INTEGRATION OF INTERMITTENT RENEWABLE ENERGIES – EDF SEI PROJECT PRESENTATION

Itron

EDF-SEI

EDF

Sustainable, yet unpredictable, renewable sources play a key role in producing energy for Reunion Island's utility EDF-SEI. Using Itron's technology, EDF-SEI can precisely monitor energy production to ensure it does not exceed its 30% production limit.
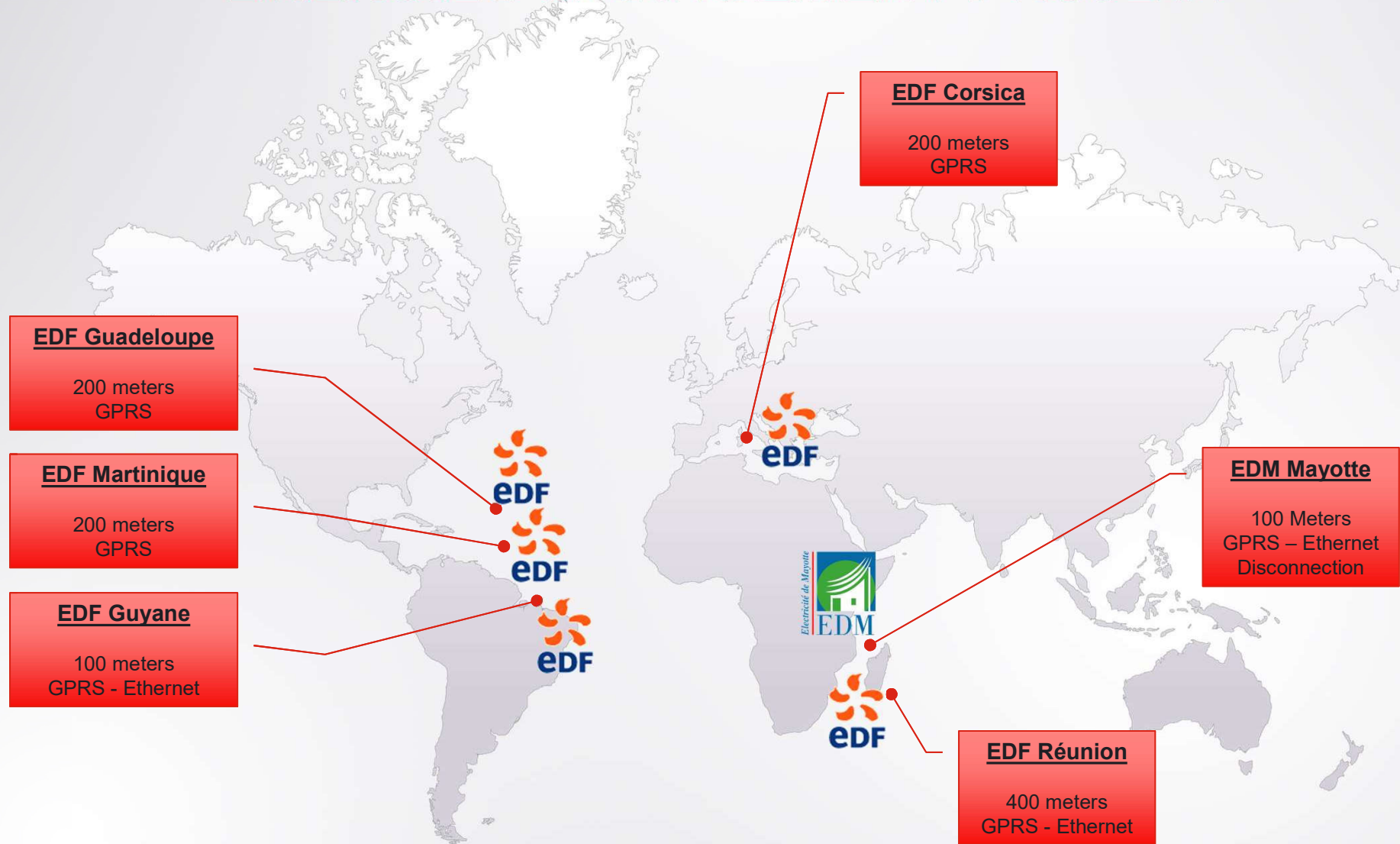
330k
ELECTRICITY CUSTOMERS

