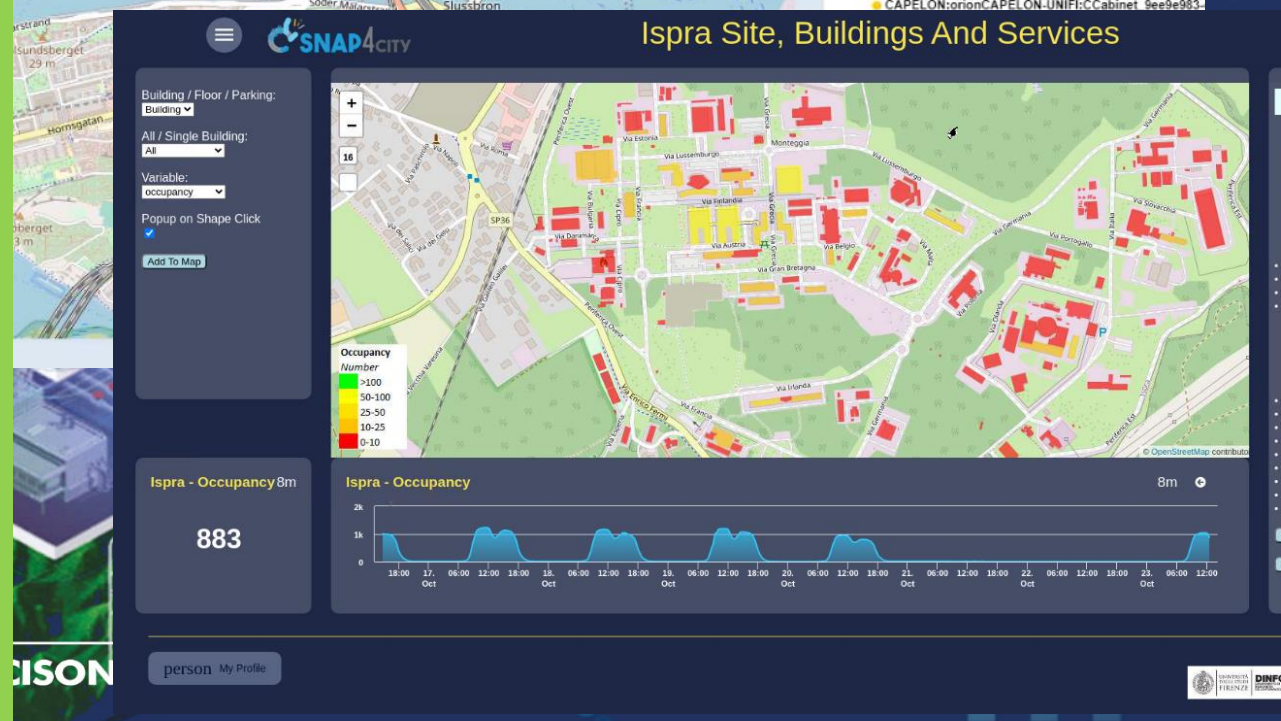
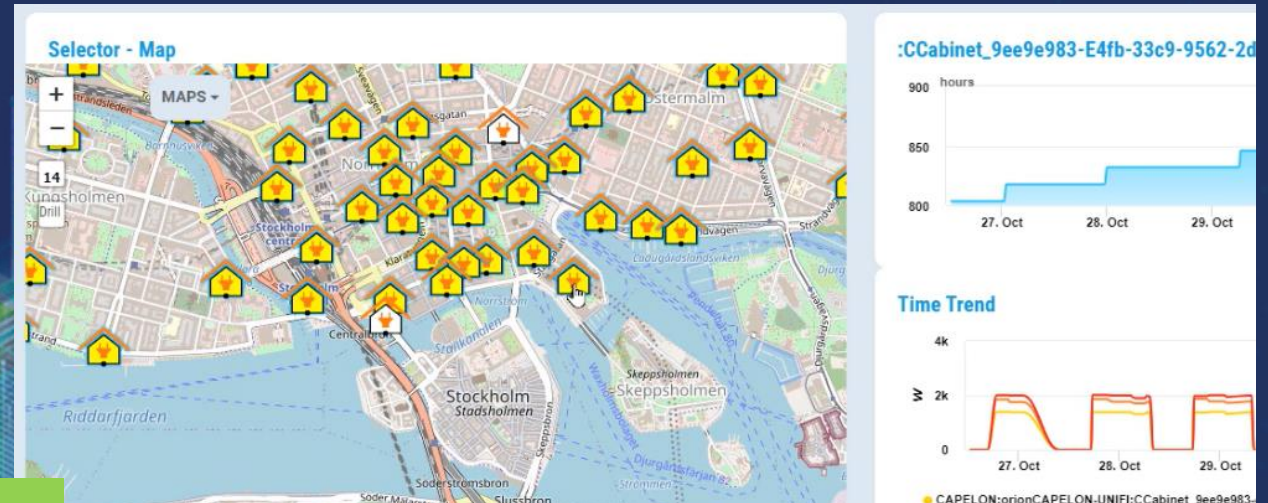




www.snap4city.org
www.snap4solutions.org

Smart Energy and Smart Buildings Operation and Plan Digital Twin



UNIVERSITÀ DEGLI STUDI FIRENZE

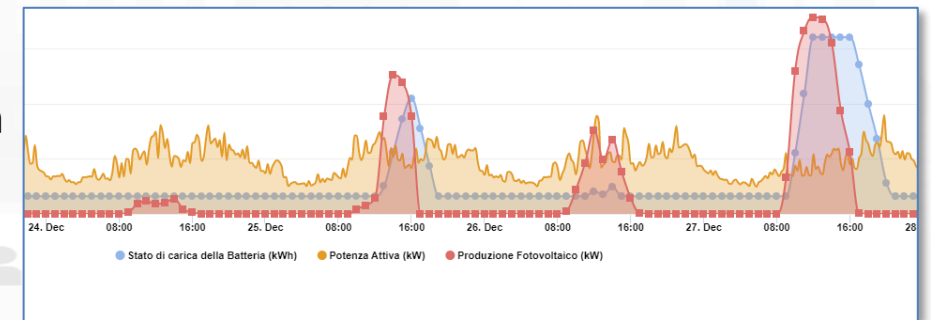
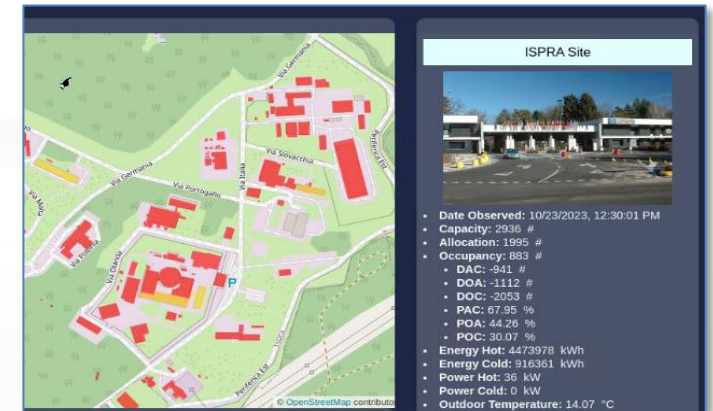
DINPO DIPARTIMENTO DI INGEGNERIA DELL'INFORMAZIONE

DISIT DISTRIBUTED SYSTEMS AND INTERNET TECHNOLOGIES LAB



City Energy and Buildings

- **Goals:**
 - Energy consumption reduction, increment of efficiency,
 - Areas and building sustainability
 - Improve accessibility to services, security and safety
- **Energy Monitoring:** Building, floors, rooms, recharging poles, cabinets, Community of Energy, Data centers, Energy for Hot / cold, air condition, energy vs temperature and usage, etc.
- **Energy Management:** Predictions, early warning, identification of critical conditions
- **Smart Light Management:** LED/mixt, cabinets, lights vs traffic, lights vs safety, energy saving, luminaries profiling, group management.
- **Smart Building Management:** consumption, number of people, etc.
 - Communities of Energy, Photovoltaic plants, sustainability
 - What-if analysis, optimisation tools
- **KPI: Energy consumption, efficiency, pros/cons**
 - Light profiling and adaptation
 - Autoclave industrial plants simulation, Photovoltaic plant simulation
 - consumption / usage, energy vs temperature
- **Mobile App:** monitoring, info-recharge, eSharing, booking, ..
- **Participatory:** problem reporting, ticketing, etc.
- **Integration of any kind**



Smart Energy

FROM CITY DASHBOARD TO APPLICATIONS

DATA AND KNOWLEDGE MANAGEMENT



Key Performance Indicators, KPI



- **United Nations Sustainable Development Goals, SDGs** (for which cities can do more to achieve some of the 17 SDGs, <https://sdgs.un.org/goals>);
- **15 minutes cities** (where primary services must be accessible within 15 minutes on foot);
- **objectives of the European Commission** in terms of pollutant emissions for: NO2, PM10, PM2.5 (https://environment.ec.europa.eu/topics/air_en);
- **SUMI: mobility and transport vs env**
 - <https://www.snap4city.org/951>
- **SUMP/PUMS: mobility and transport vs env.**
- **ISO indicators:** city smartness, digitization, tech level.
- **Low Level/Real Time:** global traffic, quality of service, betweenness, centrality, queue, time to travel, etc.

Global
&
Local

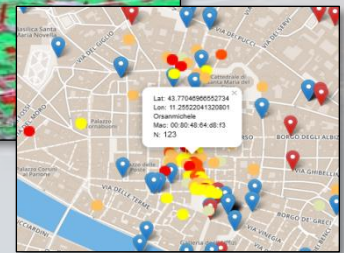
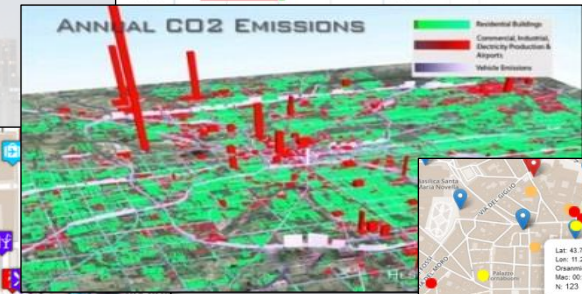
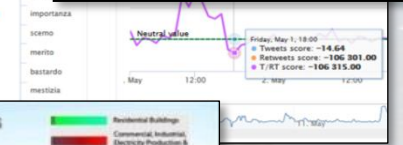
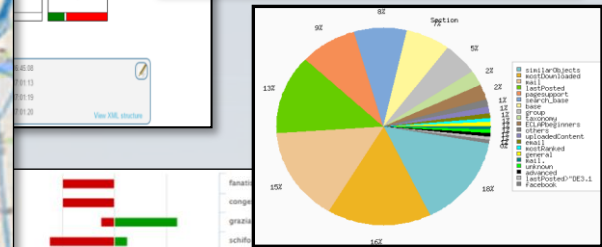
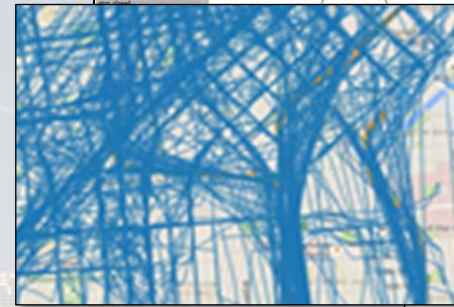
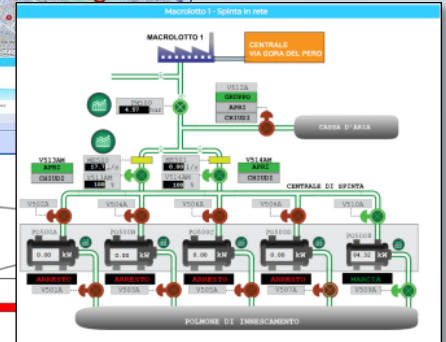
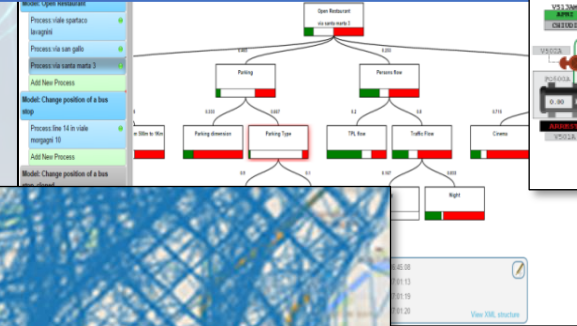
Periodic
&
Realtime

Air Quality Directive				WHO guidelines	
Pollutant	Averaging period	Objective and legal nature and concentration	Comments	Concentration	Comments
PM _{2.5}	One day			25 µg/m ³ (*)	99 th percentile (3 days/year)
PM _{2.5}	Calendar year	Target value, 25 µg/m ³	The target value has become a limit value since 1 January 2015	10 µg/m ³	
PM ₁₀	One day	Limit value, 50 µg/m ³	Not to be exceeded on more than 35 days per year.	50 µg/m ³ (*)	99 th percentile (3 days/year)
PM ₁₀	Calendar year	Limit value, 40 µg/m ³ (*)		20 µg/m ³	
O ₃	Maximum daily 8-hour mean	Target value, 120 µg/m ³	Not to be exceeded on more than 25 days per year, averaged over three years	100 µg/m ³	
NO ₂	One hour	Limit value, 200 µg/m ³ (*)	Not to be exceeded more than 18 times a calendar year	200 µg/m ³ (*)	
NO ₂	Calendar year	Limit value, 40 µg/m ³		40 µg/m ³	

Data Driven Decision Support



- Decision Support system
- Assessment / Strategies
- Data Rendering,
 - visual analytics, business intel..
- Data Analytics, ML, AI
- Data aggregation, Storage, indexing
- Data Ingestion





Digital Twin Solutions for Sustainability

OPERATION AND PLAN - CONTROL ROOMS - DECISION SUPPORT SYSTEMS - WHAT-IF ANALYSIS - OPTIMIZATION - APPLICATIONS

HORIZONTAL AI PLATFORM

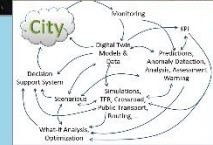
MOBILITY AND TRANSPORT

SMART ENERGY AND SMART BUILDING

ENVIRONMENT AND WASTE MANAGEMENT

CITY USER'S SERVICES AND TOURISM MANAGEMENT

- DEVELOPMENT ENVIRONMENT AND METHODOLOGY
- VISUAL PROGRAMMING, ML, AI, HPC
- TRAINING COURSES
- LIVING LABS
- GUI CUSTOM STYLES
- FULL APPLICATIONS, DASHBOARDS AND VIEWS
- MOBILE APPS



VISUAL ANALYTICS - SYNOPTICS - GRAPHICAL WIDGETS - ANALYTICS - BUSINESS INTELLIGENCE - SIMULATIONS

DASHBOARDS, WIDGETS TEMPLATES

PREDICTION - ANOMALY DETECTION - CLUSTERING - ROUTING - SENTIMENT NLP - TRAFFIC FLOW - PEOPLE FLOWS - SDG
15 MIN CITY INDEX - KPI - HEATMAPS - ORIGIN DESTINATION - ETC...

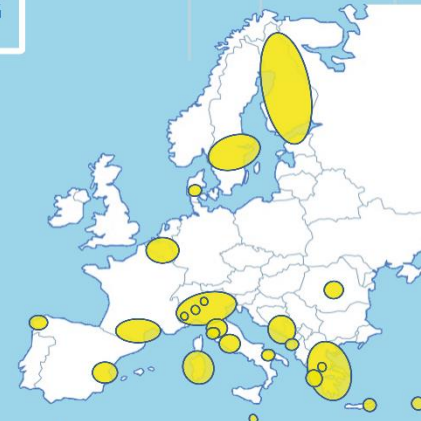
API - MICROSERVICES - GIS - BPM
VIDEO - REPORTS - MAPS - 3D ...

EXPERT SYSTEM, KNOWLEDGE BASE
SEMANTIC REASONING
SMART DATA MODEL
IOT DEVICE MODELS, STORAGE

BIG DATA ANALYTICS, ARTIFICIAL INTELLIGENCE
EXPLAINABLE AI, MACHINE LEARNING, GENERATIVE AI
OPERATIVE RESEARCH, STATISTICS

VISUAL PROGRAMMING, ADAPTERS
DATA FLOWS, WORKFLOWS
PARALLEL DISTRIBUTED PROCESSING
DATA DRIVEN

FULL INTEROPERABILITY, ANY: DATA, BROKERS, NETWORKS AND VERTICALS



Powered by **FIWARE**

FREE TRIAL

PEN Test Passed

EU GDPR COMPLIANT

SNAP4 Appliances and Dockers Installations

EUROPEAN OPEN SCIENCE CLOUD

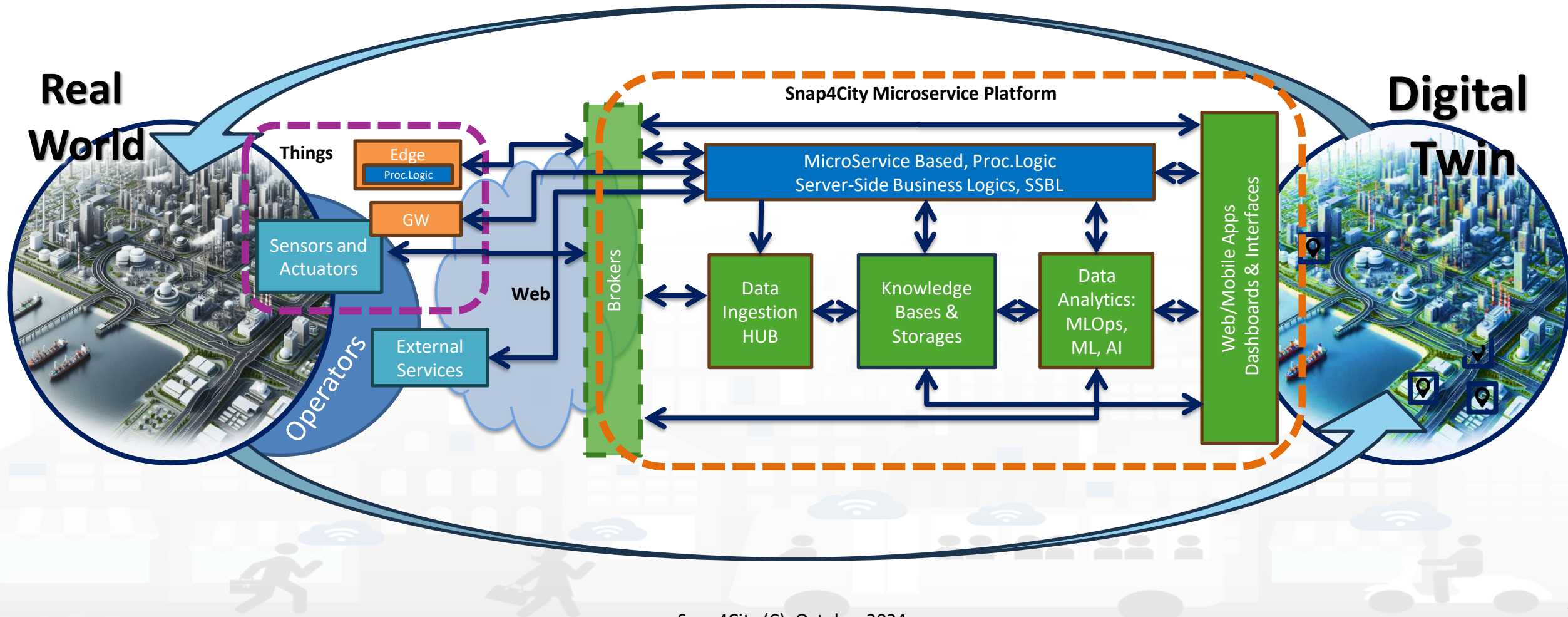
Node-RED

JS Foundation

E015 digital ecosystem

NVIDIA

Digital Twin Development Platform



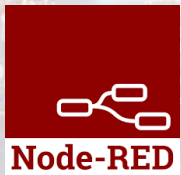
Standards and Interoperability (10/2024)



Compliant with:

- **IoT:** NGSII V2/LD, LoRa, LoRaWan, MQTT, AMQP, COAP, OneM2M, TheThingsNetwork, SigFOX, Libelium, IBIMET/IBE, Enocean, Zigbee, DALI, ISEMC, Alexa, Sonoff, HUE Philips, Tplink, BACnet, TALQ, Protocol Buffer, KNX, OBD2, Proximus, ..
- **IoT model:** FIWARE Smart Data Model, Snap4City IoT Device Models
- **General:** HTTP, HTTPS, TLS, Rest Call, SNMP, TCP, UDP, SOAP, WSDL, FTP, FTPS, WebSocket, WebSocket Secure, GML, WFS, WMS, RTSP, ONVIF, AXIS TVCam, CISCO Meraki, OSM, Copernicus, The Weather Channel, Open Weather, OLAP, VMS Milestone, TIM, HERE,
- **Formats:** JSON, GeoJSON, XML, CSV, GeoTIFF, OWL, WKT, KML, SHP, db, XLS, XLSX, TXT, HTML, CSS, SVG, IFC, XPD, OSM, Enfuser FMI, Lidar, gITF, GLB, DTM, GDAL, Satellite, D3 JSON, ...
- **Database:** Open Search, MySQL, Mongo, HBASE, SOLR, SPARQL, ODBC, JDBC, Elastic Search, Phoenix, PostGres, MS Azure, ..
- **Industry:** OPC/OPC-UA, OLAP, ModBUS, RS485, RS232,..
- **Mobility:** DATEX, GTFS, Transmodel, ETSI, NeTEx, ..
- **Social:** Twitter, FaceBook, Telegram, ..
- **Events:** SMS, EMAIL, CAP, RSS Feed, ..
- **OS:** Linux, Windows, Android, Raspberry Pi, Local File System, AXIS, ESP32, etc.

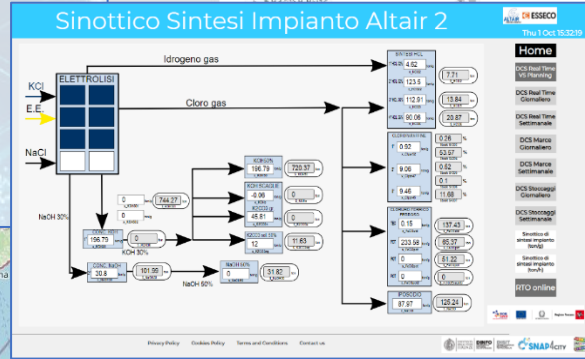
<https://www.snap4city.org/65>



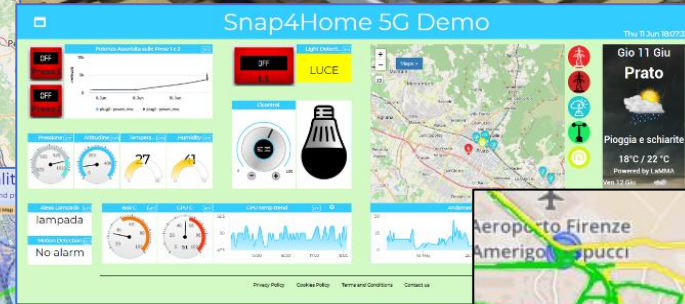
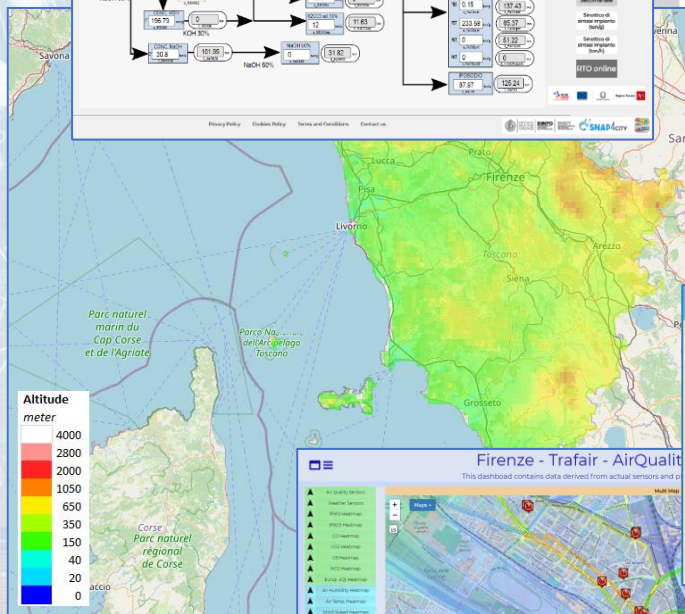
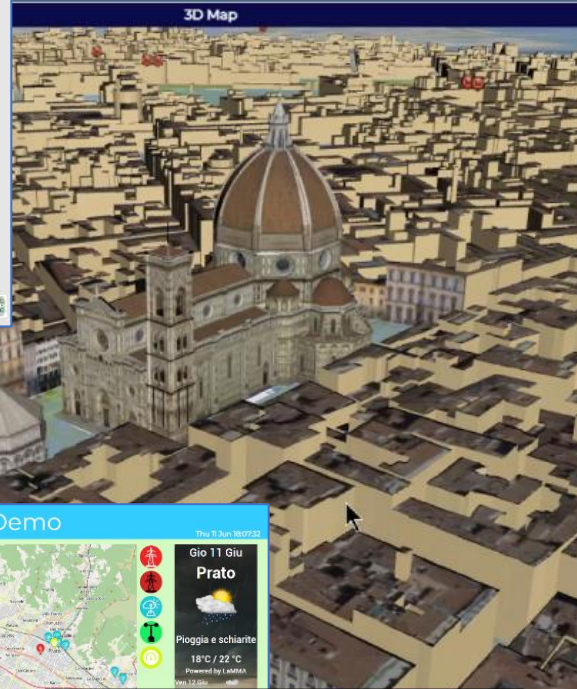
High Level Types

