



PI System to empower Smart Meter reading

Presented by **Geneviève Fritchley**



Agenda

- About Groupe E
- Smart Metering pilot project
- The challenges (technical, business, IT)
- Solution
- Demo e-vision portal
- Summary and conclusion

About Groupe E

Nr 1 electricity supplier in the French part of Switzerland



Headquarters in Fribourg

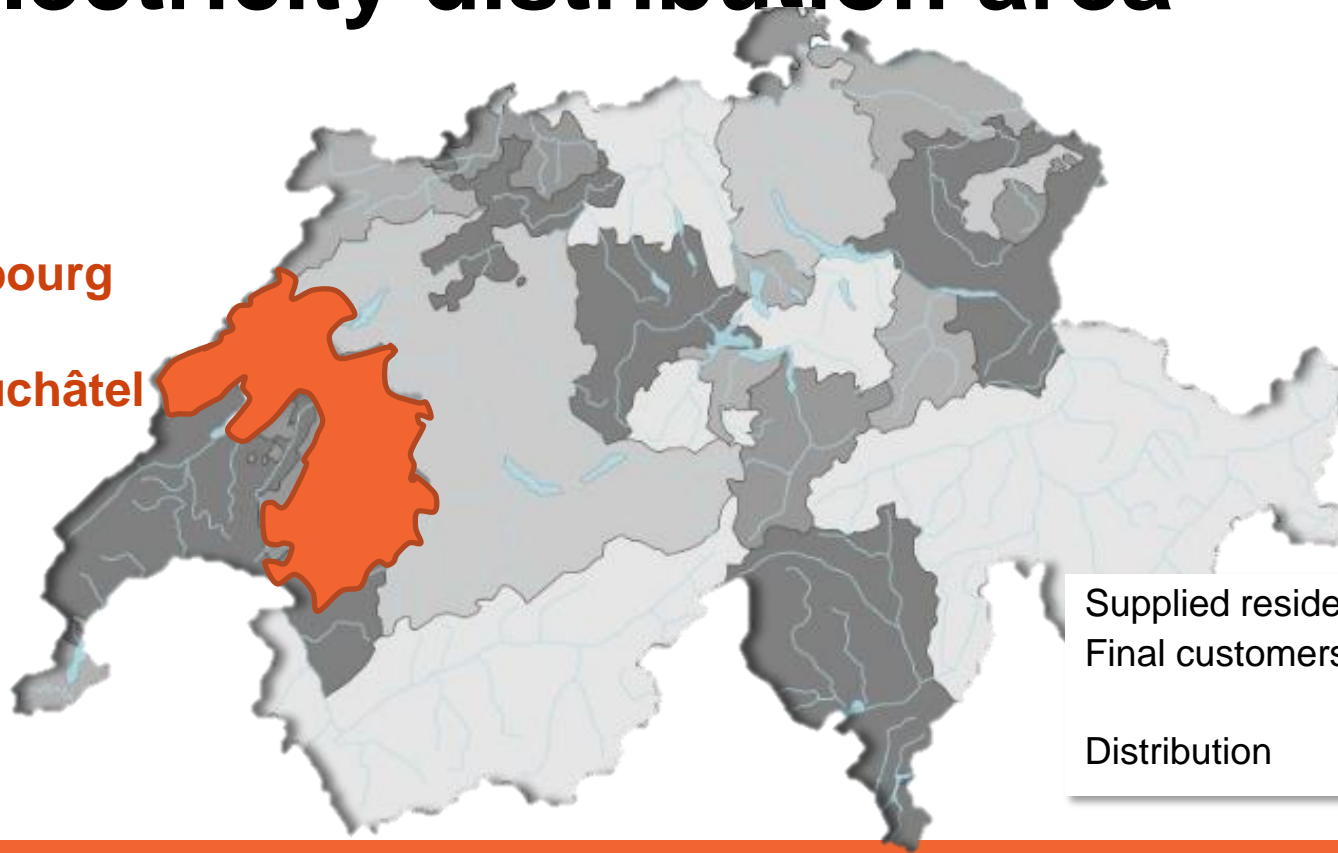
Workforce

Groupe E SA	719
Generation, distribution, engineering	
Groupe E Connect SA	507
Electric installations	
Groupe E Entretec SA	42
Thermic installations maintenance, water treatment	
Groupe E Electroménager SA	65
Electrical appliances stores	
Groupe E Greenwatt SA	10
Renewable energy	

Total	1'343 Employees
	159 Apprentices

Electricity distribution area

**Fribourg
and
Neuchâtel**



Supplied residents	460'000
Final customers	170'000
Distribution	3 TWH

Electricity generation

Groupe E generates 1,3 TWh a year (half of the distributed energy) with

- Hydroelectric power plants (11)
- Thermal power plants (3)
- Biomass, Photovoltaic, Wind energy, small hydroelectric installations



Projects

- Thermal power plant
Cornaux II
- Belenos – Hydrogen
generation
- Smart Metering /
Smart Grid



What is a Smart Meter ?



A **smart meter** is an electronic equipment measuring your energy consumption (electricity, gas or water) and enabling a two-way communication with a central system called AMI (Advanced Meter Infrastructure) or Headend System.

