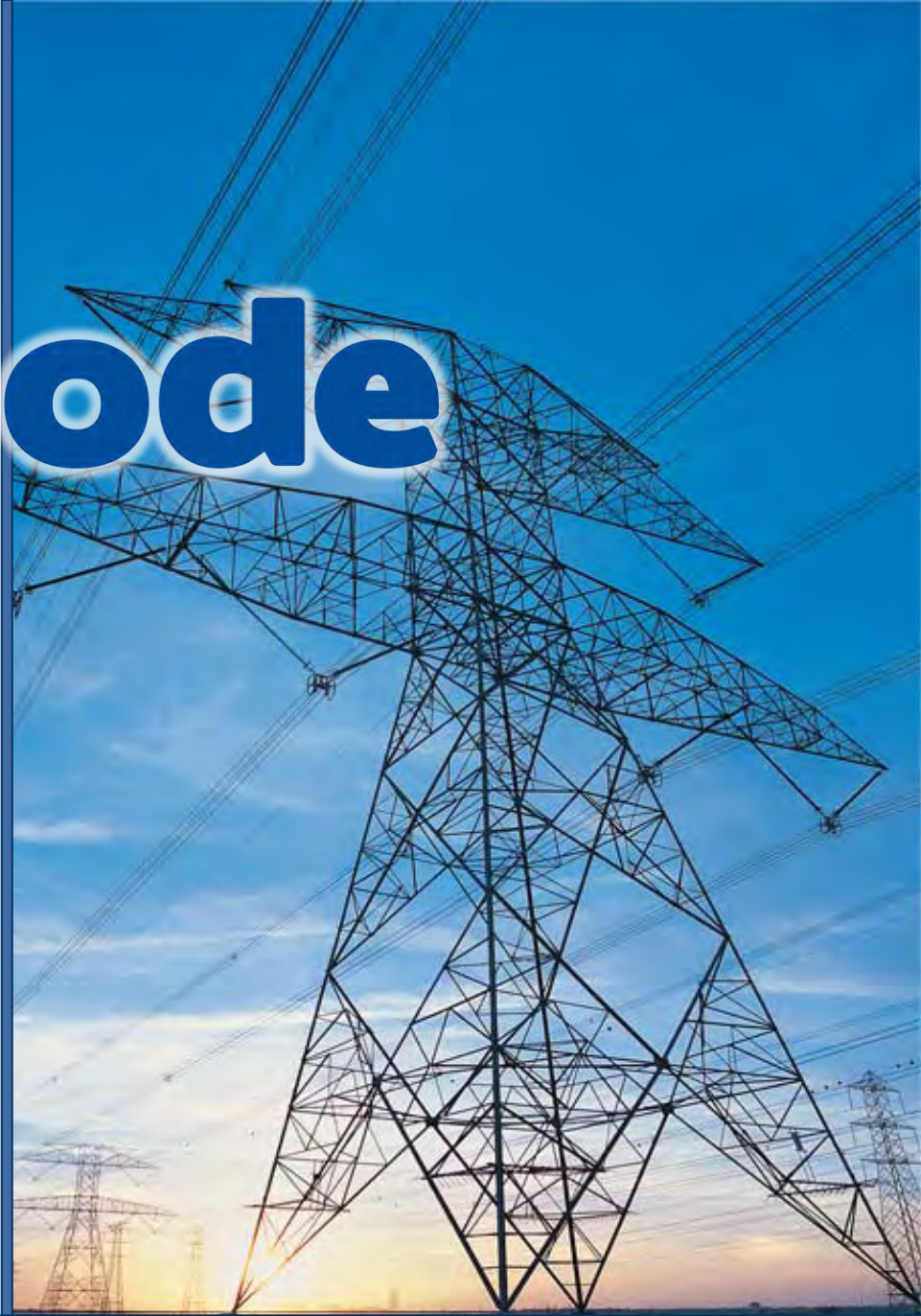




## Open Architecture for Secondary Nodes of the Electricity SmartGrid

Friederich Kupzog  
Andreas Lugmaier  
Siemens AG Österreich



OpenNode



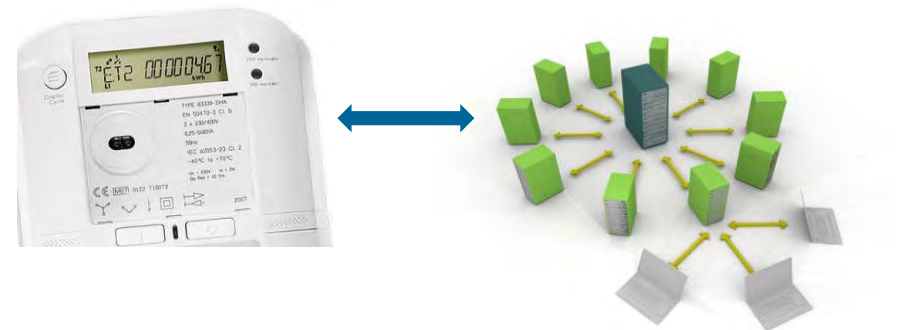
European Commission  
Information Society and Media

