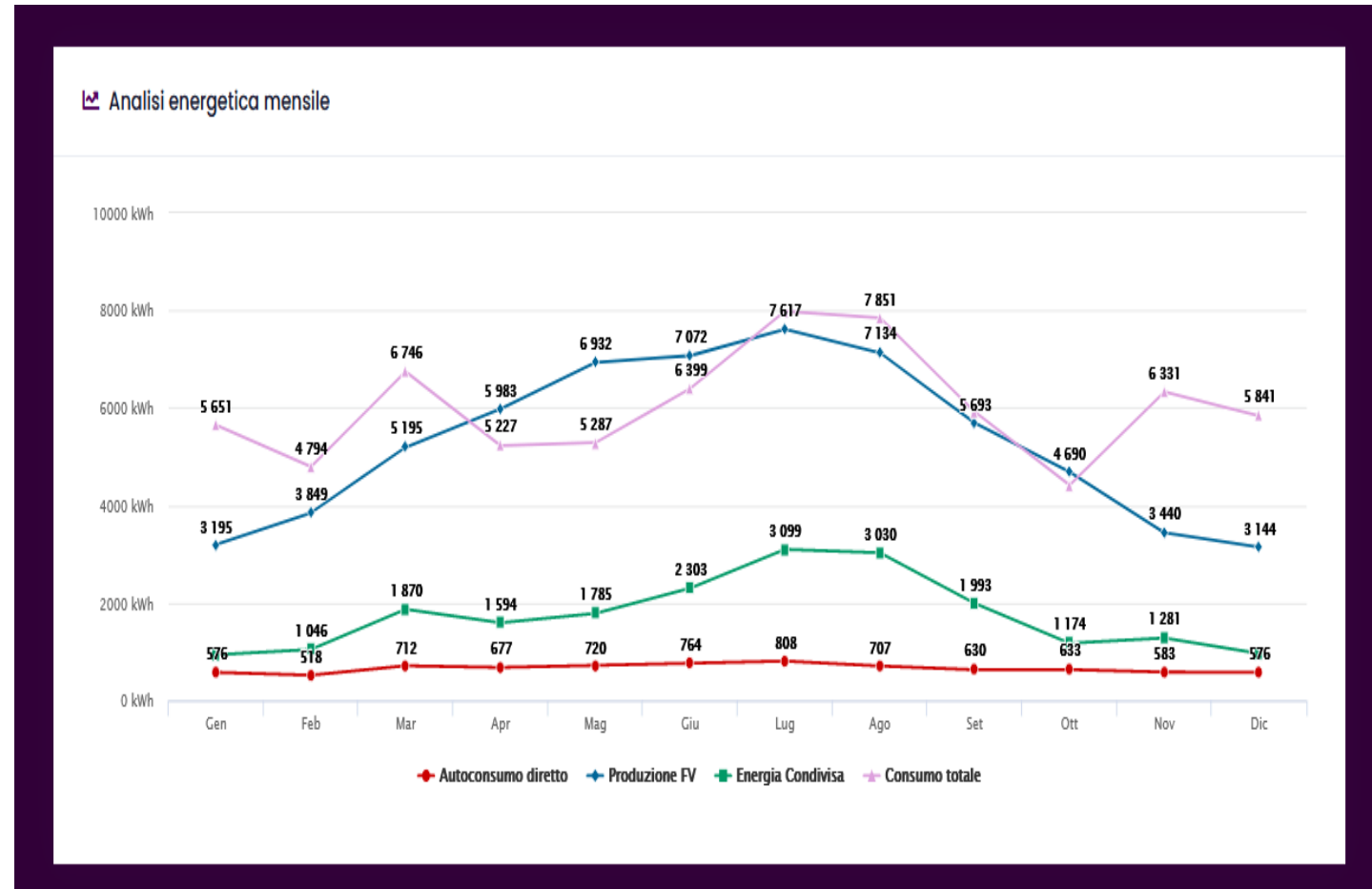


Energy-related variables

- Total annual electric consumption
- Daily annual electric consumption
- PV plants production
 - Annual self-consumed energy
 - Annual shared energy
 - Annual energy sell to the grid

Energy and environmental indicators

- Direct (physical) self-consumption
- Collective self-consumption (shared energy)
- Self-sufficiency
- Savings of CO²