Some features (depending on vendors) :

- Automatic remote meter reading for invoicing purposes
- Dynamic tariffs
- Remote Load balancing of household appliances for the grid operator
- Remote connection / disconnection of customers
- Give information to residential customers about their consumption (home display, web access) and motivate them to save energy
- Key element to the smart grid

Smart Metering Project

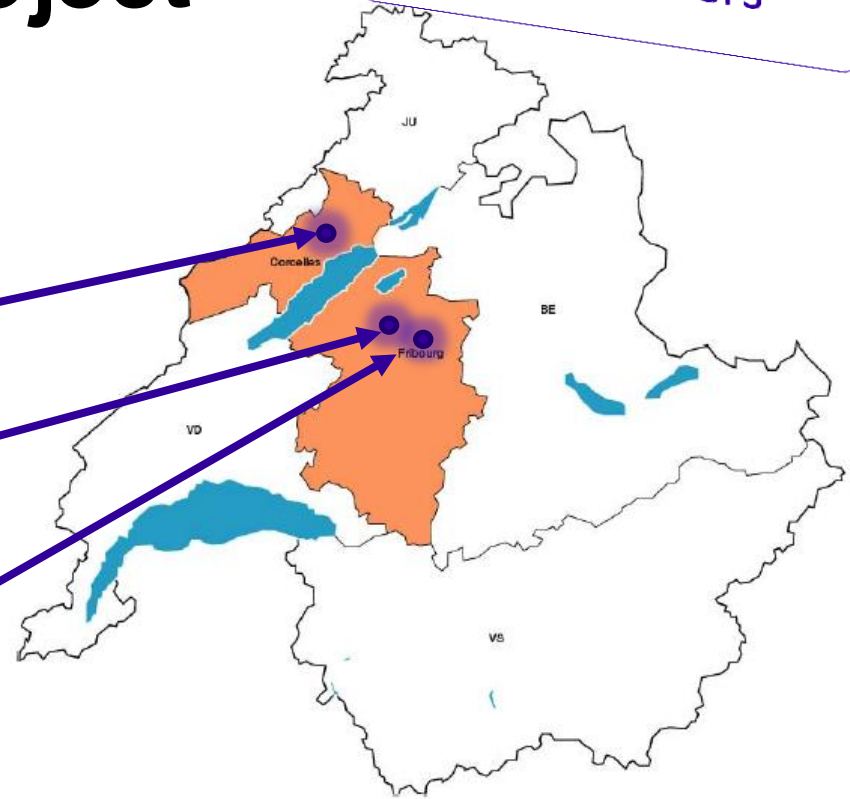


EU CONCERTO Initiative
SOLUTION project in Cernier

Pilot zone
Fiber to the
home

Neyruz

Fribourg Torry



≈ 500 meters

Smart Metering pilot project goals

Installation timing:

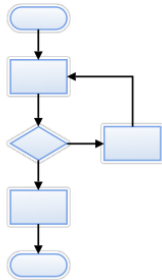
- Individual house
- Building
- Town / Country



