



SIEMENS

# Monet

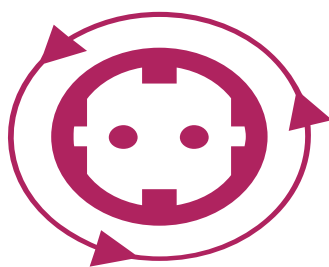
Siemens Energy Management System

Claudia Guenzi - Siemens SpA - Energy Management

## Le principali sfide del sistema energetico



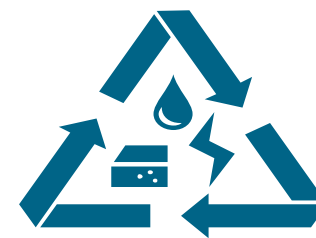
**Economic  
efficiency**



**Reliable  
power supply**



**Climate  
protection**



**Resource  
efficiency**



# Expo 2015

Some figures ...

**May 1 to October 31, 2015**

**1,1 Mln m2 between Milano and Rho**

**75 MW required**

**160 temporary buildings**

**2 permanent buildings**

***20 Mln visitors expected***

***30 electric people mover***

***50 hybrid bus***

***Show case of worldwide and innovative technologies***



# Expo 2015

## A model for tomorrow smart city

The organizing committee of Expo Milano 2015 has decided to build-up and operate the Expo site developing a model for the Smart City of the future

The Expo 2015 Smart City will be

- Sustainable
- Efficient
- Informative
- Safe

The solutions that will manage the Expo 2015 microgrid will join consolidated and innovative technologies developed by Siemens Italy named **“Enel’s strategic partner for Smart Grid technology of Expo Milano 2015”**





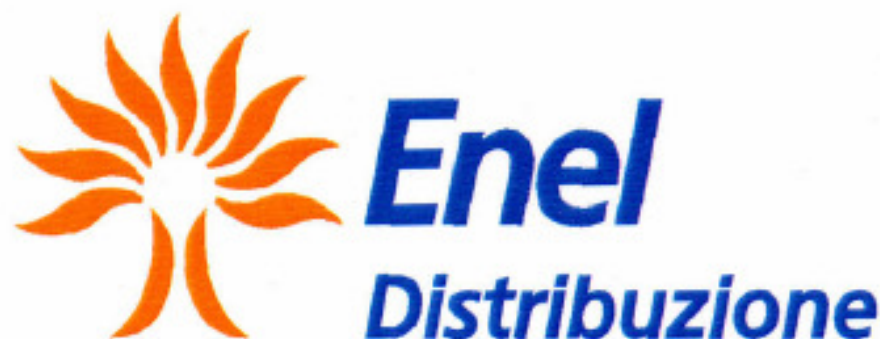
# Expo 2015 Objectives

- **Stability of supply and grid resilience**
- **Energy demand and grid capacity real time balancing**
- **Monitor, control and optimized energy management inside Expo Area**
- **Energy consumption optimization and CO2 reduction**
- **Real test of new Smart City technology**





EXPO Milano 2015  
Strategic Partnership



Global Official Smart Energy Partner of EXPO 2015 and  
leader in Smart Grids and Smart Cities solutions

chose

**SIEMENS**

leader in Smart Grids and Building Management Technologies  
as **Strategic Partner** for EXPO.

# Monet – Monitor and Operate New Energy of things

## Siemens Energy Management System

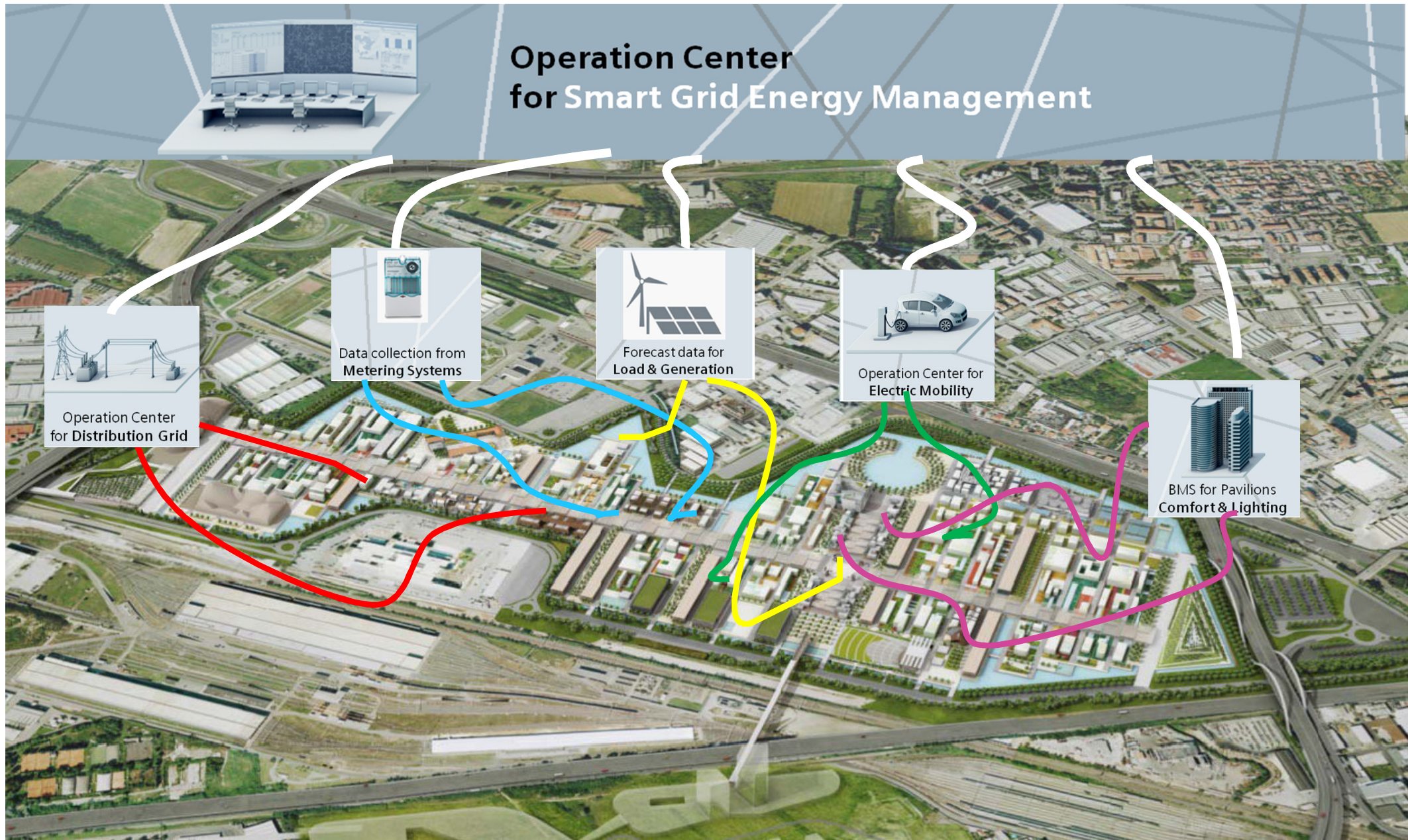


**Monet** is a *aCloud* platform able to provide **Energy Monitoring** and **Energy Management** services following the *Software as a Service* model  
Monet is a solution of monitoring, control and optimization of Energy flow inside a microgrid, a Smart City, a block of buildings