- 
1. Motivation and Project Overview
  2. Functional specification of a future substation node
  3. Related Projects and Outlook

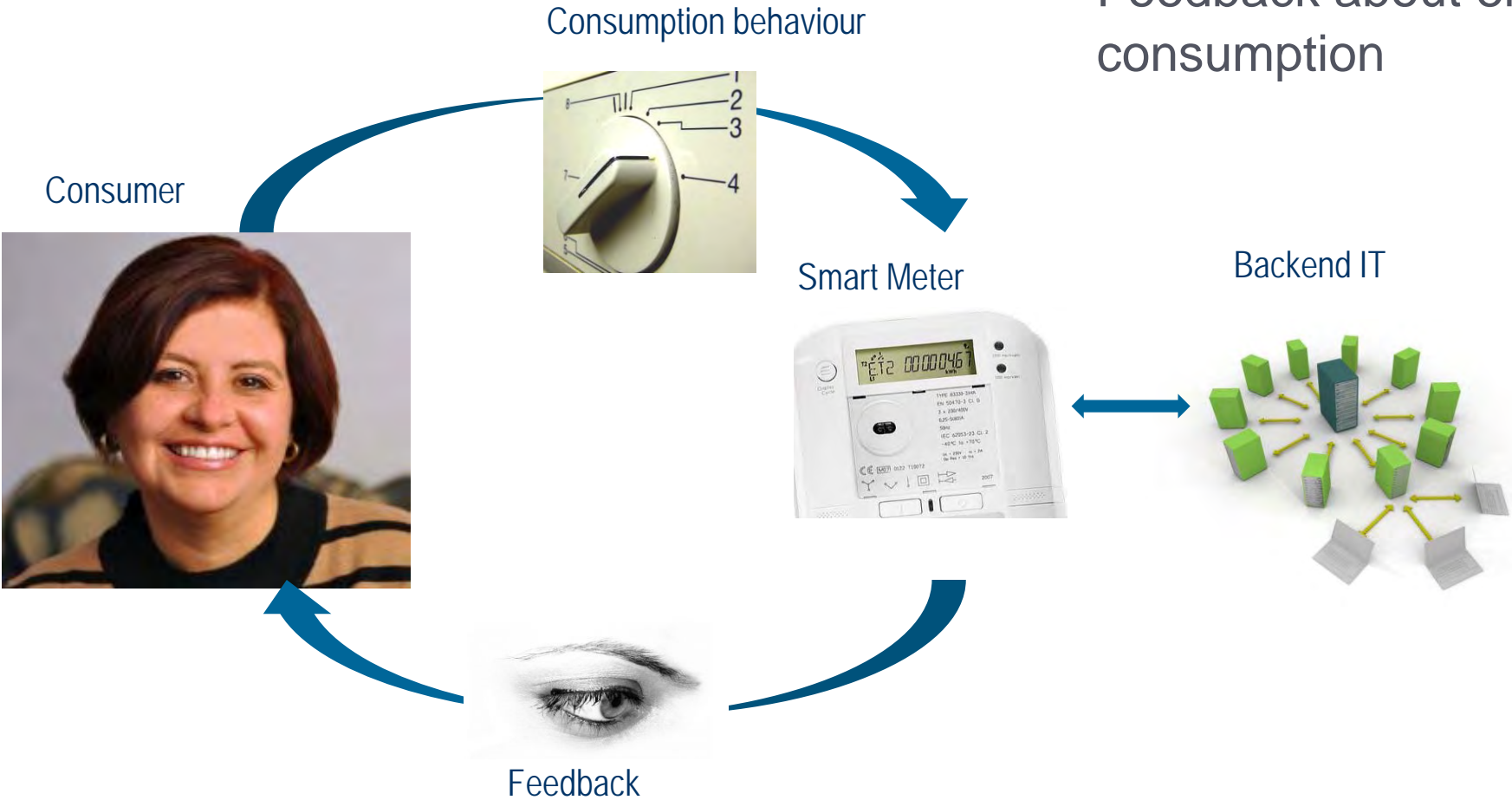


# Motivation and Project Overview

- Roll-out of Smart Metering infrastructure
- Harmonized system architecture -> “Reference Architecture”
- Important decisions about functionalities