30%
RENEWABLE RESOURCES

GENESIS AND GOALS OF THE PROJECT

» EDF SEI manages Electricity Distribution in French Islands and overseas territories

» **The goal: Integration of intermittent renewable energies in an electrical Grid without risk to the network stability**.

» Know in Near Real Time the ratio of intermittent energies over Total energy available on the Grid (Critical threshold: 30%).

» Efficiency of small producers (<36KVA) is estimated from large producers.

» Propose scenarios for grid management upon exceeding a critical threshold (progressive disconnection of Producers)

Intermittent Renewable Energies

Grid Control Objective

Ensure balance between generation and consumption

NON Intermittent Energies

DEPLOYMENT OF EDF SEI INTERMITTENT ENERGIES MANAGEMENT PROJECT

EDF Corsica

200 meters
GPRS

EDF Guadeloupe

200 meters
GPRS

EDF Martinique

200 meters
GPRS

EDM Mayotte

100 Meters
GPRS – Ethernet
Disconnection

EDF Guyane

100 meters
GPRS - Ethernet

EDF Réunion

400 meters
GPRS - Ethernet
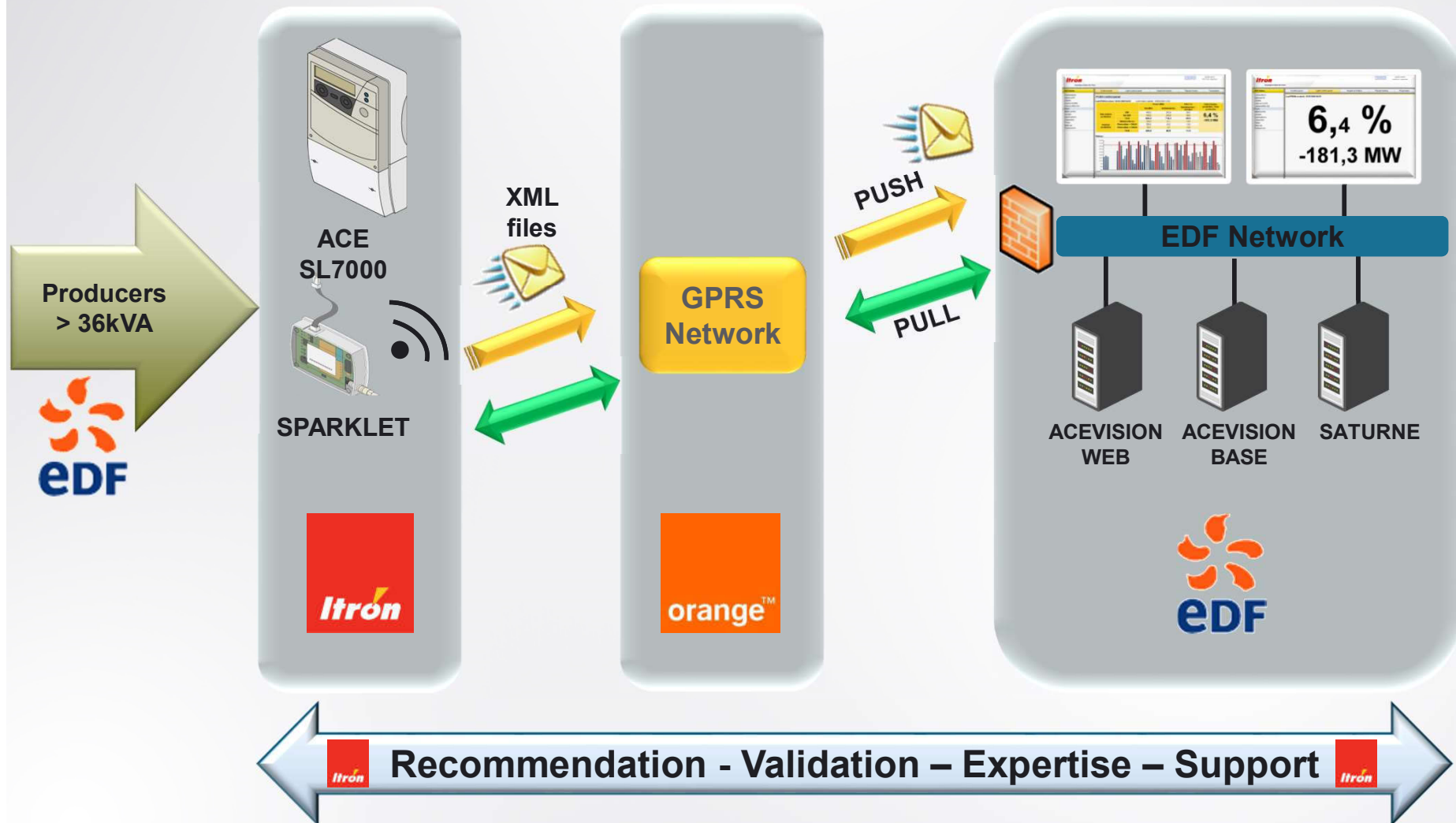
WHY THE NEED FOR A NEW CONCEPT?