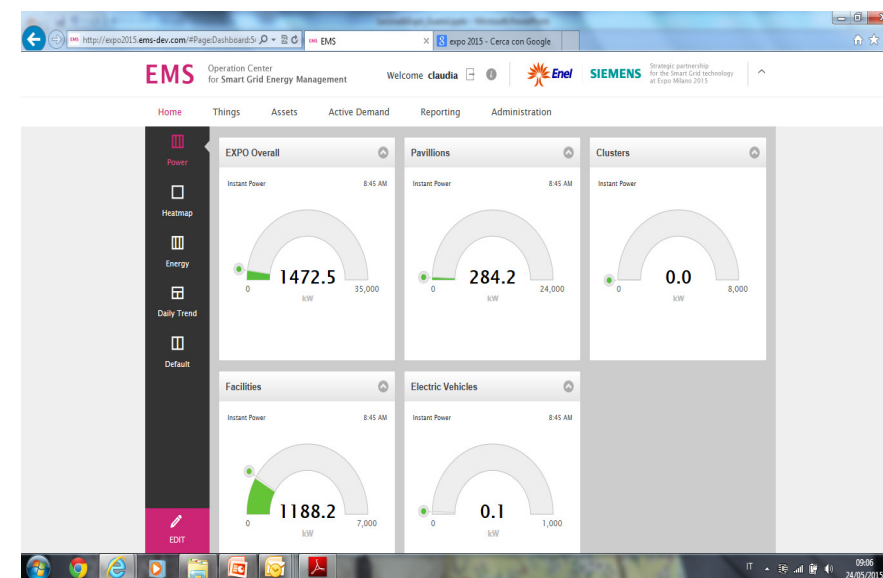
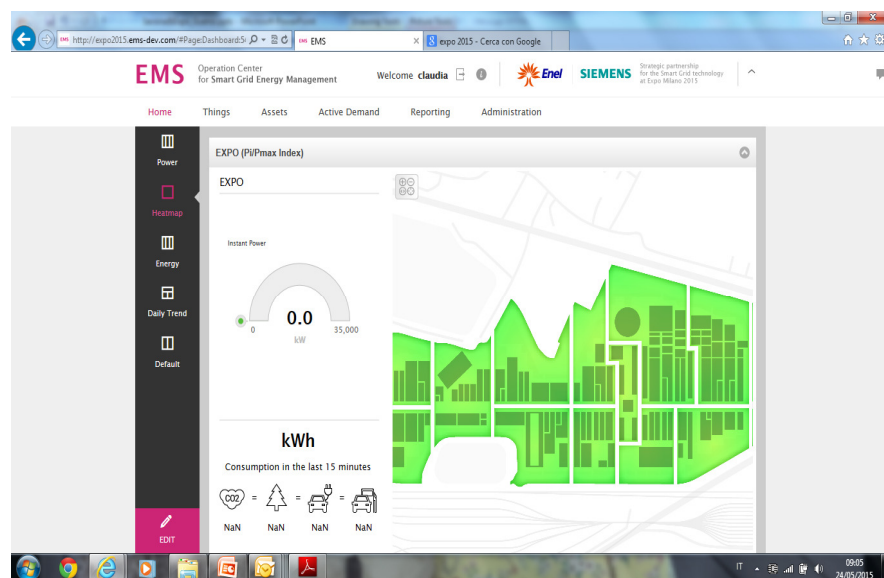
# Monet – Monitor and Operate New Energy of things

## How it works





# Monet – Monitor and Operate New Energy of things Application



## Web application

The service can be used through different devices - PC, Tablet and Smartphone

## Support Business Decisions

HMI is based on **dashboard/cockpit** and provide to the different users high level information **able to support business decision** thanks to an intuitive interface

# Monet – Monitor and Operate New Energy of things

## Main functionalities

EMS is a **Multi-Tenant** system used by **Service Provider** to provide services to the managed customers

Monet manage **Things** belongings to different categories

- ☐ Confort
- ☐ Lighting
- ☐ Meters (contatori)
- ☐ Loads
- ☐ Generation Units
- ☐ Electrochemical storage