Snap4City (C), October 2024

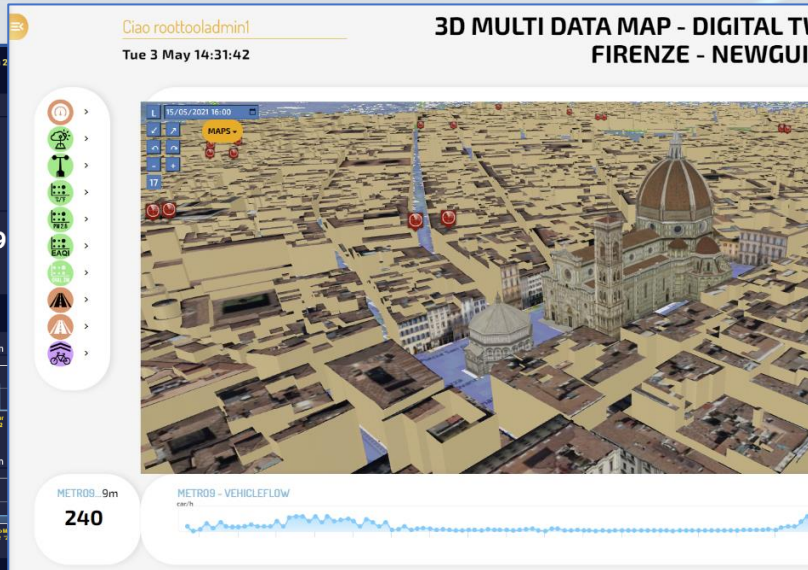
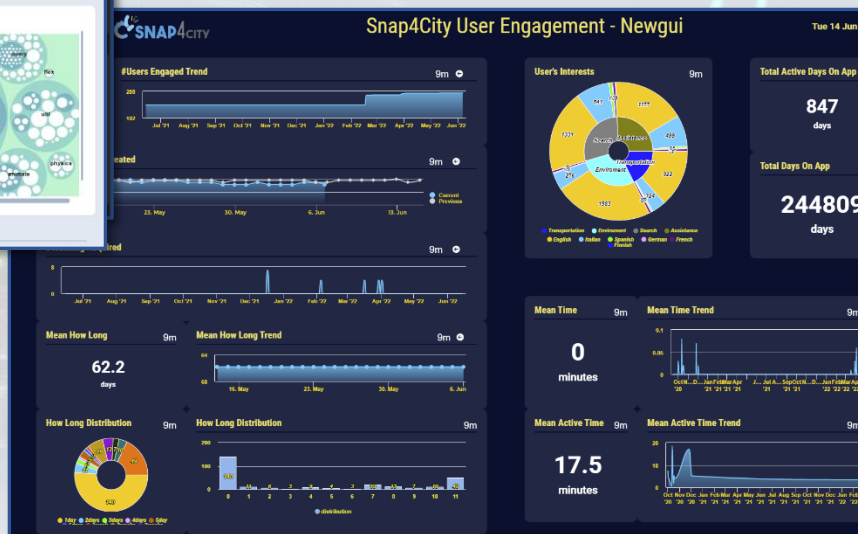
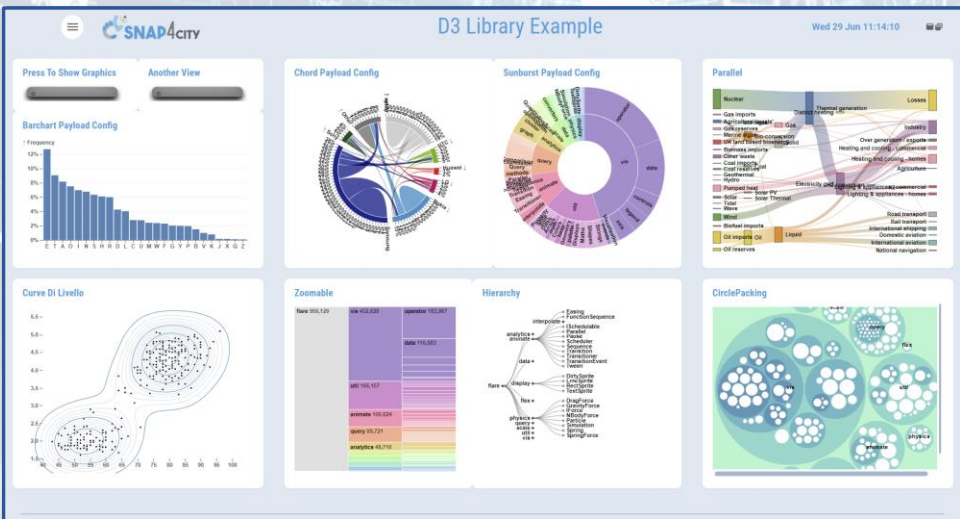
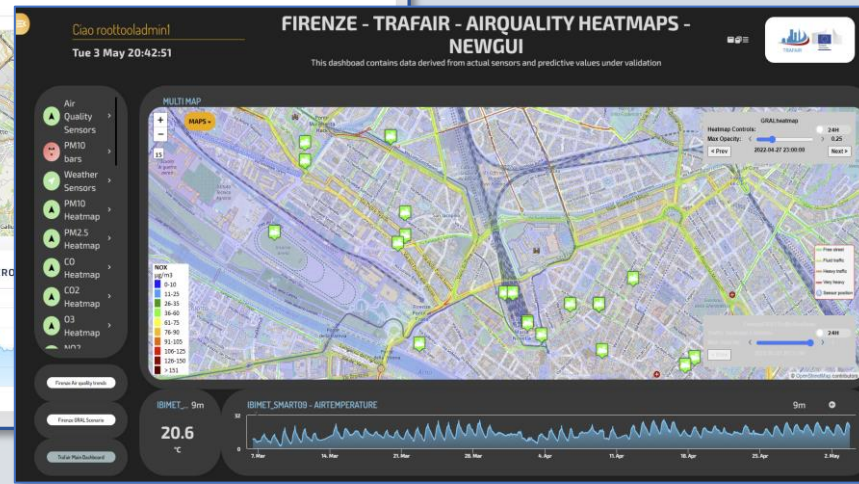
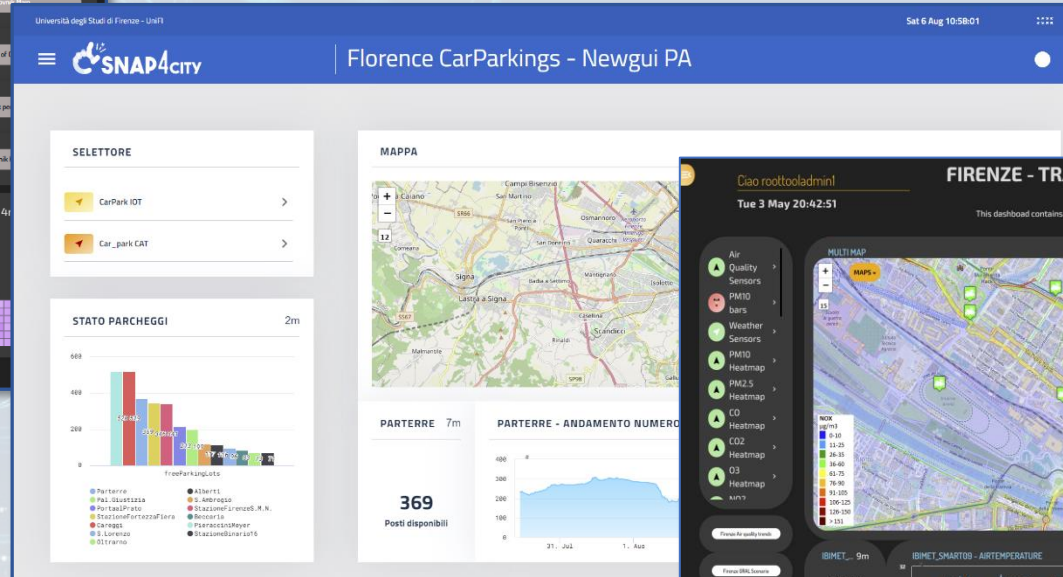
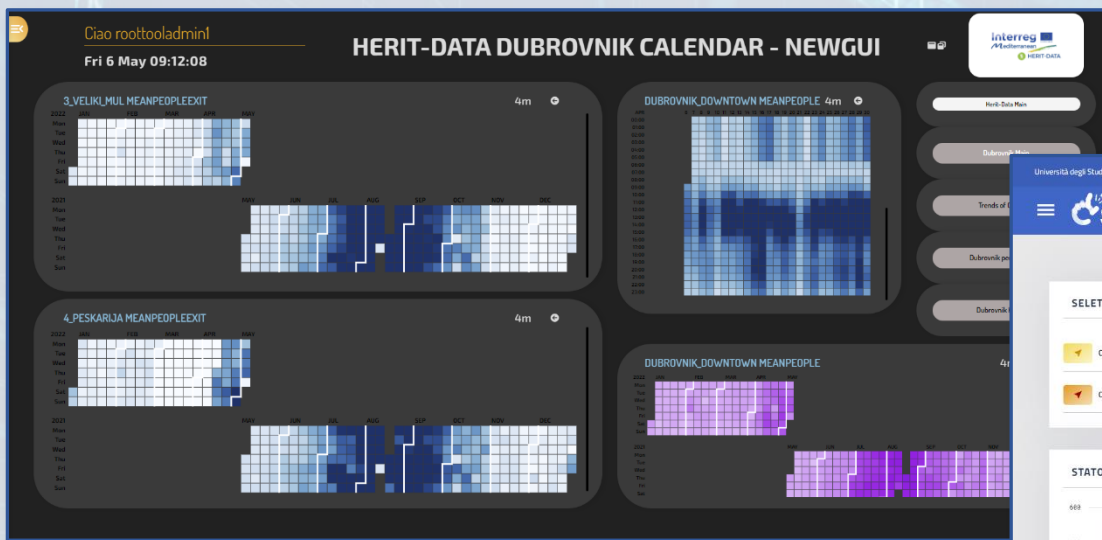
- POI, IOT Devices, shapes, ...
 - FIWARE Smart Data Models,
 - IoT Device Models
- GIS, maps, orthomaps, WFS/WMS, GeoTiff, calibrated heatmaps, ...
- Satellite data, ...
- traffic flow, typical trends, ...
- trajectories, events, Workflow, ...
- 3D Models, BIM, Digital Twins, ...
- OD Matrices of several kinds, ...
- Dynamic icons/pins, ...
- Synoptics, animations, ...
- KPI, personal KPI, ...
- social media data, TV Stream,
- routing, multimodal, constraints, ...
- decision scenarios,
- etc.



SNAP4CITY
- Digital Twin Global - Fire
demonstrator

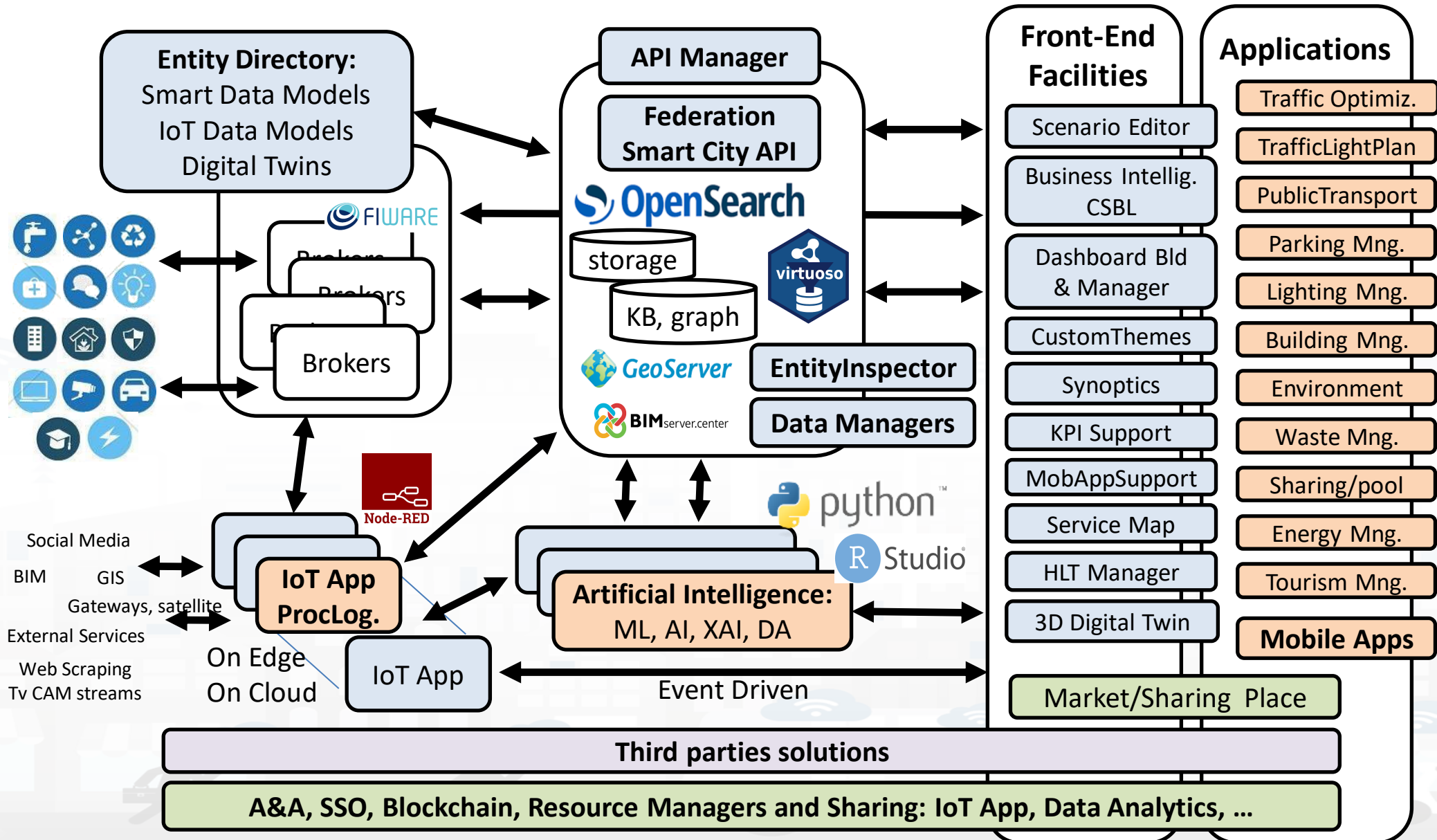


Different Themes



New styles/themes can be developed by specializing a few files from open source

<https://www.snap4city.org/793>



TOP

Monitoring and control

FROM CITY DASHBOARD TO APPLICATIONS

DATA GATHERING AND CITY DATA KNOWLEDGE MANAGEMENT

FORGING & MANAGING OPEN AND FLEXIBLE WITH AND JOB MAP

IOT APPLICATIONS VS IOT EDGE DEVICES

TWITTER VIGILANCE SOCIAL MEDIA ANALYSIS

SNAP4CITY FOR BEING...
CAPACITY ARCHITECTURE AND SYSTEM. C...
TO DEVELOPERS AND STAKEHOLDERS

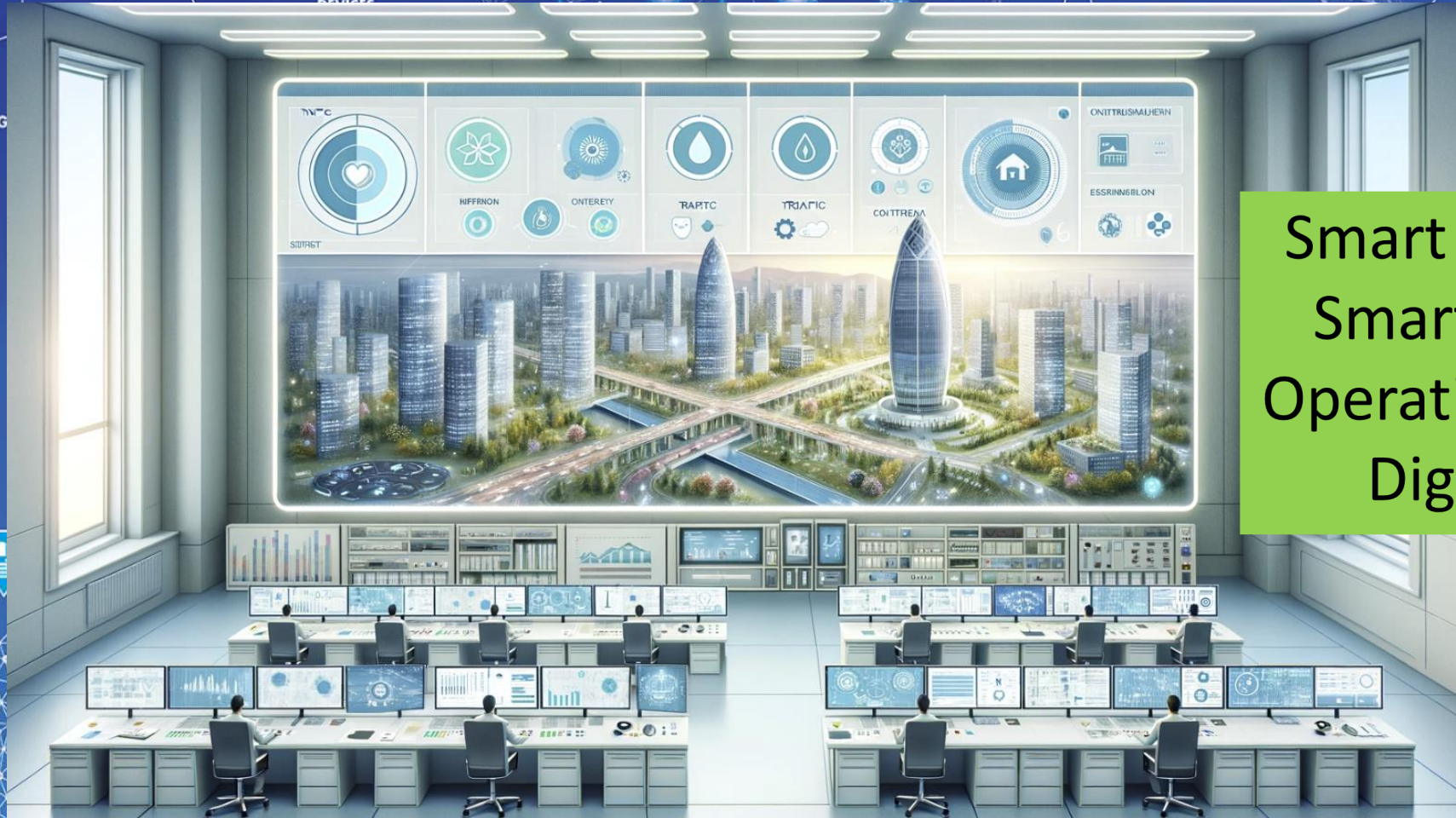
SNAP4CITY AND KM4CITY PROJECTS

HOW TO ADOPT SNAP4CITY, AND OUR ROADMAP

PORT CITY

Smart Energy and Smart Buildings Operation and Plan Digital Twin

100% OPEN SOURCE





Cabinets On Stockholm By Capelon

Tue 31 Oct 22:53:17

Capelon Cabinet (iot-search)

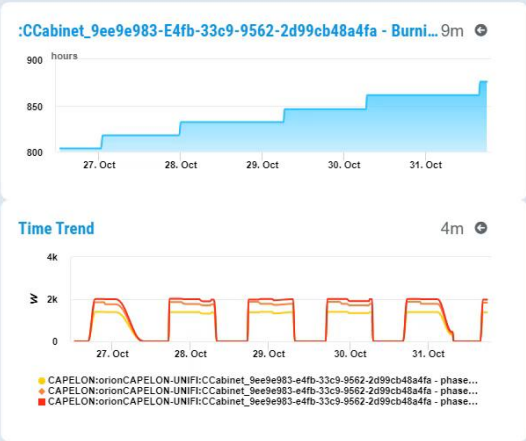
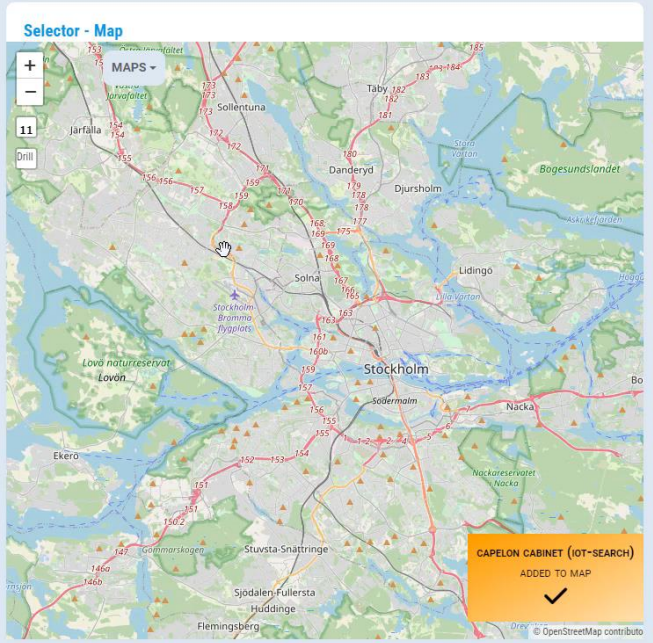
Ac...9m ActualState0Count - St... 9m

12

Radars Series

4m

● CCabinet_9ee9e983-e4fb-33c9-9562-2d99cb48a4fa



My Profile Privacy Policy Cookies Policy Terms and Conditions Contact us

ASM Merano Stadtwerke Meran

Elenco lampade Visualizzazione dati Log eventi Grafici Impostazioni

N. Punto Luce	11307
DevEui	7083D58F10085D7
Via	RomSträße
Regolazione	
Ore di servizio	
Conta energia	
Potenza attuale	
Stato	Inattivo
Nome errore	null
RSSI	
SNR	
Data	01/11/2023 12:01:18

Regolazione

Non Attivo
Stato Linea verso Sinigo

Non Attivo
Stato Linea verso Merano Centro

Powered by SNAP4Tech

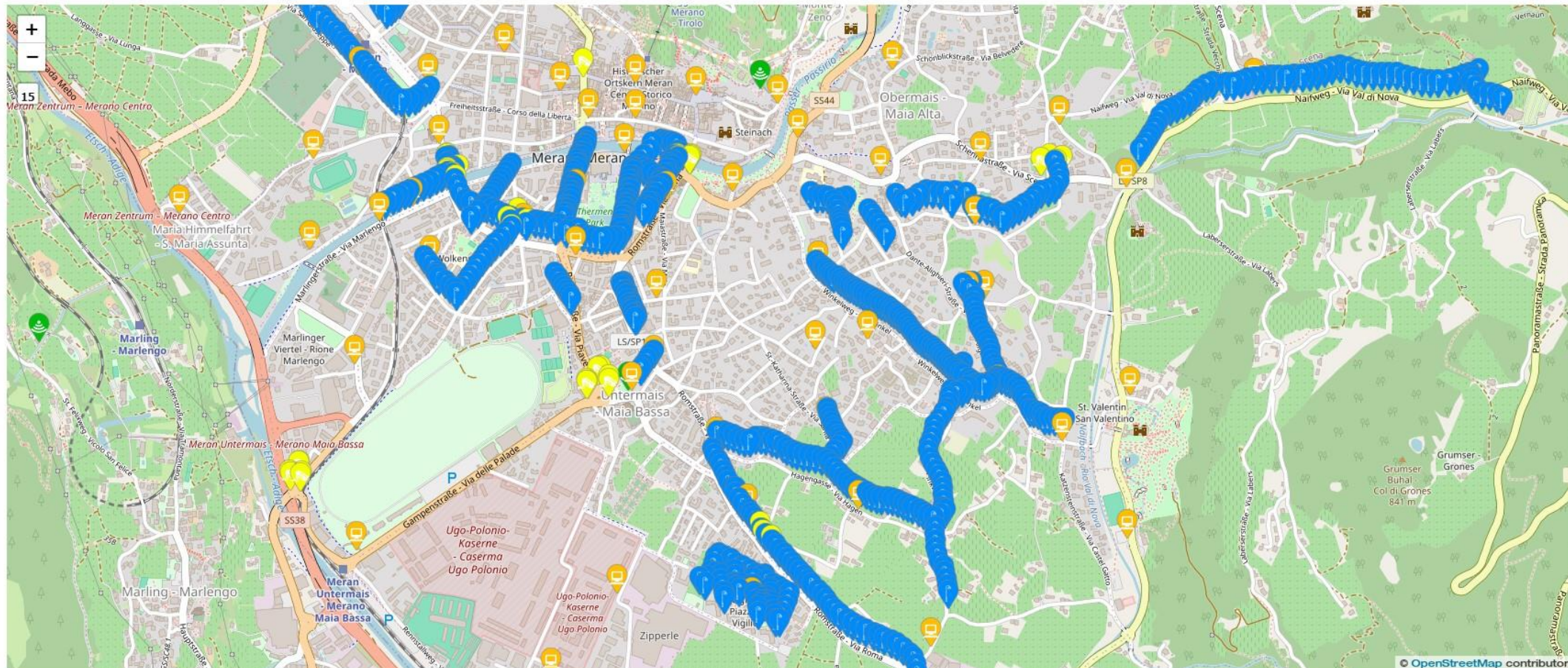
Smart Light Management

Smart Light in Merano



Merano - tutti i servizi

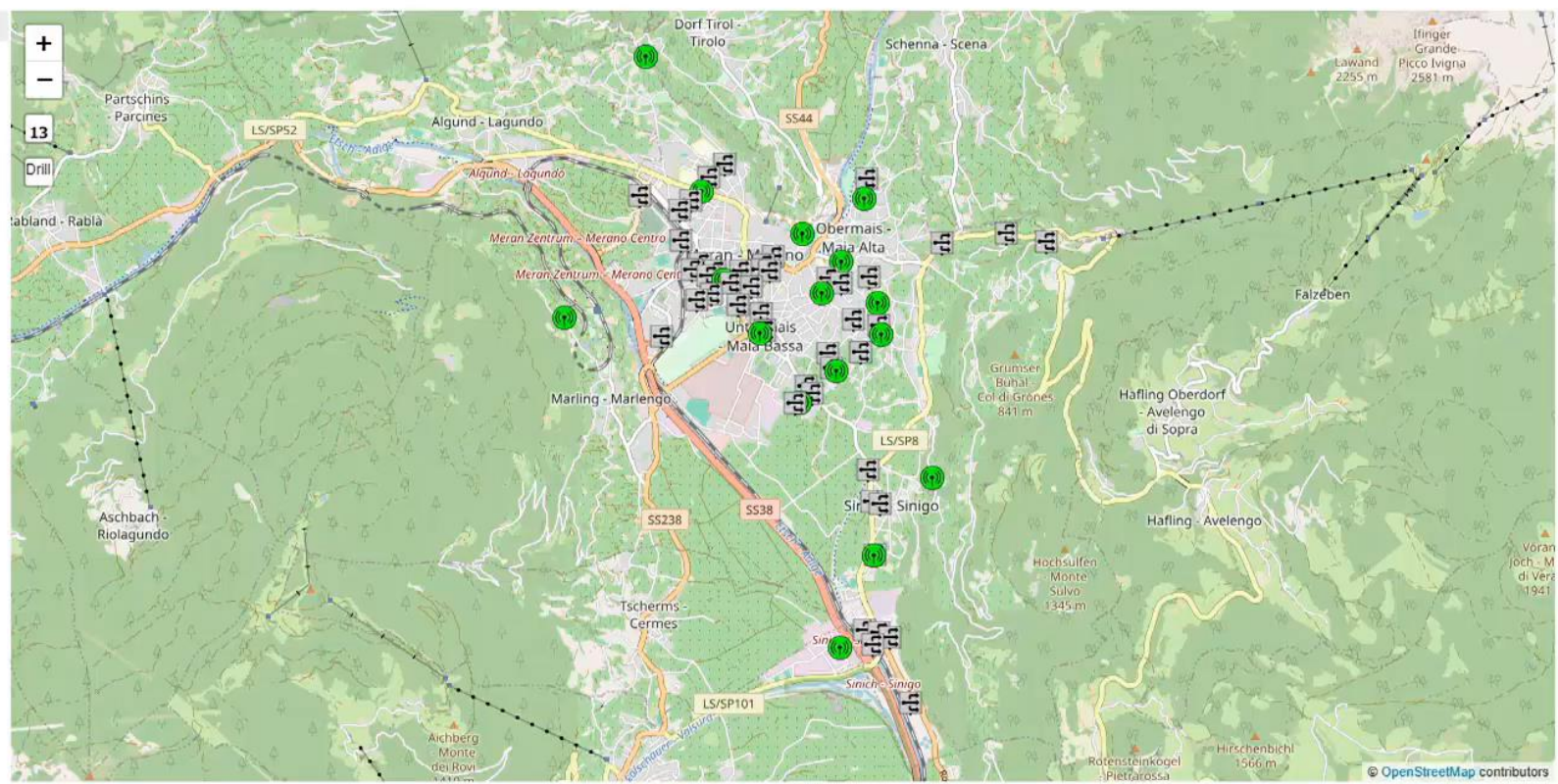
Wed 13 Dec 15:34:57



© OpenStreetMap contributors



legenda		
●	Comunicazione inattiva	47
●	Comunicazione attiva e spento	0
●	Comunicazione attiva e accesso	0
●	Punto Luce in errore	0