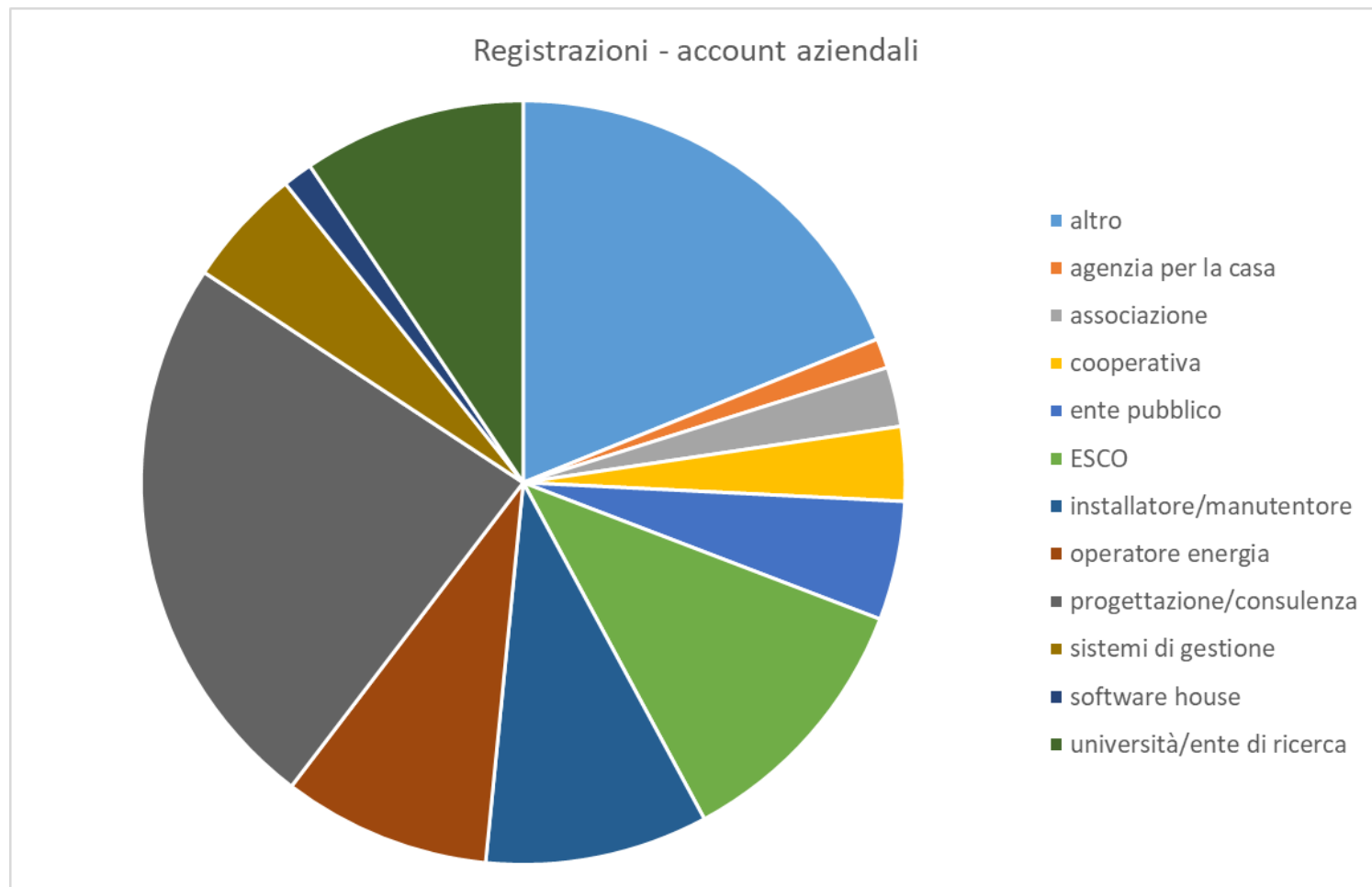
ECONOMIC- FINANCIAL OUPUTS

- Cost of PV plants
- Savings on the bill
- Revenues from the sale of electricity produced
- MISE incentive (DM MISE 16 September 2020)
- Restitution of network charges and avoided network losses (ARERA Resolution no. 318/2020)
- Tax deductions (total deduction and annual fee) (50% and 110%)
- Initial investments
- Bank loan and annual interest (if any)
- Net Present Value (NPV) at 20 years
- Internal rate of return (IRR)
- Payback time
- Annual discounted cash flows



RECON – Main stakeholders

- ✓ Local authorities
- ✓ Territorial agencies for housing
- ✓ Citizens
- ✓ Associations
- ✓ Designers
- ✓ SME



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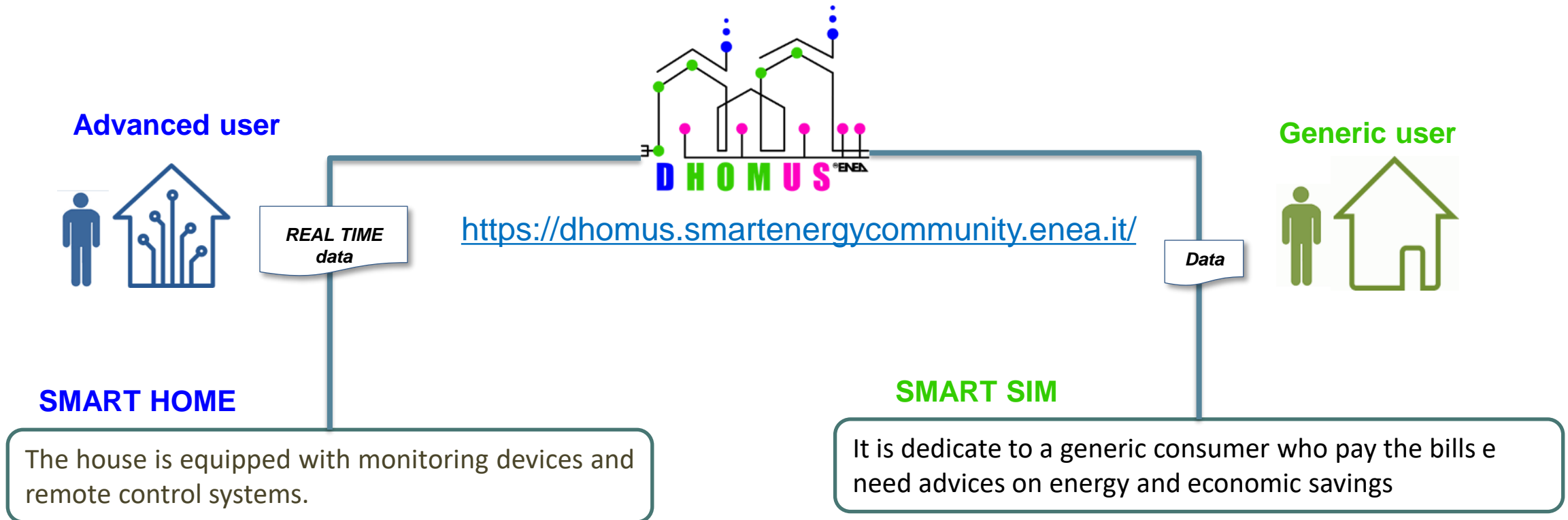
- Production plants
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REC



Data HOMes and USers

The users are the fulcrum of the platform: the ones equipped with smart devices and the simple consumers. The platform can provide customized feedback and advices for a more conscious use of energy in order to contain consumption, costs and the consequent impact on the environment.