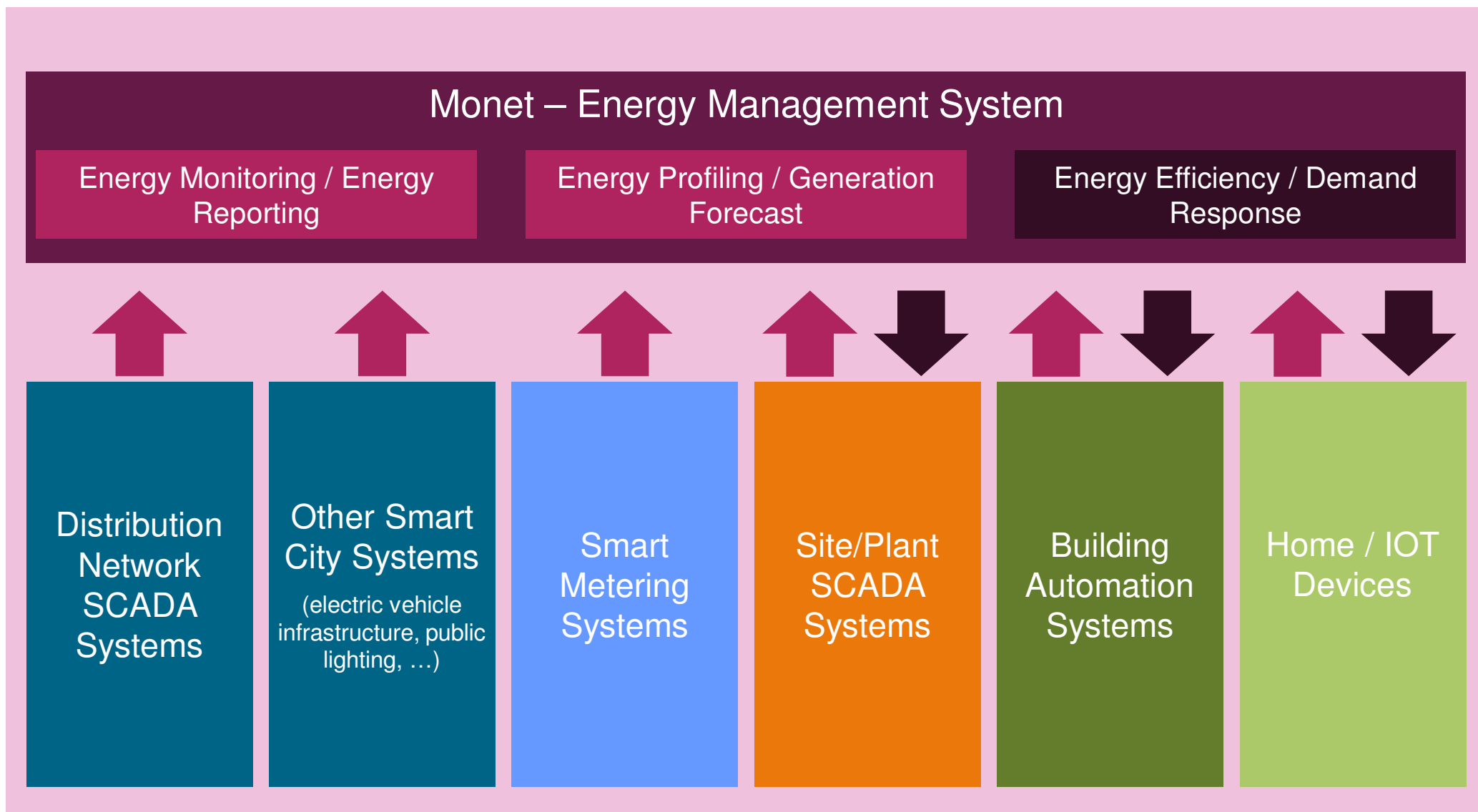
Monet manages all the **energy flows**::  
electrical, thermal, gas, water

Main functionalities are

- ☐ Manage of “Areas” and **Things**
- ☐ Assets Management
- ☐ Energy Monitoring
- ☐ Energy Reporting
- ☐ Energy Efficiency
- ☐ **Demand Response**

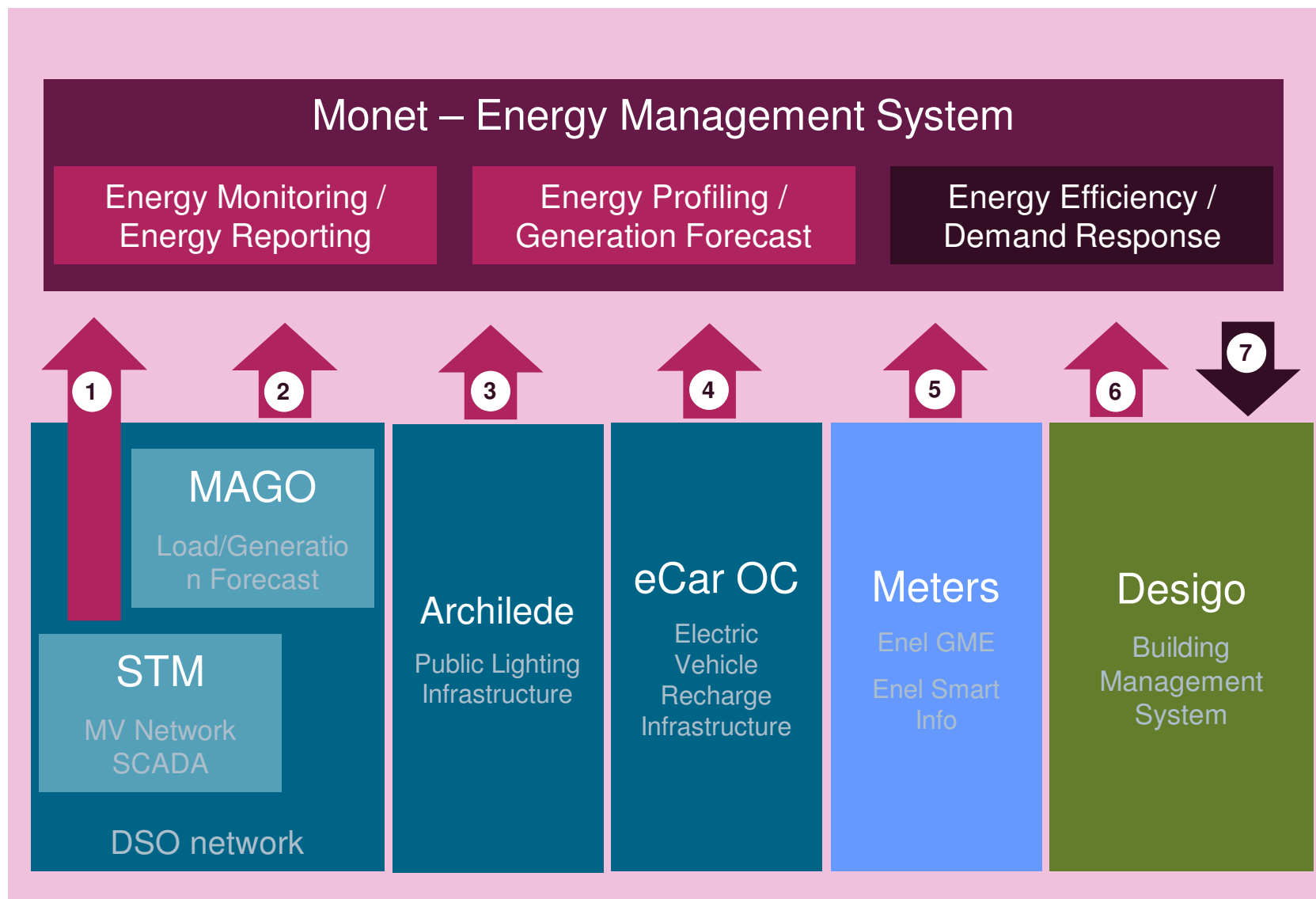


# Monet Architecture



# Monet

## Expo 2015 scenario



### Target Customer:

Smart City

1. Network information on primary and secondary substation
2. Load and Generation forecast
3. Public lighting loads information
4. E-car charging infrastructure information
5. Smart Meters systems
6. Information on confort / lighting
7. Temperature and lighting setpoint



