



SIEMENS



Energy Management System

Il cuore digitale alla base del funzionamento di una Smart Grid

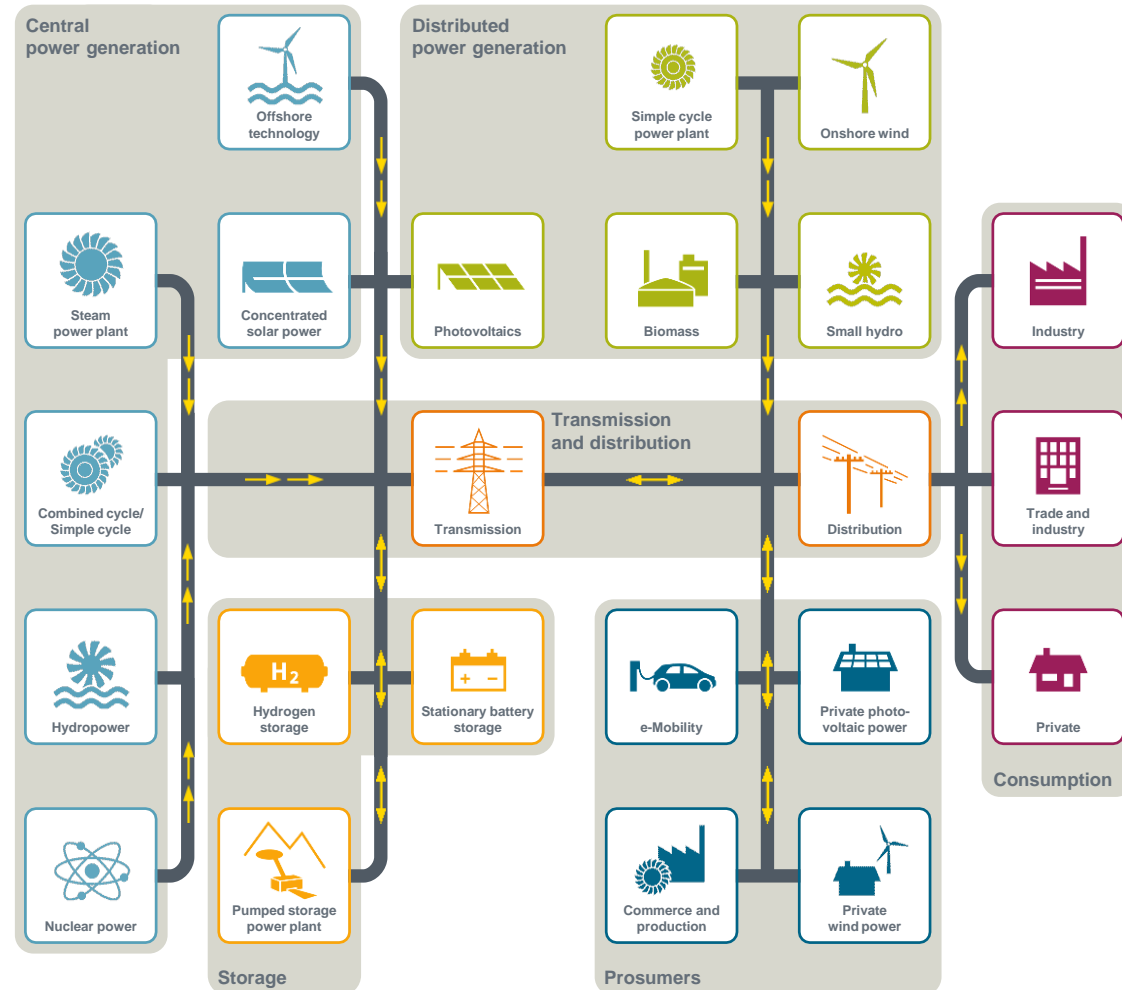
Maurizio Bigoloni – Smart Grid Solutions