DHOMUS – Smart SIM

SMART SIM: tool for energy self-assessment and benchmarking of residential users



You will receive
advices to
improve



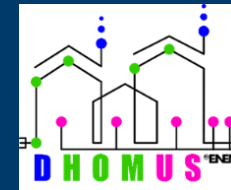
Smart Sim simulates and
compares your data with the
ones of similar users

Starting from your energy consumption
data



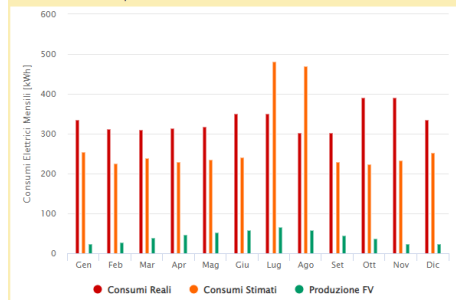
- It indicates energy consumption allocations and for which use your demand is higher
- Your environmental impact
- It informs about more competitive energy contract
- It suggests interventions to increase energy efficiency and to reduce energy costs, environmental impacts
- It helps on which energy is better to use
- It supports in defining your potential of participating in an energy community

DHOMUS – Smart SIM

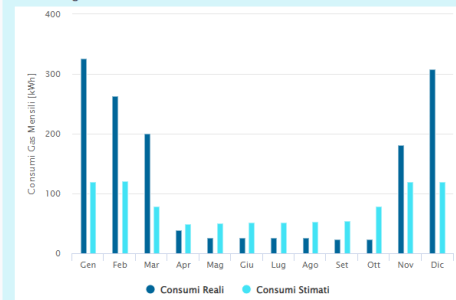


RESULTS OF THE SIMULATION

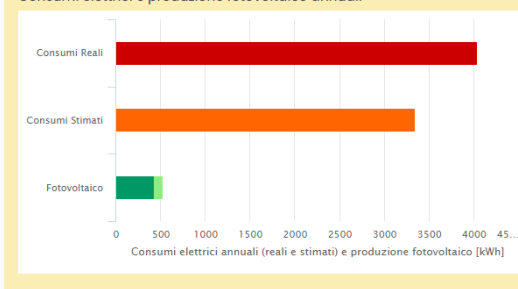
Consumi elettrici e produzione fotovoltaico mensili



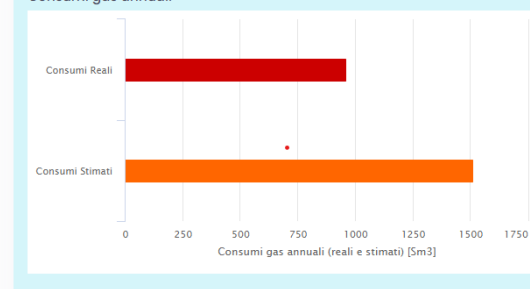
Consumi gas mensili



Consumi elettrici e produzione fotovoltaico annuali



Consumi gas annuali



ALLOCATION OF CONSUMPTION, ENVIRONMENTAL IMPACT AND BENCHMARK

ADVICE TO SAVE ON ENERGY COSTS AND ENVIRONMENTAL IMPACT

Ripartizione per usi

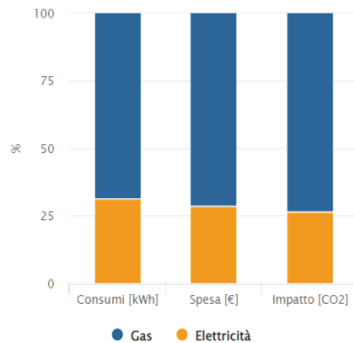
Ripartizione per usi dei consumi di energia primaria



- Riscaldamento
- Acqua Calda Sanitaria
- Refrigerazione
- Illuminazione
- Cura del corpo
- Raffrescamento
- Cucina
- Lavaggio - Pulizia
- Computer - TV
- Altro

Ripartizione per vettore energetico

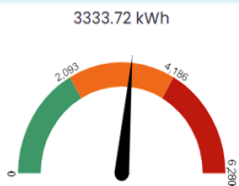
Ripartizione per vettore energetico dei consumi di energia primaria, della spesa e delle emissioni di anidride carbonica equivalente



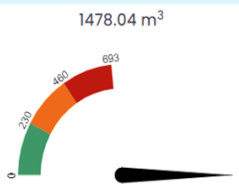
Confronto con abitazioni delle stesse caratteristiche

I grafici mostrano un confronto tra i consumi simulati dell'abitazione e i consumi medi statistici (sulla base dei nostri dati di archivio) di una abitazione delle stesse caratteristiche in termini di occupazione, dimensioni e collocazione climatica.

Elettricità



Gas



Cambio fornitore

Attenzione! Esistono contratti molto più competitivi
Il risparmio potenziale è: 0 €

Complimenti, il contratto è molto competitivo

Trova offerte Arera

Interventi di riqualificazione energetica dell'abitazione

Risparmi derivanti da interventi di riqualificazione dell'abitazione, in termini di energia primaria, di spesa e di emissioni di anidride carbonica equivalente.

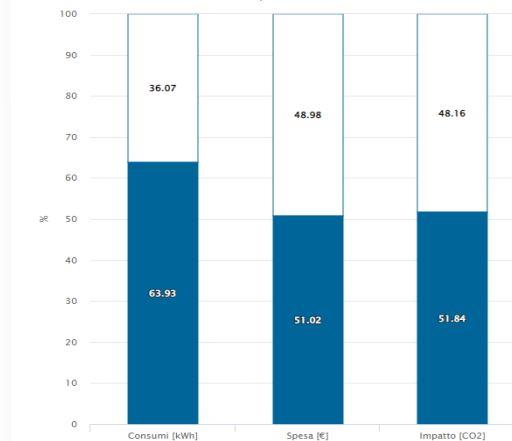
Il grafico riporta inizialmente il miglior intervento in termini di risparmio di energia primaria; è possibile visualizzare tutti gli altri interventi simulati utilizzando il menù a tendina.