SYSTEM PERFORMANCE

- The system has to cope with retrieving data from at least 500 metering points within 5 minutes
- Standard AMR solution not possible
- Innovation: rather than the system pulling the meter data, each meter posts its data to an FTP server (demand during last 5minutes interval)
- Every 5 minutes:
  - Summation of intermittent renewable energy
    - Estimation for missing data elements from push
    - Contribution from small producers (<36KVA) from efficiency percentage from large producers
  - Summation of non intermittent energy (thermal or hydro)
  - Ratio monitoring
  - Alerts prompting actions

COMPONENTS OF THE SOLUTION

ACE SL7000
C&I meter

Sparklet
Modem
GPRS - IP

HV

MV

LV

ITRON Total
System

GPRS
Network
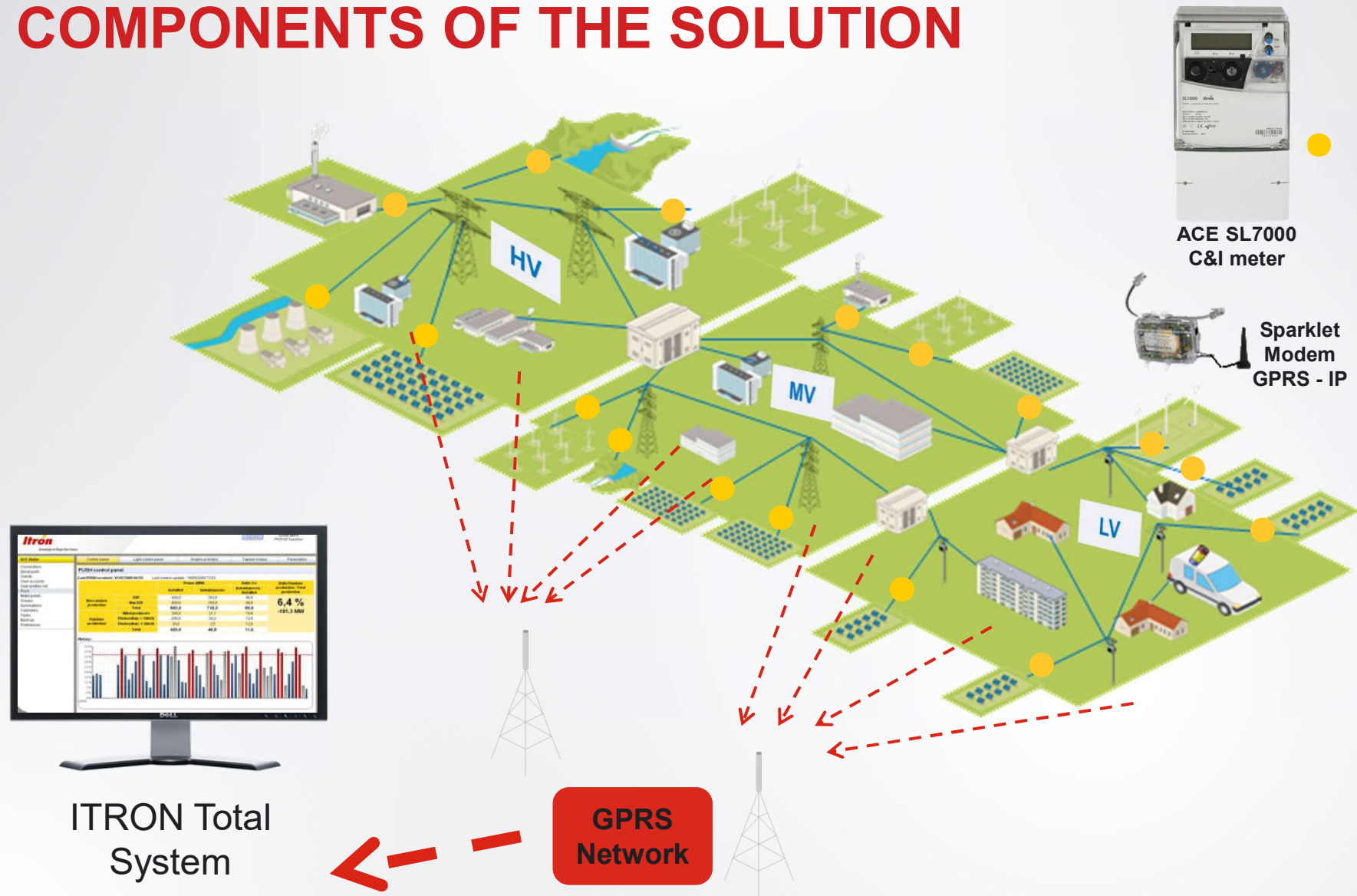
STAKEHOLDERS IN THE SOLUTION

SOLUTION FOR PRODUCERS AND EDF-SEI

Communication port dedicated to producer

Comm port dedicated to EDF

Communication Network of producer

ACE SL7000

RTC modem

OR

GPRS modem

OR

Ethernet Modem

» Monitoring injection
» NOX indicators
» Management of single units
» Management of pooled units
» Production control
» Automatic alarms
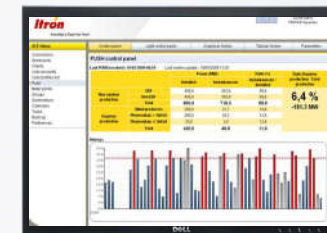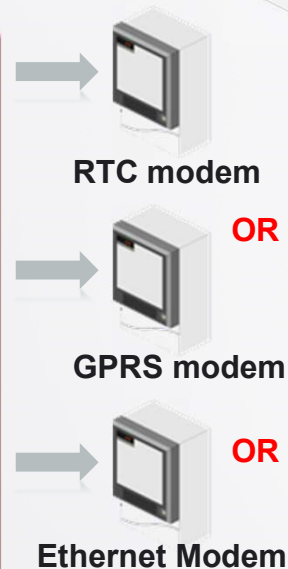
» Network security
» Network topology
» Monitoring of intermittent renewable energies
» Management of producers
» Control of network data