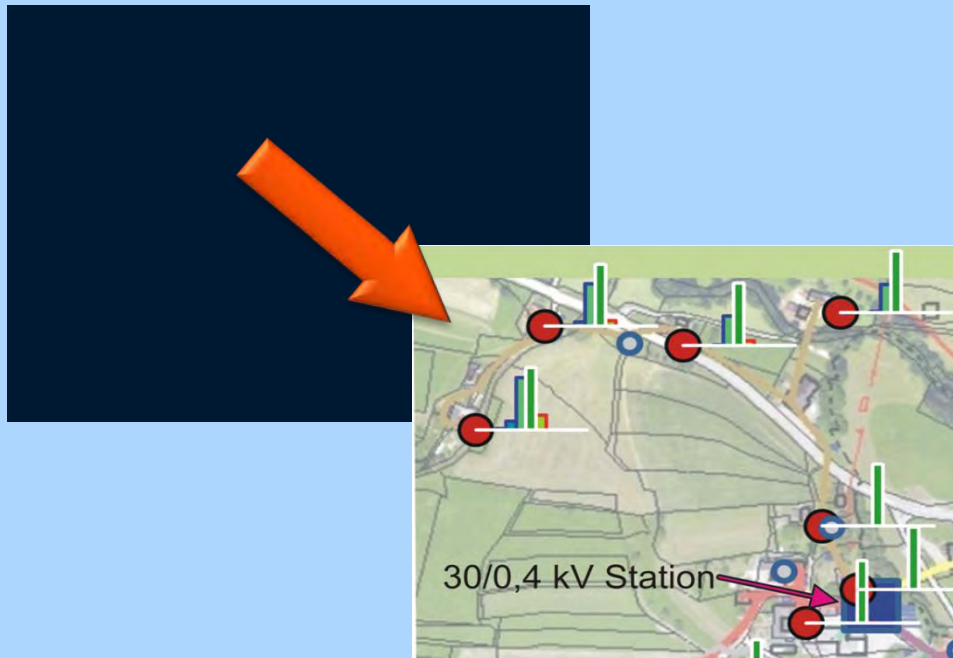


- Focus: Energy Customer
- Feedback about energy consumption



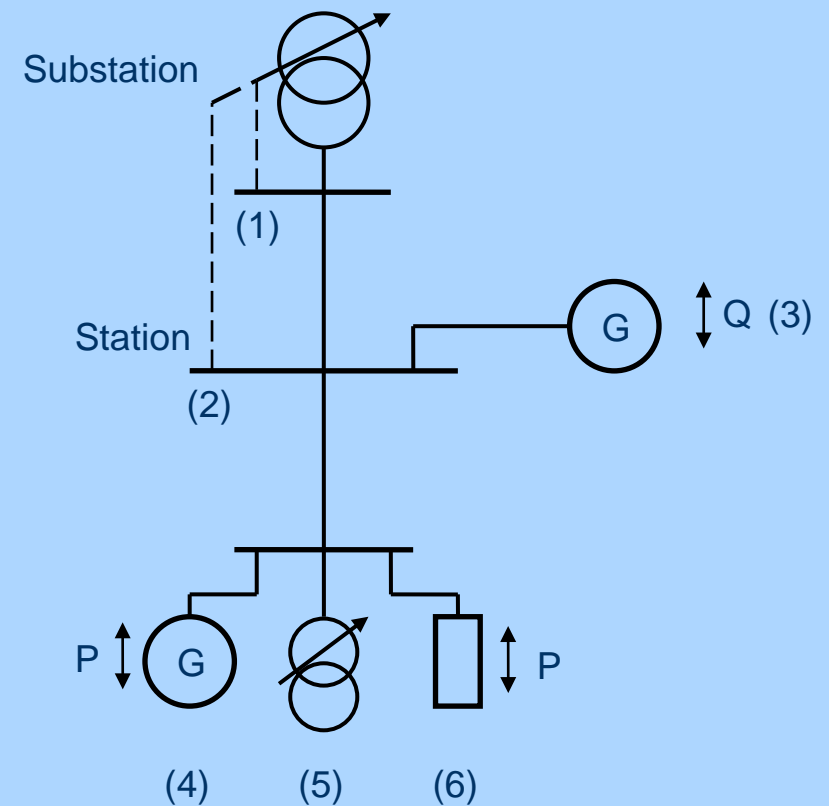


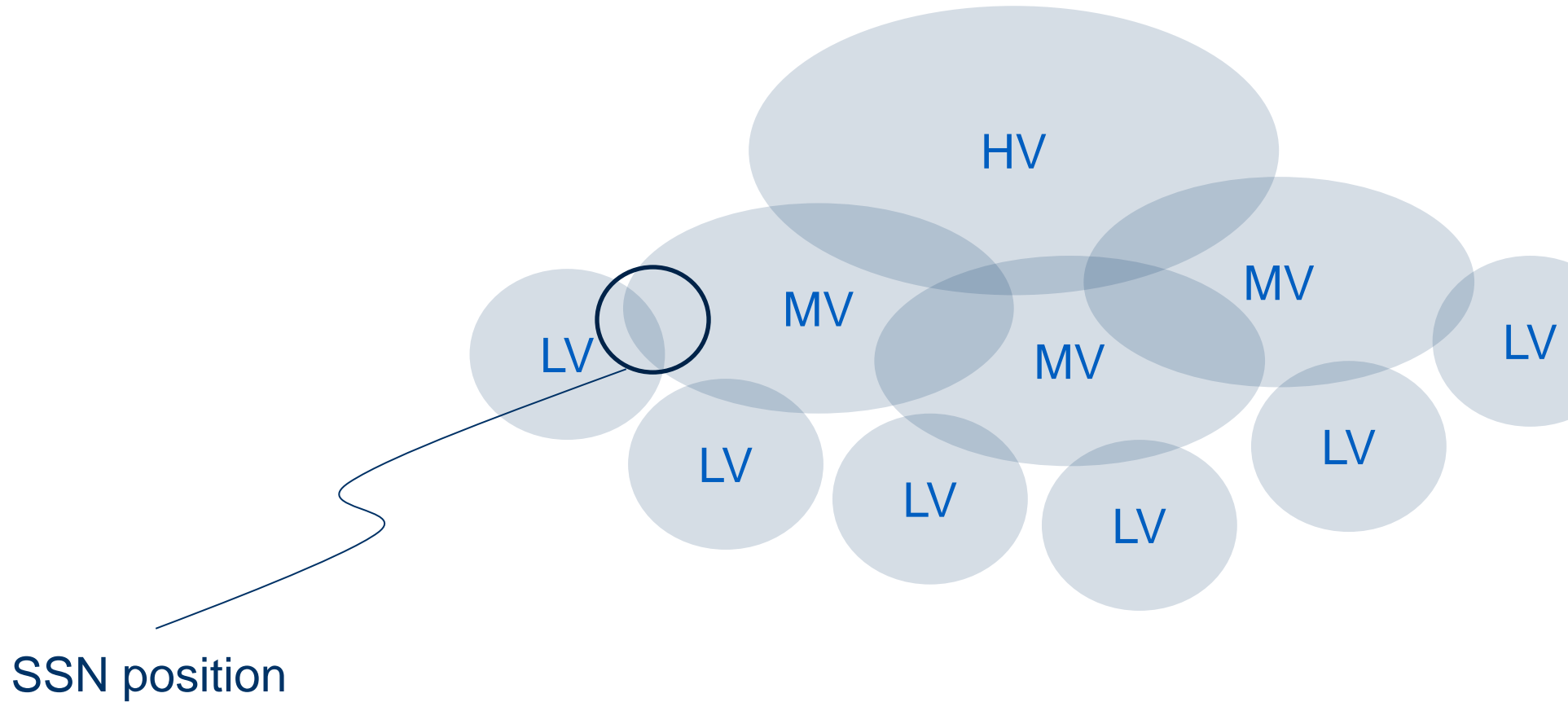