Building / Floor / Parking:

Building

All / Single Building:

All

Variable:

occupancy

Popup on Shape Click

Add To Map



Ispra - Occupancy 8m

883

Ispra - Occupancy



ISPRA Site



- Date Observed: 10/23/2023, 12:30:01 PM
- Capacity: 2936 #
- Allocation: 1995 #
- Occupancy: 883 #
 - DAC: -941 #
 - DOA: -1112 #
 - DOC: -2053 #
 - PAC: 67.95 %
 - POA: 44.26 %
 - POC: 30.07 %
- Energy Hot: 4473978 kWh
- Energy Cold: 916361 kWh
- Power Hot: 36 kW
- Power Cold: 0 kW
- Outdoor Temperature: 14.07 °C
- Total Number of Buildings: 76 of 304 #
- Total Number of Floors: 104 #
- Total Number of Zones: 139 #
- Total Number of Parking Areas: 4 #

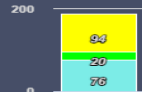
See Trends

Parking Overview

person My Profile

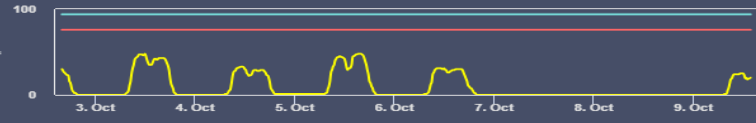


Actual 4m



● Capacity
● Occupancy
● Allocation

Capacity - Allocation - Occupancy 4m



● capacity ● occupancy ● allocation

Occupancy Weekly Time Trend Compare 9m



● Current
● Previous

Office Mq 9m

803.9 m²

Temp. 9m

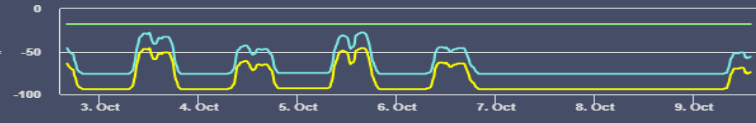
20.6 °C

Difference 4m



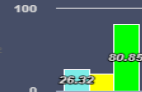
● DOA
● DOC
● DAC

DOA - DOC - DAC 4m



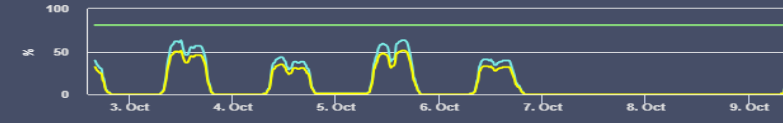
● DOA ● DOC ● DAC

Percentage 4m



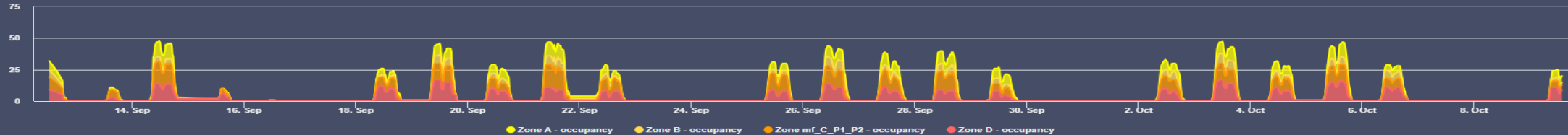
● POA
● POC
● PAC

POA - POC - PAC 4m



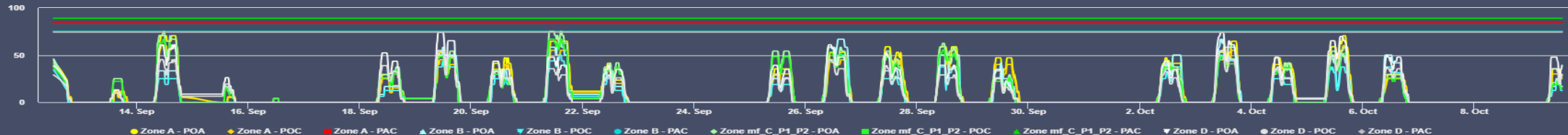
● POA ● POC ● PAC

Occupancy Per Zones - Monthly Time Trend Comparison Stacked 4m



● Zone A - occupancy ● Zone B - occupancy ● Zone mf_C_P1_P2 - occupancy ● Zone D - occupancy

Percentage Per Zones - Monthly Time Trend Comparison 4m



● Zone A - POA ● Zone A - POC ● Zone A - PAC ● Zone B - POA ● Zone B - POC ● Zone B - PAC ● Zone mf_C_P1_P2 - POA ● Zone mf_C_P1_P2 - POC ● Zone mf_C_P1_P2 - PAC ● Zone D - POA ● Zone D - POC ● Zone D - PAC

Heat Power 9m

0 kW

Heat Energy 9m

1931279 kWh

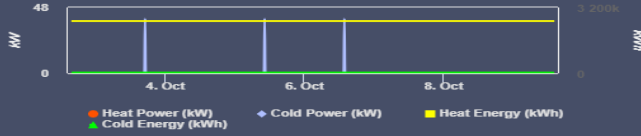
Cold Power 9m

0 kW

Cold Energy 9m

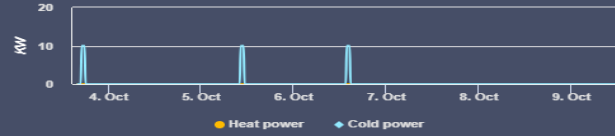
888311 kWh

Energy Trends 4m



● Heat Power (kW) ● Cold Power (kW) ● Heat Energy (kWh)

Average Hourly Power 4m



● Heat power ● Cold power

En./Mq 9m

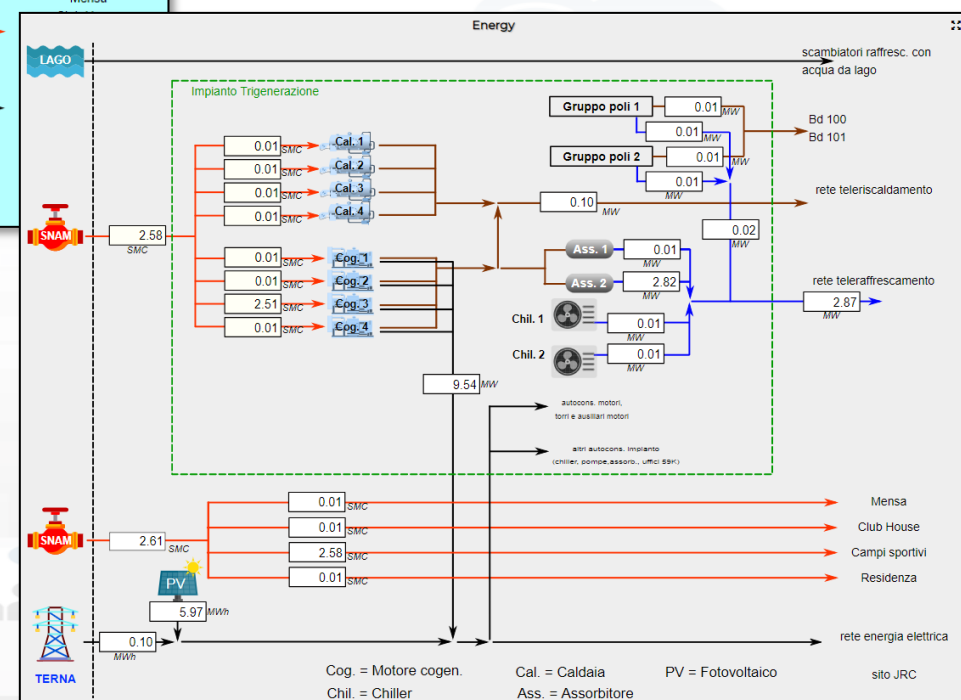
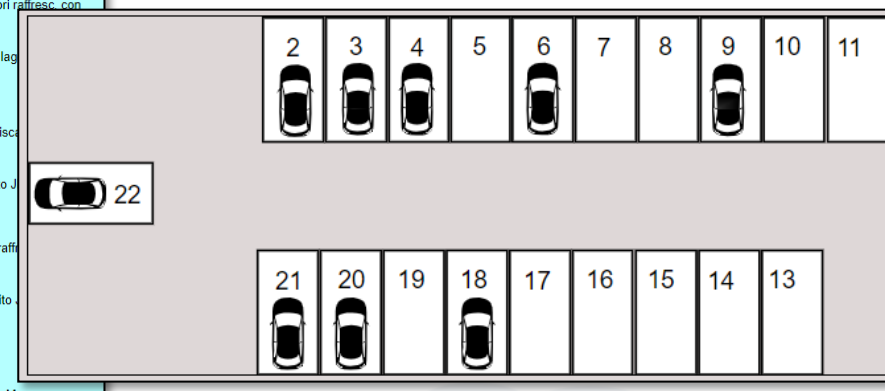
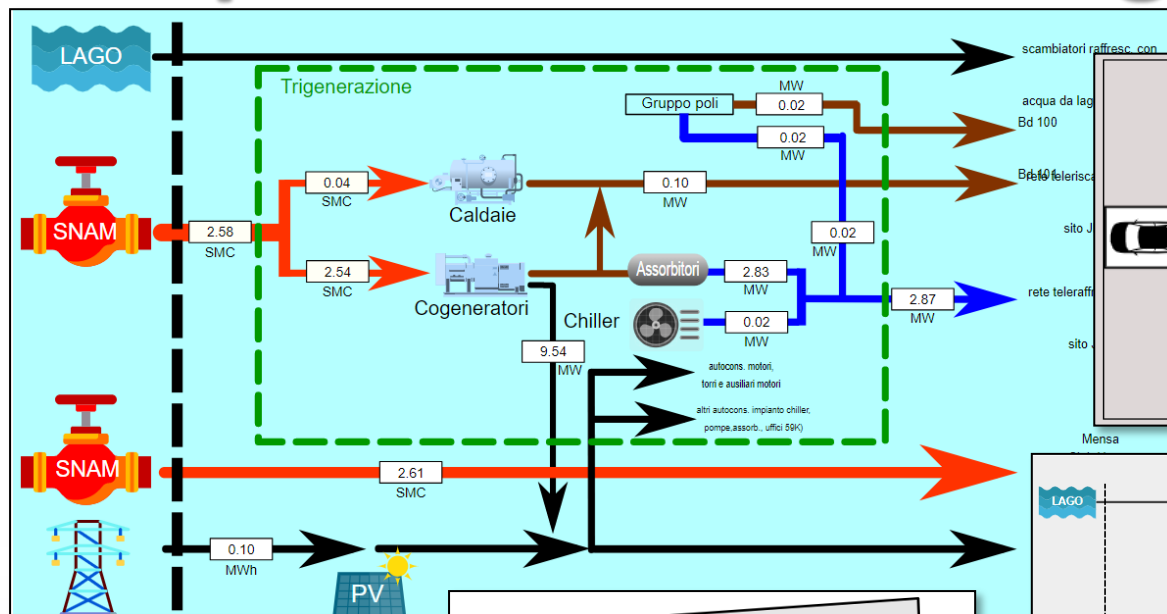
0 kWh

En./Pax 9m

0 kWh

Special Custom Widgets

- Smart parking
- Smart Energy
- Smart Light
- Smart
- Energy View
- Custom Controls



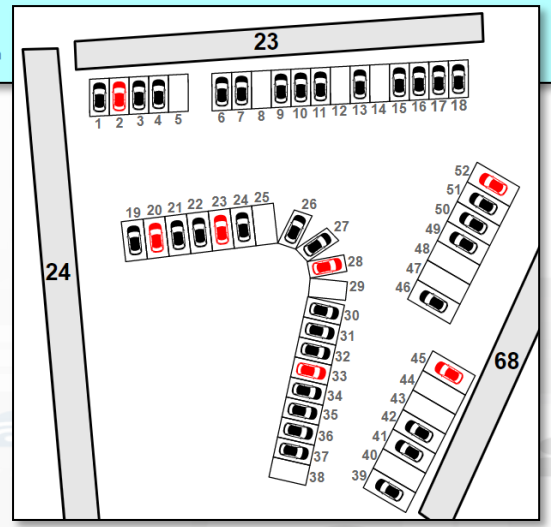
Custom control widget showing a row of five smiley faces (from sad to happy) and two data fields:

- Total clicks: 6
- Mean rate value: 0.00

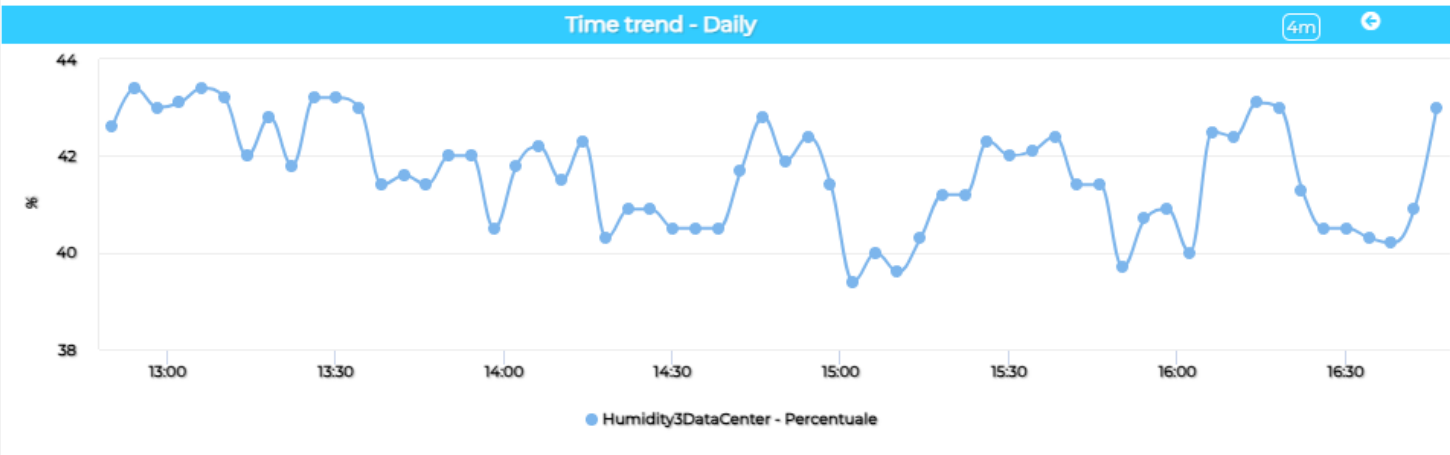
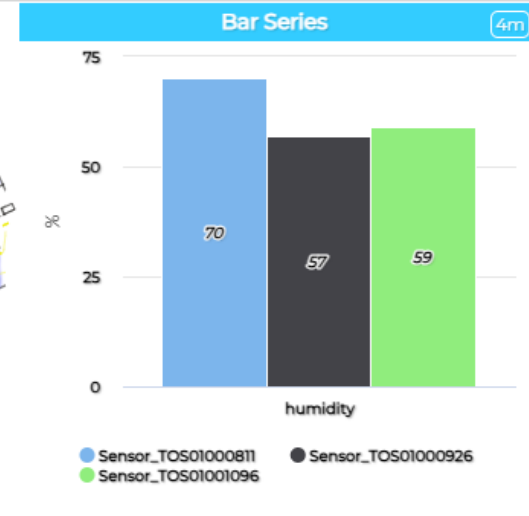
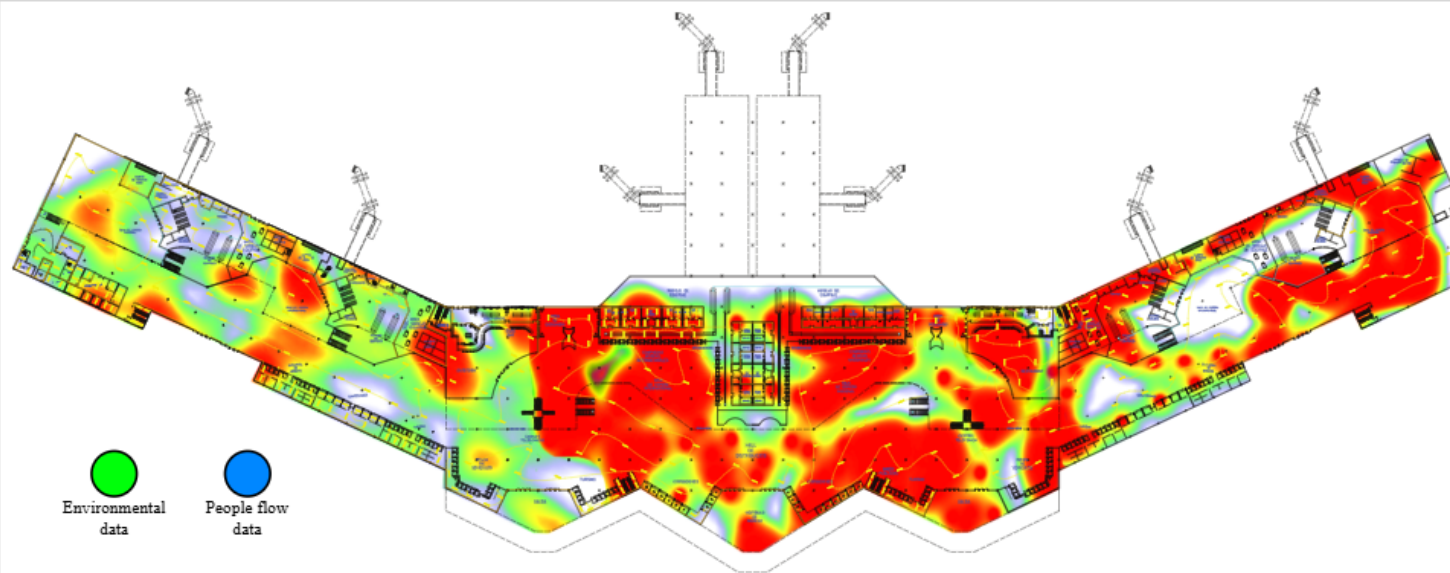
Custom control widget showing a time range selector:

- Begin: 17:00
- Finish: 4:00

Custom control widget showing a grid of smiley faces (from sad to happy) for user interaction.



Floor status monitoring with heatmaps

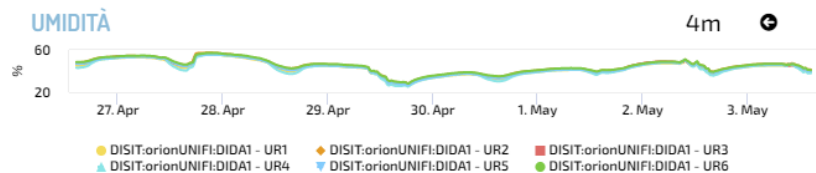
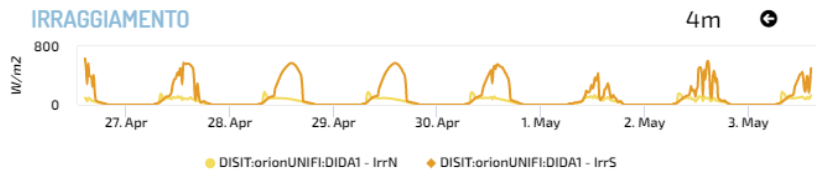
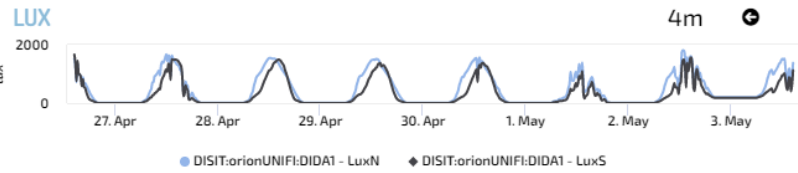


Environment zone
A

Environment
Zone B

Ciao roottooladmin!

Tue 3 May 14:37:14



DIDA DATA 2 - NEWGUI

7 AFFORDABLE AND
CLEAN ENERGY

11 SUSTAINABLE CITIES
AND COMMUNITIES

to see BIM log as user: info@disit.org, passwd: guest

BIM SANTA VERDIANA



Last Value

Time Trend Chart: Glob - Day



<https://www.snap4city.org/dashboardSmartCity/view/index.php?iddashboard=MzI4OA==>

TOP

Decision Support Tactic and Strategic Plans What-if Analysis



Smart Energy and Smart Buildings Operation and Plan Digital Twin





Available AI Solutions on Snap4City

More than 80 Available Solutions & 300 AI applic.

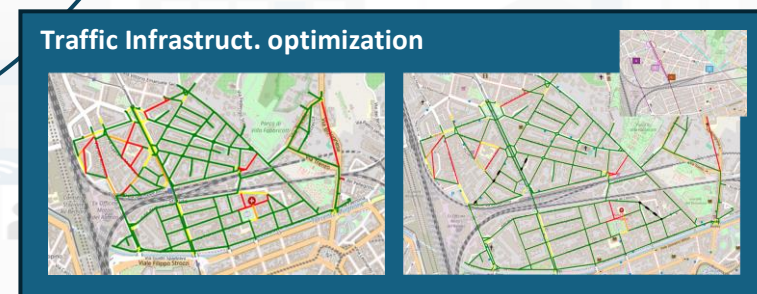
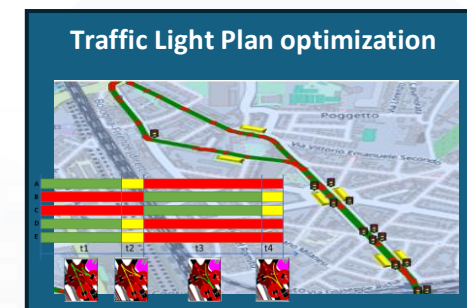
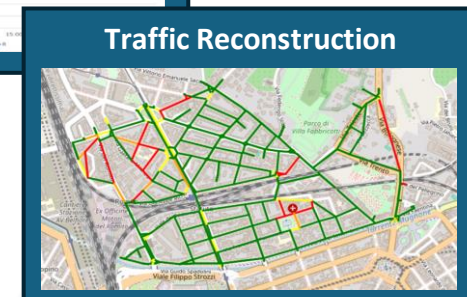
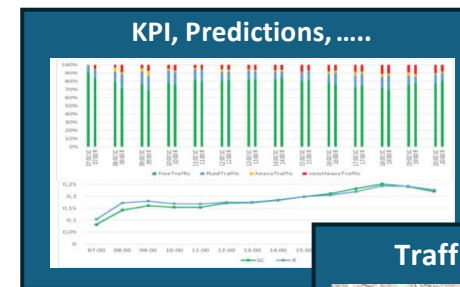
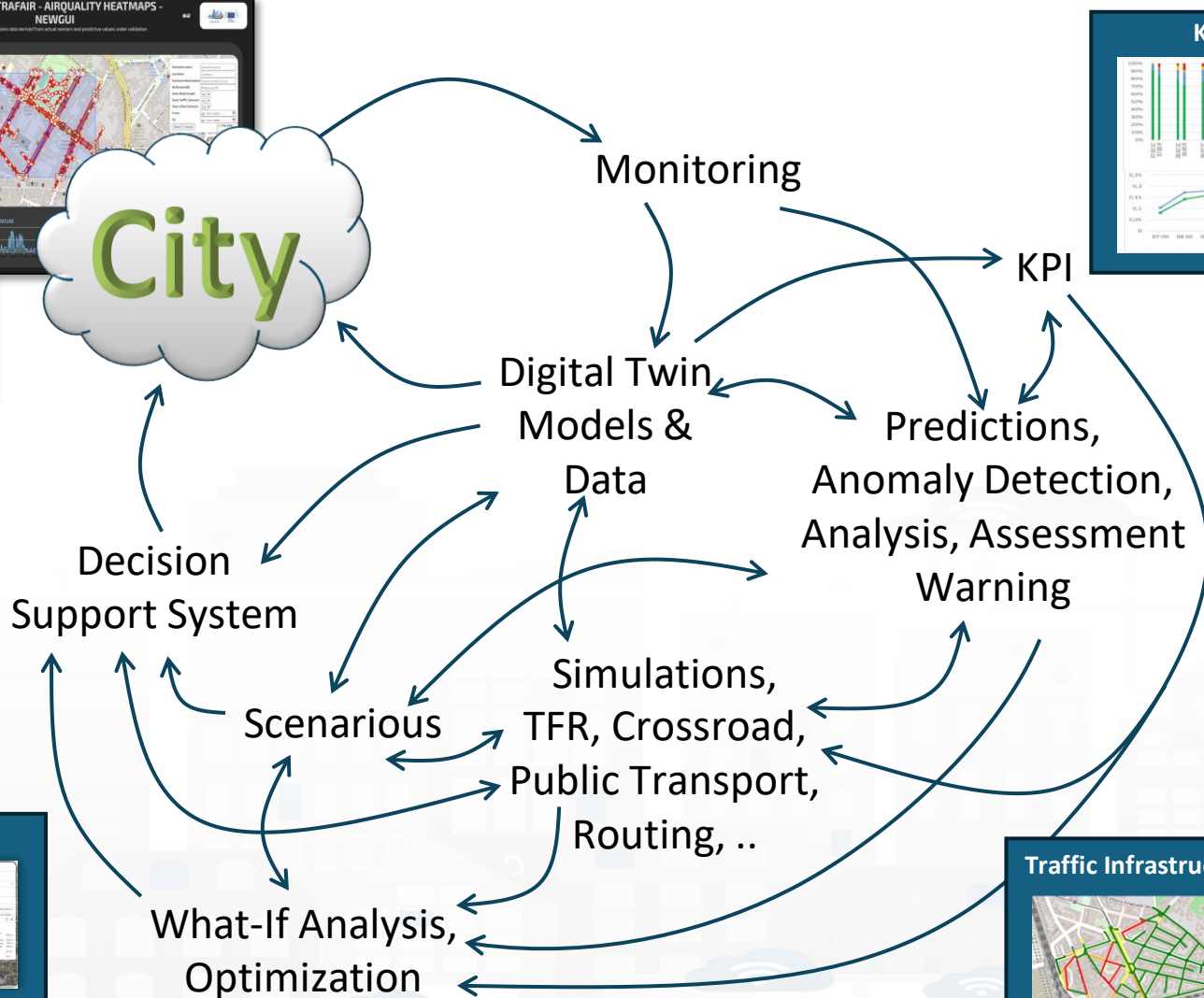
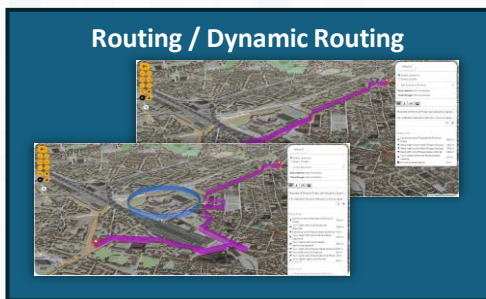
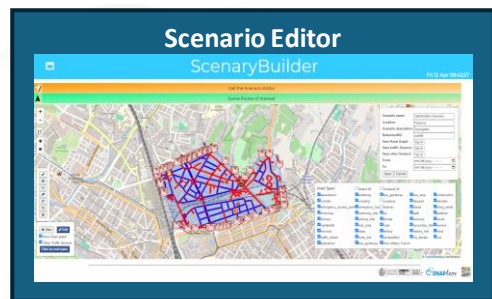
<https://www.snap4city.org/997>

- **Mobility and Transport**
- **Environment, Weather, Waste, Water**
- **City Users Behaviour and Social analysis**
- **Energy and Control**
- **Tourism and People**
- **Security and Safety**
- **High Level Decision Support Solutions**
 - **Asset management**
 - **Resilience and Risks Analysis**
- **Low level Techniques**



https://www.snap4city.org/download/video/DPL_SNAP4SOLU.pdf

<https://www.snap4city.org/download/video/course/p4/>





- **15 Minute City Index:**
 - 13 subindexes: energy, slow mobility, fast mobility, housing, economy education, culture and cults, health, entertainment, gov, food, security...