Tutto elettrico

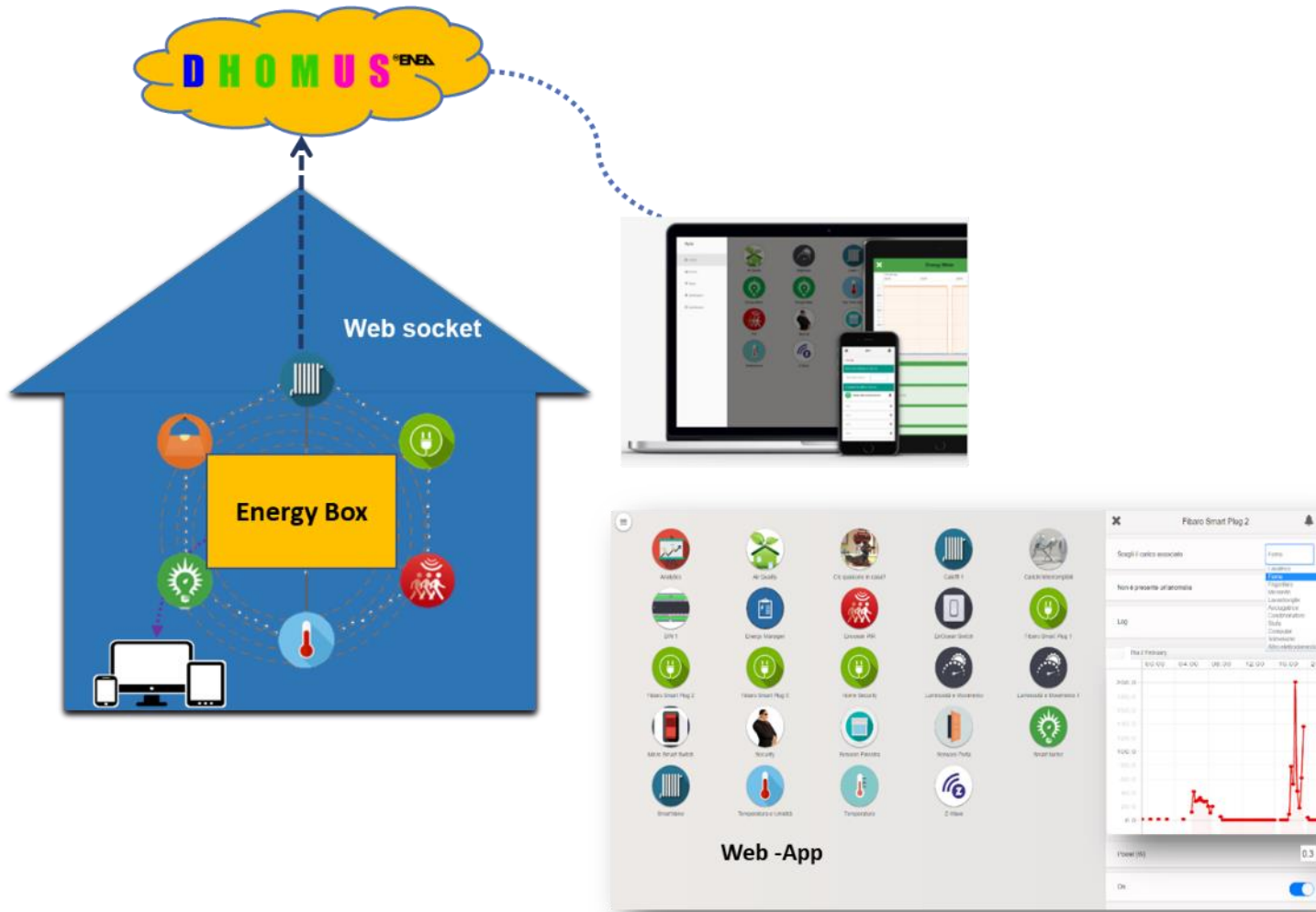
Seleziona un intervento per il ricalcolo

Tutto elettrico

Risparmi in termini di energia primaria, di spesa e di emissioni di anidride carbonica equivalente

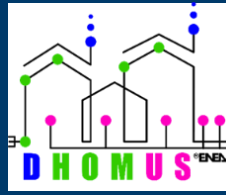


DHOMUS – Smart Home

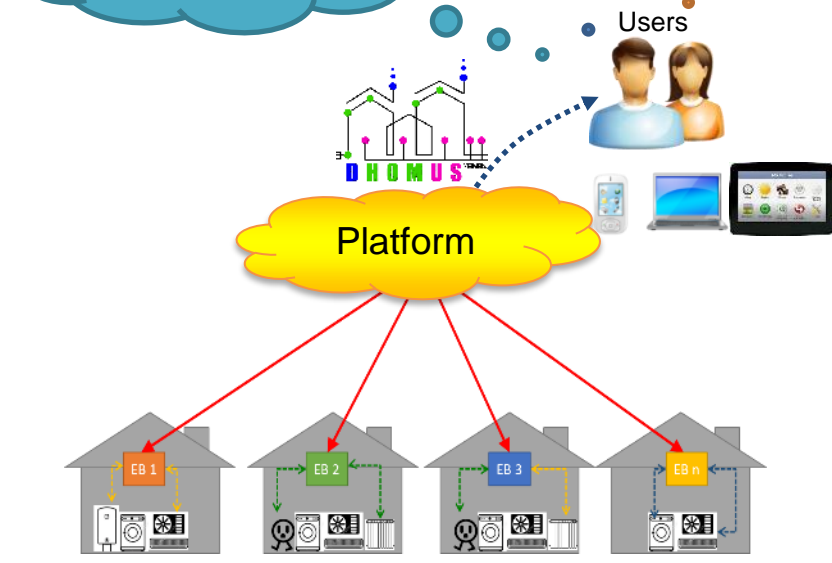


Dhomus is able to acquire data from:

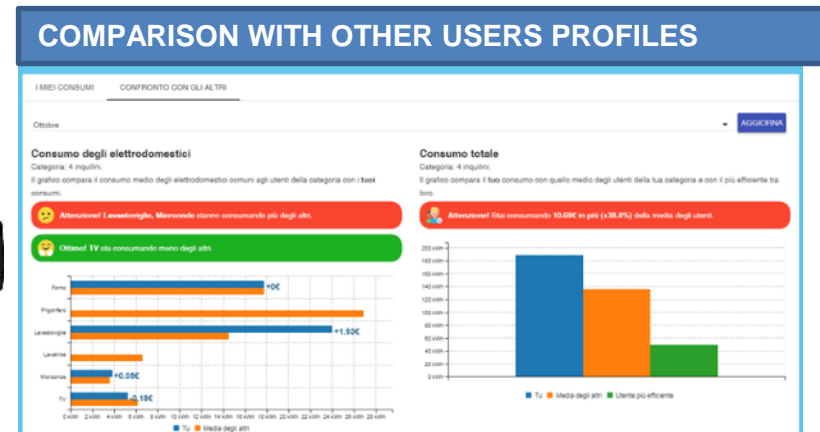
- The “**Smart Home kit**” developed by Enea, based on the use of commercial sensors
- **Third party sensors** capable of transferring the acquired data from a proprietary cloud to the DHOMUS cloud
- **User Devices (DU)** connected to the new generation Smart Meters.



What does it offer to citizens?



- Data synchronization
- Report on anomalies, consumption, statistics.
- KPI processing,
- District benchmarking,
- Competitive comparison;
- Interaction by request / adherence to flexibility.
- Customized feedback and advice
- Identification of characteristic profiles



WARNING-TIPS



PRIVACY

At platform level, data :

- anonymously acquired;
- aggregated to define KPI;
- Only used for statistical assessment.

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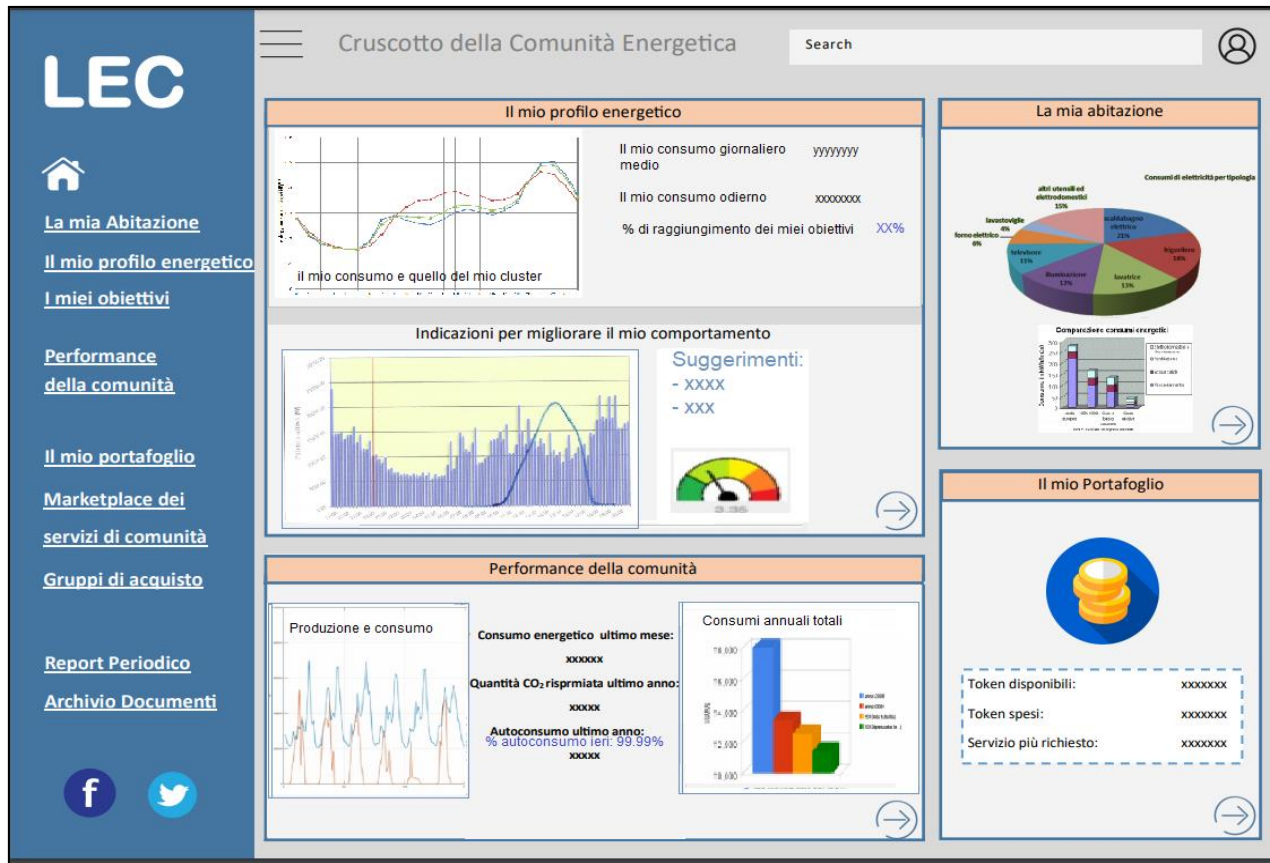
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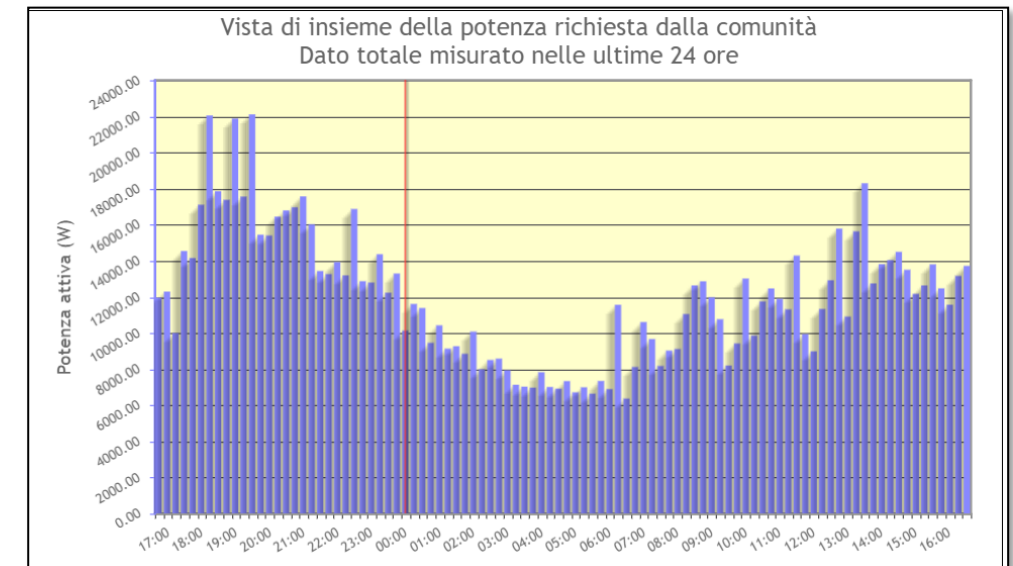
CRUISE