Impact on field operations



Impact operating processes



Customer behaviour and acceptance



Web access



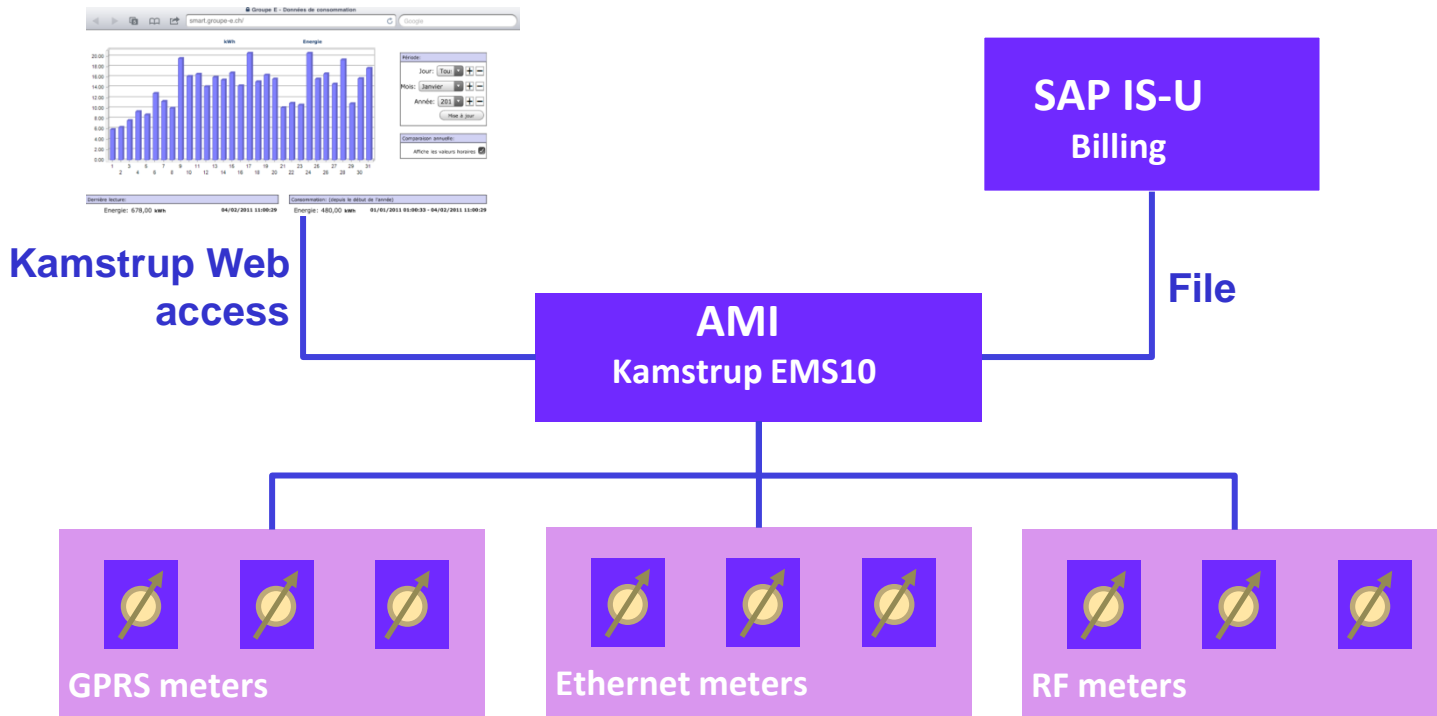
Coordination



Costs



The metering technical challenge



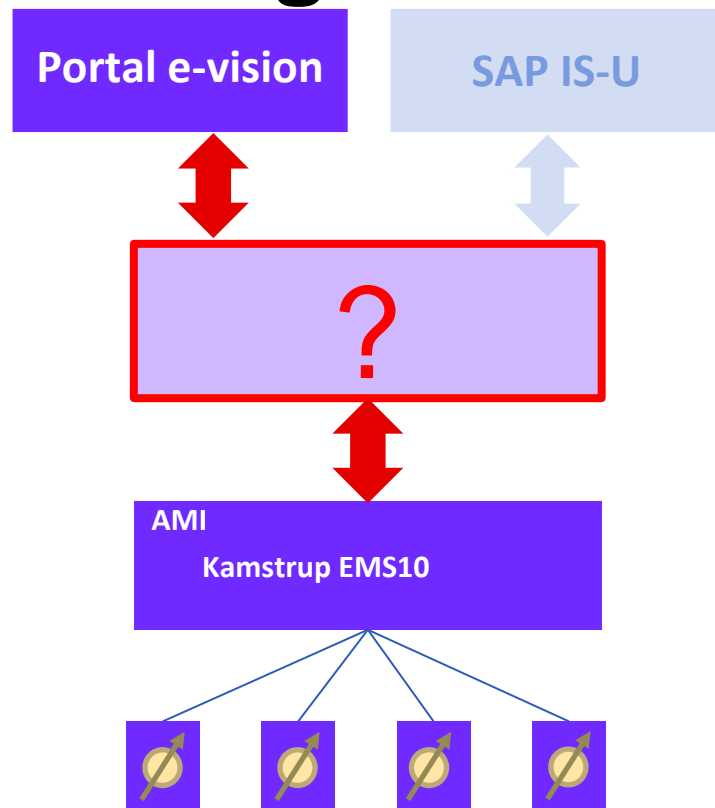
The business challenge

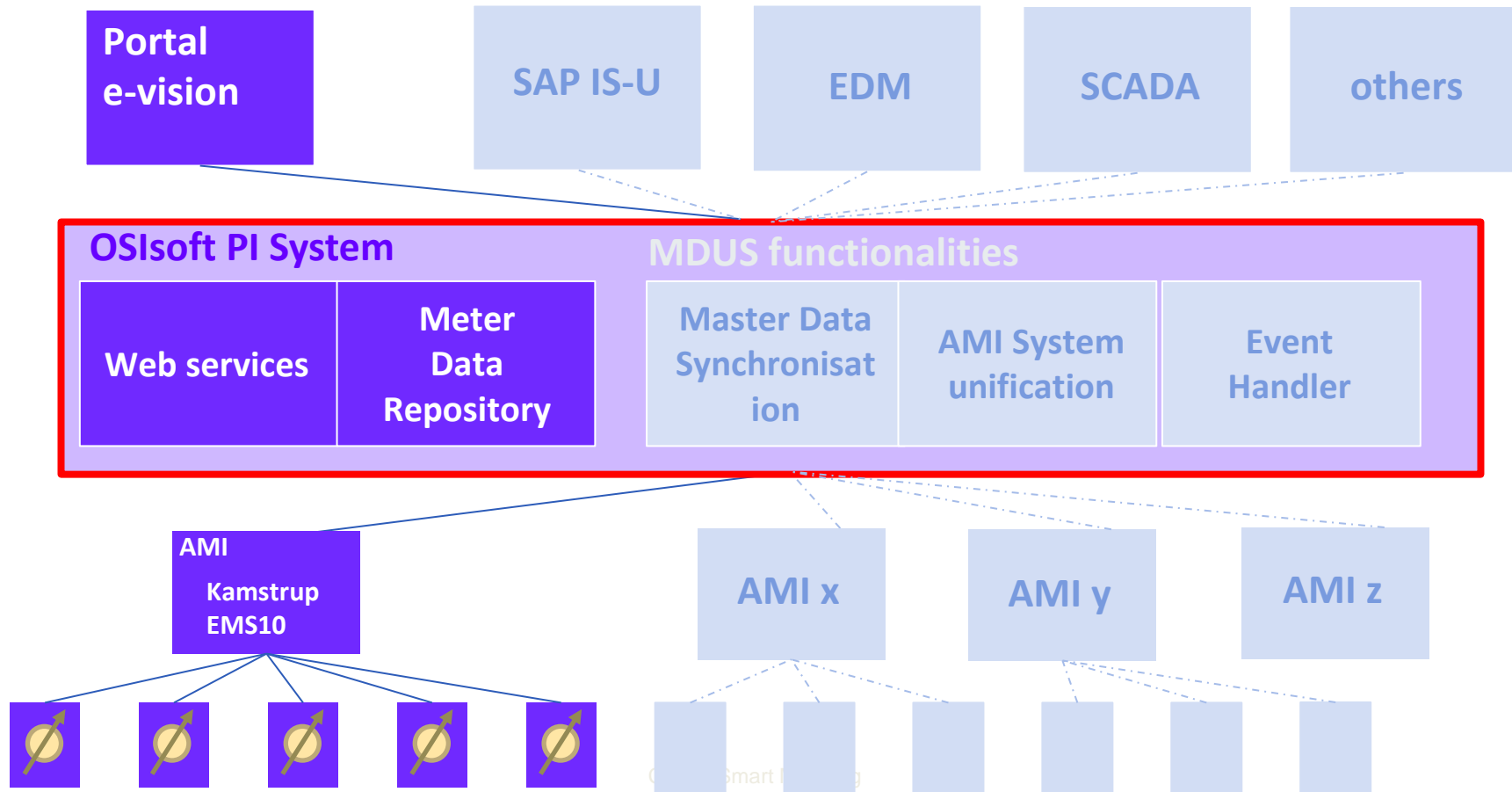
Help our customers to save energy

- Develop a user-friendly portal to visualise
 - Their instantaneous electricity consumption in real time
 - Their past consumption
 - To compare their electricity consumption with others
- Give energy saving tips
- Validate whether such a portal is useful to customers in case of a Smart Metering rollout