- Optimization of car sharing/pooling
- Monitoring and Prediction of energy consumption
- Stimulating: Bike sharing, e-bikes, car charge, etc.
- Sizing energy plants



- Predictive maintenance
- Decisions Support Systems
- Process optimization, control
- Industry 4.0 integrated solutions



- Reduction of emission, reduction of congestion
- Smart City infrastructure: monitoring and resilience, long terms predictions
- Effective and Low cost smart solutions
- What-if analysis, Simulations
- Origin Destination matrices computation



- Optimization of Waste Collection
- business intelligence tools for decision makers
- Reduction production costs
- Monitoring resource consumption



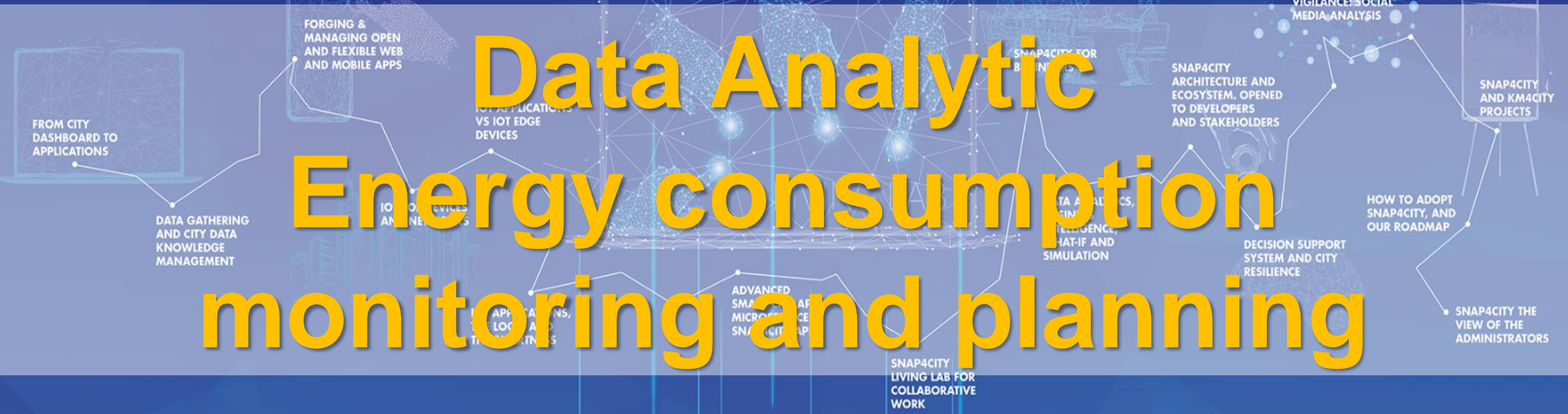
- Reduction of emission, reduction of congestion
- Monitoring and Predicting: NO2, NOX, CO2, Traffic flow, pollutant, landslide, waste, etc.
- Traffic flow reconstruction
- Demand vs Offer of Mobility analysis



- Shortening justice time
- Prediction of mediation proneness
- Assisting institution is taking legal decisions
- Anonymization and indexing legal docs.
- Ethical Explainable Artificial Intelligence

TOP

Data Analytic Energy consumption monitoring and planning

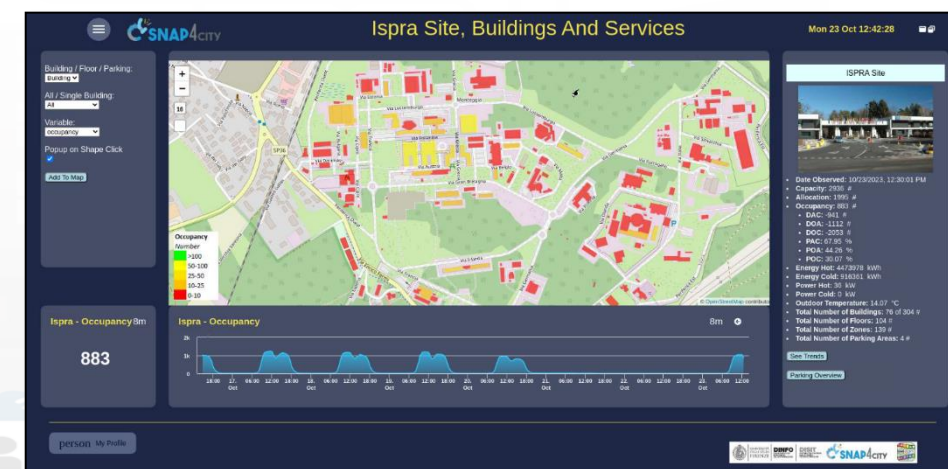
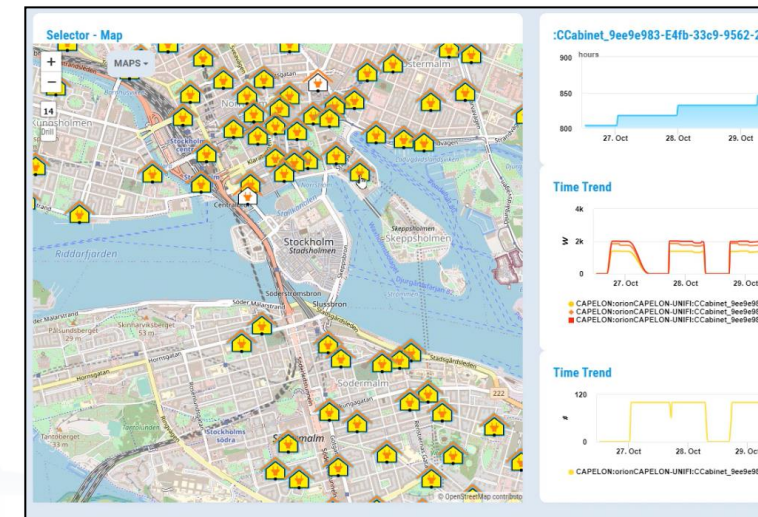


Smart Energy and Smart Buildings Operation and Plan Digital Twin



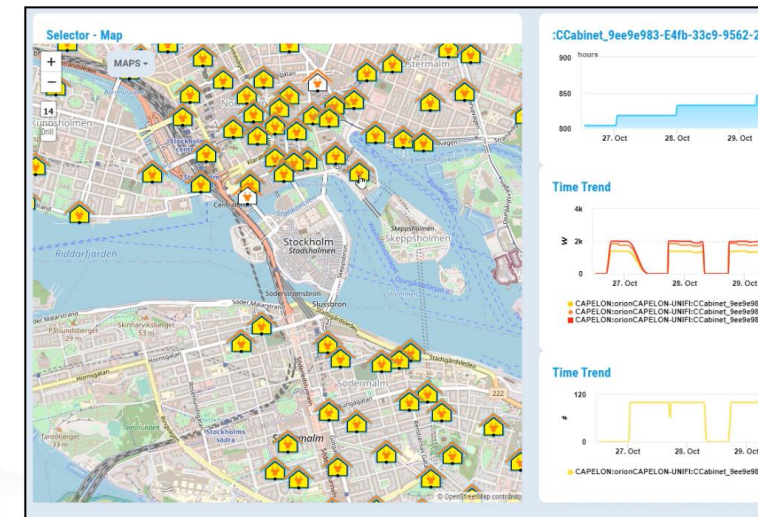
Energy Domain (2024/8)

- Goals:
 - Energy consumption reduction, increment of efficiency, sustainability
 - accessibility to services
- Solutions for Operation (monitoring, managing, mobile apps, digital signages, control rooms)
 - Monitoring energy consumption (heating, cooling, prod,...), conditions, charging stations, etc.
 - **Managing Smart Light** for city: dimering, programming, traffic control, controllers, legacy, etc.
 - Early detection/warning, alarm, of critical conditions
 - Managing smart services: cabinets, lockers, etc.
 - Production of suggestions, nudging
 - Global and local 3D/2D representations of area and buildings
 - Managing Communities of Energy, certification via Blockchain
 - Computing predictions of any kind
- Solutions for Planning (optimization and what-if analysis)
 - Reduction of energy costs, via optimization
 - Identification of roofs with better orientation
 - Optimization of battery storage size for PV plants
 - Community of Energy planning and viability
- Algorithms and computational solutions, see next slide



Tools: Energy Domain (2024/8)

- Monitoring Energy Consumption in single building, area and per zone
- Smart Light management, unicast and multi cast management, smart light controlled by **traffic flow data**
- Monitoring Energy provisioning on **recharging station**
- Matching Energy consumption with respect to the actual usage
- Computing Roof orientation for Photovoltaic installations
- Optimisation of Photovoltaic installations to identify the best parameters of size and storage
- Collecting and managing **Communities of Energy**
- Computing **KPI**
- Etc.



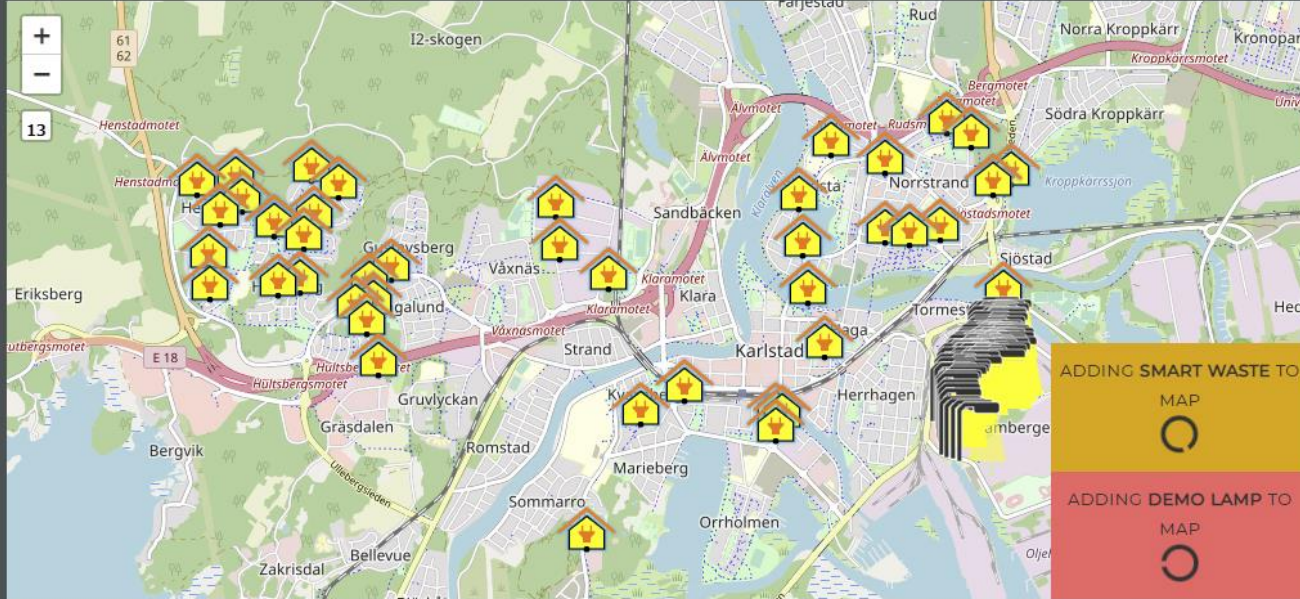


Karlstad - Capelon

CAPELON

Sun 28 Nov 20:02:16

- Cabinet
- Smart Light
- Demo Lamp
- Smart Waste

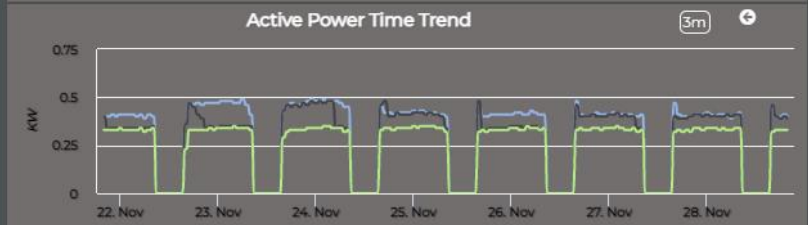
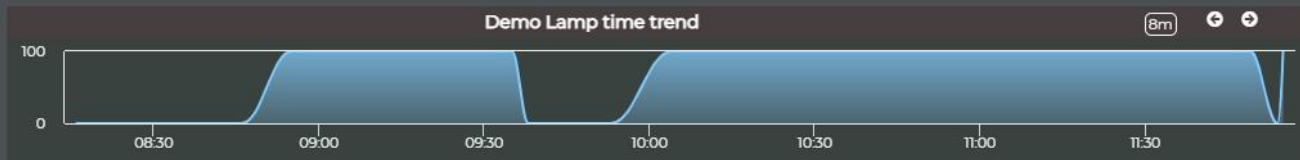
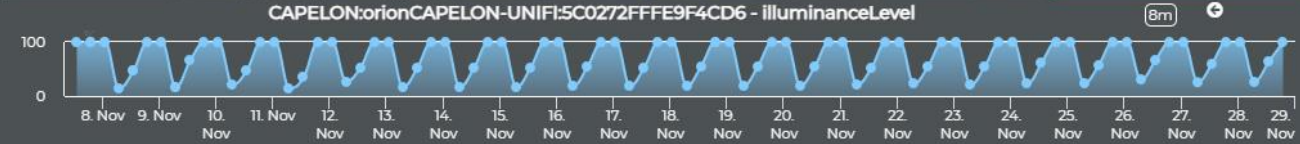


ADDING SMART WASTE TO MAP

ADDING DEMO LAMP TO MAP

Lamp ON

Lamp OFF



Cabinets' Monitoring in Stockholm

CAPELON



App Maps Google Gmail Snap4City Snap4 Calendar Translate Google Scholar Cita... DISIT DISIT old Facebook DataCenter Trello Km4City major tools Impostazioni YouTube Google Forms News Tutti i preferiti



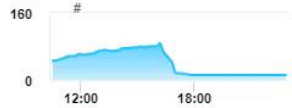
Cabinets On Stockholm By Capelon

Tue 31 Oct 22:53:17

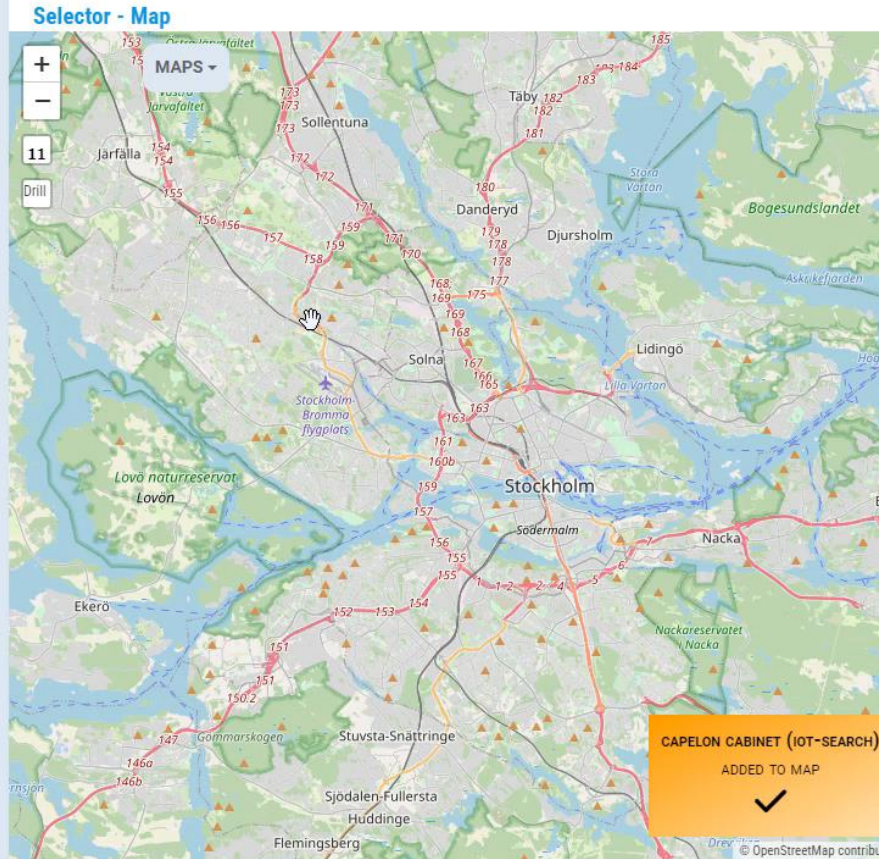
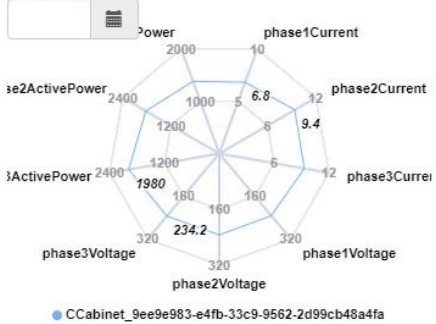
Capelon Cabinet (iot-search)

Ac...9m ActualState0Count - St... 9m

12



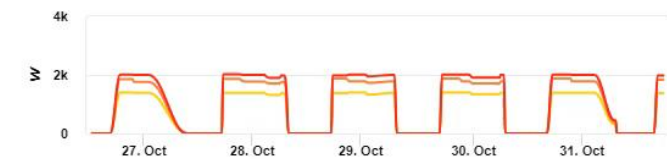
Radar Series 4m



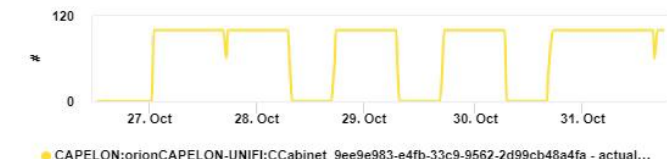
:CCabinet_9ee9e983-E4fb-33c9-9562-2d99cb48a4fa - Burni... 9m



Time Trend 4m



Time Trend 4m



My Profile

Privacy Policy Cookies Policy Terms and Conditions Contact us





Cabinets On Stockholm By Capelon

Tue 31 Oct 22:53:17

Capelon Cabinet (iot-search)

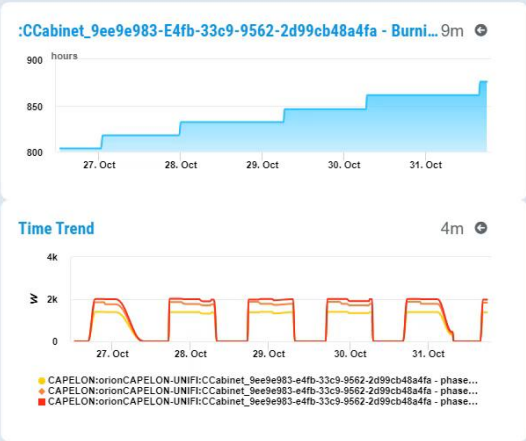
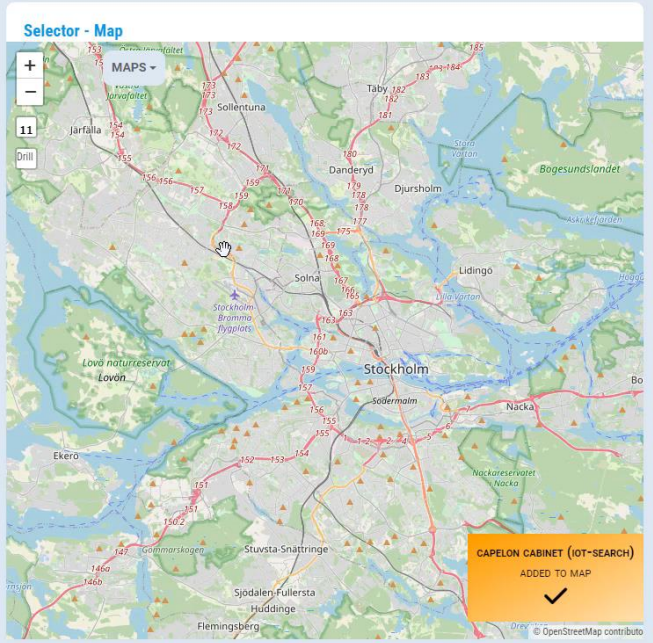
Ac...9m ActualState0Count - St... 9m

12

Radars Series

4m

● CCabinet_9ee9e983-e4fb-33c9-9562-2d99cb48a4fa



My Profile Privacy Policy Cookies Policy Terms and Conditions Contact us

ASM Merano Stadtwerke Meran

Elenco lampade Visualizzazione dati Log eventi Grafici Impostazioni

N. Punto Luce	11307
DevEui	7083D58F10085D7
Via	RomSträße
Regolazione	
Ore di servizio	
Conta energia	
Potenza attuale	
Stato	Inattivo
Nome errore	null
RSSI	
SNR	
Data	01/11/2023 12:01:18

Regolazione

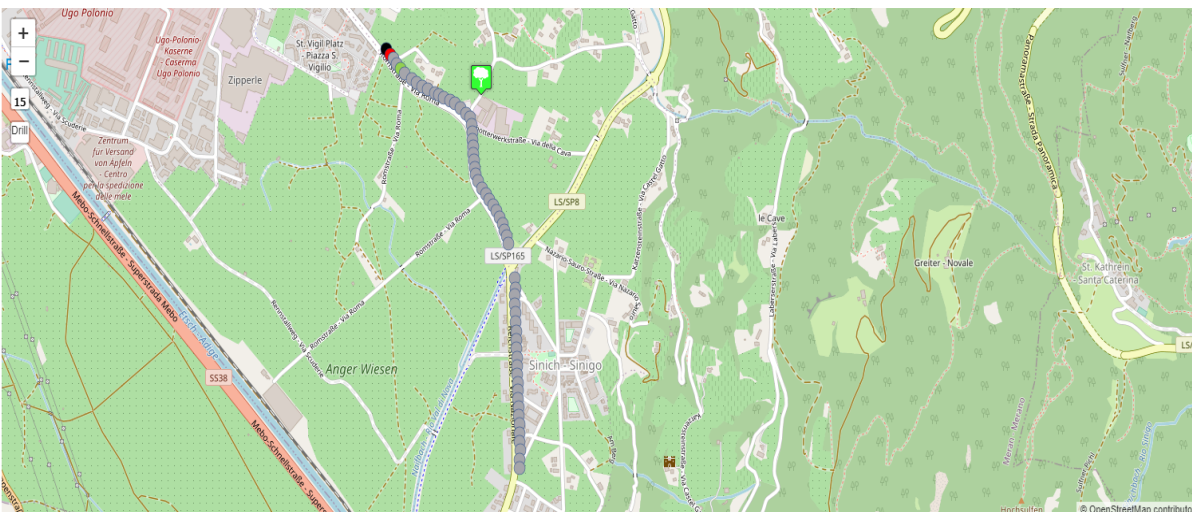
Non Attivo
Stato Linea verso Sinigo

Non Attivo
Stato Linea verso Merano Centro

Powered by SNAP4Tech

Smart Light Management

Smart Light Management in Merano, Italy



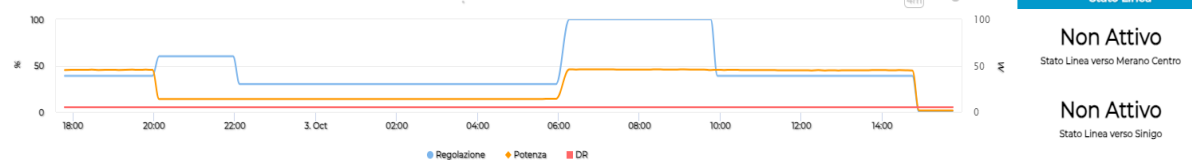
All lamps Data visualization Event logs Graph Settings