# Monet

## \ Dashboard

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Home

Things

Assets

Active Demand

Reporting

Administration

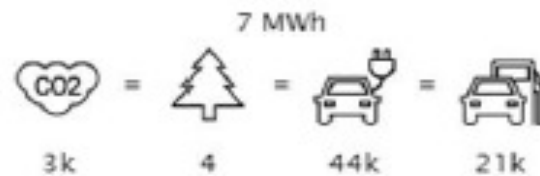
Public

EXPO

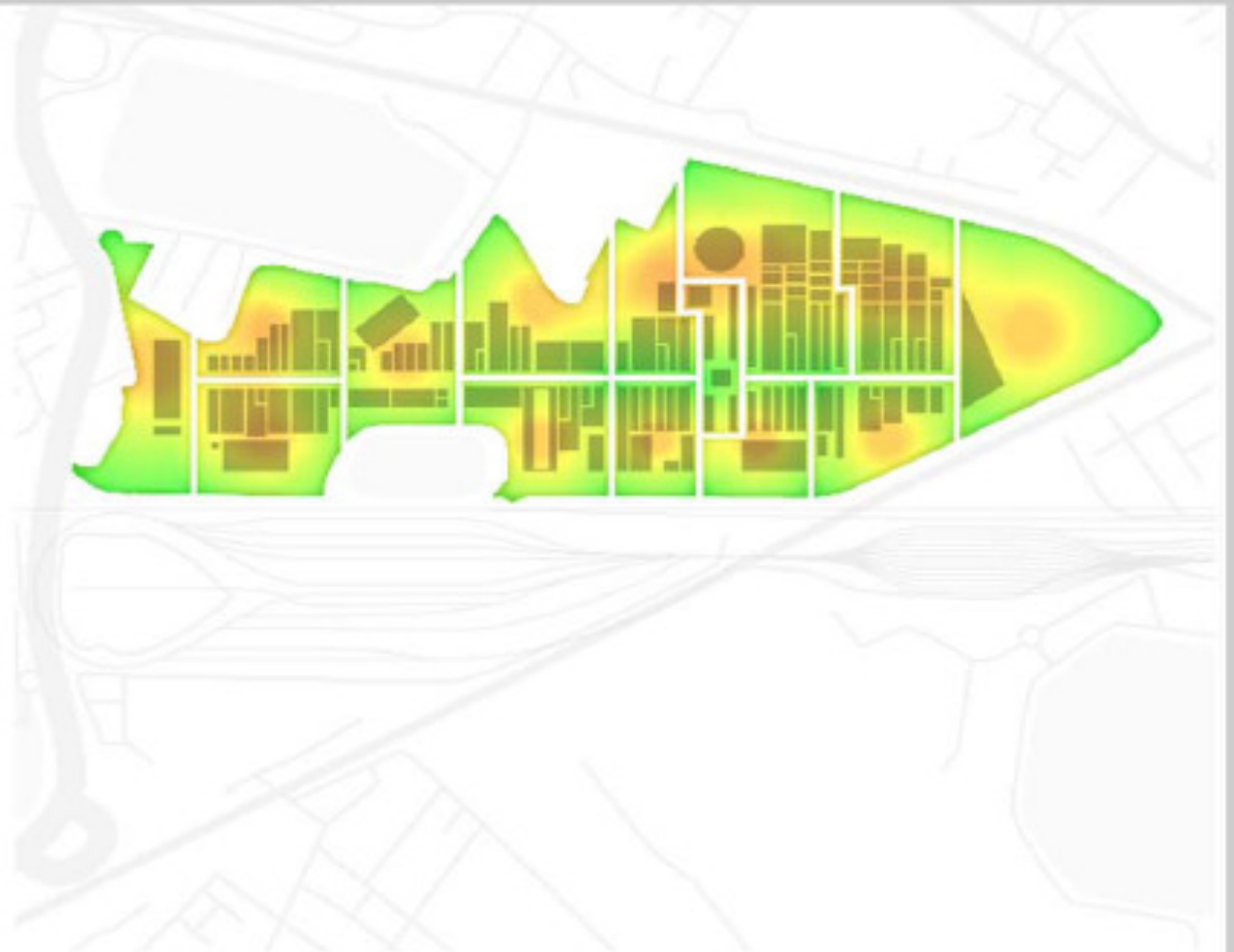
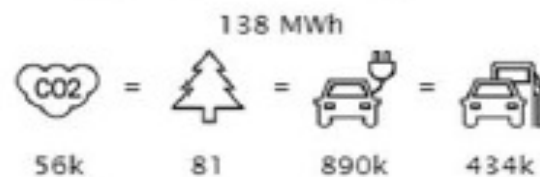
Default



Consumption in the last 15 minutes



Consumption in the last day



EDIT

# Monet \ Dashboard

SIEMENS

EMS

Welcome **maurizio**



Power



Heatmap



Energy



Daily Trend



EDIT

## EXPO - Overall

Instant Power  
**6,204.3 kw**

Period Energy (cum.)  
**43,073.35 kWh**



Energy limit 245,000 kWh

Self-consumption (cum.)  
**N/A kWh**



## Pavillions

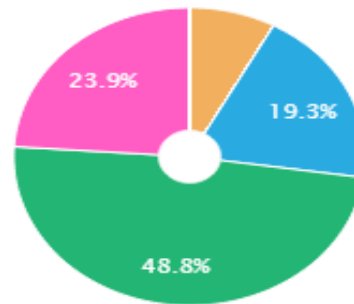
Instant Power  
**3,287 kw**

Period Energy (cum.)  
**22,994.59 kWh**



Energy limit 168,000 kWh

## EXPO by Usage

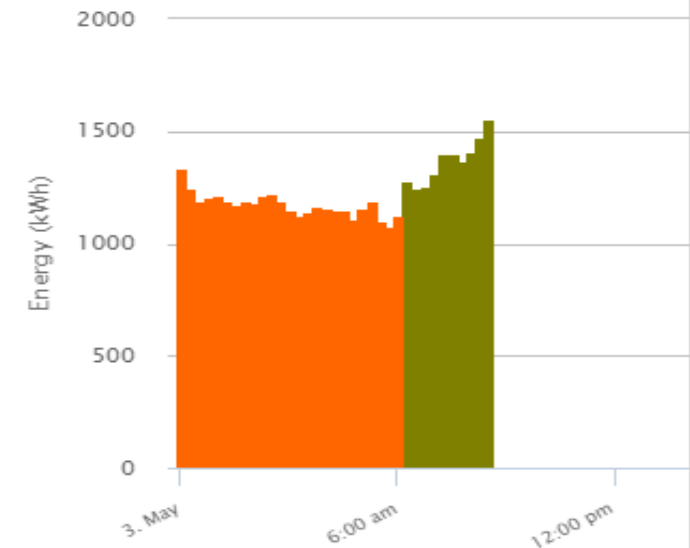


- Comfort  
3,733.91 kWh
- Facilities  
9,102.05 kWh
- Pavilions  
22,991.65 kWh
- Clusters  
11,266.41 kWh