The IT architecture challenge

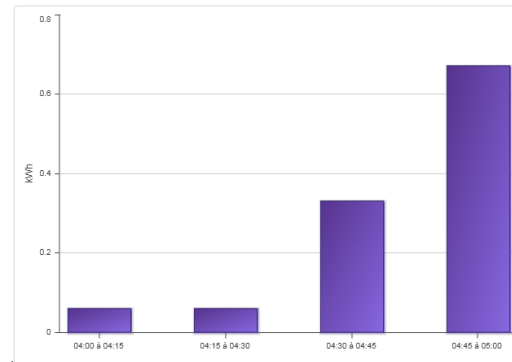
- Connect the Kamstrup AMI infrastructure to the portal for the pilot project
- Define the IT architecture for later Smart Metering rollout





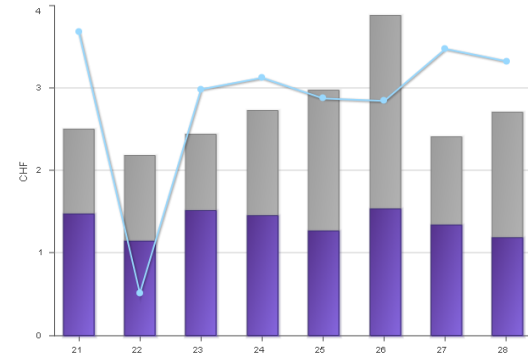
Load profile of the latest ¼ hour

- Each load profile represents one meter reading every ¼ h = 96 values per day
- Most AMI systems interfaces supply one load profile per day with 96 values
- Requirement : historical load profile of the latest ¼ hour available on the portal
- After using the PI Interface for UFL (Universal File Loader), a new interface using Kamstrup web services has been developed
- The load profiles are stored in the PI Server



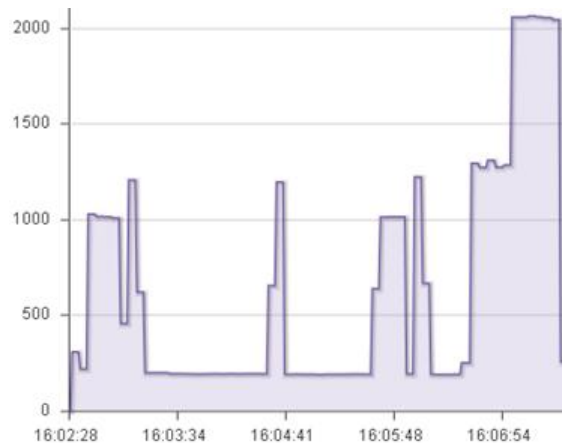
Consumption comparison issue

- Function originally foreseen in the portal
- Decision to use the PI System to manage, aggregate and store the load profiles
 - Define consumption profile characteristics
 - Regression of the consumption profile characteristics into 8 reference groups
 - Generation and storage of the comparison load profiles
 - Web service to deliver the requested load profile to the portal



The realtime issue

- Essential functionality with real added value for customers
- Would mean a conceptual change for Kamstrup software



→ Solution

- Development of a direct real time webservice using a Kamstrup proprietary protocol between the PI System and the smart meters
- Asynchronous meter reading scheduled every second from the portal
- Works with IP and GPRS communication

Configuration in PI Asset Framework

Elements

- Elements
 - Configuration Parameters
 - Groupes_Cemier
 - Groupes_FP
 - Reference Groups
 - Reference Group 1
 - Reference Group 2
 - Reference Group 3
 - Reference Group 4
 - Reference Group 5
 - Reference Group 6
 - Reference Group 7
 - Reference Group 8
 - Reference Group all consumers
 - Smart Meter Root

Reference Group 1

General Child Elements Attributes Ports Version

Filter

Name	Value
1-5:1.29.0	0.10977777838707 kWh
Search Criteria	0
Heating	Electrical
Housing	N/A
People	<=3
Surface	N/A
Water	Electrical

CH100630123450000000000000326440

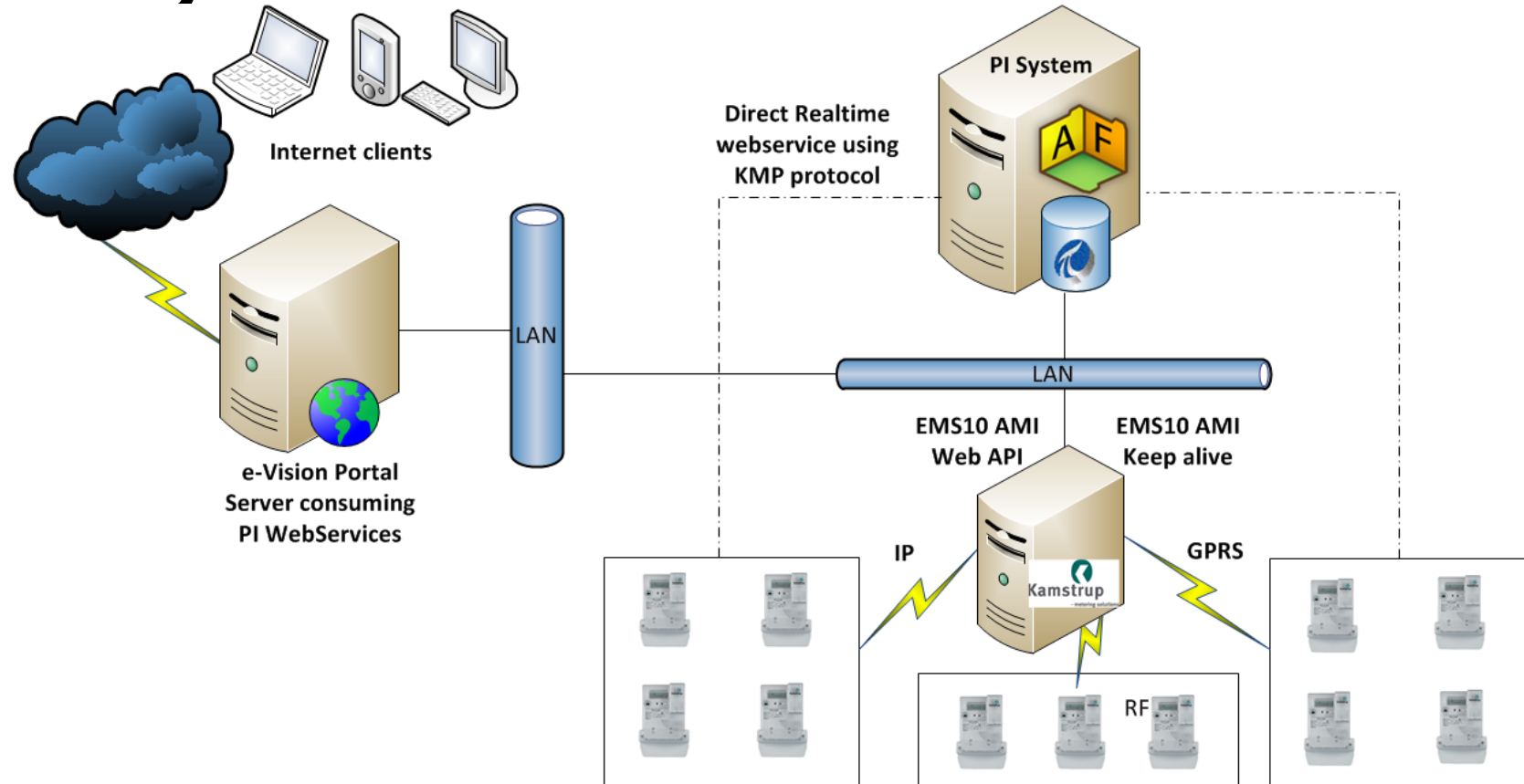
General Child Elements Attributes Ports Version