N. Punto Luce	11251
DevEui	7083D5BF100085DB
Via	Romstraße
Regolazione	100
Ore di servizio	1440
Conta energia	28709
Potenza attuale	24
Stato	ON
Nome errore	INF_DALI_LAMPON
RSSI	-42
SNR	10.5
Data	03/10/2023 15:42:43

ON

OFF

- DALI_NTC_MISSING
- INF_AUX_TRIGGER
- DALI_FADE_TIME_DISABLE
- DALI_BA_LAST_NOT_CONFIG
- ERR_DALI_THERMAL_SHUTDOWN
- ERR_DALI_THERMAL_DERATING
- ERR_DALI_POWER_LIM
- INF_DALI_OVERALL
- INF_POWER_FAIL
- INF_BUSS_POWERED_BY_FRE
- INF_DALI_BANK_ERR
- INF_PHOTOCELL_DISABLED
- INF_SCHEDULER_DISABLED
- INF_LL_CHANGED



Non Attivo
Stato Linea verso Merano Centro

Non Attivo
Stato Linea verso Sinigoi



Add device to multicast

Multicast2:

DevEui:

Multicast address:

Multicast network session key:

Multicast application session key:

Salva

Multicast configuration

Multicast2:

Set UTC timestamp

Set cpPush

Set configuration

Salva

- Managing DALI 2 devices FlashNet via LoraWan
- programming SmartLight via UniCast and MultiCast
- Controlling devices
- Automation of Smart Luminaries on the basis of Traffic Flow
- Usage of Chirpstack as net server

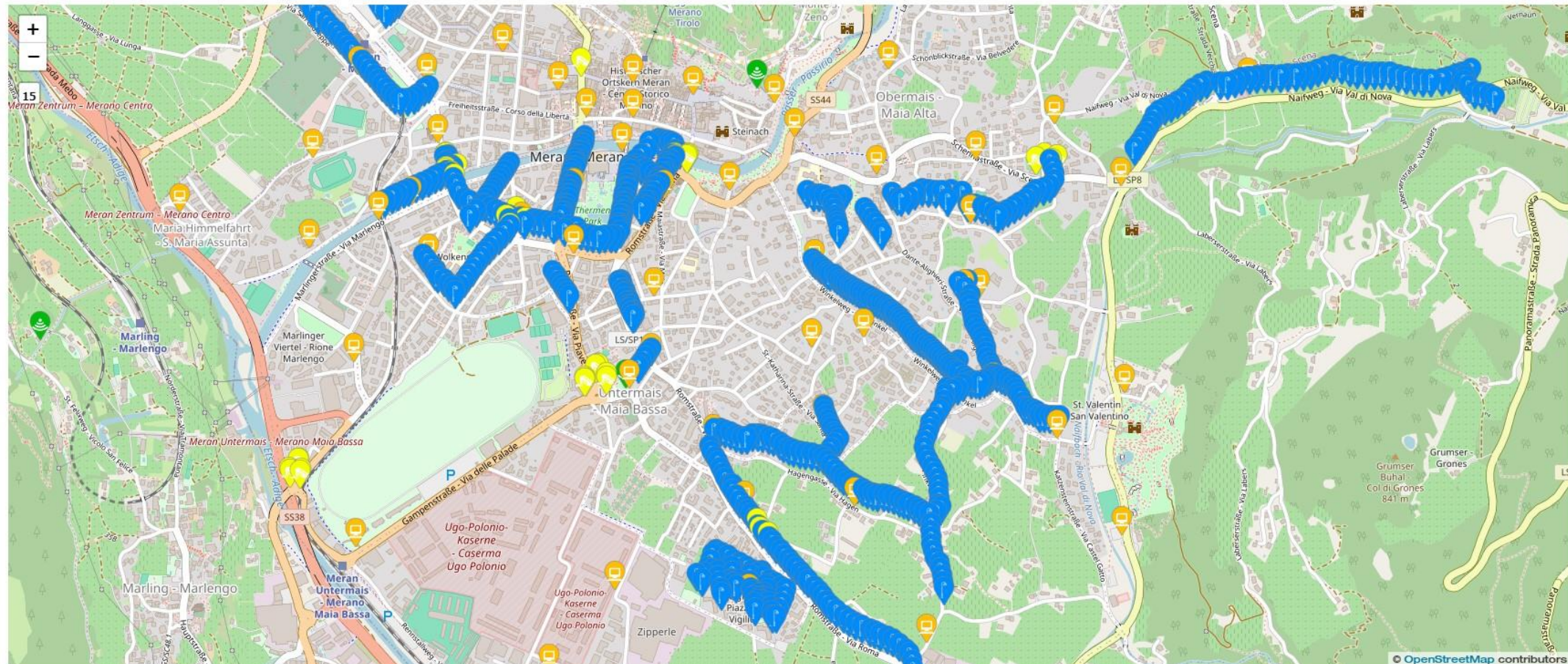
<https://www.snap4city.org/968>

Smart Light in Merano



Merano - tutti i servizi

Wed 13 Dec 15:34:57



© OpenStreetMap contributors



Cuneo Assets' Monitoring, Safety



Monitoraggio Generale
Thu 4 Jan 18:13:19

- CameraModelP1448-LE
- UpsModelRiello
- UpsModelSeltec
- SwitchModelMicrosense
- SwitchModelNetonix

Legenda

Valore	Significato	Simbolo
0	Buono stato	●
1	Non raggiungibile	●
2	Raggiungibile, dati non disponibili	●
3	Identificata anomalia	●

SWITCH015

VALUE NAME: 1721615250

Last update: 2024-01-04 13:34:24.334Z

Description	Value	Buttons
dateObserved	01/04/24, 02:34:24 PM	Last 4h 24h 7d 30d 6m 1y 2y 10y
fanSpeed	4985	Last 4h 24h 7d 30d 6m 1y 2y 10y
generalStatus	0	Last 4h 24h 7d 30d 6m 1y 2y 10y
poeValue1	48	Last 4h 24h 7d 30d 6m 1y 2y 10y
poeValue10	0	Last 4h 24h 7d 30d 6m 1y 2y 10y
poeValue11	0	Last 4h 24h 7d 30d 6m 1y 2y 10y
poeValue12	0	Last 4h 24h 7d 30d 6m 1y 2y 10y
poeValue13	0	Last 4h 24h 7d 30d 6m 1y 2y 10y
poeValue14	0	Last 4h 24h 7d 30d 6m 1y 2y 10y

TempValu... 9m **49**

TempValue1 - 7 Days

• More than 400 devices

Monitoraggio Dettagliato
Thu 4 Jan 18:05:15

Tabella Device

Cerca per Indirizzo, ID o device...

Camera UPS Switch ● ● ● ●

ID	Stato	Tipo device	Indirizzo	IP	Azioni
TC010182	●	Camera	Cuneo Sud Palo Angolo Parco Giochi	172.16.12.185	📍
TC010178	●	Camera	Cuneo Sud Palo Alto verso Asilo	172.16.12.181	📍
TC010181	●	Camera	Cuneo Sud Palo davanti Biblioteca	172.16.12.184	📍
TC010179	●	Camera	Biblioteca Cuneo Sud Esterna Sopra Ingresso	172.16.12.182	📍
TC010184	●	Camera	Cuneo Sud Angolo verso Parco Giochi	172.16.12.187	📍
TC010185	●	Camera	Cuneo Sud Angolo verso Bar	172.16.12.188	📍
TC010183	●	Camera	Cuneo Sud Angolo davanti Megafresco	172.16.12.186	📍
TC010203	●	Camera	Rotonda Corso Francia Croce Rossa	172.16.12.203	📍
TC010204	●	Camera	Rotonda Corso Francia Distributore	172.16.12.204	📍
SWITCH041	●	Switch	Rotonda Corso Francia Croce Rossa	172.16.15.222	📍
TC010202	●	Camera	Rotonda Corso Francia Tabaccaio	172.16.12.202	📍
SWITCH040	●	Switch	Rotonda Corso Francia Croce Rossa	172.16.15.223	📍

Tabella Dettaglio

TC010185

dateObserved: 04/01/2024, 14:34

generalStatus: ●

tempStatus1: 1

TEMP STATUS

Valore	Significato
1	Buono stato
2	Letture dato fallita

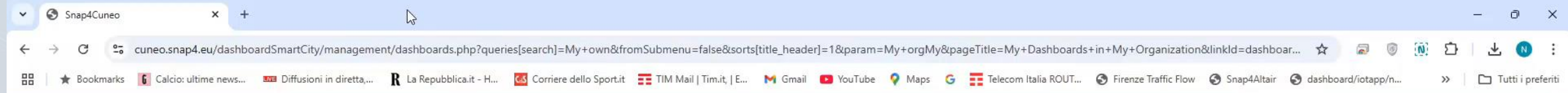
Legenda

● 11 ● 13 ● 22 ● 4

Non raggiungibile

- TV Cams: color, Thermal
- Traffic Gates
- Switches
- UPS

Cuneo Assets' Monitoring, Safety



My Dashboards in My Organization

Snap4Cuneo

Switch To New Layout (Beta)

User: userareamanager, Org: Organization
Role: AreaManager, Level:

LOGOUT

- Dashboards (Public)
- Dashboards of My Organization
- My Dashboards in My Organization**

- Kibana
- Extra Dashboard Widgets
- Data, my Data, OpenData
- Knowledge and Maps
- IOT Applications
- IOT Directory and Devices
- Resource Manager
- Development Tools
- Management
- Decision Support Systems
- Deploy and Installation
- Help and Contacts
- Documentation and Articles
- My Profile
- Km4City portal
- DISIT Lab portal



Prev 1 Next

My own

New dashboard

Conteggi Persone e Biciclette
Passive

My own (Organization)

Edit Management Clone Delete

Conteggi Telecomere
Passive

My own (Organization)

Edit Management Clone Delete

Cruscotto Videosorveglianza
Passive

My own (Organization)

Edit Management Clone Delete

Dashboard varchi
Passive

My own (Organization)

Edit Management Clone Delete

Monitoraggio dettagliato
Passive

My own (Organization)

Edit Management Clone Delete

Monitoraggio dettagliato - WIP
Passive

My own (Organization)

Edit Management Clone Delete

Monitoraggio generale
Passive

My own (Organization)

Edit Management Clone Delete

Telecamere Cuneo
Passive

My own (Organization)

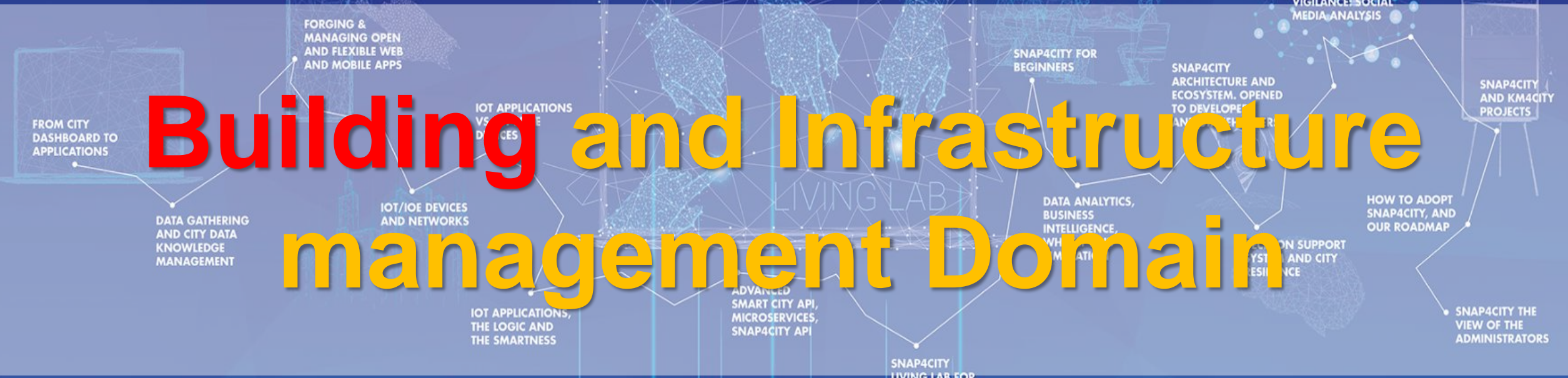
Edit Management Clone Delete

test delega
Passive

My own (Organization)

TOP

Building and Infrastructure management Domain



<https://www.snap4city.org/970>



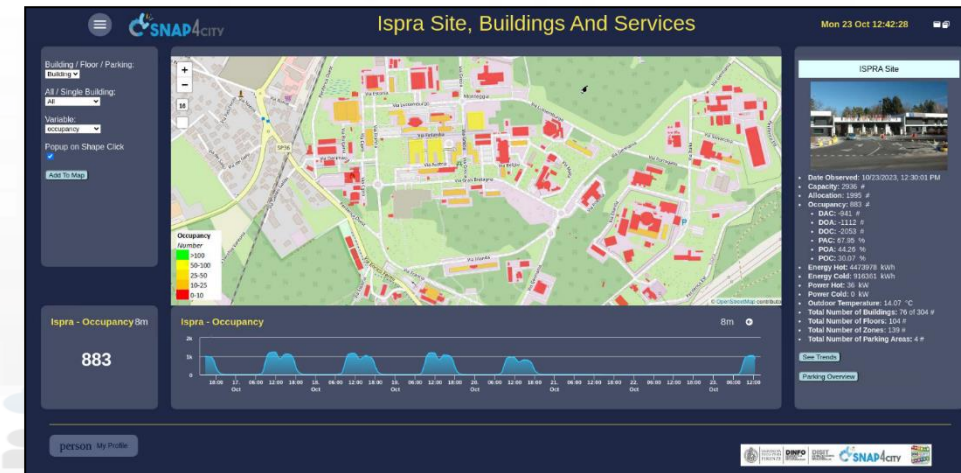
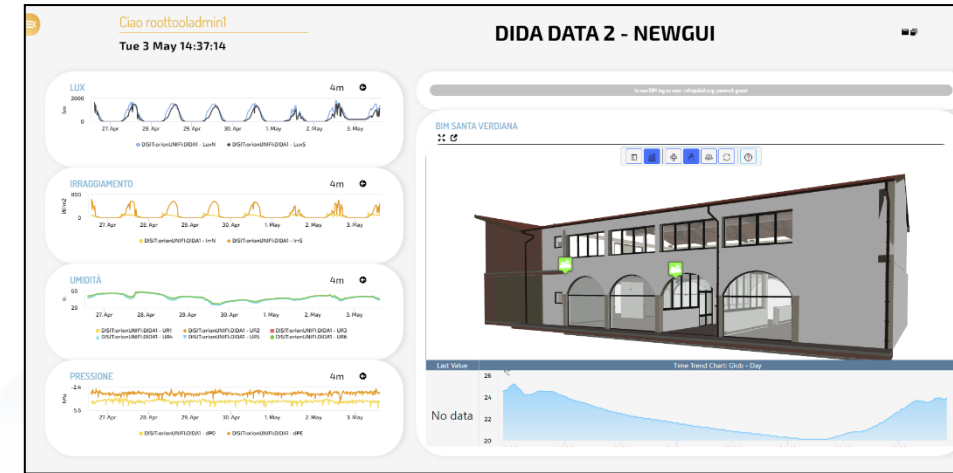
Smart Building

FROM CITY
DASHBOARD TO
APPLICATIONS



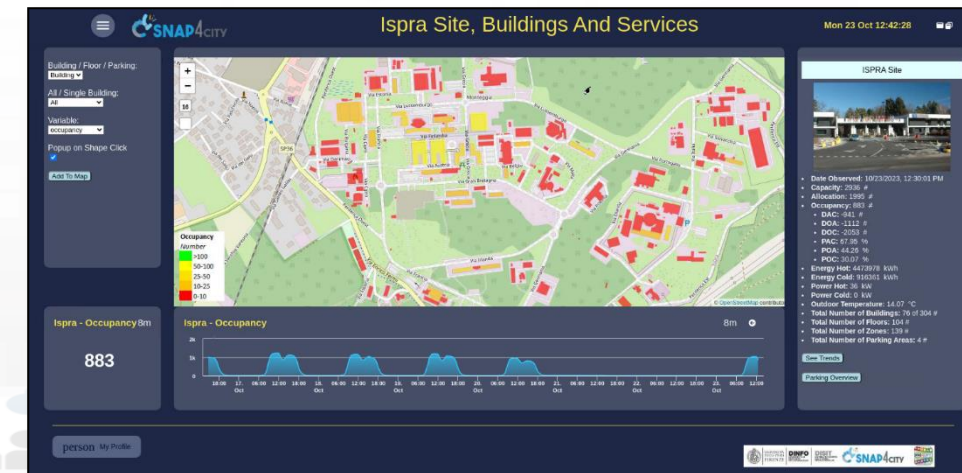
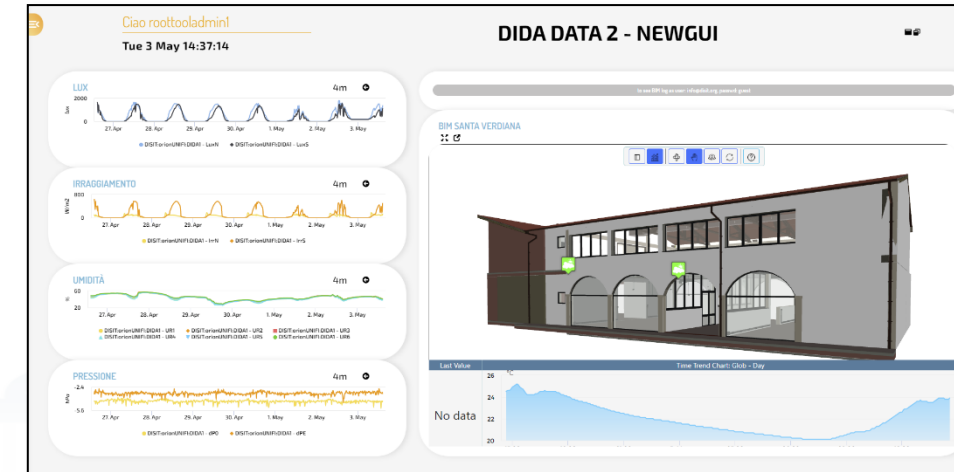
Snap4Building Domain (2024/8)

- **Goals:**
 - increase efficiency, cost reduction, sustainability
 - Accessibility to services, Security/Safety
- **Solutions for Operation (monitoring, managing, mobile apps, digital signages, control rooms)**
 - Monitoring: usage, energy, environmental conditions, people flows, services, etc.
 - Early detection/warning, alarm, of critical conditions, notifications, decision support
 - Production of suggestions/prescriptions, nudging
 - Managing smart services: cabinets, dispenser, lockers, etc.
 - Global and local 3D/2D representations of area and buildings
 - Integration with Video Management Systems
 - Computing predictions of any kind
- **Solutions for Planning (optimization and what-if analysis)**
 - Reduction of energy costs via optimization
- Algorithms and computational solutions, see next slide



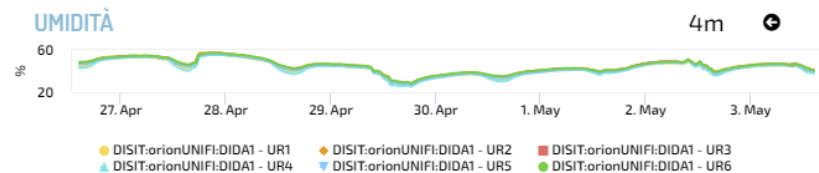
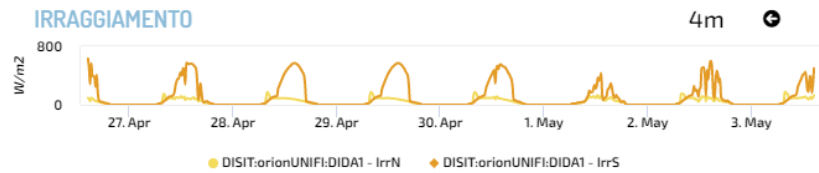
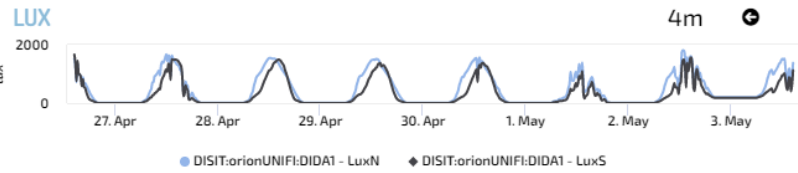
Smart Buildings, Snap4Building (2024/8)

- **Digital Twin for monitor, control and manage distributed infrastructures**
 - 2D/3D representations of the whole set of buildings, BIM modeling
 - Entities (building, floors, rooms, parking, charging stations, gates, etc.) with their shapes and descriptors, and data monitoring the allocation to office, meeting, cafeteria, storage, stairs, elevator, etc.
- **Monitoring and computing KPIs on real time for**
 - **energy** consumed or produced (hot/cold), **parking**, **logistic**, **presences**, **cleaning**, **air quality**, **departments**, **subareas**, **maintenance**, etc.
 - **allocation/designation**, **dispositions**, **heating**, **cooling**, **temperature**, **equipment**, etc.
 - **grouped in Zones**



Ciao roottooladmin!

Tue 3 May 14:37:14



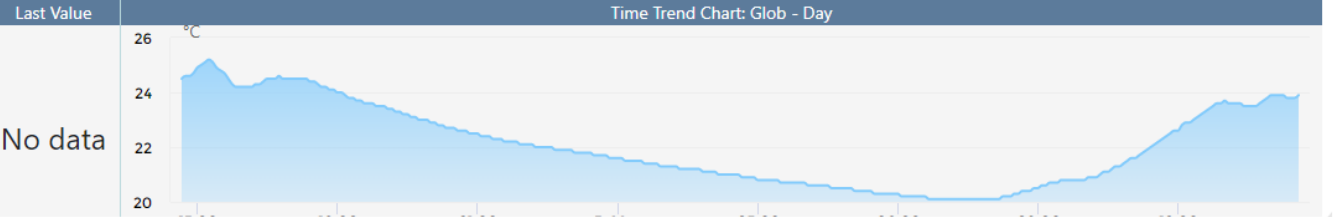
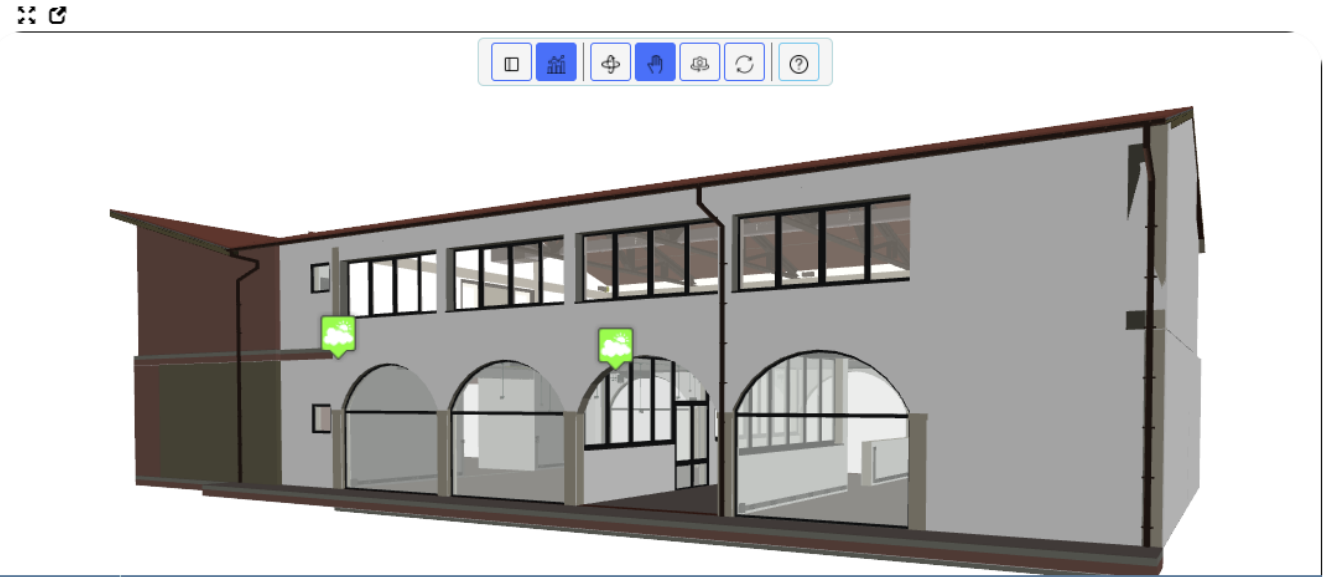
DIDA DATA 2 - NEWGUI

7 AFFORDABLE AND
CLEAN ENERGY

11 SUSTAINABLE CITIES
AND COMMUNITIES

to see BIM log as user: info@disit.org, passwd: guest

BIM SANTA VERDIANA



<https://www.snap4city.org/dashboardSmartCity/view/index.php?idashboard=MzI4OA==>

Ispra Site, Buildings And Services

Mon 23 Oct 12:42:28

Building / Floor / Parking:
Building

All / Single Building:
All

Variable:
occupancy

Popup on Shape Click

[Add To Map](#)

ISPRA Site

- Date Observed: 10/23/2023, 12:30:01 PM
- Capacity: 2936 #
- Allocation: 1995 #
- Occupancy: 883 #
 - DAC: -941 #
 - DOA: -1112 #
 - DOC: -2053 #
 - PAC: 67.95 %
 - POA: 44.26 %
 - POC: 30.07 %
- Energy Hot: 4473978 kWh
- Energy Cold: 916361 kWh
- Power Hot: 36 kW
- Power Cold: 0 kW
- Outdoor Temperature: 14.07 °C
- Total Number of Buildings: 76 of 304 #
- Total Number of Floors: 104 #
- Total Number of Zones: 139 #
- Total Number of Parking Areas: 4 #