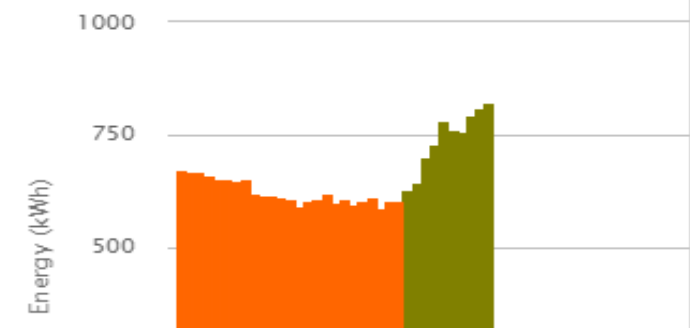
## EXPO by Area



## EXPO by Scenario



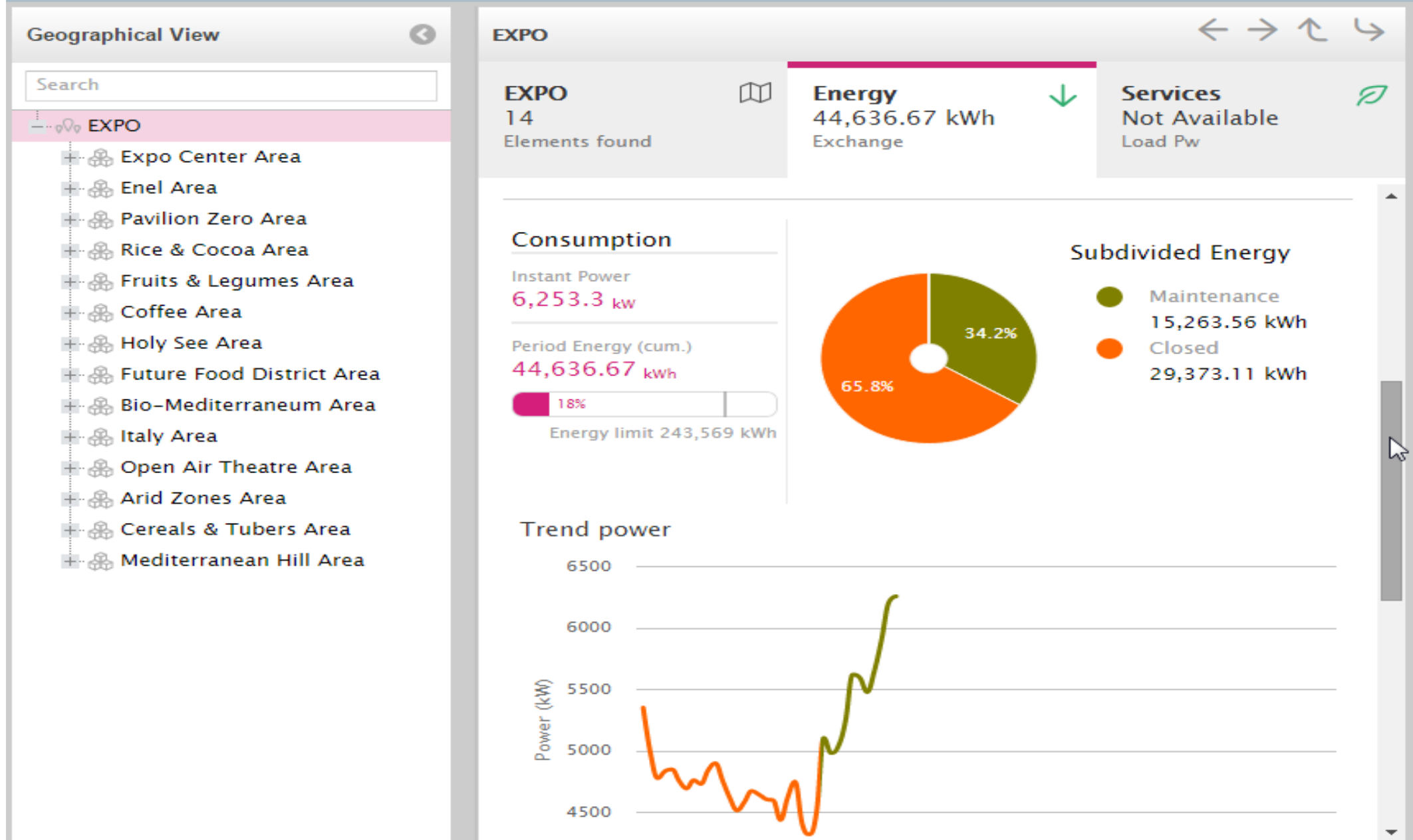
## Pavillions





# Monet

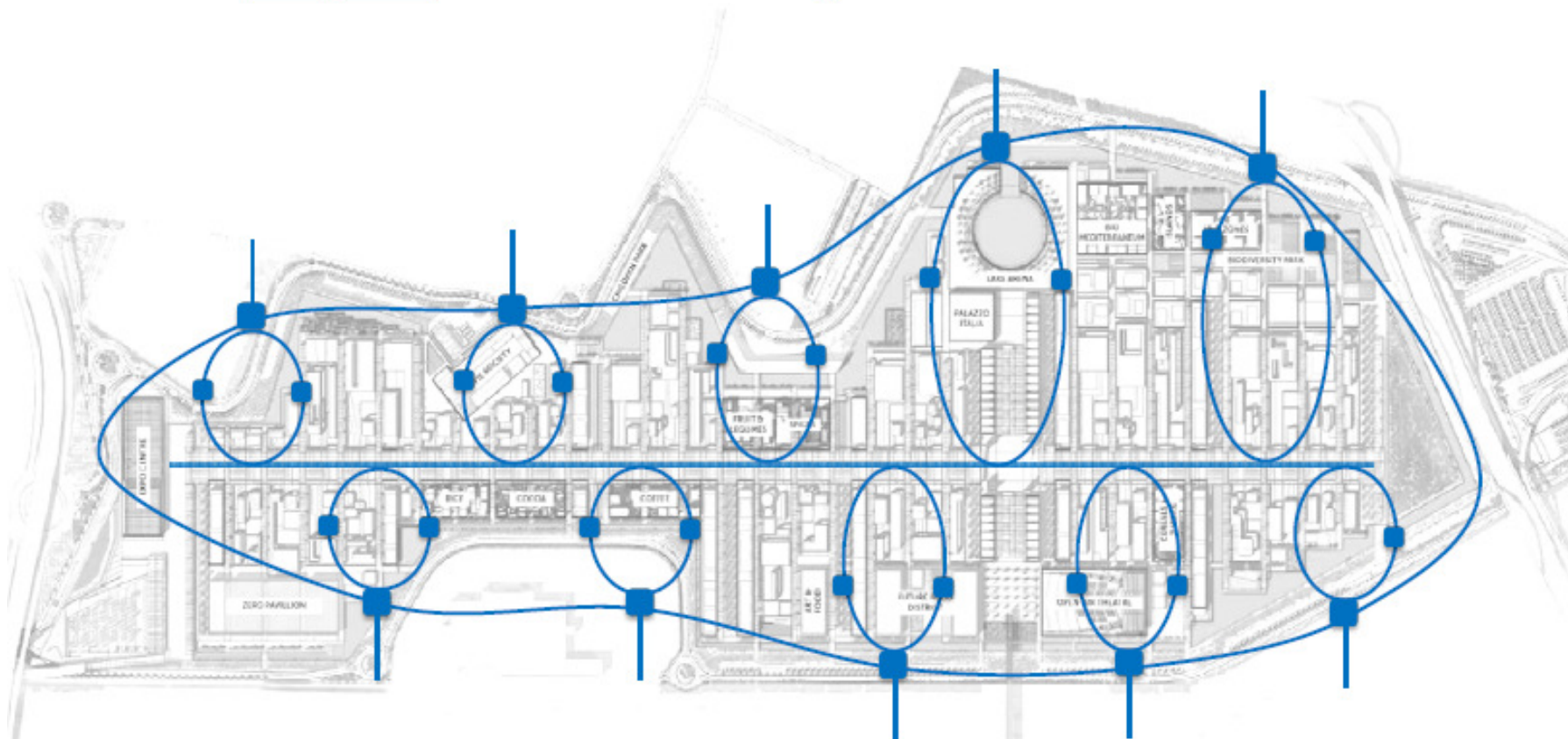
## \ Geographical Navigation



# Monet

## \ Electrical navigation

The services provided by Enel Distribuzione allow the Pavilions to be completely integrated with the meshed configuration of **EXPO Smart Grid**



10 interconnected rings which allow a complete re-feeding even in the case of failure to a  
A2A feeder

13

# Monet

## \ Electrical navigation

### Electrical View

EXPO

Feeder 01

- + CP\_1 - (40)1001
- + ASVC1 - 30102
- + N22-N23 - 30110
- + N21 - 30109
- + CHILD.PARK - 30108
- + N18 - 30107
- + N16-17 - 30106
- + N14-15 - 30105
- + CNA TRIULZA - 301...
- + N10 - 30103
- + ASVB1 - 30101

- + Feeder 01A
- + Feeder 02
- + Feeder 03
- + Feeder 04
- + Feeder 04A
- + Feeder 05
- + Feeder 06
- + Feeder 06A
- + Feeder 07