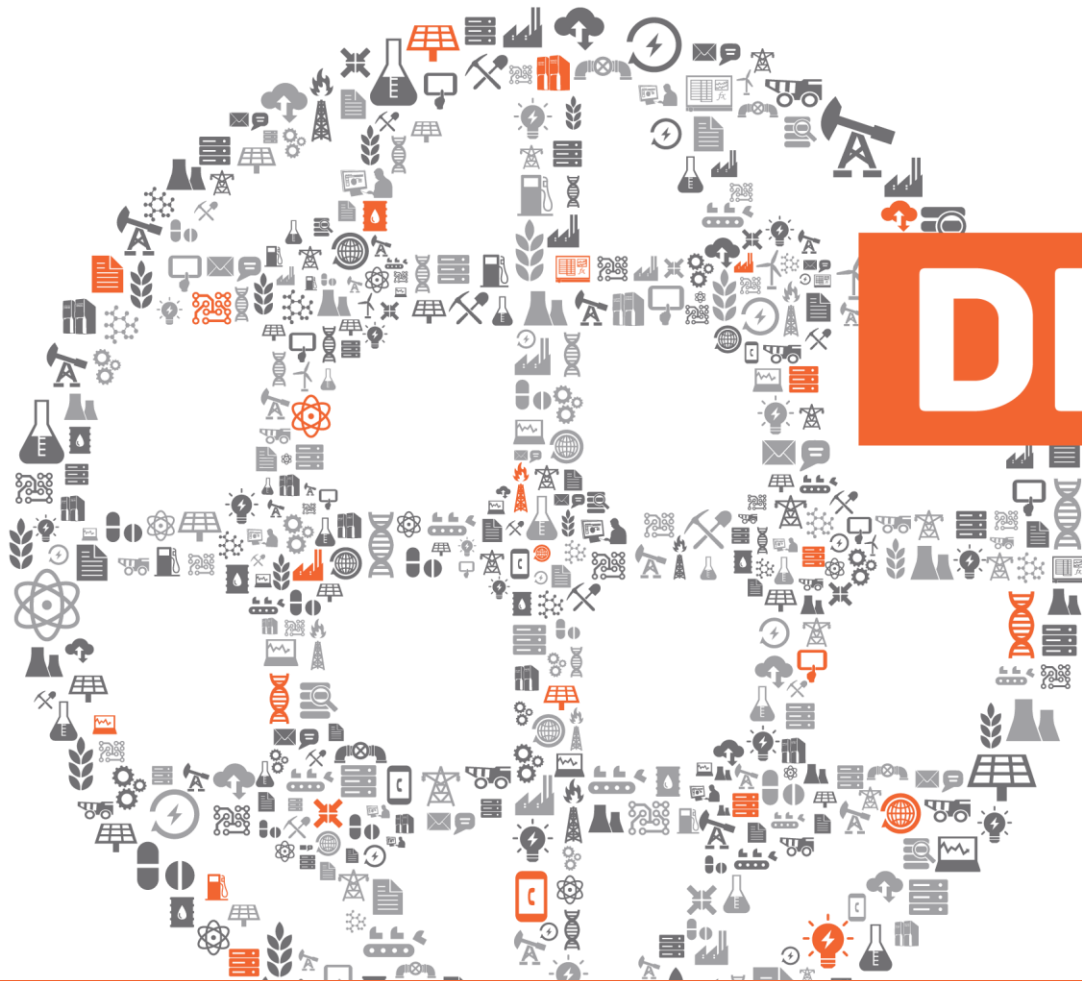
Filter

Name	Value
1-1:1.29.0	0.0299999993294477 kWh
1-1:2.29.0	0 kWh
Heating	Chauffage central à gaz
Housing	Maison individuelle
IP_Address	172.19.176.219
Media	GPRS
Meter_nr	326440
People	2
Port	4023
RT_STATUS	String Array
Surface	100-200
Water	Autre

- CH100630123450000000000000326440
- CH100630123450000000000000338611
- CH100630123450000000000000347655
- CH10073000111111
- randcp