[See Trends](#)

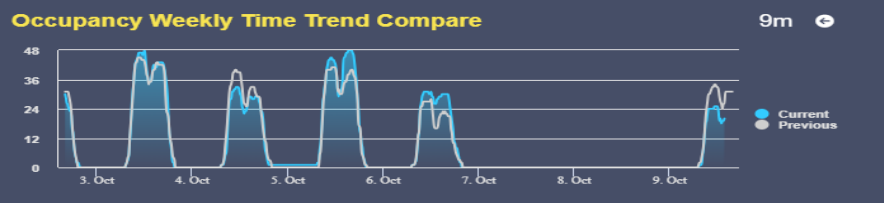
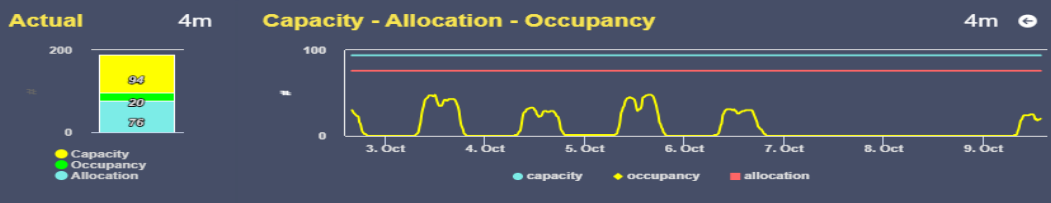
[Parking Overview](#)

Ispra - Occupancy 8m

883

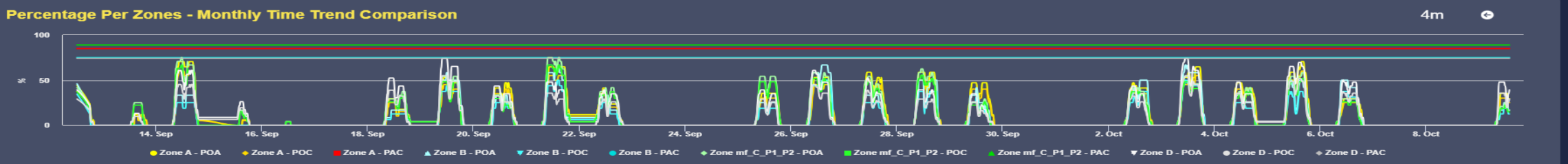
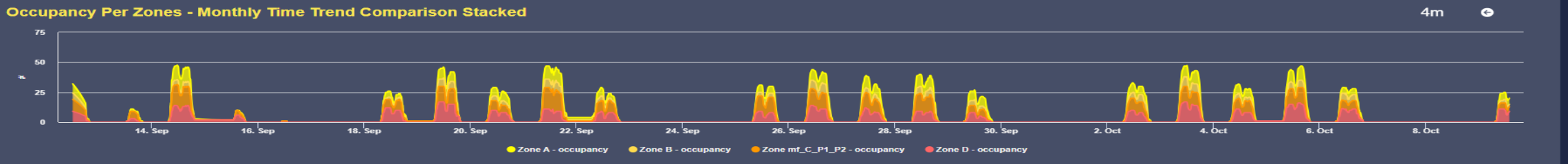
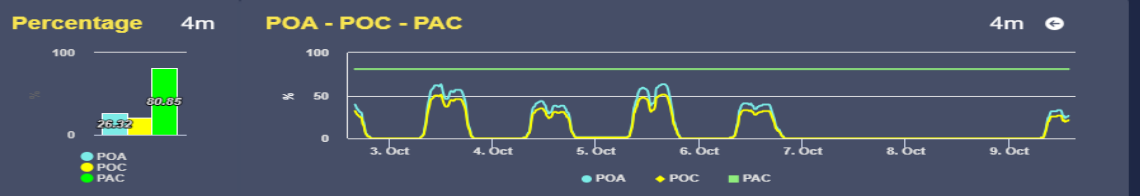
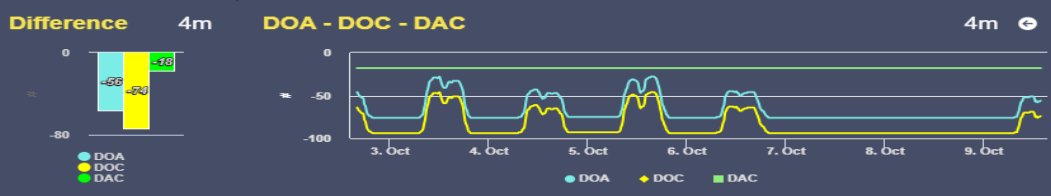
Ispra - Occupancy 8m

person My Profile



Office Mq 9m
803.9 m²

Temp. 9m
20.6 °C

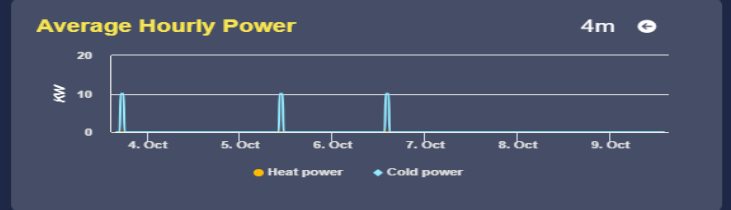
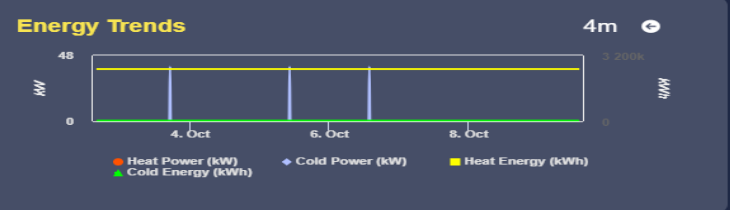


Heat Power 9m
0 kW

Cold Power 9m
0 kW

Heat Energy 9m
1931279 kWh

Cold Energy 9m
888311 kWh



En./Mq 9m
0 kWh

En./Pax 9m
0 kWh

Floor Details

Ispra Floor, Zone And Room Details

Fri 6 Oct 18:41:54

Allocation Number

- >50
- 25-50
- 13-25
- 5-13
- 0-5

Floor PT of Building 58A

- Date Observed: 10/6/2023, 6:30:02 PM
- Capacity: 37
- Allocation: 31
- Occupancy: 1
 - DAC: -6#
 - DOA: -30#
 - DOC: -36#
 - PAC: 83.78%
 - POA: 3.23%
 - POC: 2.7%

[See Trends](#)

Select a Zone metric: Allocation

Room 017

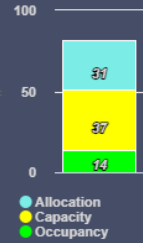
- Date Observed: 10/6/2023, 12:01:00 PM
- Zone Id: 58A_PT_B
- Capacity: 1
- Allocation: 0
- mq: 12.16
- Average hourly temp. Xi: 24.07°C
- Average hourly temp. Xs: 20.92°C
- Average hourly temp. Xt: 6.00°C
- Heat Start temp.: 17.92°C
- Cold Start temp.: 23.92°C

[See Trends](#)

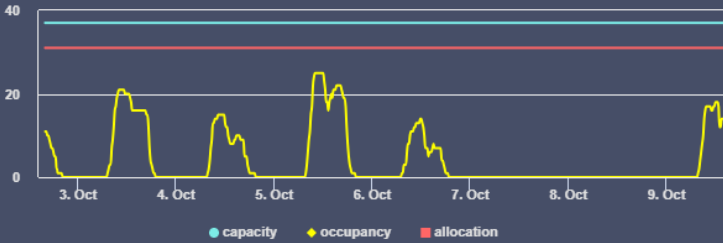
Building 58A PT Trends

Mon 9 Oct 13:51:30

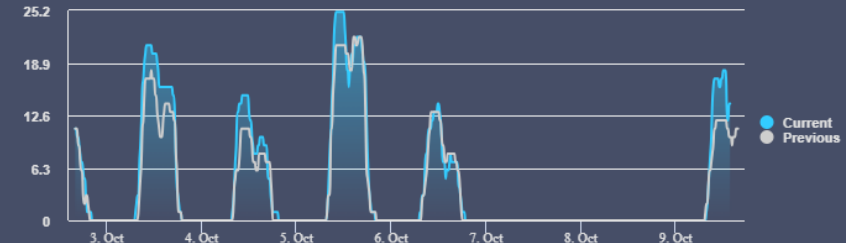
Actual 4m



Capacity - Allocation - Occupancy 4m



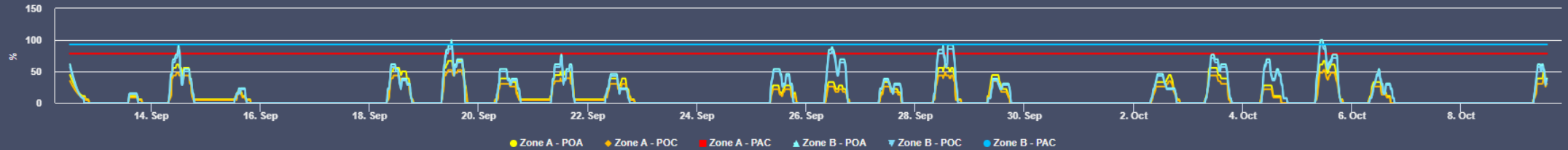
Organization: Orion-1: Floor2_58A_PT - Occupancy 9m



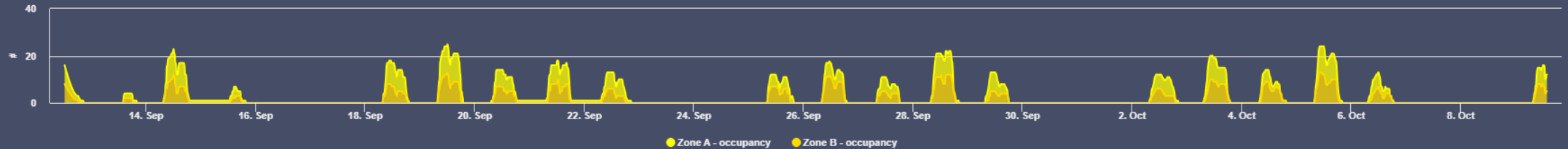
Temp. 9m

21.7 °C

Percentage Per Zones - Monthly Time Trend Comparison 4m



Occupancy Per Zones - Monthly Time Trend Comparison Stacked 4m

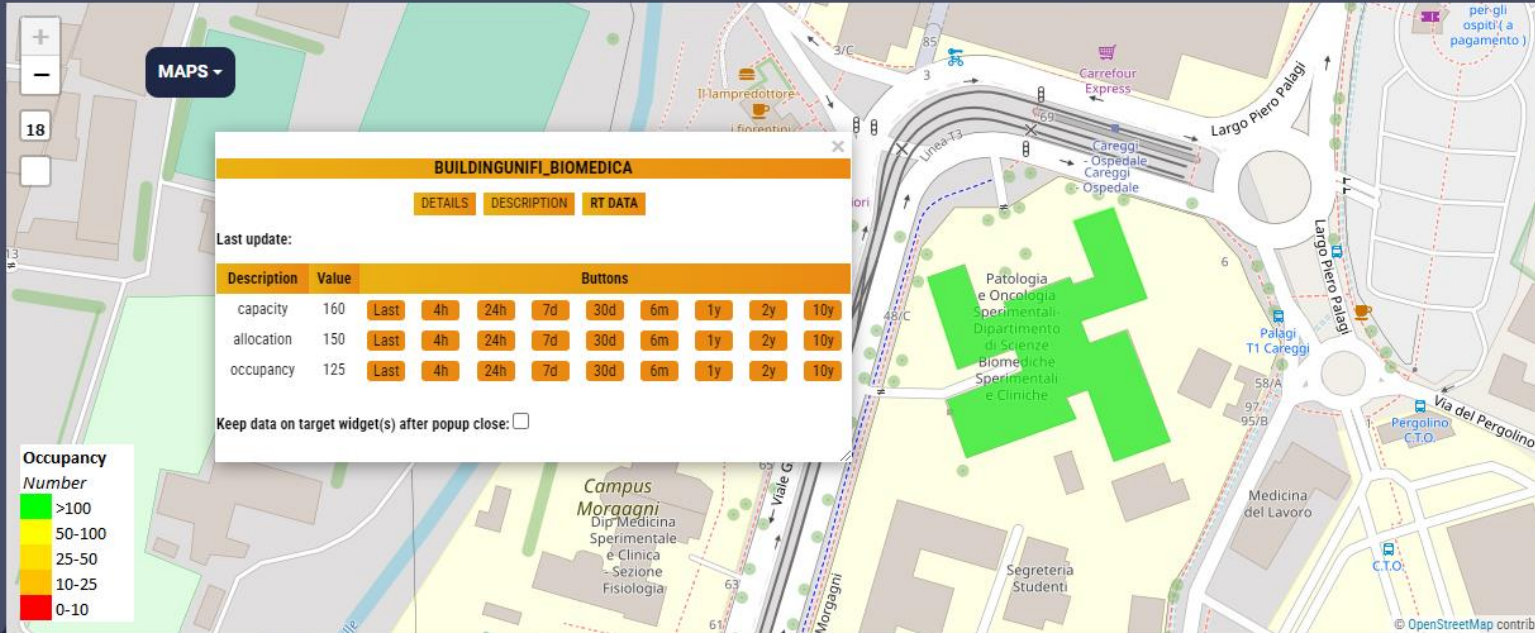


Smart Building

Building ID:
UniFI Biomedica

Variable:
occupancy

Popup on Shape Click



BuildingUniFI Biomedica



- Date Observed: 1/11/2023, 10:11:01
- Capacity: 160 #
- Allocation: 150 #
- Occupancy: 125 #
 - DAC: 100 #
 - DOA: 90 #
 - DOC: 80 #
 - PAC: 80 %
 - POA: %
 - POC: 60 %
- Energy Hot: 160 kWh
- Energy Cold: 140 kWh
- Power Hot: 24 kW
- Power Cold: kW
- Outdoor Temperature: 19 °C

See Trends

Energy Production 1m

17.8
kW

Energy Production Weekly Trend



My Profile

Privacy Policy Cookies Policy Terms and Conditions Contact us

TOP

Community of Energy and Photovoltaic Plant Simulator

FROM CITY DASHBOARD TO APPLICATIONS

FORGING & MANAGING OPEN AND FLEXIBLE WEB AND MOBILE APPS

IOT APPLICATIONS (IOT GATEWAY SERVICE)

SNAP4CITY FOR BEGINNERS

SNAP4CITY ARCHITECTURE AND ECOSYSTEM, OPENED TO DEVELOPERS AND STAKEHOLDERS

TWITTER VIGILANCE: SOCIAL MEDIA ANALYSIS

SNAP4CITY AND KM4CITY PROJECTS

DATA GATHERING, CITY DATA, NETWORKS, MANAGEMENT

IOT/IOE DEVICES AND NETWORKS

DATA ANALYTICS, BUSINESS INTELLIGENCE, WHAT CAN WE DO WITH THE DATA?

HOW TO ADOPT SNAP4CITY, AND OUR ROADMAP

Community of Energy and Photovoltaic Plant Simulator

ADVANCED SMART CITY API, MICROSERVICES, SNAP4CITY API

IOT APPLICATIONS, THE LOGIC AND THE SMARTNESS

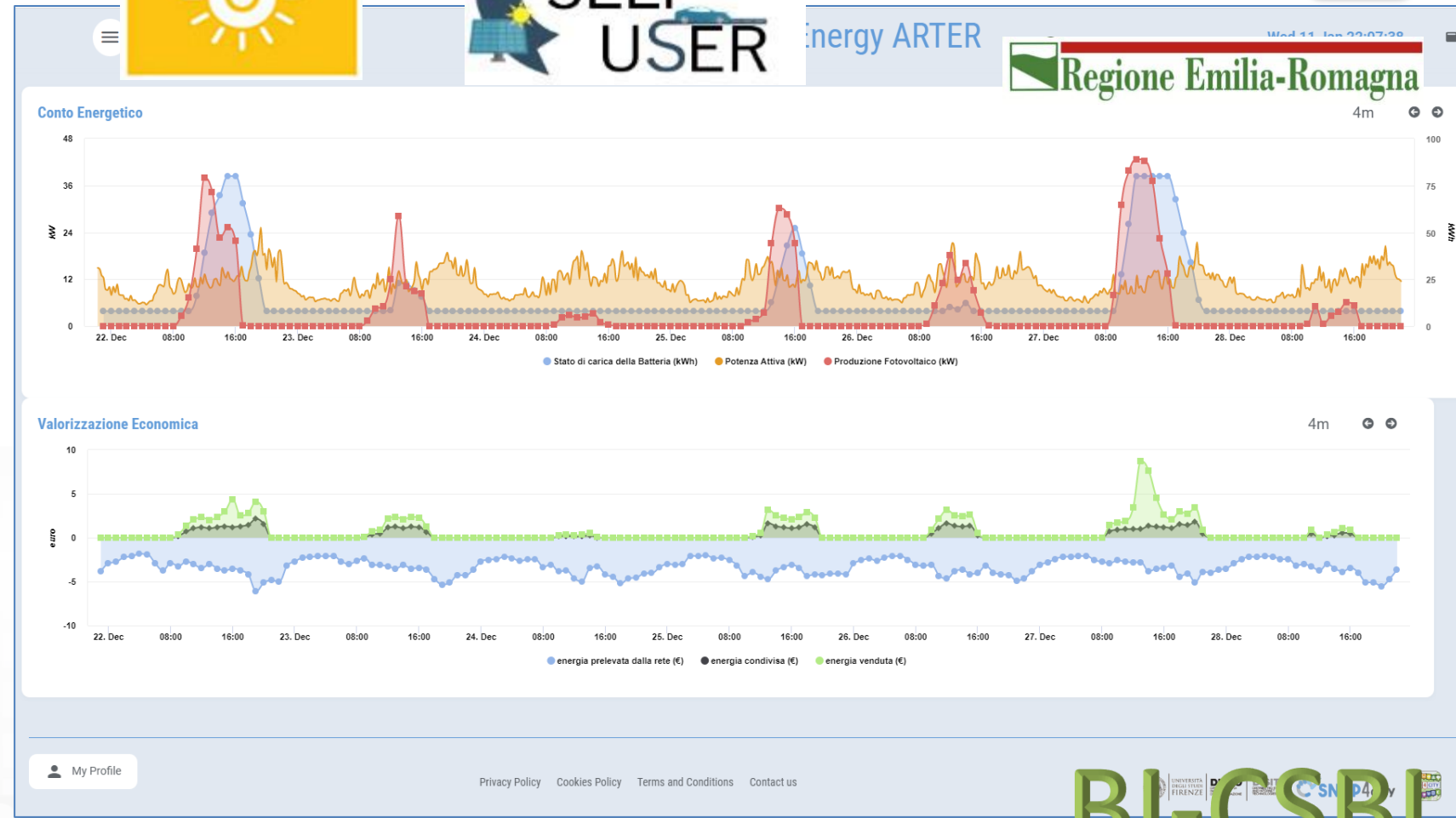
SNAP4CITY THE VIEW OF THE ADMINISTRATORS

SNAP4CITY LIVING LAB FOR COLLABORATIVE WORK





- **Field-tested energy community: the self-consumer condominium**
- The Self User project creates in the pilot condominium, through the collection and analysis of data, a model for calculating and enhancing the impact of an energy community on a community of people, with a view to actions to combat energy poverty



<https://www.selfuser.it>





SELF USER

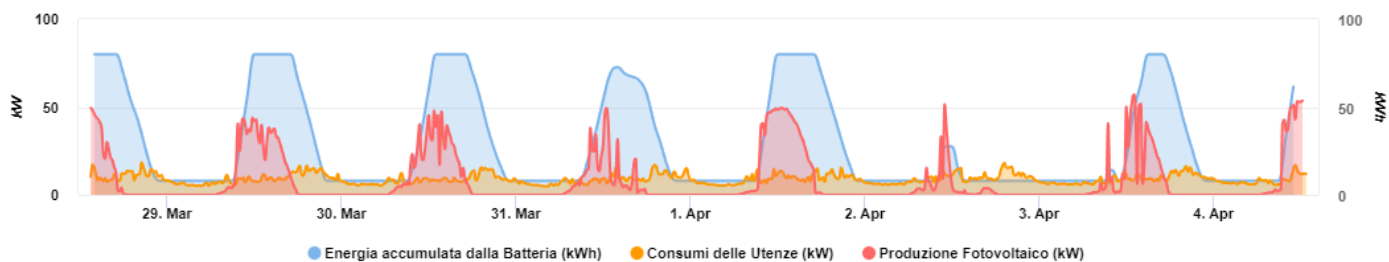
Monitoraggio in tempo reale della comunità energetica condominiale

Tue 4 Apr 13:20:04



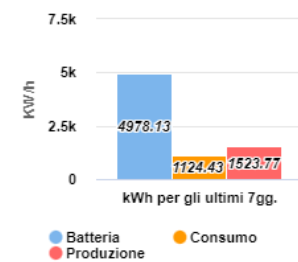
Conto Energetico

4m



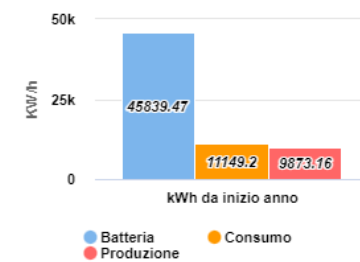
KWh Ultimi 7 Gg.

4m



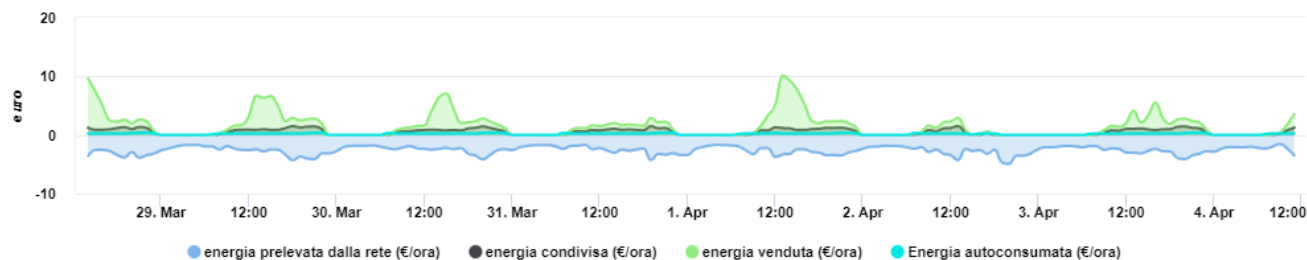
KWh Da Inizio Anno

4m



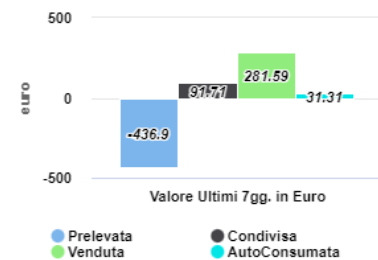
Valorizzazione Economica

4m



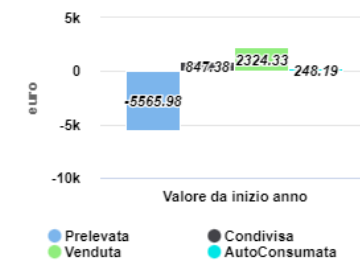
Valore Ultimi 7gg.