REC

CRUISE: Dashboard for REC management



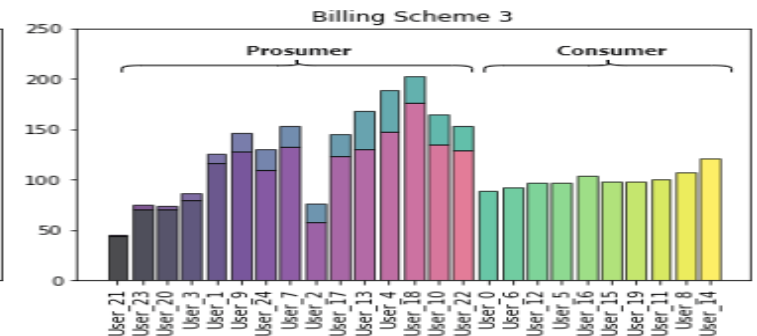
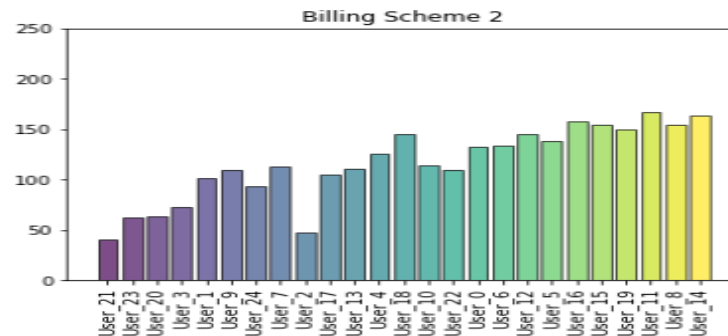
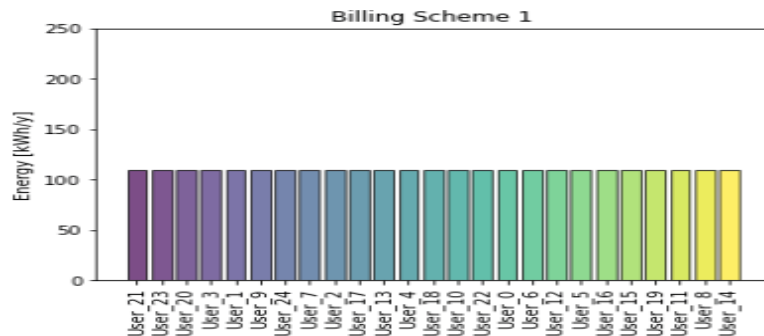
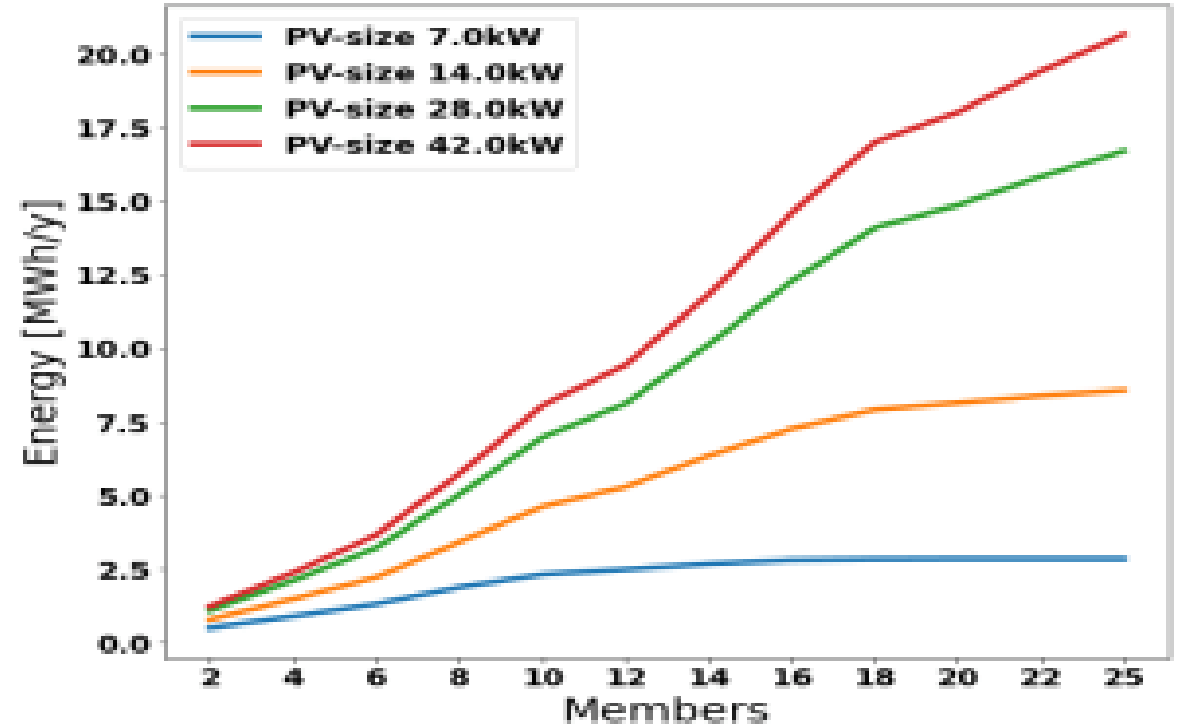
- ✓ Continuous supervision
- ✓ Performance analysis (KPI)
- ✓ Forecasting and strategies estimation
- Comparison and definition of rewarding policies, criteria and methods
- ✓ Territorial communication