## Step 1: Observability



See also: ISOLVES project

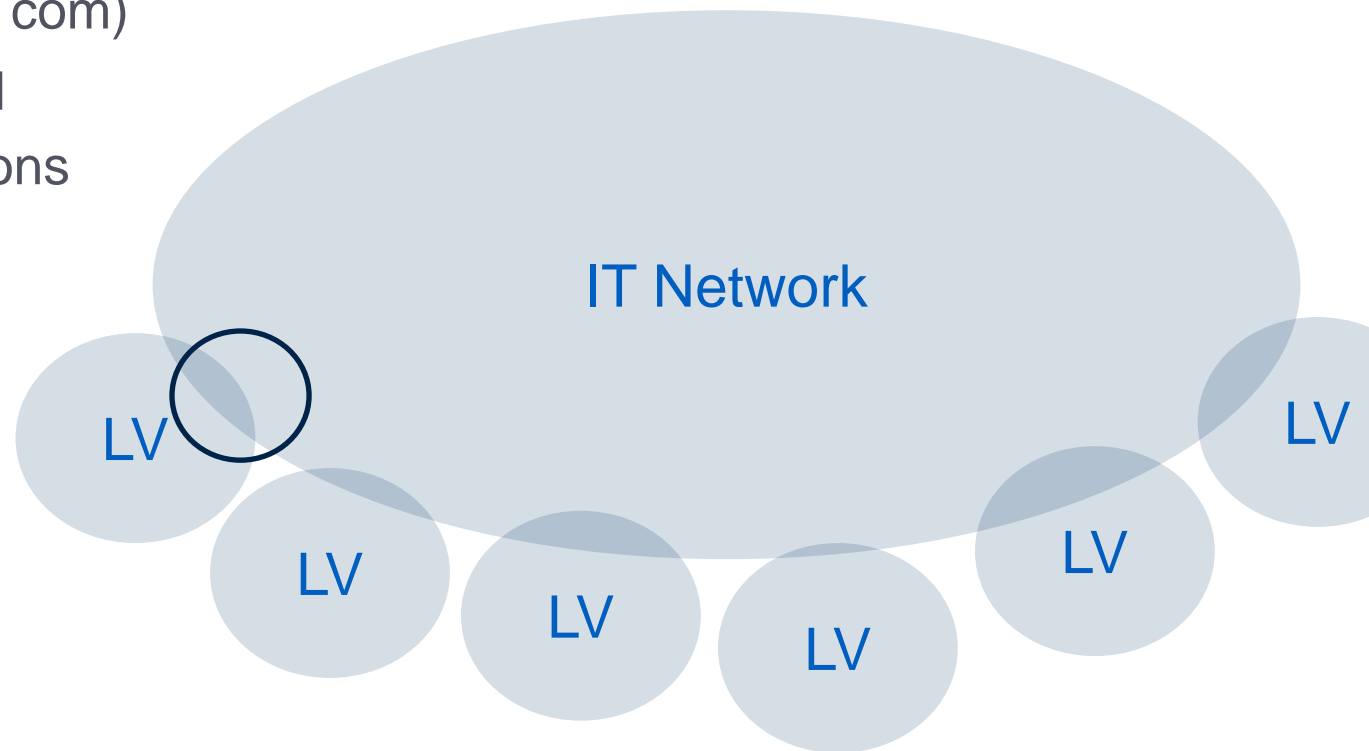
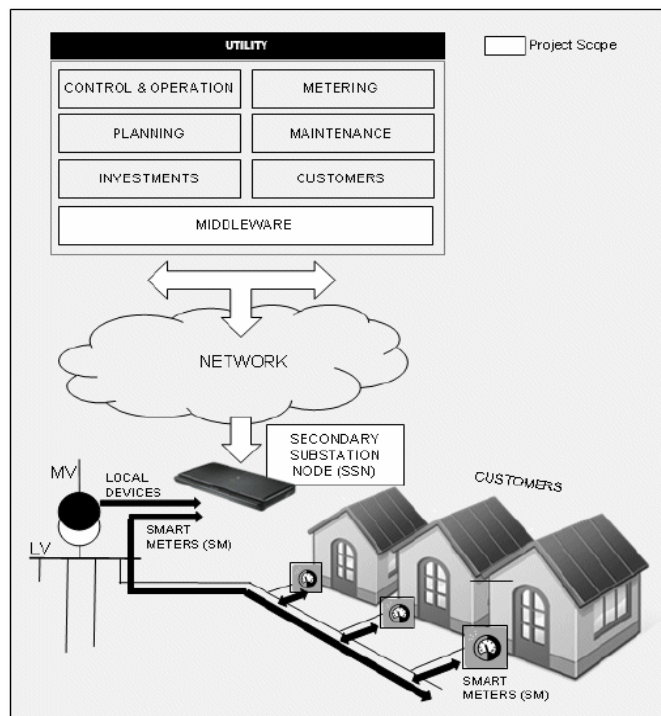
## Step 2: Active Control