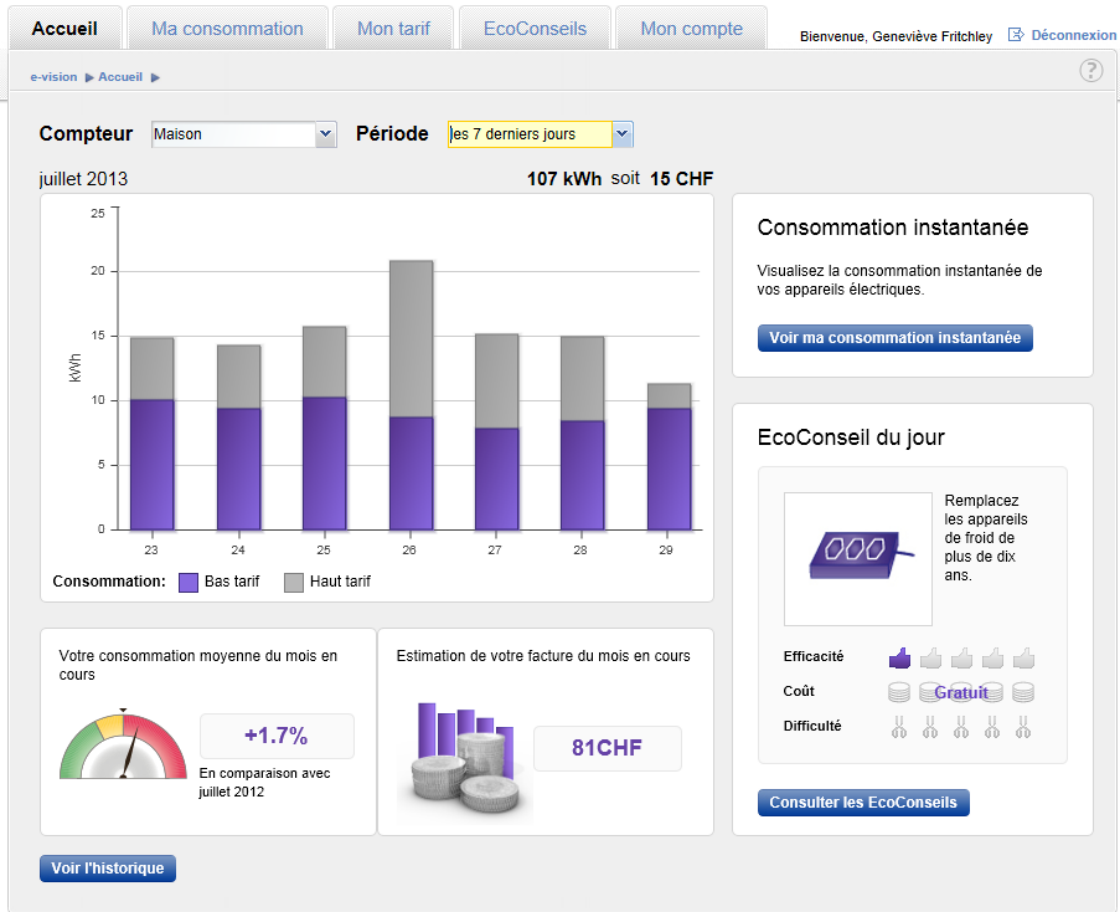
PI System architecture



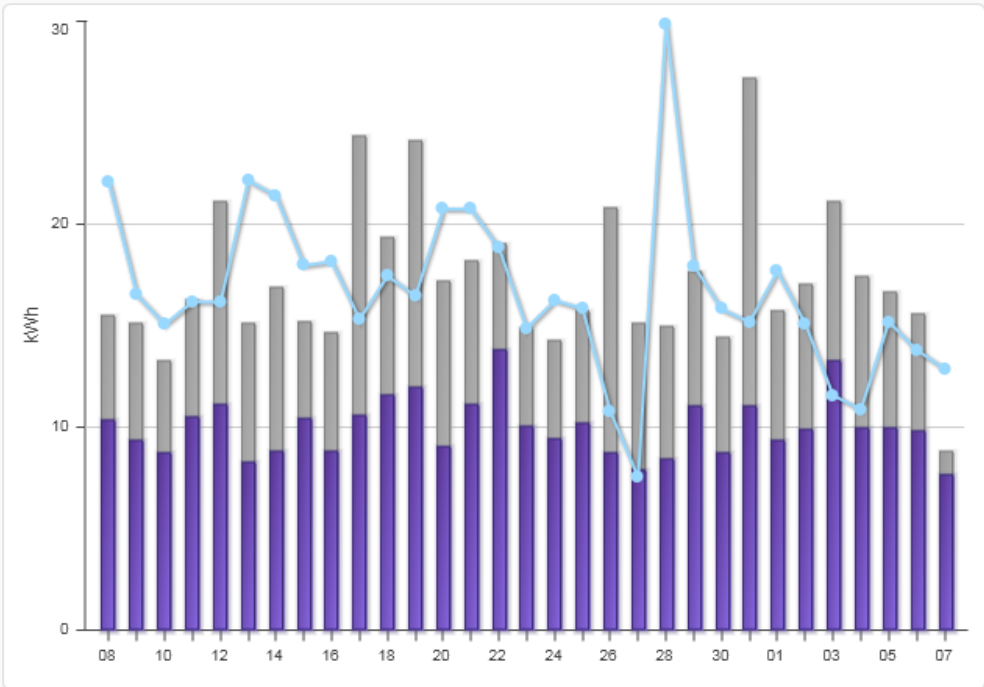


DEMO

<https://e-vision.groupe-e.ch>



e-vision welcome page



Compteur et période sélectionnés

Consommation: Appareils électriques - 1to1 energy easy comfort - Bas tarif Appareils électriques - 1to1 energy easy comfort - Haut tarif