### EXPO > Feeder 01

#### Feeder 01

11

Elements found

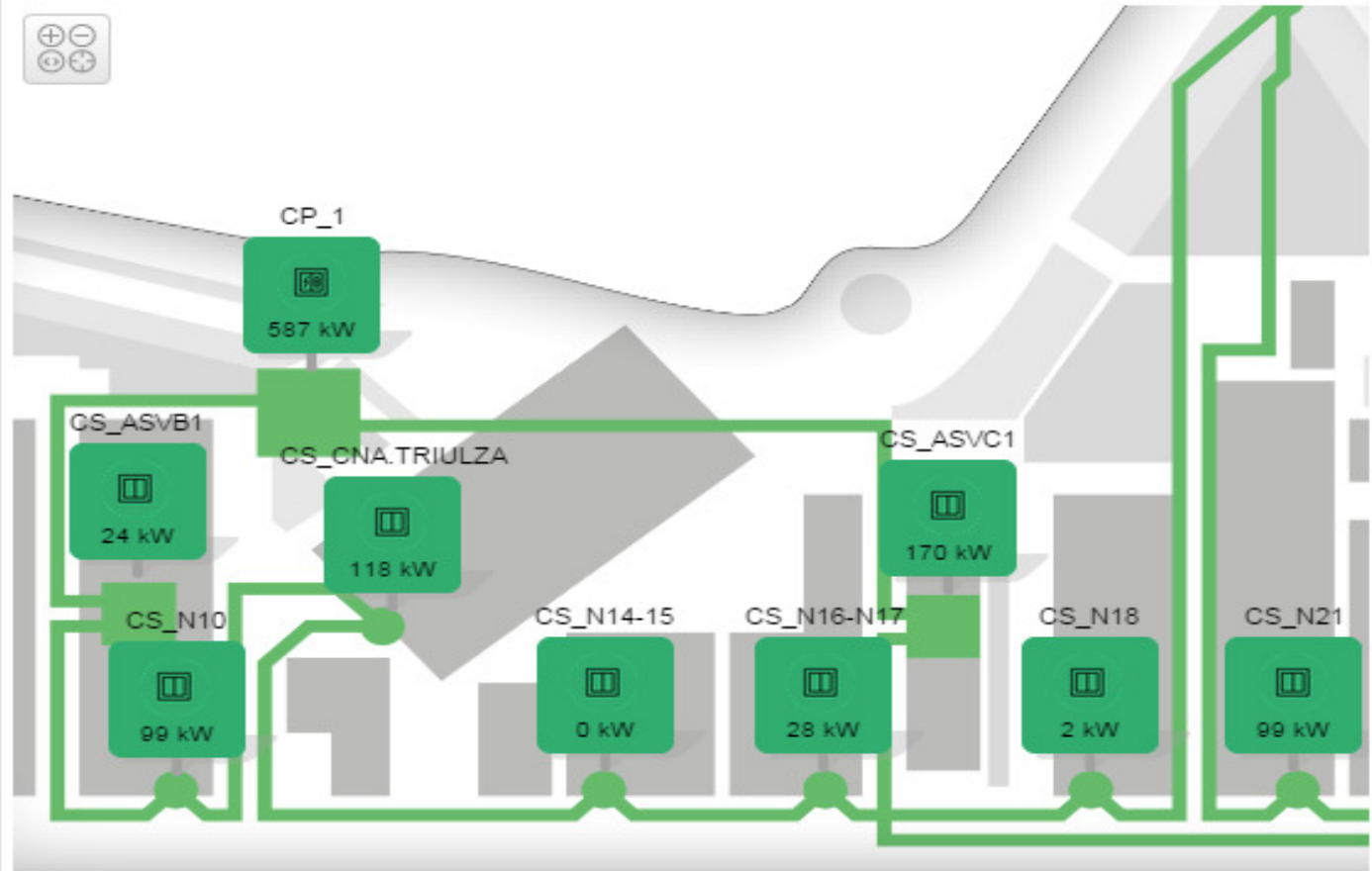
#### Energy

3,729.64 kWh  
Consumption

#### Services

NA

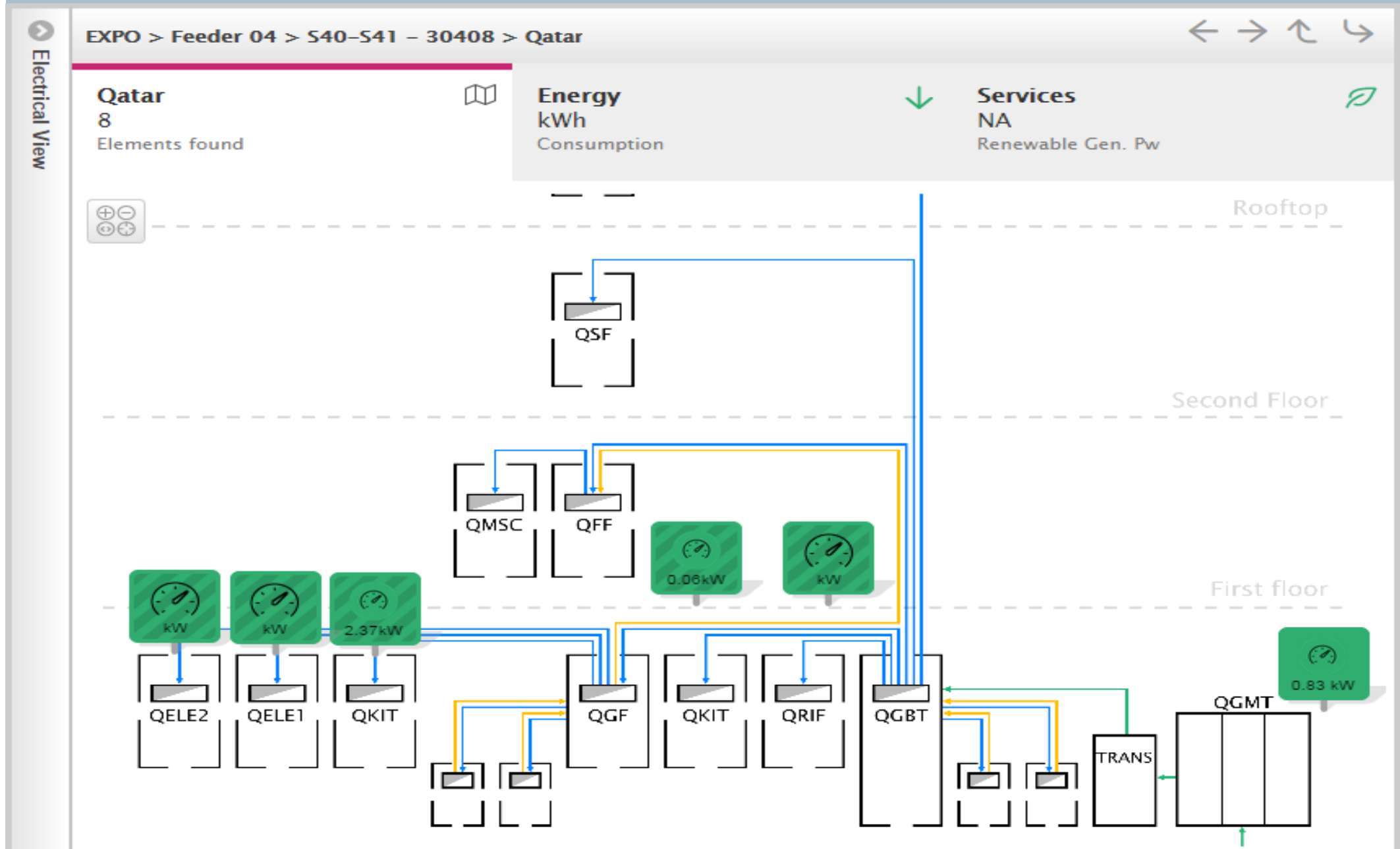
Other Gen. Pw





# Monet

## \ Electrical navigation (2)



# Monet \ Reporting

EMS

Welcome **maurizio**   

Energy



Things



Assets

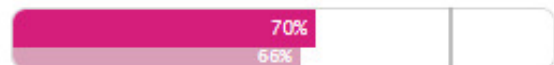
|                    |            |                          |              |            |                          |
|--------------------|------------|--------------------------|--------------|------------|--------------------------|
| Report:            | Period:    | From/To:                 | Measurement: | Dimension: | m <sup>2</sup> :         |