SSN: Secondary Substation Node

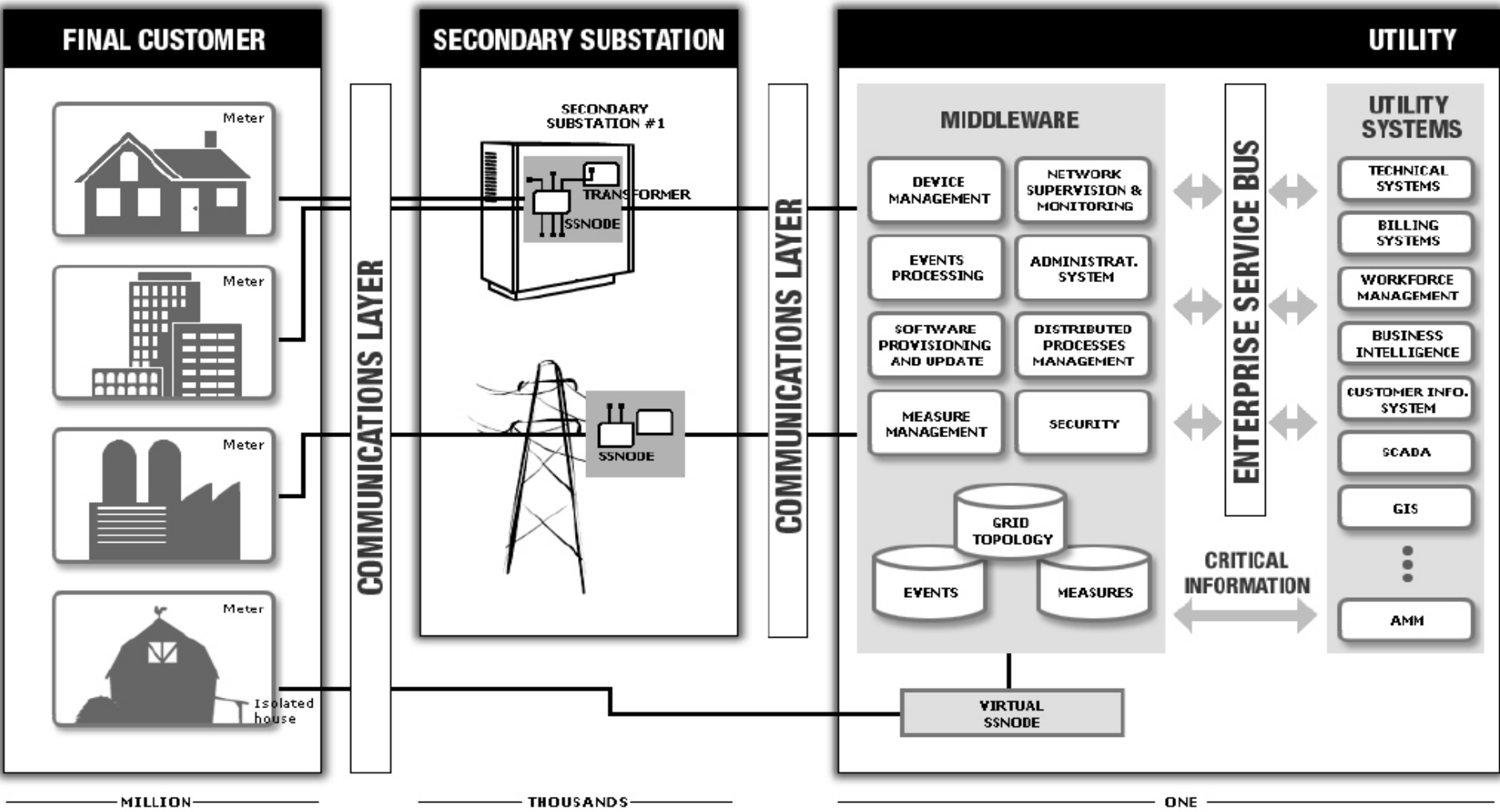
- “Last Mile” (e.g. Power Line com)
- Linking ICT and Energy grid topology for functional reasons