EDF SEI PUSH PROJECT IN A FEW FIGURES

300 XML files handled
every 5 minutes

ITRON Total

300 meters

300 XML files every
5 minutes
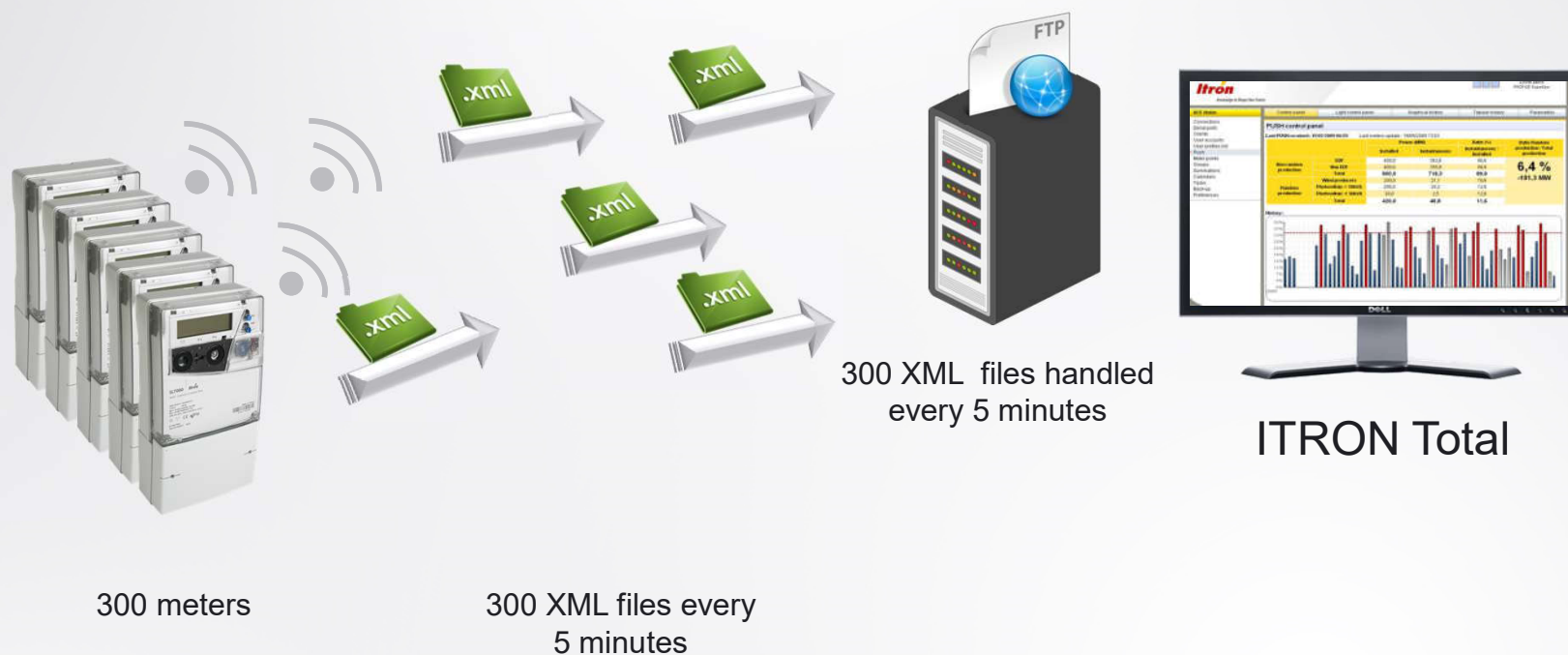
Figures for a subset of 300 meters

300x12x24 : **86,400 files handled daily**

PUSH CONTROL PANEL

PUSH control panel

Last PUSH received : 27/05/2009 10:35   Last meters update : 17/04/2009 10:56

		Power (MW)		Ratio (%)	Ratio Random production / Total production
		Installed	Instantaneous	Instantaneous / Installed	
Non random production	EDF	400,0	362,4	90,6	**16,0 %**
	Non EDF	400,0	354,8	88,7	
	Total	800,0	717,2	89,7	**-119,6 MW**
Random production	Wind producers	200,0	64,4	32,2	
	Photovoltaic > 36kVA	200,0	65,5	32,8	
	Photovoltaic ≤ 36kVA	20,0	6,6	32,8	✔
	Total	420,0	136,5	32,5	