4m



Valore Da Inizio Anno

4m



<https://www.snap4city.org/dashboardSmartCity/view/Baloon.php?iddashboard=MzczNg==>

Ciao roottooladmin1

Sat 11 Nov 17:26:28

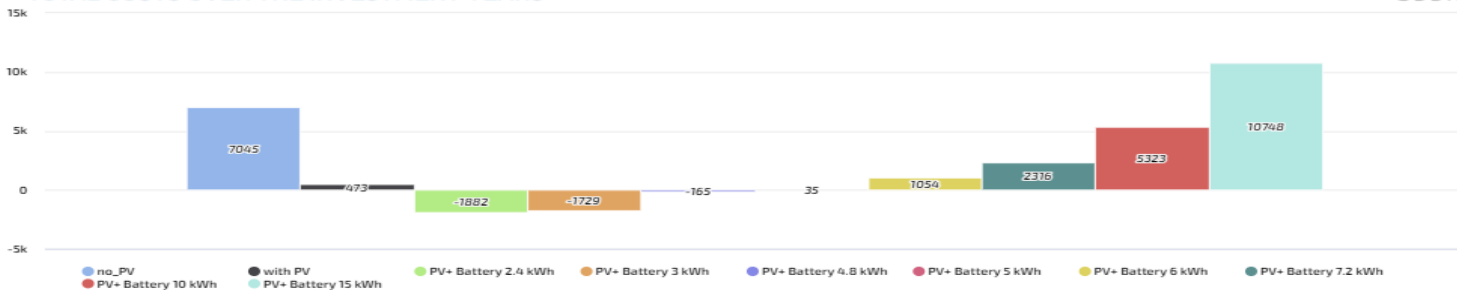
ONLINE PHOTOVOLTAIC SYSTEM SIMULATOR

User Manual

Italian Version

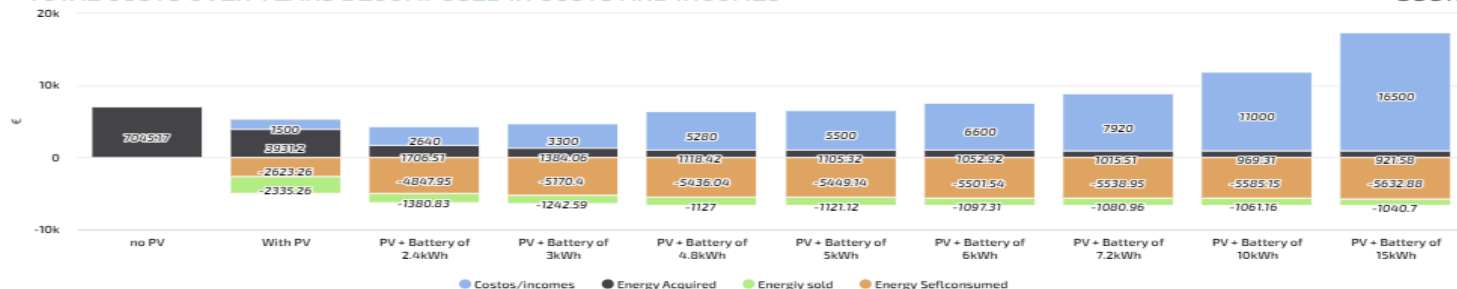
TOTAL COSTS OVER THE INVESTMENT YEARS

599m



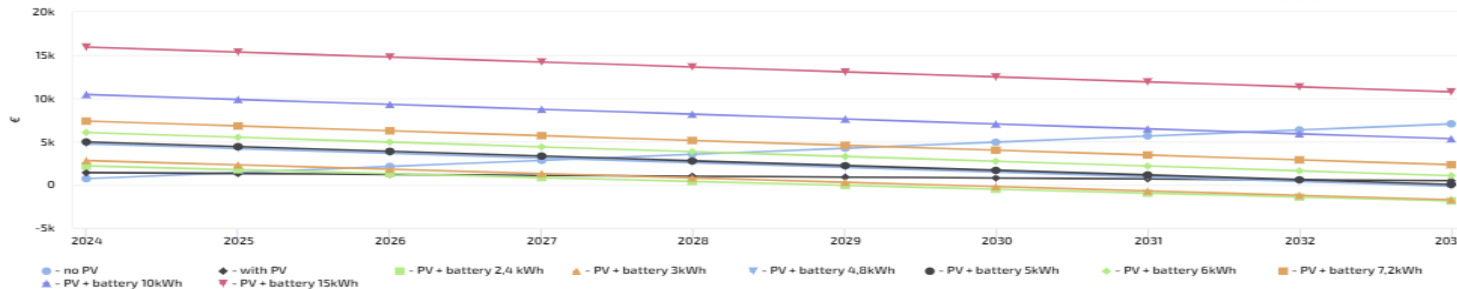
TOTAL COSTS OVER YEARS DECOMPOSED IN COSTS AND INCOMES

599m



BREAK EVEN TREND FOR THE DIFFERENT KIND OF PLANTS

599m



PARAMETERS OF YOUR PV PLANT

We suggest you PV plus battery of 2.4 kWh

Annual Consumption

Price of energy sold (€/kWh)

Price of Energy Acquired (€/kWh)

Years of Investment

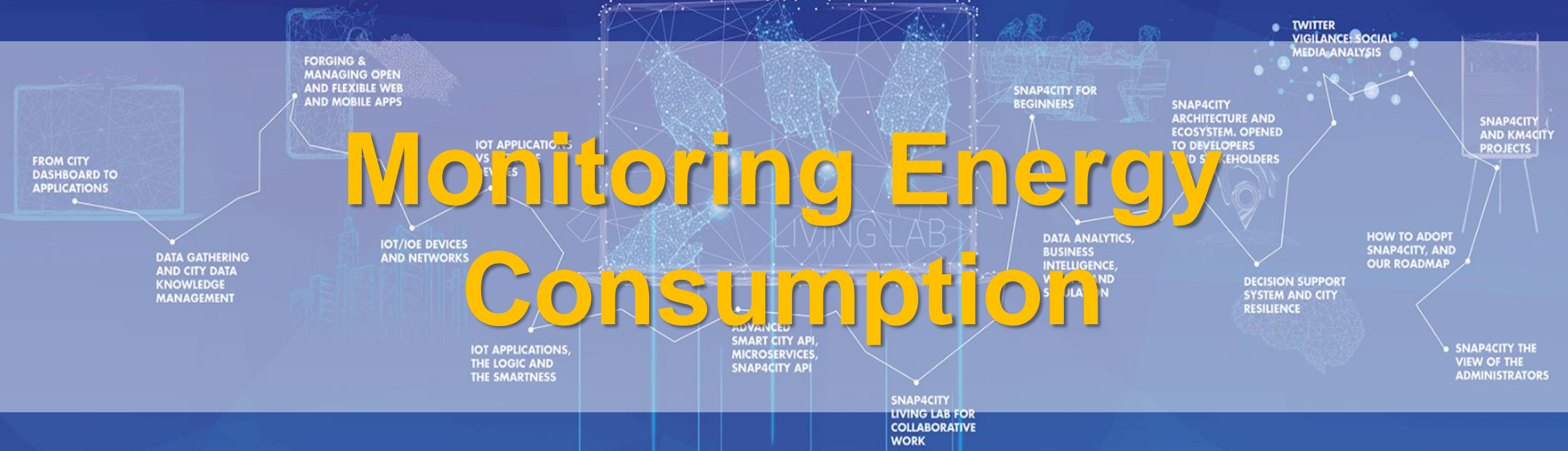
Months for typical trends

Compute

7 AFFORDABLE AND
CLEAN ENERGY



Monitoring Energy Consumption



Monitoring recharging station and assets

Ciao roottooladmin1
Thu 31 Oct 00:58:34

CUSTOM PINS ON MAP - NEW GUI

SELEC...
+
-
15
SELECTOR - MAP
Free street
Fluid traffic
Heavy traffic
Very heavy
Sensor position
© OpenStreetMap contributors

DISI...9m
241

DISIT:ORIONUNIFI:CARPARKSTAZIONEFIRENZES.M.N. - FREEPARKINGLOTS
9m
640
0
06:00 12:00 18:00 25.Oct 06:00 12:00 18:00 26.Oct 06:00 12:00 18:00 27.Oct 06:00 12:00 18:00 28.Oct 06:00 12:00 18:00 29.Oct 06:00 12:00 18:00 30.Oct 06:00 12:00 18:00

Energy monitoring and business intelligence

Green and Data Driven District

Aggregated KPI JuicePark SmartPole CityAnalytics

Energy produced to date JuicePark <input type="text" value="0"/> kWh SmartPole <input type="text" value="27.341"/> kWh	CityAnalytics insight Average daily people <input type="text" value="9845.3"/> Average Milan resident over tourist ratio <input type="text" value="1.57"/>	Videoanalysis - KPI to date People counted <input type="text" value="0"/> Vehicle counted <input type="text" value="520"/> People aggregation <input type="text" value="0"/>
WiFi sessions daily peak Max connected devices <input type="text" value="0"/>	SOS events to date SmartPole requests <input type="text" value="0"/> JuicePark requests <input type="text" value="0"/> AED requests <input type="text" value="0"/>	Vehicle charging sessions to date EV car <input type="text" value="0"/>

Juice Park
Detailed KPIs

Smart Pole
Detailed KPIs

[Privacy Policy](#) [Cookies Policy](#) [Terms and Conditions](#)

7 AFFORDABLE AND CLEAN ENERGY

11 SUSTAINABLE CITIES AND COMMUNITIES

main
smart pole

Charging Station

Number of Daily Ses... (sm)	Daily Energy Consumpt... (sm)
0 #	0 kWh
Number of Total Ses... (sm)	Total Energy Consumed (sm)
10 #	15 kWh

Video Analysis

People Counts (hourly) (sm)

People in Forbidden Area (sm)

People Aggregation (sm)

Last Event (sm) **Last Event** (sm)

21/04/2022 10:48 21/04/2022 10:47

SOS - Number of Pushes (sm) **SOS - Last button us...** (sm)

7 # 29/03/2022 11:48

SOS - Daily Number of Button Pus... (sm)

0 #

Power Meter - Energy Consumed (sm)

Power Meter - Energy Produced (sm)

WiFi - Connections per Day (sm)

Thu 21 Apr 10:48:31

21/04/2022 10:48

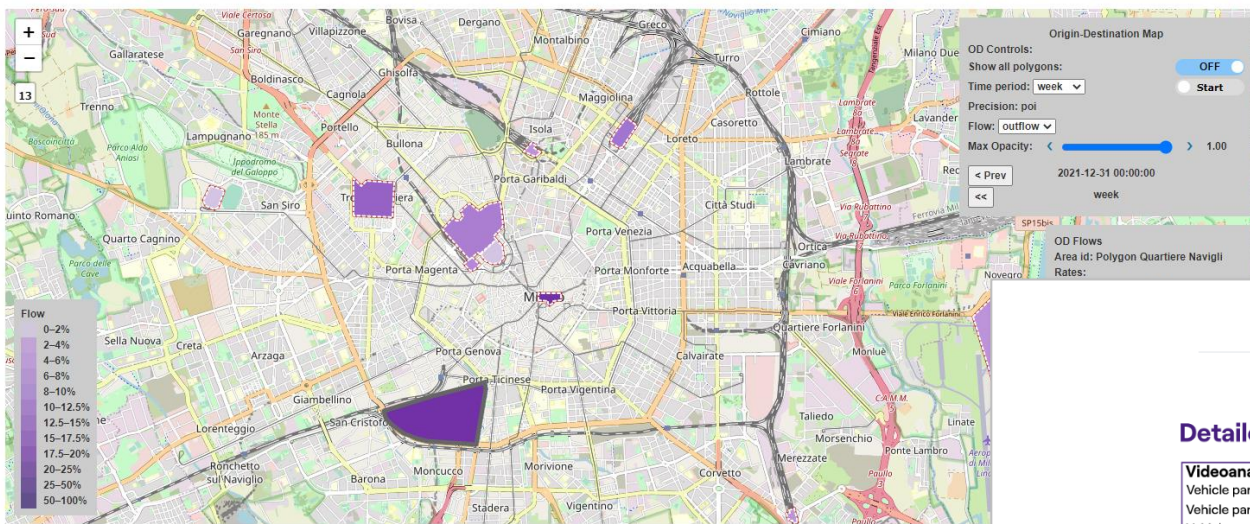
[Privacy Policy](#) [Cookies Policy](#) [Terms and Conditions](#)

Energy monitoring and business intelligence

Green and Data Driven District

Aggregated KPI JuicePark SmartPole CityAnalytics

POI - OD POI - PRESENZE POI - PRESENZE (TS) ACE - PRESENZE ACE - PRESENZE (TS)



Privacy Policy Cookies Policy Terms and Conditions

Green and Data Driven District

Aggregated KPI JuicePark SmartPole CityAnalytics

Detailed KPIs

Videoanalysis

People counted daily: 0
 People counted to date: 0
 People aggregation daily: 0
 People aggregation to date: 0
 Vehicle counted daily: 0
 Vehicle counted to date: 21

Power meter

Daily energy consumed: 9.024 kWh
 Energy consumed to date: 27.341 kWh
 Daily energy produced: 1.409 kWh
 Energy produced to date: 4.252 kWh

WiFi

Max number of connected devices in the last day: 0
 Hourly average connected devices: #####

eBike

Daily number of sessions: 0
 Number of sessions to date: 0
 Total Energy consumed: 0
 Average energy consumed: 0
 Last charger session: 17/05/2022 11:25

Emergency

SOS requests to date: 0
 SOS request daily: 0
 AED requests to date: 0
 AED requests to daily: 0

Privacy Policy Cookies Policy Terms and Conditions

Green and Data Driven District

Aggregated KPI JuicePark SmartPole CityAnalytics

Detailed KPIs

Videoanalysis

Vehicle parked daily: 8
 Vehicle parked to date: 87
 Vehicle count daily: 24
 Vehicle count to date: 520

Power meter

Energy consumed daily: 0 kWh
 Energy consumed to date: 0 kWh
 Energy produced daily: 0 kWh
 Energy produced to date: 0 kWh

WiFi

Max number of connected devices in the last day: 0
 Hourly average connected devices: #####

Emergency

SOS Requests to date: 0
 SOS request daily: 0

EV charged

Number of sessions daily: 0
 Number of sessions to date: 0
 Total Energy consumed: 0
 Average energy consumed: 0
 Last charger session: 0

Privacy Policy Cookies Policy Terms and Conditions

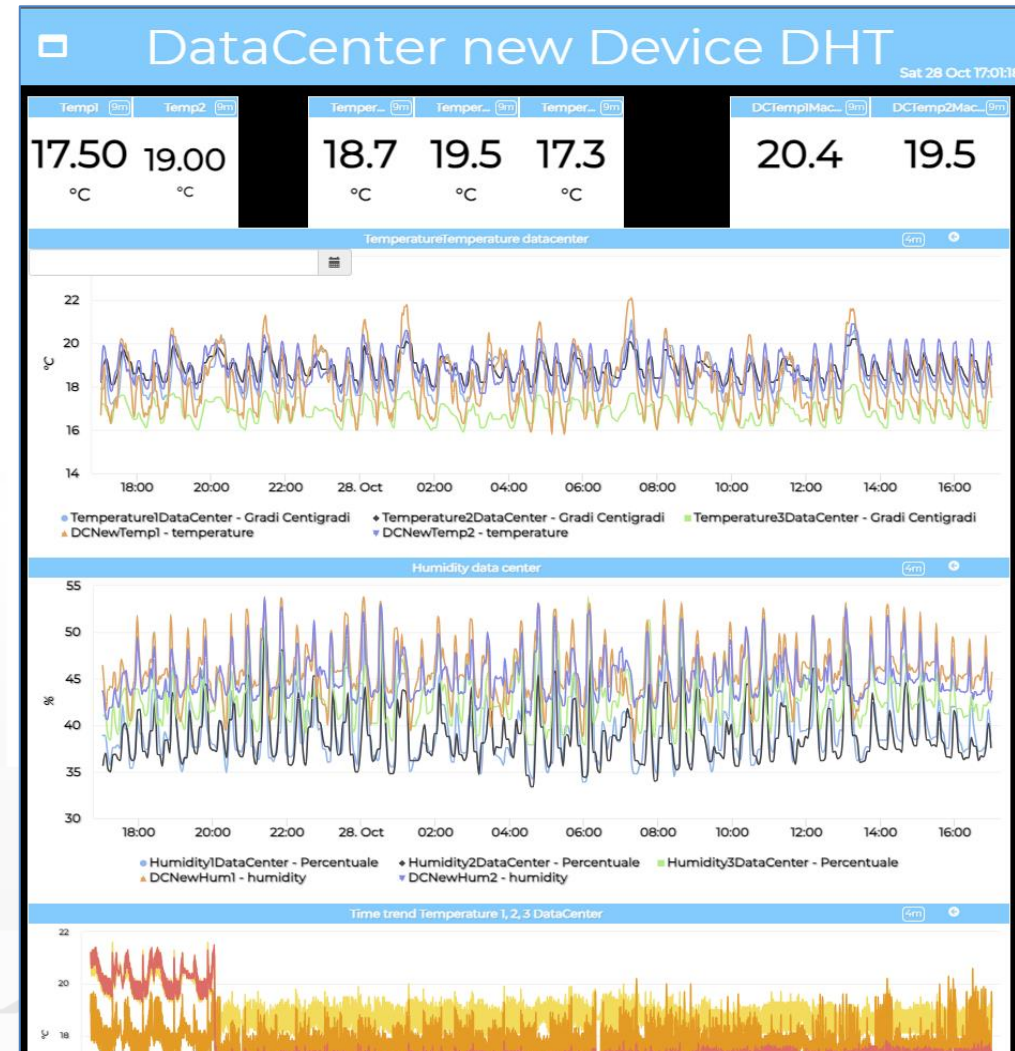
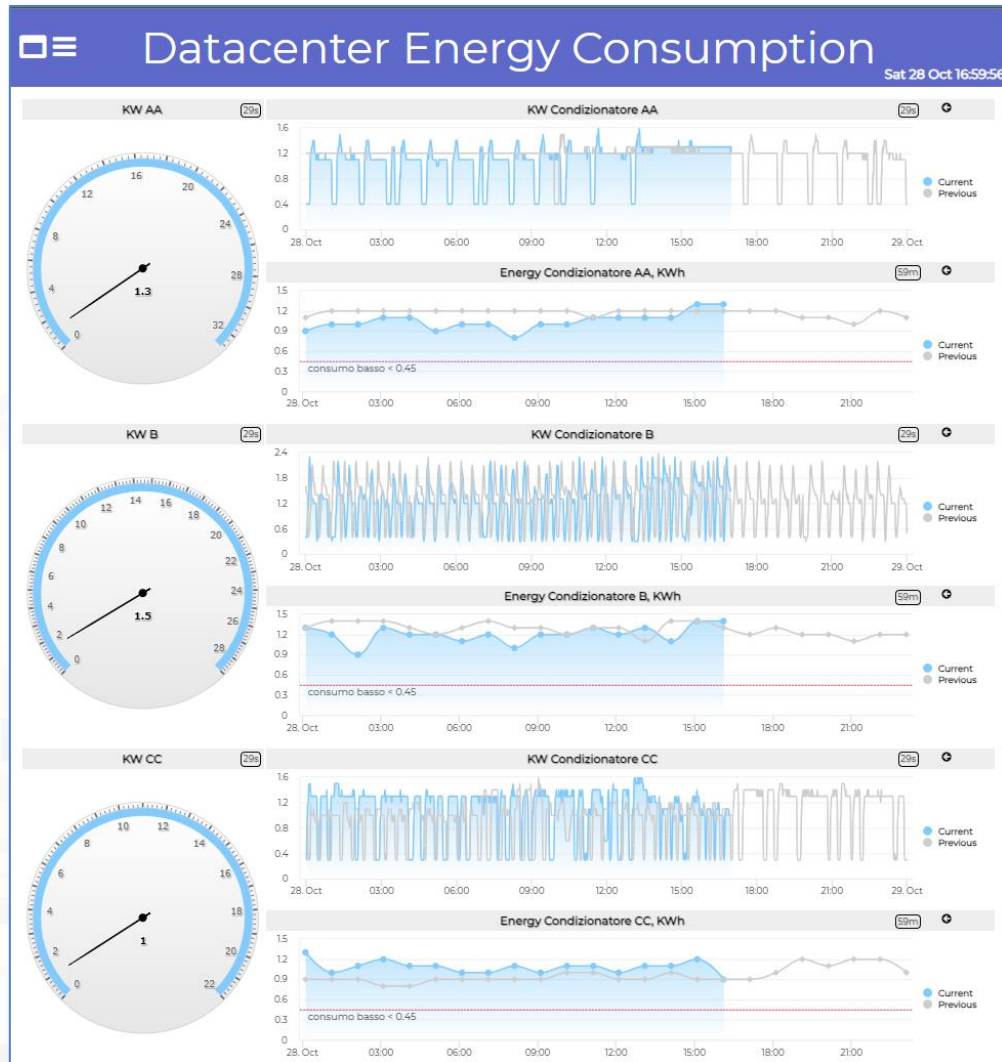
7 AFFORDABLE AND CLEAN ENERGY



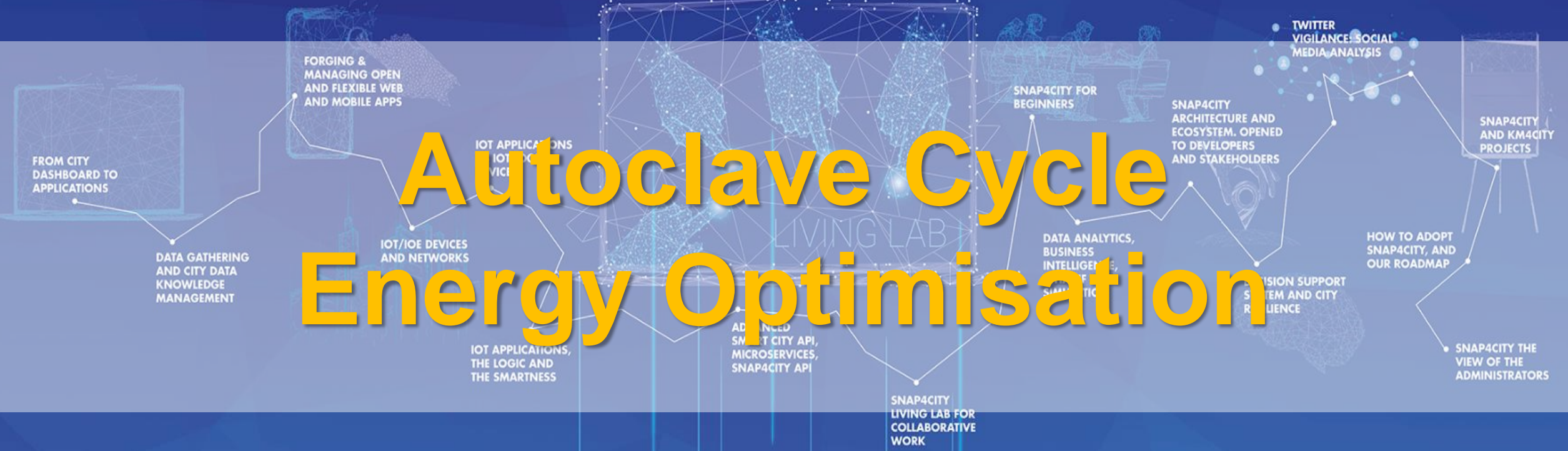
11 SUSTAINABLE CITIES AND COMMUNITIES



Data Center monitoring



Autoclave Cycle Energy Optimisation





Sinottico Impianto Presse - Autoclave

Stato Presse

Select Pressa

PRESSA 6

Press to update the list

Status

9m

NO STATUS

Tempo Vulcanizzazione Pressa

4m

Organization:iotobsf:Pressa_6 - tempoVulc

Tempo Preriscaldamento Pressa

4m

Organization:iotobsf:Pressa_6 - tempoPresisc

Temperatura Settore Pressa

4m

Organization:iotobsf:Pressa_6 - settTemp

Pressione Pressa

4m

Organization:iotobsf:Pressa_6 - actPress

Temperatura Piani Pressa

4m

Stato autoclave

USCITA_PRESSIONE: 100 %

INGRESSO_VAPORE: 0 %

TEMP_MOTORE_VENT: 27.1 °C

Internal pressure: 0.027999997 BAR

Air Temp.: 28.666666 °C

Hitc Temp.: 27 °C

SP Air Temp.: 0 °C

Lotc Temp.: 27 °C

Motor: 0 A, 0 rpm, 0 kW

TEMP_RAFFREDDAMENTO: 27.7 °C

NOME RICETTA: Cilindri ebanite aria calda

- Main Dashbaord
- Autoclave db - Weekly
- Autoclave KPI - Weekly
- Impianto Presse - Weekly
- OpcUaValues - Weekly
- OpcUaValues and rison



<http://dashboard/dashboardSmartCity/view/index.php?iddashboard=MTk=>

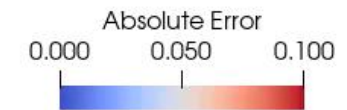
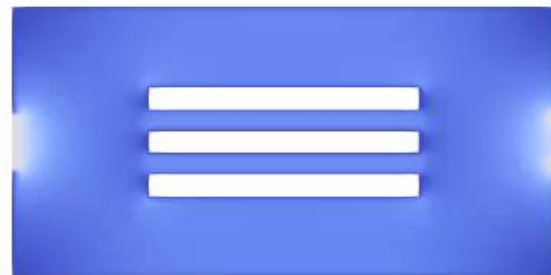
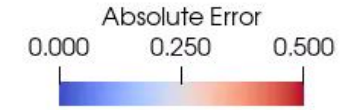
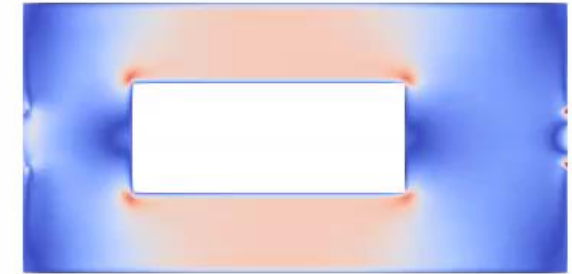
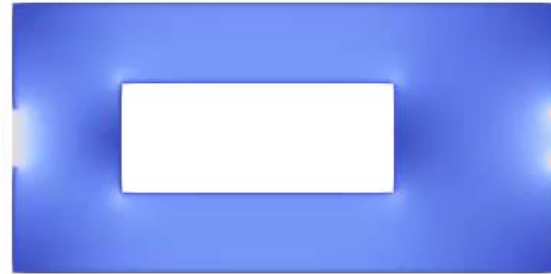


PINN: Physically Informed Neural Networks Models

- **Solving Navier-Stokes PDE** (partial differential equations) equation, **via PINN** approach
 - Reduction of computing costs for simulating load effect into the autoclaves curing process
 - Validation wrt Open Foam
 - Precision on steady and transitory cases
 - Definition of Transfer Learning techniques
- Videos on <https://www.snap4city.org/1010>



Comparison of PINN vs OpenFoam and error



Industry Domain controlling production quality and notification management

FROM CITY DASHBOARD TO APPLICATIONS

FORGING & MANAGING OPEN AND FLEXIBLE WE AND MOBILE APP

IoT APPLICATIONS VS IoT EDGE DEVICES

SNAP4CITY FOR G...EN

SNAP4CITY ARCHITECTURE AND ECOSYSTEM, OPENED TO DEVELOPERS AND STAKEHOLDERS

TWITTER VIGILANCE SOCIAL MEDIA ANALYSIS

SNAP4CITY AND KM4CITY PROJECTS

GENERATE AND CITY DATA KNOWLEDGE MANAGEMENT

DATA ANALYTICS RISKES INTELLIGENCE, WHAT-IF AND SIMULATION

DECISION SUPPORT SYSTEM AND CITY RESILIENCE

HOW TO DO... SNAP4CITY AND... OUR ROADMAP

ADVANCED... T C... MICE... SNAP4CITY

SNAP4CITY THE NEW OF THE ADMINISTRATORS

SNAP4CITY LIVING LAB FOR COLLABORATIVE WORK





EN.TE.R.PR.I.S.E.