Internet of Things
Cloud Computing
Energy Services

Smart Grid Systems

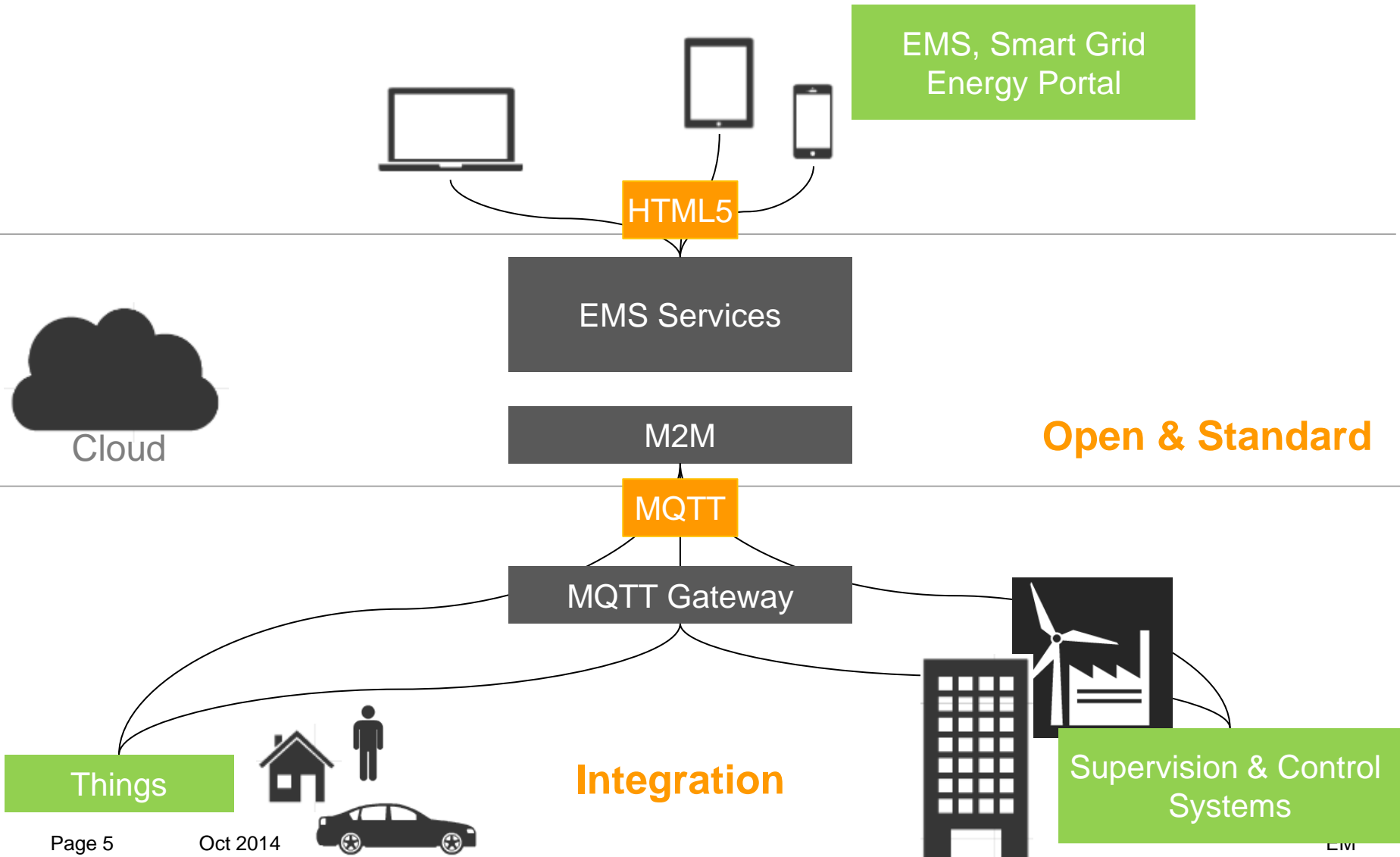
- Grid SCADA
- Smart Metering
- Smart Building
- Public Lighting
- Renewable Gen.
- Energy Storage
- Electric Vehicles



A man in a white shirt is pointing at a large screen displaying a complex energy management system interface. The screen shows a network of glowing blue lines and nodes, representing an energy grid or data flow. The background of the screen is a city skyline at night. The man is standing in front of the screen, looking at the data. The overall scene is set against a city skyline at dusk or night.