CRUISE: Dashboard for REC management (ENEA)

Mathematical models for data analysis allow to understand different aspects of the Energy Community:

- The optimal **dimension** based on **real** consumption data of members;
- Possible aggregation for the **self-consumption** optimization
- Models for **economic allocations** based on contract stipulated among members of the Energy Community



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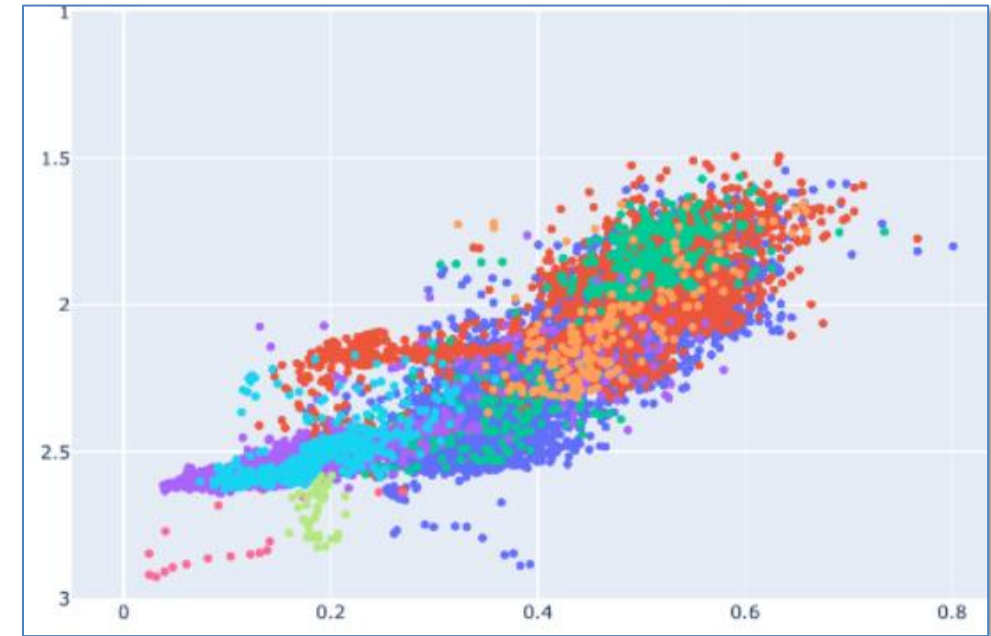
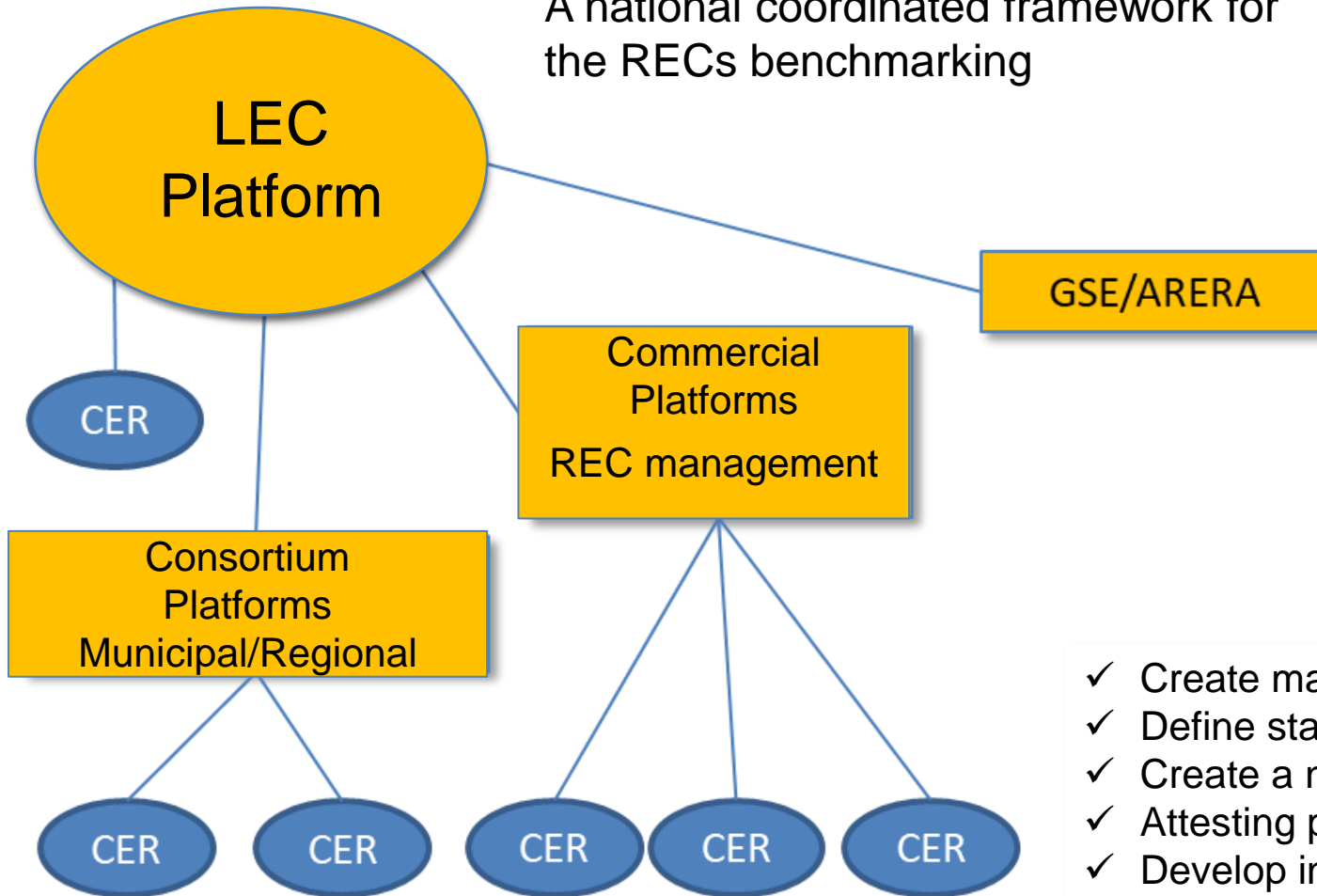
REC Cluster performance comparison