Comparaison

Consommation: Année précédente

Statistiques

Période en cours

Consommation totale (kWh) **530.72**

Consommation moyenne (kWh/j) **17.12**

Coût total (CHF) **76.09**

Année précédente

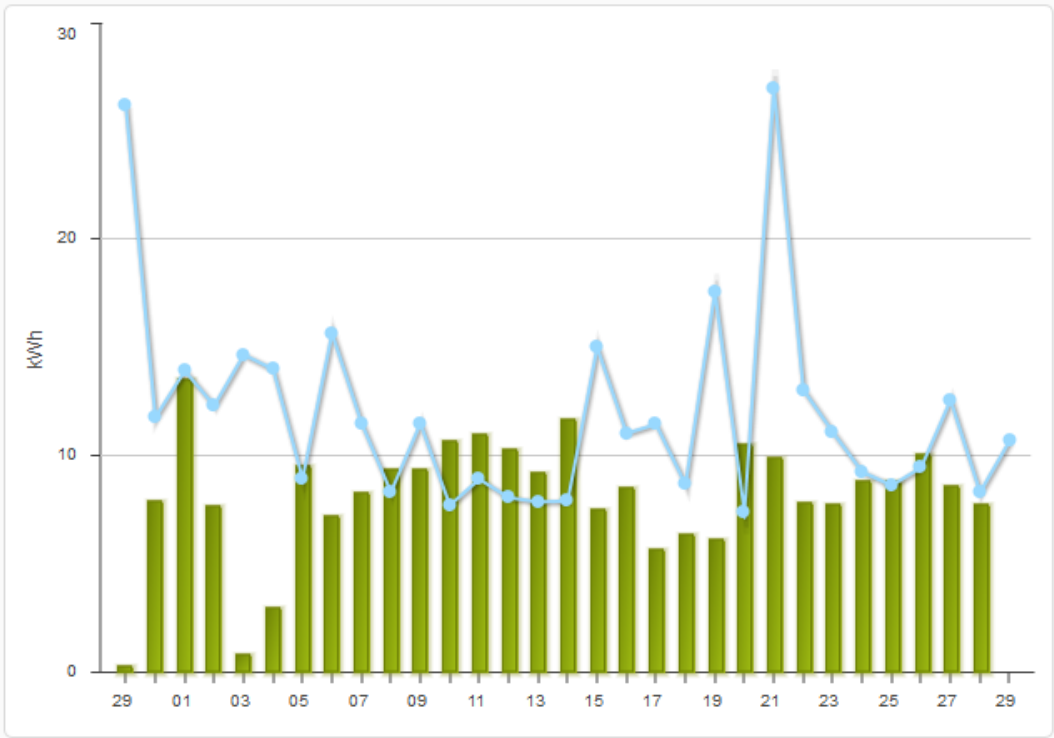
Consommation totale (kWh) **515.71**

Consommation moyenne (kWh/j) **16.64**

Coût total (CHF) **74.39**

Différence (%) **2.91**

Consumption comparison with same period previous year



Compteur et période sélectionnés

- Production:** ■ Tarifs de reprise - petite installation - Tarif unique
- Consommation:** —●— Appareils électriques - 1to1 energy easy comfort