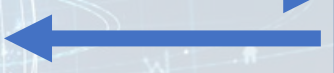
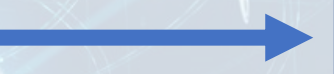
(ENhanced **TE**chnological **R**&D of new **PR**oducts and Processes for Innovation, **S**mart factory and green **E**conomy)



Administrative Data from AS400

Real Time Data, Historical, Events from DCS

Unique National Energy Costs (PUN)



Big Data Analytics
Artificial Intelligence Engine



Analytical Data from the product quality Lab (LIMS/SAM)

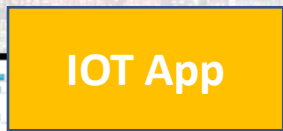
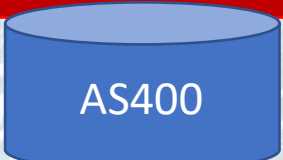
SNAP4 GeNotiLab



GeNotiLab Architecture for ALTAIR



Analytical Data from the product quality Lab(LIMS/SAM)



Users
Analysis
Notifications



IOT App Analytics

Dashboards



IOT App Management

- Tools:
- List of Chemical Analyses
 - List of Notifications
 - Define notifications
 - Program, send notifications
 - see notification status

IOT App Vs Telegram



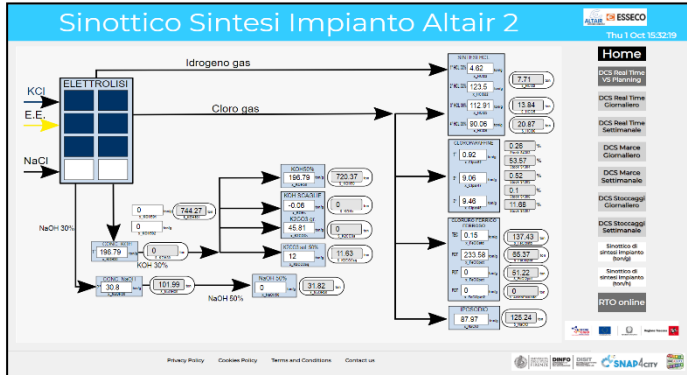
Telegram Bot



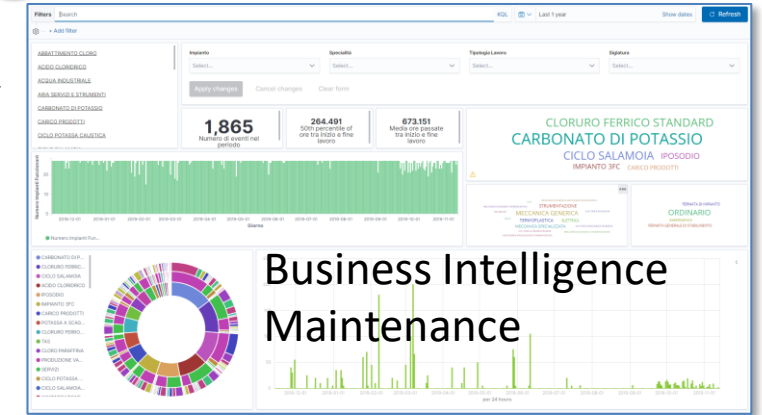
Industry Domain predictive maintenance



Workflow for Ticket management



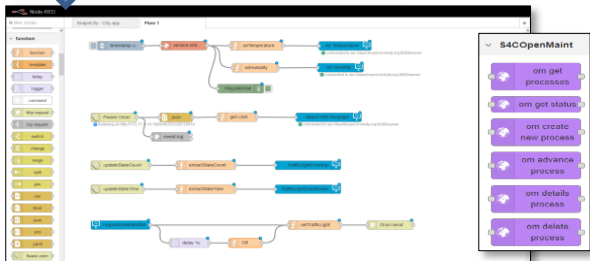
Consumptions/productions



Events/actions

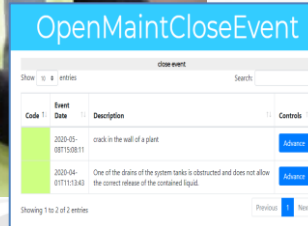
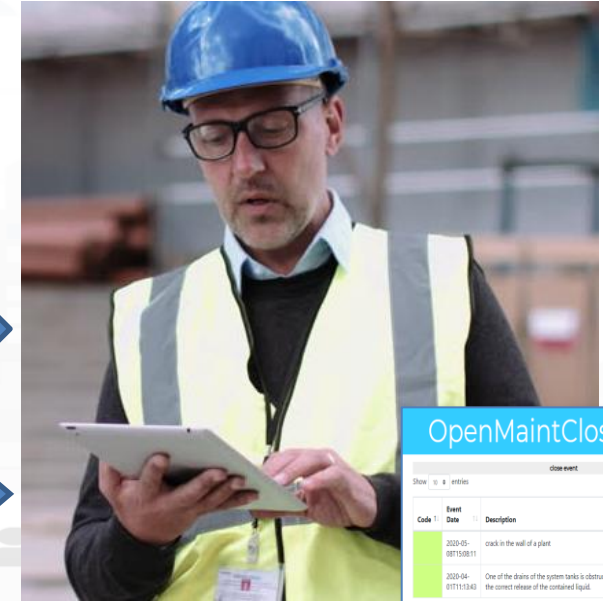
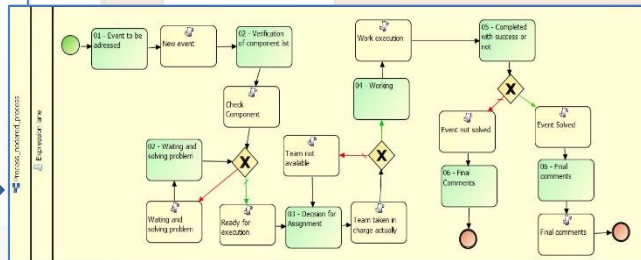
Business Intelligence
Maintenance

Dashboards and actions



IOT App, Data
event firing,
event detection
and firing
Critical event
management

OpenMaint: BPM Workflow
management, team assignment,
material control, ...



Digital Twin Local, 3D vs Real Time Data



UNIVERSITÀ
DEGLI STUDI
FIRENZE

DINFO
DIPARTIMENTO DI
INGEGNERIA
DELL'INFORMAZIONE

DISIT
DISTRIBUTED SYSTEMS
AND INTERNET
TECHNOLOGIES LAB

Tue 8 Jun 11:04:55

BIM Integration for Digital Twin



[Privacy Policy](#) [Cookies Policy](#) [Terms and Conditions](#) [Contact us](#)



UNIVERSITÀ
DEGLI STUDI
FIRENZE

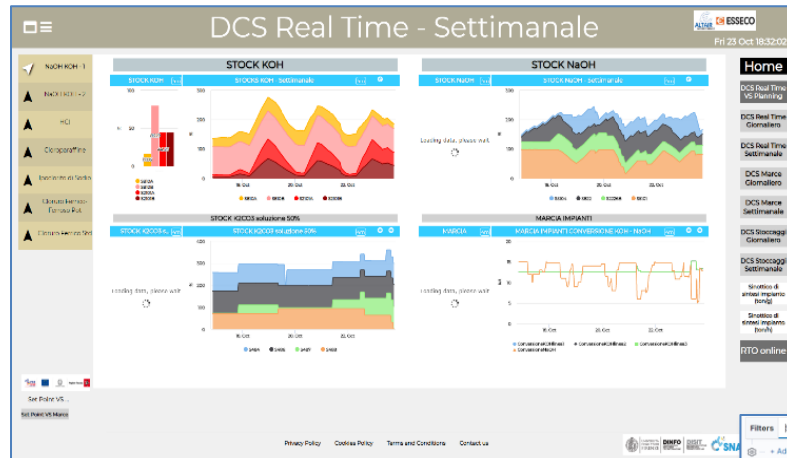
DINFO
DIPARTIMENTO DI
INGEGNERIA
DELL'INFORMAZIONE



DISIT
DISTRIBUTED SYSTEMS
AND INTERNET
TECHNOLOGIES LAB

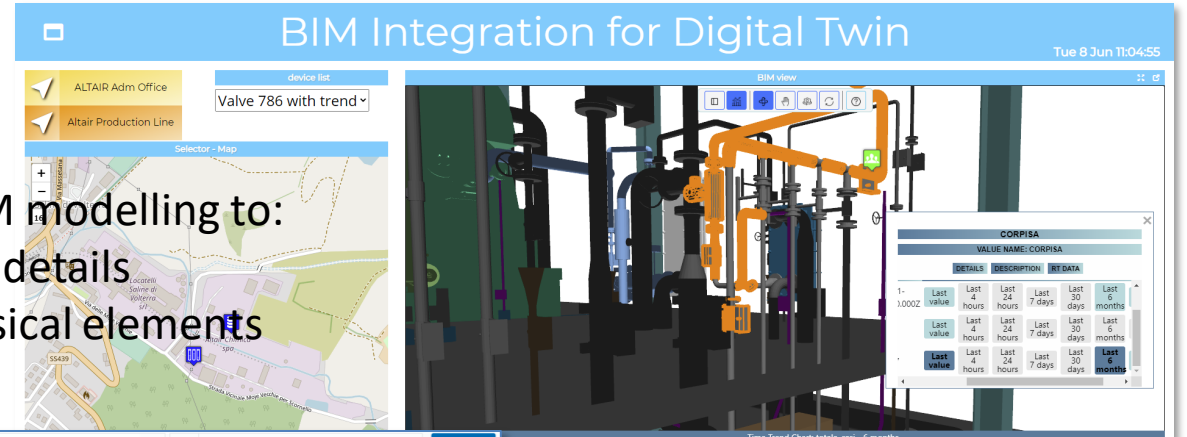
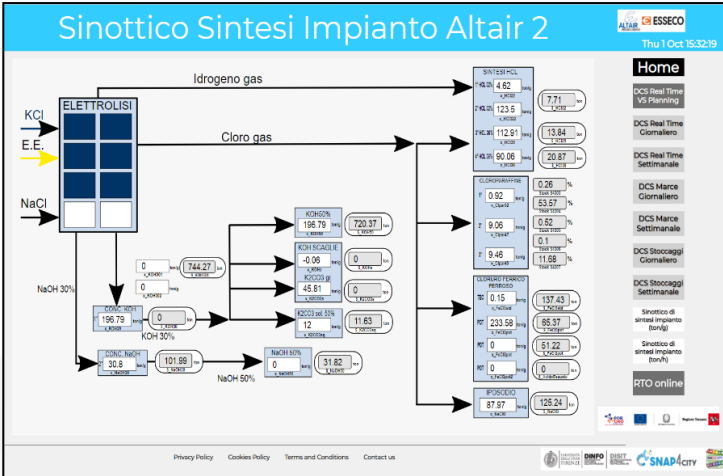


Closing the loop

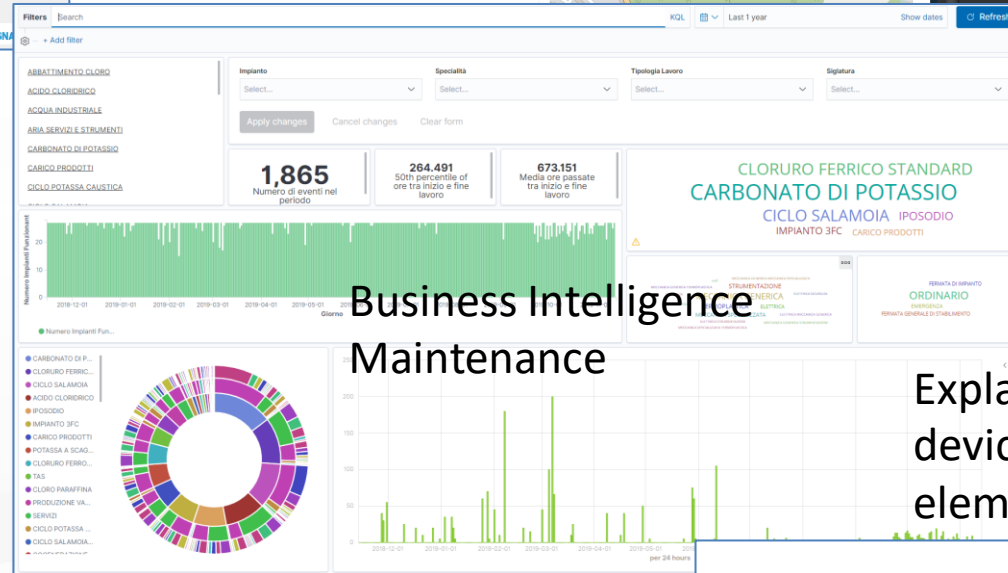


Historical and Real Time Data

Synoptics for real time monitoring

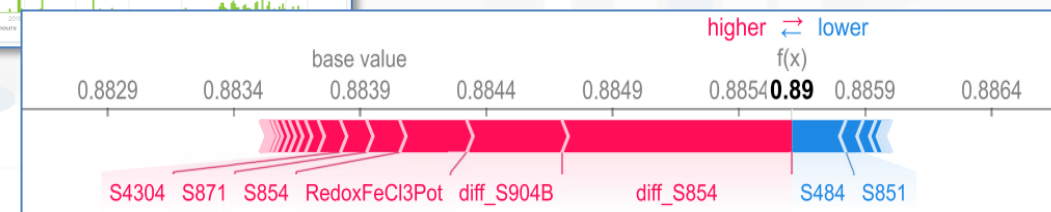


Map and 3D BIM modelling to:
-- represent the details
-- associate physical elements with data



Business Intelligence Maintenance

Explainable AI to map critical values of devices and detection to physical elements in the plant



<https://www.snap4city.org/dashboardSmartCity/view/index.php?iddashboard=MzA1NA==>

References



booklets



- Smart City



https://www.snap4city.org/download/video/DPL_SNAP4CITY.pdf

- Industry

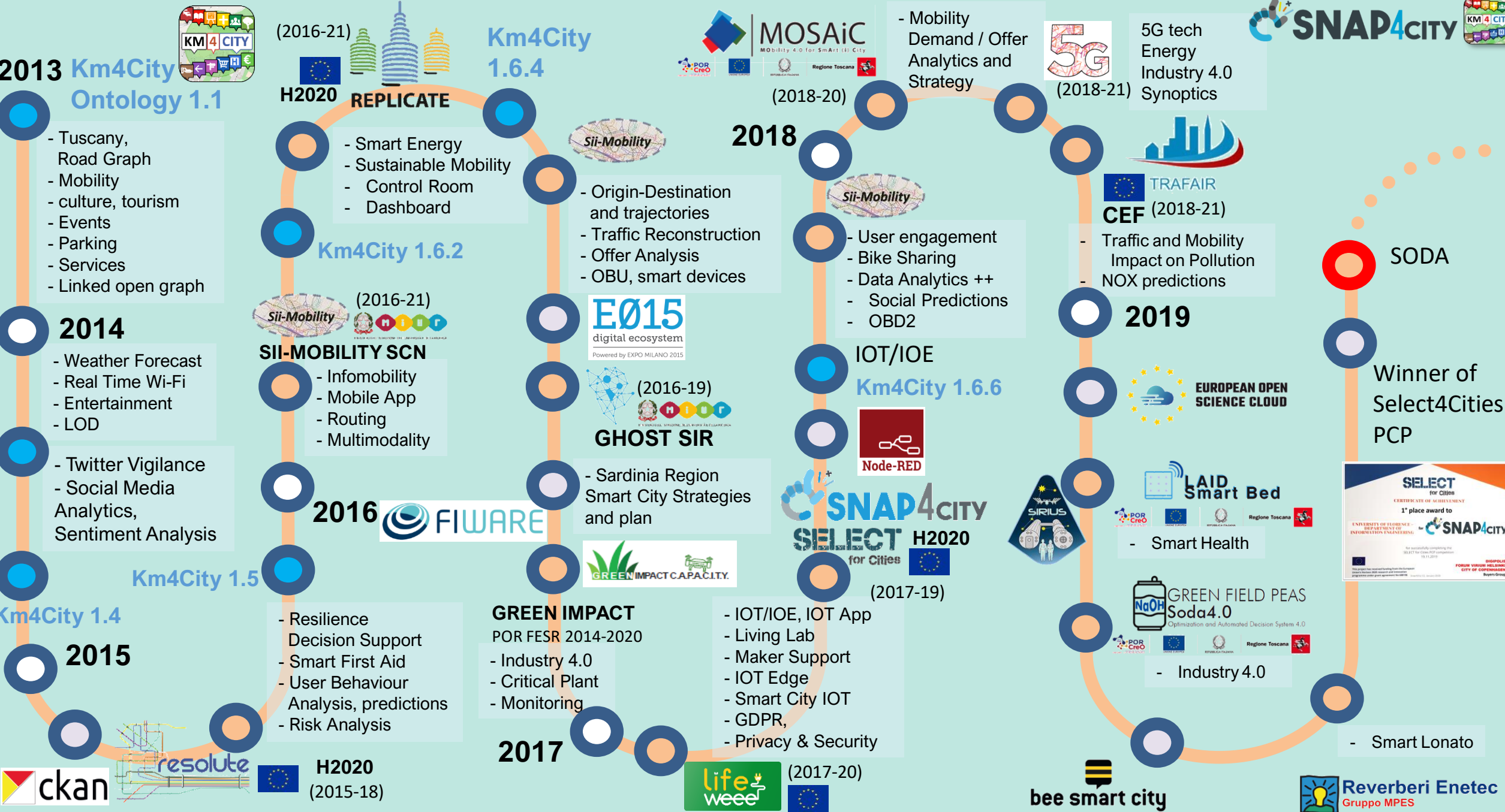


https://www.snap4city.org/download/video/DPL_SNAP4INDUSTRY.pdf

- Artificial Intelligence



https://www.snap4city.org/download/video/DPL_SNAP4SOLU.pdf



2013 Km4City Ontology 1.1

- Tuscany, Road Graph
- Mobility
- culture, tourism
- Events
- Parking
- Services
- Linked open graph

2014

- Weather Forecast
- Real Time Wi-Fi
- Entertainment
- LOD

- Twitter Vigilance
- Social Media Analytics, Sentiment Analysis

Km4City 1.4

2015

- Resilience Decision Support
- Smart First Aid
- User Behaviour Analysis, predictions
- Risk Analysis



DISIT lab roadmap vs model and tools' usage

(2016-21) **H2020 REPLICATE**

Km4City 1.6.4

- Smart Energy
- Sustainable Mobility
- Control Room
- Dashboard

Km4City 1.6.2

(2016-21) **SII-MOBILITY SCN**

- Infomobility
- Mobile App
- Routing
- Multimodality

2016 FIWARE

Km4City 1.5

- IOT/IOE, IOT App
- Living Lab
- Maker Support
- IOT Edge
- Smart City IOT
- GDPR, Privacy & Security

2017

GREEN IMPACT
POR FESR 2014-2020

- Industry 4.0
- Critical Plant
- Monitoring

2018

MOSAiC
MOBILITY 4.0 FOR SMART CITY

- Mobility Demand / Offer
- Analytics and Strategy

- Sii-Mobility*
- Origin-Destination and trajectories
 - Traffic Reconstruction
 - Offer Analysis
 - OBU, smart devices

E015
digital ecosystem
Powered by EXPO MILANO 2015

(2016-19) **GHOST SIR**

- Sardinia Region Smart City Strategies and plan

SNAP4CITY
SELECT H2020
for Cities

- Smart Waste

(2017-20) **life weee**

(2018-21) **5G**

- 5G tech
- Energy
- Industry 4.0
- Synoptics

- Sii-Mobility*
- User engagement
 - Bike Sharing
 - Data Analytics ++
 - Social Predictions
 - OBD2

2019

IOT/IOE
Km4City 1.6.6

Node-RED

TRAFAIR CEF (2018-21)

- Traffic and Mobility Impact on Pollution
- NOX predictions

EUROPEAN OPEN SCIENCE CLOUD

LAID Smart Bed

- Smart Health

GREEN FIELD PEAS Soda4.0
Optimization and Automated Decision System 4.0

- Industry 4.0

bee smart city

SNAP4CITY

SODA

Winner of Select4Cities PCP

SELECT for Cities
1st place award to **SNAP4CITY**

Smart Lonato

Reverberi Enetec
Gruppo MPES

Reverberi Enetec
Gruppo MPES



2020



- Smart Tourism
- 6 Pilots
- Data Analytics
- Extended platform



- Smart Mobility
- PISA, PUMS
- Living lab



Km4City 1.6.7

Smart Ambulance (2021-22)

Enterprise (2021-22)
Industry 4.0



Contract

2021

PC4City (2020-21)
Monitoring Terrain



CAPELON

- Smart Light
- Sweden

Almafluida Industry 4.0 (2021-22)

AMPERE (2021-22)
Industry 4.0

SYN-RG-AI
SmartCity



uni.systems
SmartCity, 2021-23



AXIS collab
SmartCity

2022



Asymmetrica
Smart City, 2022-23

Contract, 2022-23



2023



Contract, 2022-23



Security and Risk



Italferr, Smart City



CN MOST, 2022-26



EI THE, 2022-26

G. Agile, 2021-23



2023-26 Finanziato dall'Unione europea NextGenerationEU

Merano, smart light

OceanRace,
Genova, AWS

Cuneo,
smart city

2024

Km4City 1.6.8

TOURISMO



UrbanDT4TF

ELLIE IA
2025-2027



Contract, 2024-25



Rhodes,
smart city

eShare
UNIFI TUSS
MOST

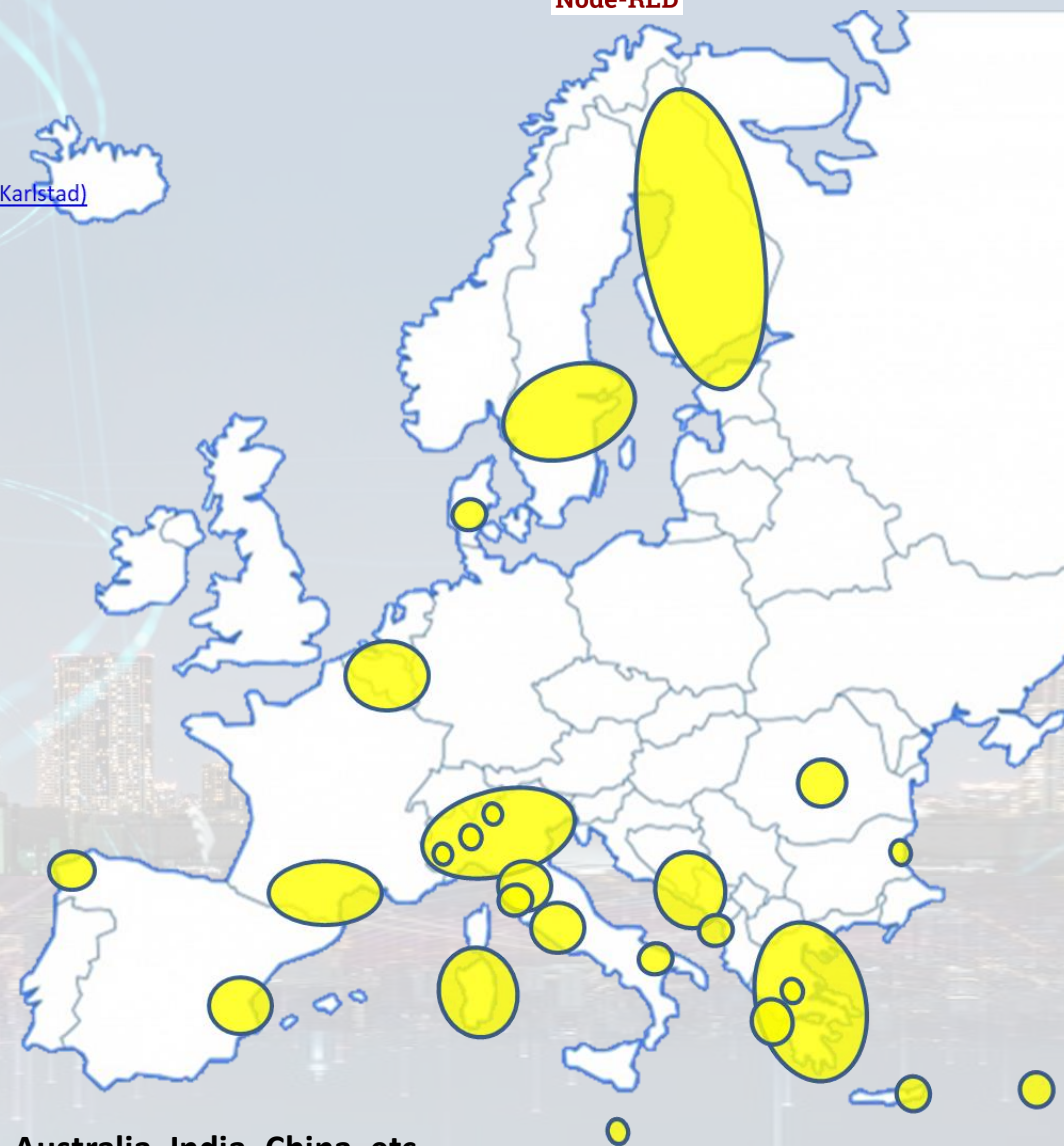




- Update: 29-10-2024
- 12 running installations in Europe
 - Snap4.city.org, Greece, Merano, Cuneo, ..
 - Toscana, Pisa, Sweden, ISPRA, Snap4.eu,
 - Altair, Italmatic, Romania, Rhodes,
- 16 projects, 12 pilots on 10 Countries
 - >40 cities/area
- **Widest MULTI-tenant deploy has**
 - 24 Organizations / tenant
 - > 8850 users on
 - > 1800 Dashboards
 - > 17 mobile Apps
 - > **2.2 Million of structured data per day**
 - > 580 IoT Applications/node-RED
 - > 750 web pages with training
 - > 75 videos, training videos

Main Organizations/areas

- [Antwerp area \(Be\)](#)
- [Bari \(I\)](#)
- [Bisevo, Croatia](#)
- [Bologna \(I\)](#)
- [Brasov \(Ro\), by ICEBERG](#)
- [Capelon \(Sweden: Västerås, Eskilstuna, Karlstad\)](#)
- [Cuneo \(I\)](#)
- [DISIT demo \(multiple\)](#)
- [Dubrovnik, Croatia](#)
- [Firenze area \(I\)](#)
- [Garda Lake area \(I\)](#)
- [Greece \(Gr\)](#)
- [Helsinki area \(Fin\)](#)
- [Limassol \(Cy\)](#)
- [Livorno area \(I\)](#)
- [Lonato del Garda \(I\)](#)
- [Malta \(Malta\)](#)
- [Merano \(I\)](#)
- [Modena \(I\)](#)
- [Mostar, Bosnia-Herzegovina](#)
- [Oslo & Padova \(Impetus\)](#)
- [Pisa area \(I\)](#)
- [Pistoia \(I\)](#)
- [Pont du Gard, Occitanie \(Fr\)](#)
- [Prato \(I\)](#)
- [Rhodes \(Gr\)](#)
- [Roma \(I\)](#)
- [Santiago de Compostela \(S\)](#)
- [Sardegna Region \(I\)](#)
- [Siena \(I\)](#)
- [SmartBed \(multiple\)](#)
- [Toscana Region \(I\), SM](#)
- [Valencia \(S\)](#)
- [Varna \(Bulgaria\)](#)
- [Venezia area \(I\)](#)
- [WestGreece area \(Gr\)](#)



• + Israel, Colombia, Brasile, Australia, India, China, etc.



Be smart in a SNAP!



CONTACT

DISIT Lab, DINFO: Department of Information Engineering
Università degli Studi di Firenze - School of Engineering

Via S. Marta, 3 - 50139 Firenze, ITALY
https://www.disit.org

www.snap4city.org

Email: snap4city@disit.org

Office: +39-055-2758-515 / 517
Cell: +39-335-566-86-74
Fax.: +39-055-2758570