SSN: Secondary Substation Node



# OpenNode proposed architecture



1. Atos Origin Sociedad Anónima Española (ATOS ORIGIN) – SPAIN
2. IBERDROLA DISTRIBUCION ELECTRICA, S.A. (IBD) – SPAIN
3. EDP Inovação SA (EDP) – PORTUGAL
4. ELECTRICITE DE FRANCE S.A. (EDF) – FRANCE
5. SIEMENS AG (SIEMENS) – GERMANY/AUSTRIA
6. Nucleo de Comunicaciones y Control, SL (NUCLEO) – SPAIN
7. KEMA NEDERLAND BV (KEMA) – NETHERLANDS
8. Instituto de Tecnología Eléctrica (ITE) – SPAIN



# Functional specification

of a future substation node

**M Logging**

MA20 Maintenance Management

## **F Control Messages and Price Signalling**

MA02 Remote Tariff Programming

MA06 SMs Remote Disconnection and Reconnection

MA07 SMs Power Control (Demand Side Management)

MA10 Alarms and Events Management

MA14 Load Profile Management

MA16 Load Shedding initiated by Control Centre

MA17 Remote Switching of MV Lines

AD06 Var Control

OP02 Customer Device Management

OP04 Prepayment Mode

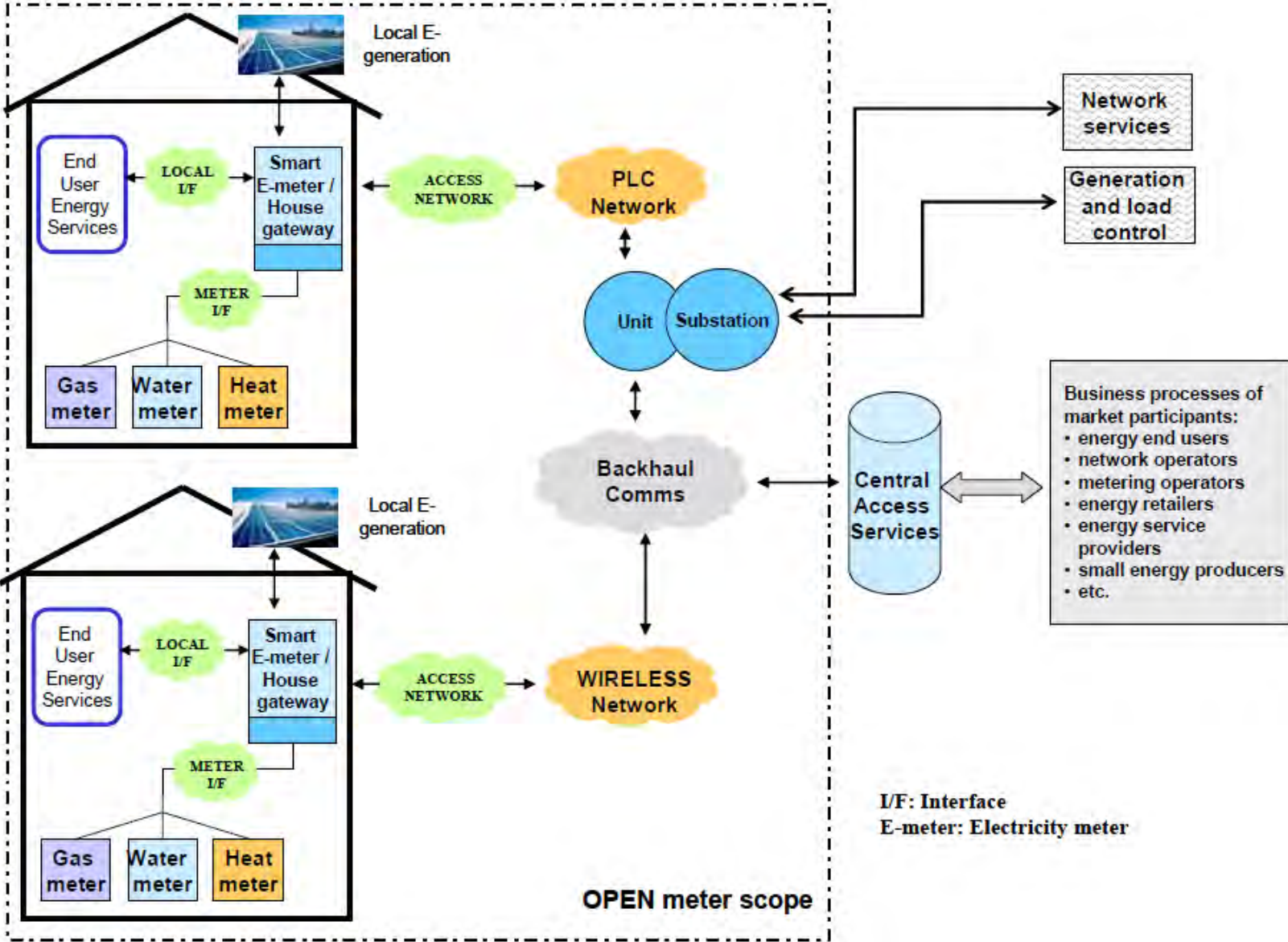
OP16 Transmission of Load Management Orders