EMS is a Cloud platform providing set of services for Energy Monitoring and Energy Management

Overall Architecture



Monitoring Services

- Meter Raw Data
- Aggregation
 - ✓ Geographical
 - ✓ Electrical
 - ✓ Usage
 - ✓ Scenario
 - ✓ Mode
- Profiling
 - ✓ Typical Days
 - ✓ Energy Rules

The screenshot displays the EMS (Energy Management System) Operation Center for Smart Grid Energy Management. The interface is divided into several sections:

- Header:** "EMS Operation Center for Smart Grid Energy Management" and "Welcome mau".
- Navigation:** Home, Things, Assets, Active Demand, Reporting, Administration.
- Left Sidebar:** Geographical, Electrical, Technical, Events, Things.
- Geographical View:** Search bar, "Expo" (selected), Clusters, Thematic Areas, Exhibition Site, Pavillions, Corporate Areas, Food & Drink Areas.
- Expo Detail:** "Expo 6", "Elements found", and a 3D architectural rendering of the Expo site.


Management Services

- Climate Mngt
- Lighting Mngt
- Load Control
- Generator Control
- Energy Storage Mngt

Expo > Corporate Areas > Vanke

Vanke
5
Elements found

Energy
0 MWh
Exchange



Temperature:
Luminosity:
Load Power:
Renewable Generation Power:
Other Generation Power:
Storage Energy:

Climate Control

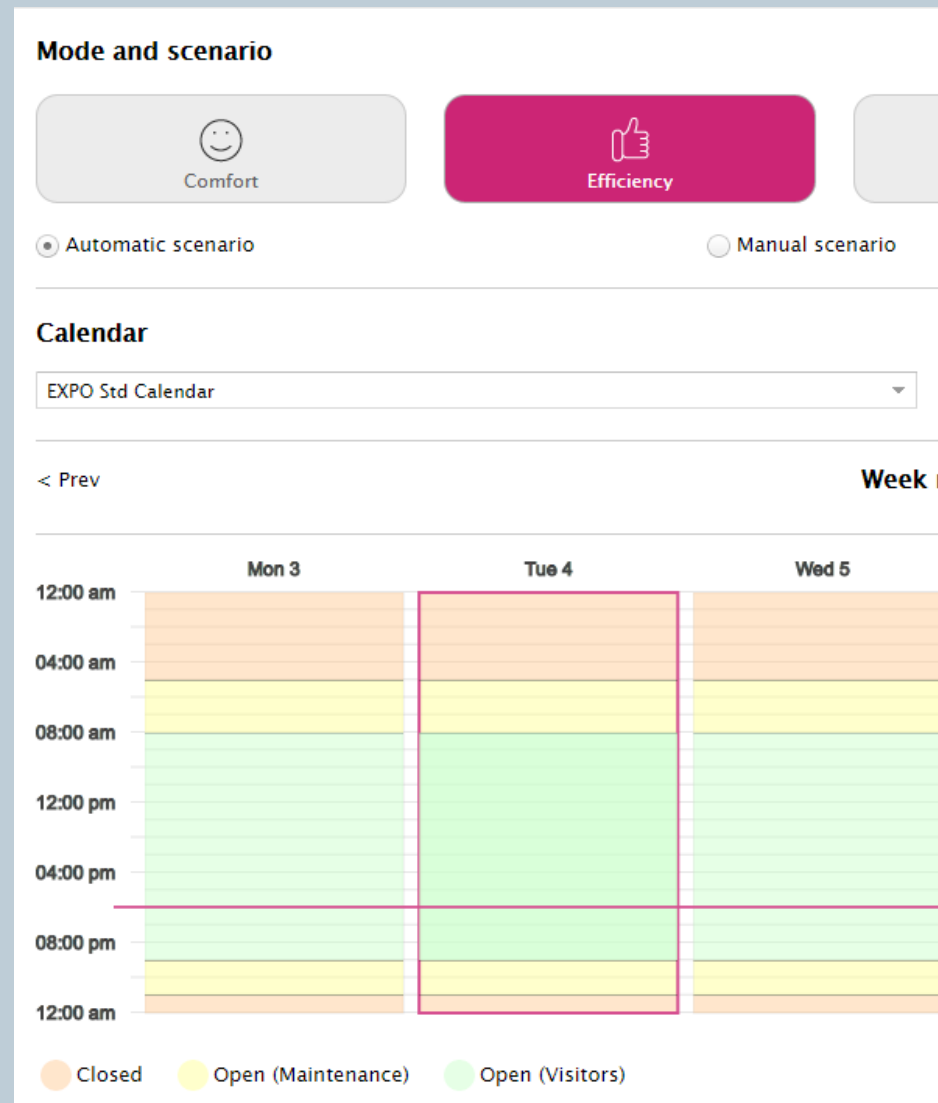
Lighting Control

Load Management

Renewable Generation Management

Active Demand Modes

- Comfort
- Efficiency
- Demand-Response
- Over-Limit
- Emergency



Energy Rules Engine

The Rules Engine has been designed and implemented in collaboration with **Politecnico di Milano**



**POLITECNICO
DI MILANO**

It consists of:

- *Static* analysis and evaluation phase
- *Dynamic* decisions generation phase

Energy Rule Definition



Trigger

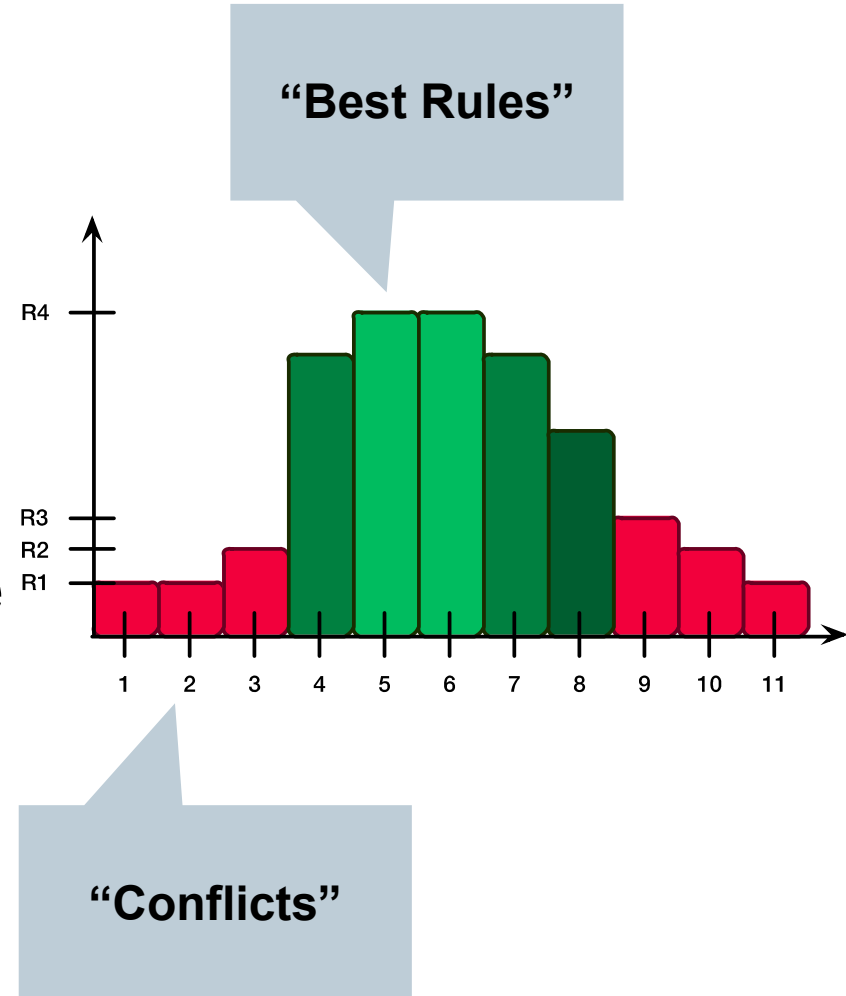
Conditions that have to be verified in order to make the rule effective.

Action

Commands to be issued in order to control a specific physical parameter.

Energy Rule Evaluation

- Rules are statically analyzed in order to identify (and resolve) potential conflicts among them
- Dynamic (run-time) decisions depends on the currently selected mode (comfort, efficiency, emergency, etc.)



EXPO 2015

EMS first application is
the Energy Management
of EXPO Smart Grid.

*Siemens, Strategic Partner of Enel
for the Smart Grid technology at
EXPO Milano 2015*



Siemens Energy Management Division

Thank you