| Electric consumpti | Day        | <input type="checkbox"/> | kWh          | Usage      | <input type="checkbox"/> |
| Main site:         |            | Reference site:          |              |            |                          |
| EXPO               |            | EXPO                     |              |            |                          |
| Date/Typical:      | Date:      | Date/Typical:            | Date:        |            |                          |
| Date               | 05/02/2015 | Date                     | 05/01/2015   |            |                          |
| <div>Search</div>  |            |                          |              |            |                          |

## Consumption

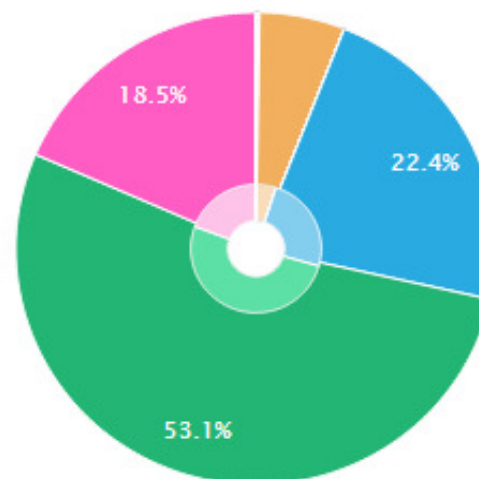
Instant Power

**5,616.93** kW (6,063.13 kW)

Period Energy (cum.)