## Related Projects and Outlook

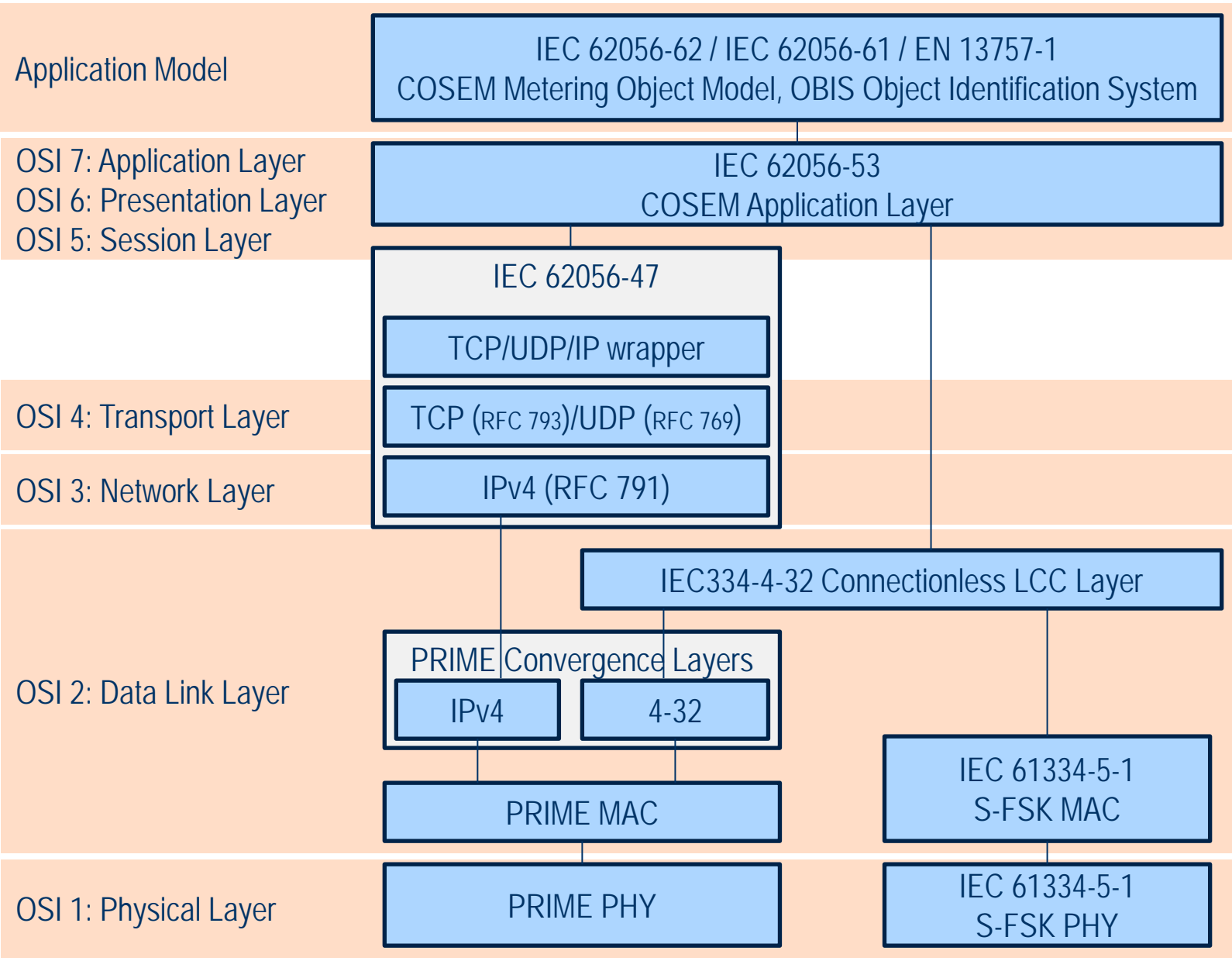
OpenMeter – Meter-focussed sister project