Statistiques

Production

Production totale (kWh) **242.98**

Production moyenne (kWh/j) **7.84**

Recette totale (CHF) **53.46**

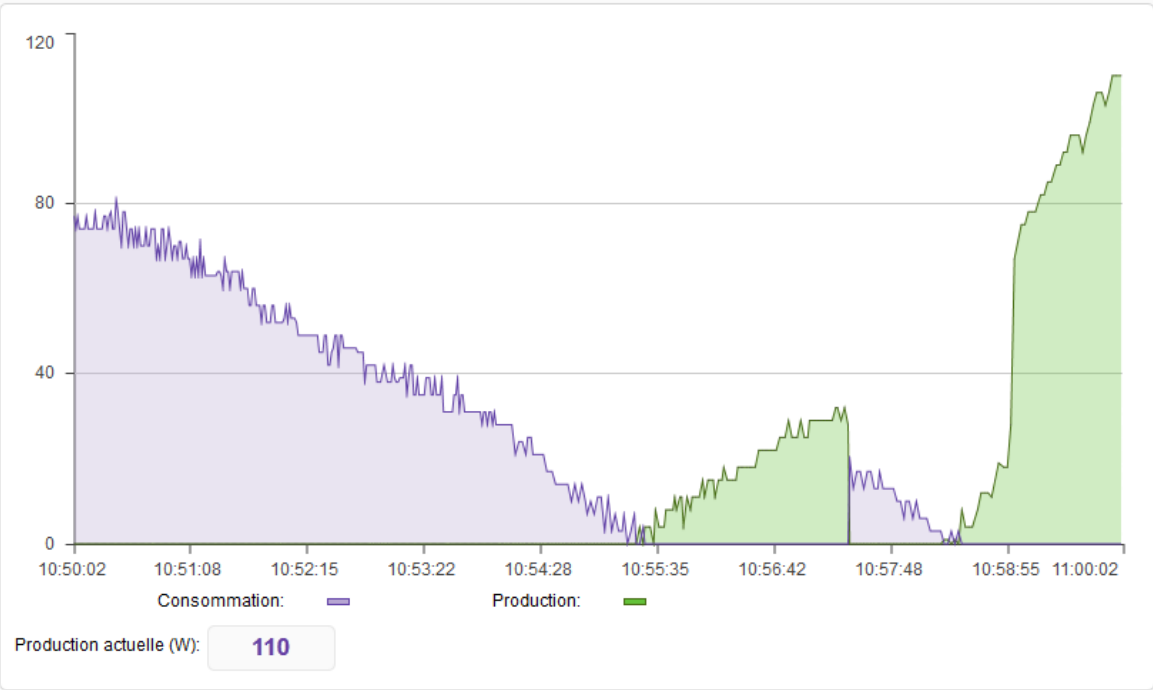
Consommation

Consommation totale (kWh) **369.73**

Consommation moyenne (kWh/j) **11.93**

Coût total (CHF) **52.71**

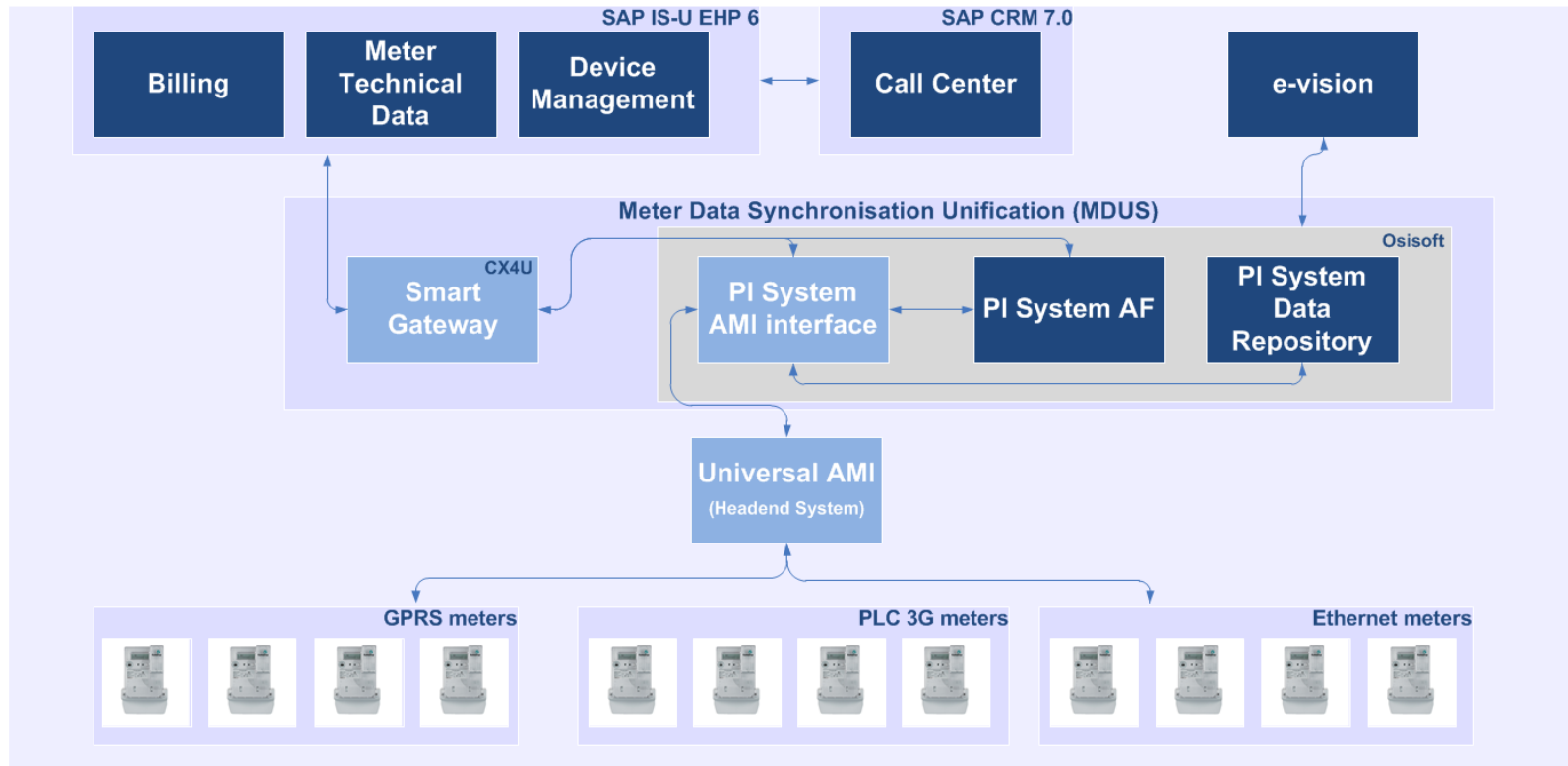
Solar energy generation



Consommation	Minimum (W):	0	Moyenne (W):	32	Stop
	Maximum (W):	81	Totale (Wh):	4	
Production	Minimum (W):	0	Moyenne (W):	10	
	Maximum (W):	110	Totale (Wh):	2	

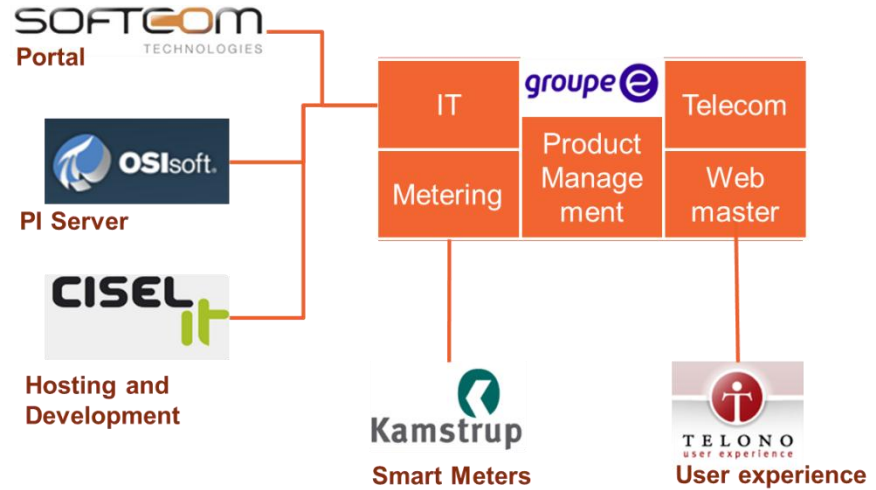
Realtime consumption / generation

Next step : Discussion Rollout Architecture



In summary

Success factor : involve the right business partner



Business Challenge

- Help our customers to save energy
- Explore Smart Metering capabilities
- Be prepared for Smart Metering Rollout

Solution

- The PI System is an elegant solution as the central element in a Service Oriented Architecture for Smart Metering

Results and Benefits

- Product e-vision launched to customers outside the smart metering pilot
- Basis infrastructure for Smart Metering is implemented and scalable

Geneviève Fritchley

genevieve.fritchley@groupe-e.ch

IT Project Manager

Groupe E

Please don't forget to.....

Complete the Online Survey
for this session



Eventmobi.com/emeauc13

Share what you saw with
friends on Twitter, Facebook
or LinkedIn!

#UC2013





**THANK
YOU**

Brought to you by

