FUTURE INTERNET SMART UTILITY SERVICES

FINESCE

WP4 FI building the Energy Marketplace

Overview

SEVENTH FRAMEWORK PROGRAMME

FUTURE INTERNET PPP

Outline

- Premise
- Context & Problem
- Proposed Solution
- Open Call: Proposed Topics
- Conclusion

Premise

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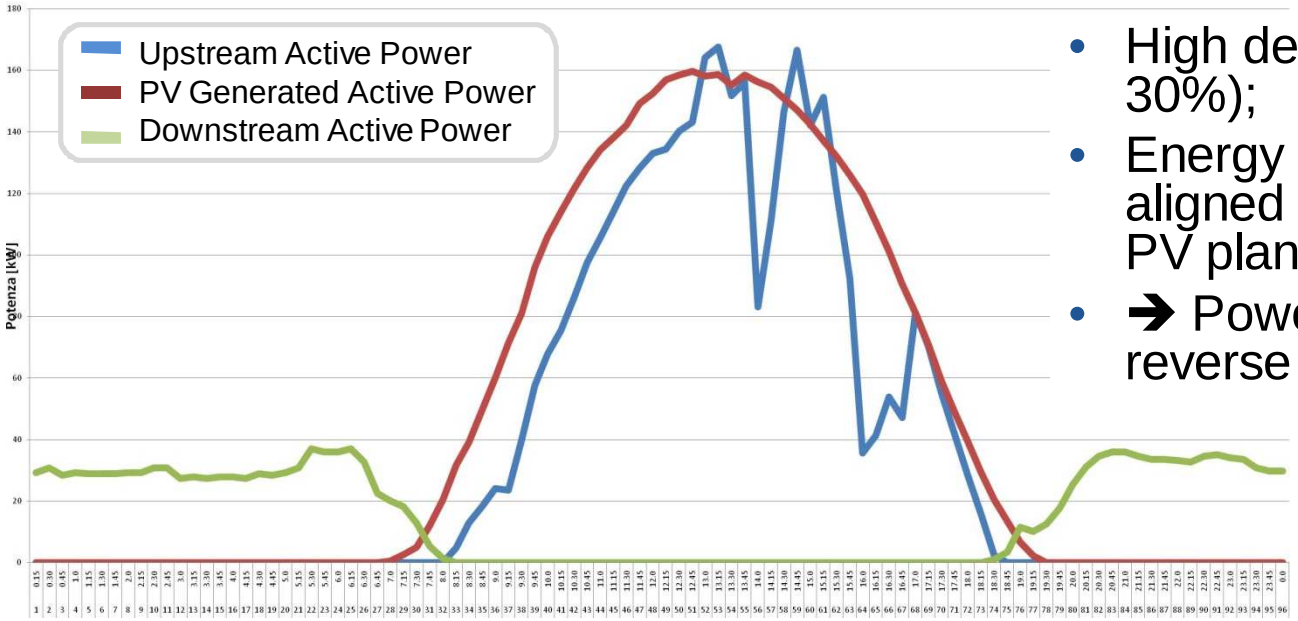
- **Energy scenario** is characterised by a growing density of distributed **RES**
  - **Side effect**: Electricity injected in grid has **high deviation** in Voltage/Current, due to weather conditions.
  - Consequently that introduces **instability in grid**, **power losses** and **critical conditions** for electrical components that may reduce their operational lifecycle.
- Many solutions from the state of the art, mostly based on controlling power generation: **high cost**
- In **FINSENY**, we analysed a new promising approach as a combination of:
  - **Demand Side Management**
  - **new Market mechanisms**
- In **FINESCE**, we aim to instantiate a **marketplace for Energy**, enabled by **Future Internet technologies**, for demonstrating advantages of this approach.