ADDRESS – Active Demand in Energy Markets



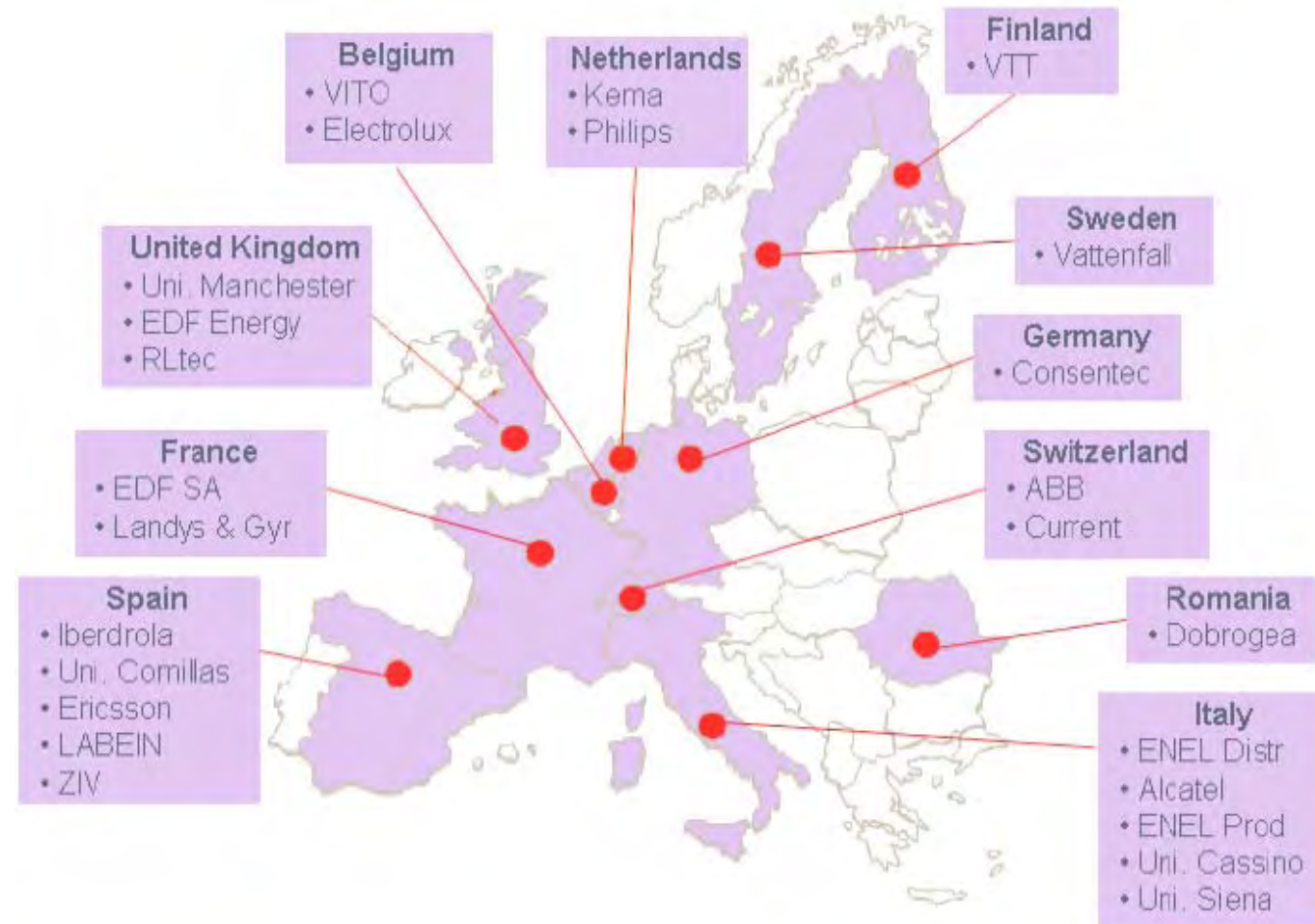


# OpenMeter Protocol Stack

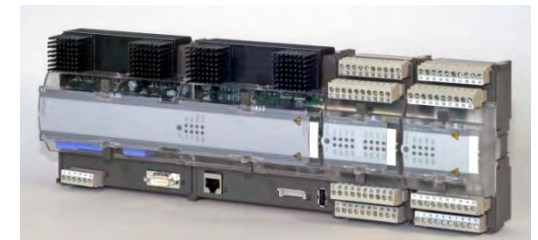


## Active Demand (AD)

- active participation in power system markets
  - domestic and
  - small commercial consumers
- provision of services to the different participants



- Three Prototypes to be developed
  - 2 Hardware Prototypes
  - 1 „Virtual Prototype“ in software
- Lab Tests of these Prototypes at KEMA
- Field tests in Spain, France and Portugal



**Thank you.**