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Consortia
CER network
Municipalities

The Local Energy Communities platform

A national coordinated framework for the RECs benchmarking



- ✓ Create market pioneer experiences
- ✓ Define standards with stakeholders
- ✓ Create a network of standardized CERs
- ✓ Attesting performance and benchmarking
- ✓ Develop innovative services with a high technological content

Interoperability platforms (SCP)

Smart City Platform PROJECT

HOME ARCHITETTURA ADESIONE SPECIFICHE STRUMENTI PROGETTI AIUTO

Benvenuti!

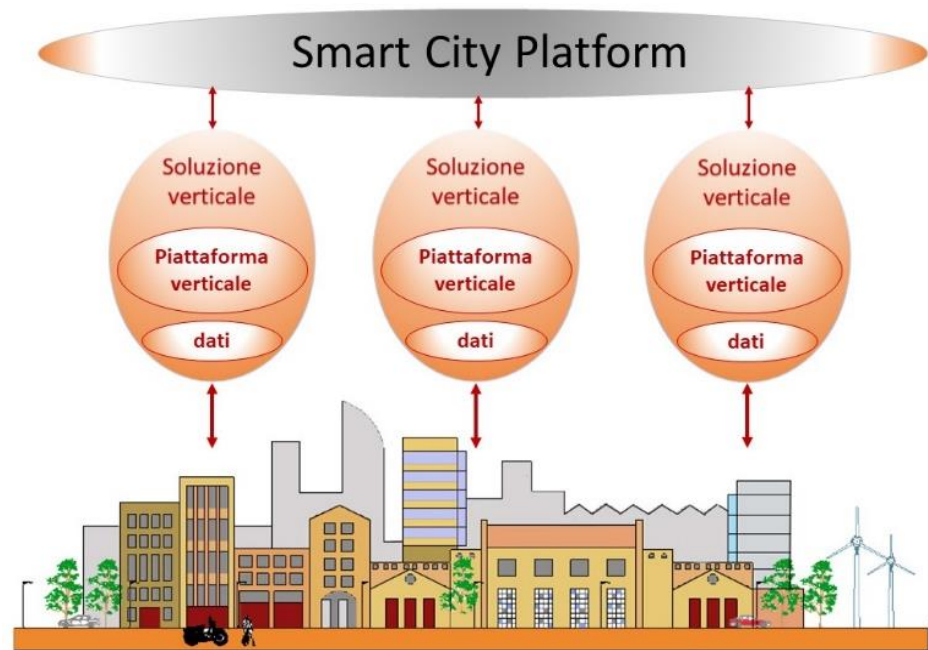
L'obiettivo del progetto Smart City Platform è quello di mettere a disposizione dei cittadini, delle municipalità e dei diversi stakeholder un valido strumento in grado di raccogliere i dati dalla città e armonizzarli attraverso un linguaggio comune, per una riqualificazione dei contesti urbani e territoriali in chiave smart. L'iniziativa avviata da ENEA ha lo scopo di abilitare la comunicazione tra attori e piattaforme che parlano lingue diverse, interpretando dati eterogenei in maniera corretta e senza ambiguità, mantenendo le soluzioni tecnologiche esistenti e rendendo interoperabili i diversi sistemi di raccolta e gestione dati.

A tale scopo sono stati definiti:

- un insieme di specifiche pubbliche ([Smart City Platform Specification for interoperability layer](#), SCPS) per utilizzare il linguaggio comune e abilitare la comunicazione interoperabile tra soluzioni eterogenee;
- un prototipo di piattaforma su scala cittadina/distrettuale ("Smart City Platform", SCP) per il recupero di dati dalle differenti soluzioni (Solution Verticali) presenti nella città;
- un prototipo di piattaforma su scala nazionale ("inter Smart City Platform", iSCP) per il recupero di dati da differenti Smart City e per comunicare con altre piattaforme agenti su scala nazionale.

Scopri le seguenti sezioni del Sito Web

ARCHITETTURA	ADESIONE	SPECIFICHE	STRUMENTI	PROGETTI
Architettura di Riferimento	Adesione al progetto SCP	Le specifiche SCPS	Strumenti per gli Utenti	Progetti con SCP/SCPS
L'approccio ad albero multi-livello dell'architettura SCP, utilizzato intra-city e inter-city.	Entrare a far parte della community, diventando nodo dell'architettura.	Utilizza le Smart City Platform Specification per abilitare la comunicazione interoperabile.	Definire gli UrbanDataset della community grazie agli strumenti e alle risorse disponibili.	Progetti aderenti alle specifiche SCPS e/o dotati di una piattaforma SCP.
SCOPRI DI PIÙ	SCOPRI DI PIÙ	SCOPRI DI PIÙ	SCOPRI DI PIÙ	SCOPRI DI PIÙ



Soluzioni verticali e piattaforme orizzontali di gestione urbana alle varie scale (fonte ENEA)

Prototype of a platform on a city / district scale

(Smart City Platform) SCP on which the data from the different solutions (Vertical Solutions) present in the city converge to provide a tool to the municipalities, free from closed proprietary solutions. (real-time data exchange platform of value (KPI - Key Performance Indicators) with guarantee and reliability for the companies that manage the basic urban services and to support the planning of development interventions, monitoring the state of affairs, efficiency and performance of its infrastructures, for the Public Administration and the development of new services and new products based on data processing for companies and startup.

Prototype of a platform on a city / district scale

<https://smartcityplatform.enea.it/#/it/specification/index.html>

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Thank you very much for your attention