Context…

Trial site: Terni (Italy)

- **Terni** is in Umbria region, ~100km from Rome;
- It's an industrial town with one of the oldest **steelworks** and one of the **first hydropower** generator in Italy

…& Problem

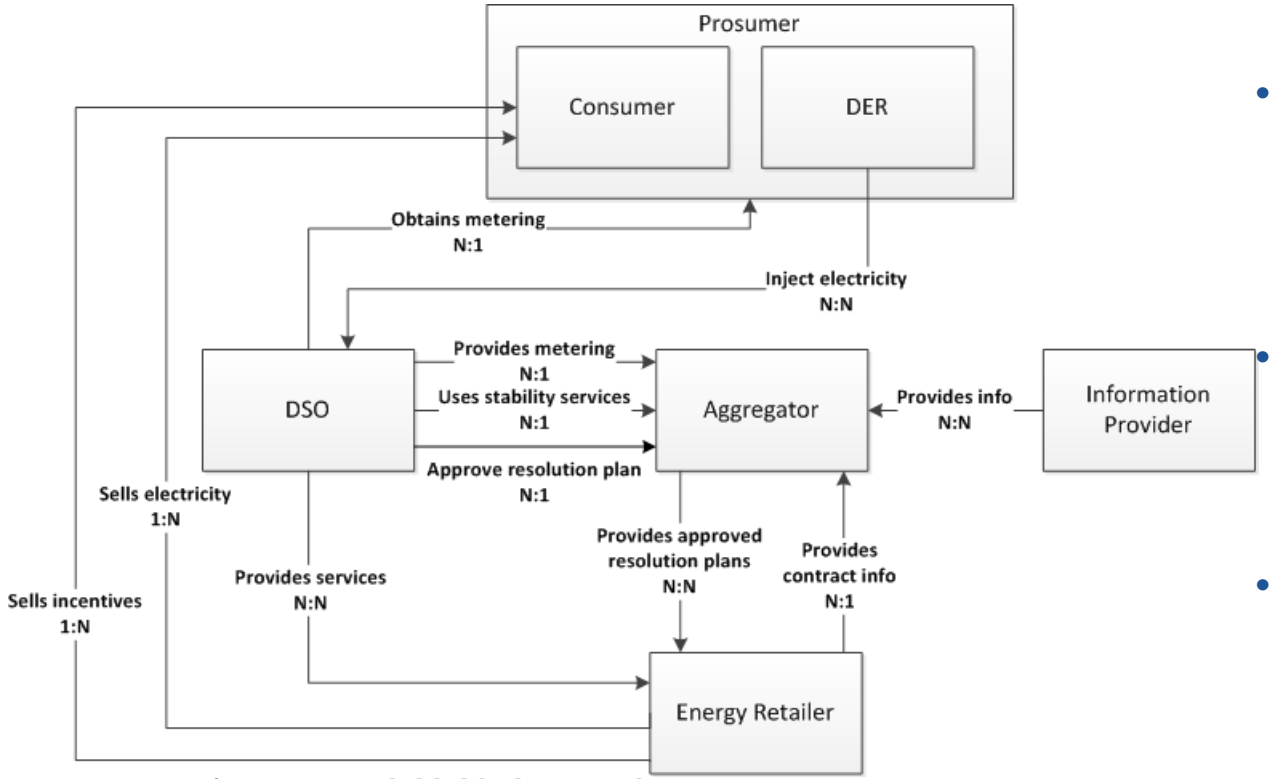


24-hours Load Profile

- High density of DERs (15-30%);
- Energy consumption not aligned w.r.t. production from PV plant
- ➔ Power losses due to reverse **power flows**

Energy Consumption needs to be shifted in order to **maximise** usage from local PV plants and **minimise** power flows