**170,627.8** kWh (162,675.05 kWh)

Energy limit 243,569 kWh



## Subdivided Energy

|            |               |       |
|------------|---------------|-------|
| (Mix)      | 450.48 kWh    | ↑ 87% |
| Comfort    | 10,149.48 kWh | ↑ 23% |
| Facilities | 39,628.16 kWh | ↓ -5% |
| Pavilions  | 93,721.19 kWh | ↑ 7%  |
| Clusters   | 32,601.78 kWh | ↓ -1% |

# Monet

## \ Efficiency & Demand-Response

Site: Qatar

### Mode and scenario



Comfort



Efficiency



Demand-response



Over-limit



Emergency

☒ Automatic scenario☐ Manual scenario

Maintenance

### Calendar

Expo Calendar

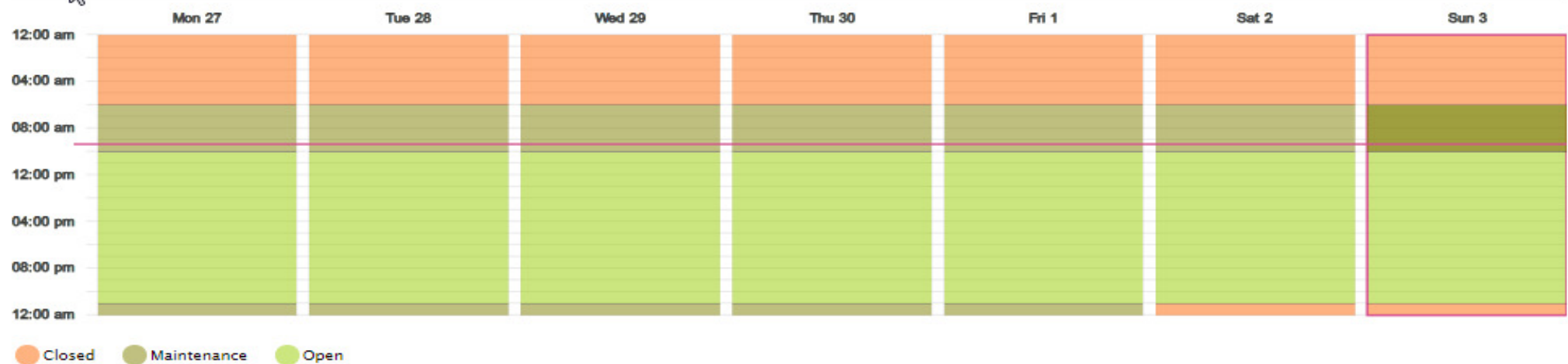
Month

Week

&lt; Prev

Week N.18 | April 2015

Next &gt;



Site timezone: Europe/Rome (GMT+02:00)

### Rules

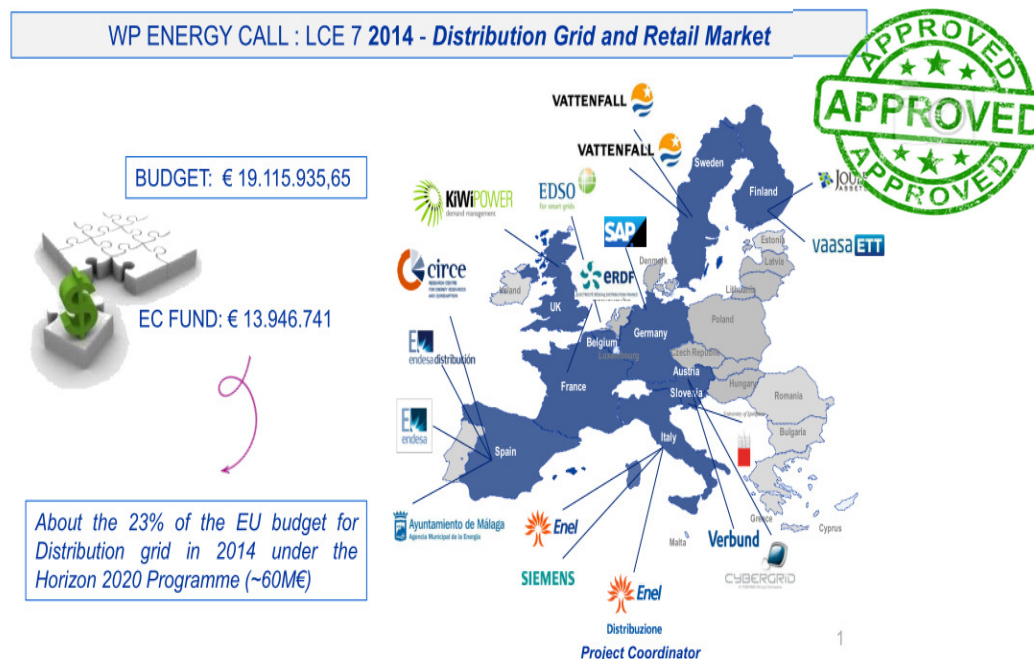
Base Rules Set

| Active | Rule name            | Rule type | References | Tags                        | Actions |
|--------|----------------------|-----------|------------|-----------------------------|---------|
| ✓      | Base Rule            | Base      |            |                             |         |
| ✗      | Base Rule Emergency  | Mode      |            | EmergencyLoad, DRLoad, O... |         |
| ✗      | Base Rule Over-Limit | Mode      |            | OverLimitLoad, DRLoad       |         |



# Monet Future projects

## Horizon 2020 LCE7 Distribution Grid **FLEXICIENCY**



## Horizon 2020 SCC-01- 2015 Lighthouse Genova - Anversa - Goteborg **EASIER**



Engaging And Sustainable Integrated Energy-efficient solutions for Roll-out in cities

## Horizon 2020 SCC-01- 2015 Lighthouse Bologna – Paris - Berlin **Smart NEXUS**



New Energy x Urban Sustainability



The background of the slide is a composite image. It features a man in a dark suit and a woman in a black dress standing in a virtual space. They are surrounded by glowing blue digital overlays that include various data visualizations such as pie charts, bar graphs, and line charts. In the background, the Milan Cathedral (Duomo di Milano) and the Spina Verde tower are visible, suggesting a connection between traditional architecture and modern technology.

# Thanks

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