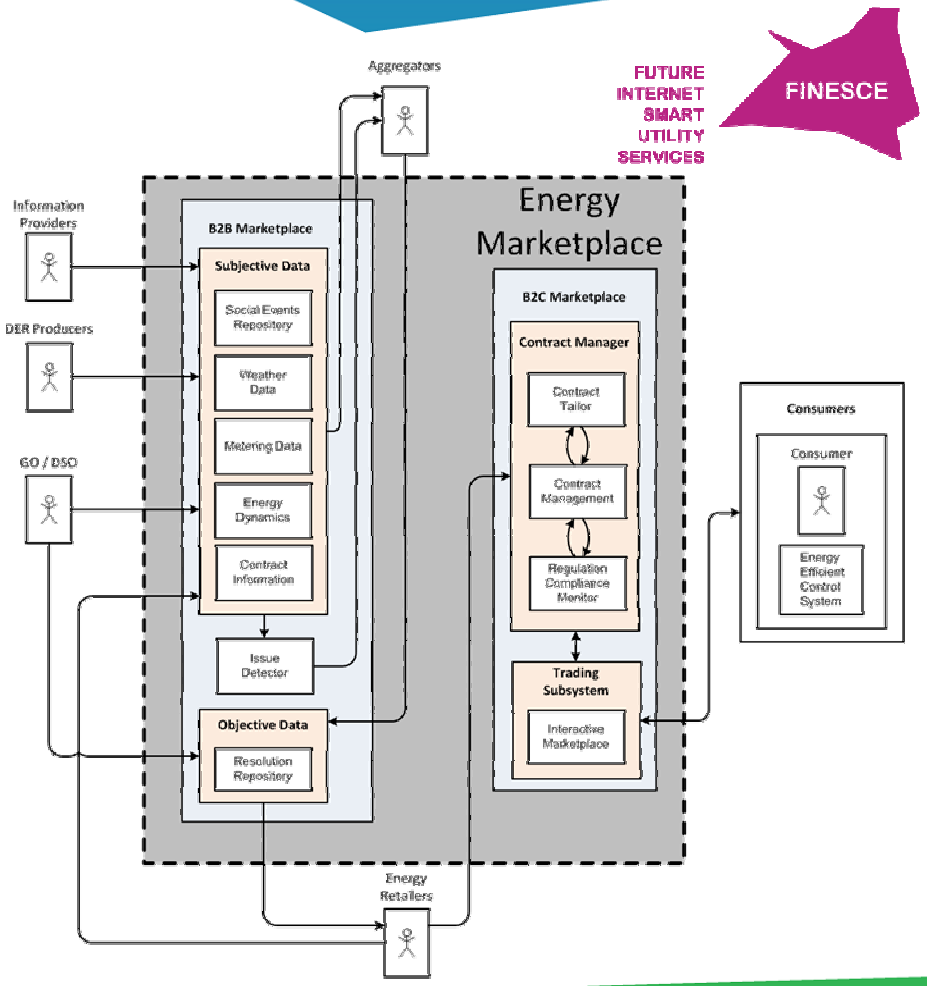
Proposed Solution: Actors



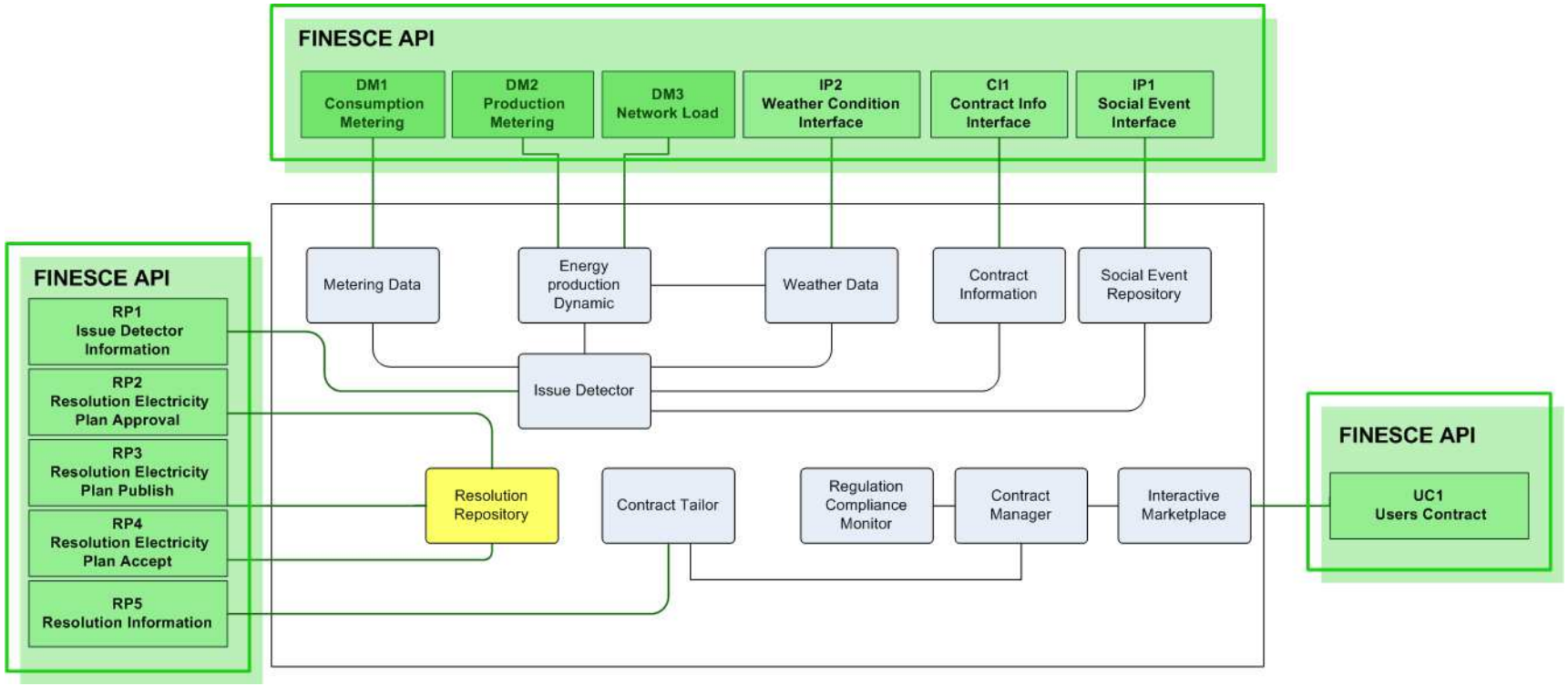
- **Aggregator**
  - identifies **imbalances** in power demand and supply
  - proposes a **resolution plan** to address them
- **DSO**
  - has the control of **distribution grid**
  - **approves** resolution plans
- **Energy Retailer**
  - transforms the resolution plans to specific **incentives** tailored to the consumer

Proposed Solution

- Introduction of «**resolution plans**» in the energy market for «optimisation»:
  - **DSOs** to achieve grid stability and minimise power flows/losses;
  - **Energy Retailers** to maximise incomes from energy selling.



Proposed Solution: System & API



Open Call: Proposed Topics

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- A new Automatic Meter Reading (**AMR**) by deploying sensors based on **DLMS/COSEM protocol** (Device Language Message Specification), compliant to **IEC 62056** for data readout, service functions and parameterisation;
- This will allow the usage of a **common language** for data exchange in energy measurements (interoperability);
- DLMS-based AMR will be **integrated** in the Terni trial site, by using a set of FI-WARE Generic Enablers (e.g. IoT chapter).

Conclusion

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- Proposed a **market-mechanism** approach for addressing **instability** in a grid characterised by high density of **DERs**;
- Identified actors, system and API, as well as enhancements for the AMR based on open protocol sensors (topic for Open Call);
- If you are interested to our activity, please, don't hesitate to:
  - Contact **finesce@baumgroup.de**
  - Ask for further details during Table Session
  - Participate to next Innovation Events
  - **Save this date**: **5th Innovation Event, Terni**

Oct 17 2013

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THANKS FOR YOUR KIND ATTENTION