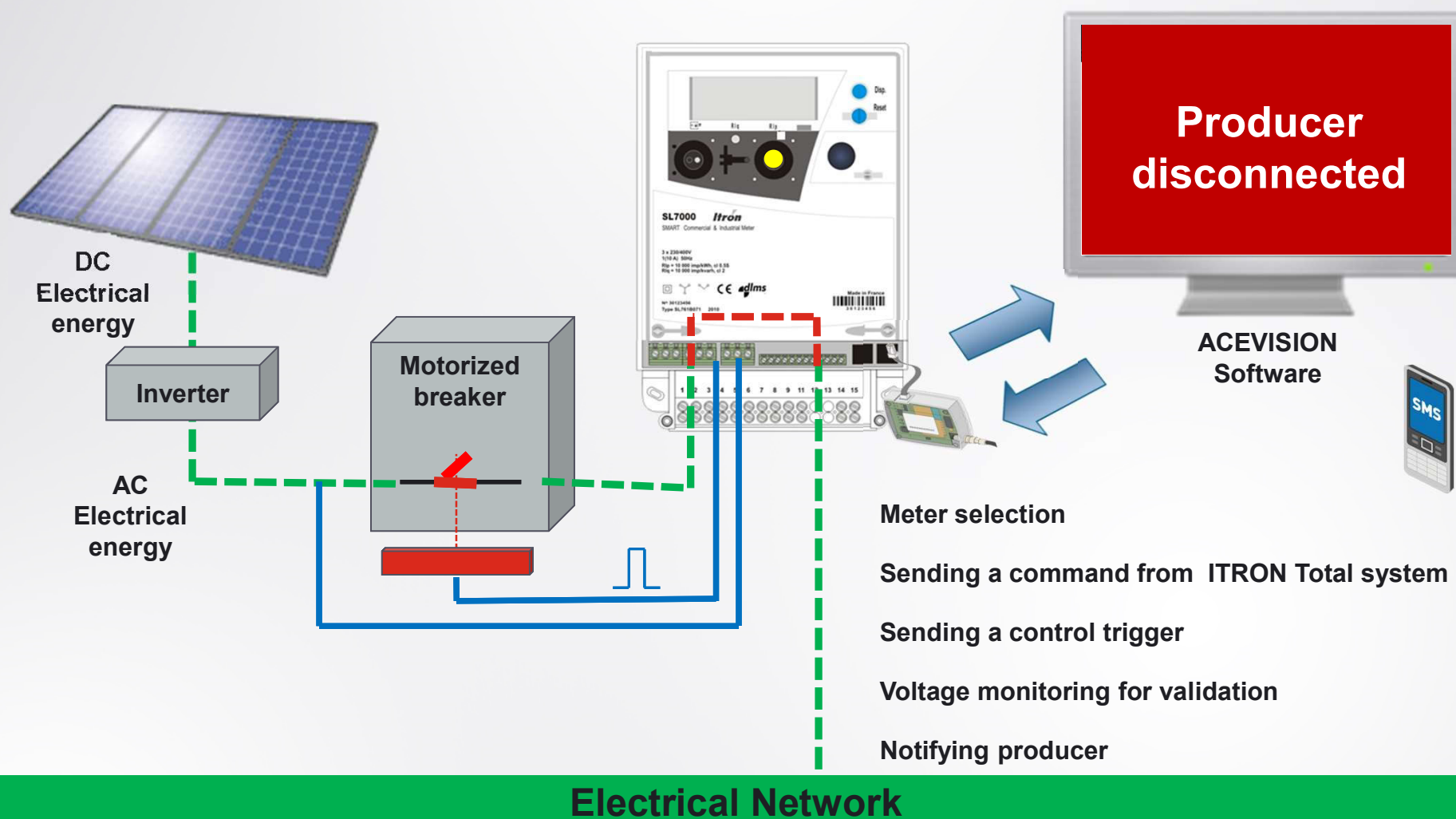History :
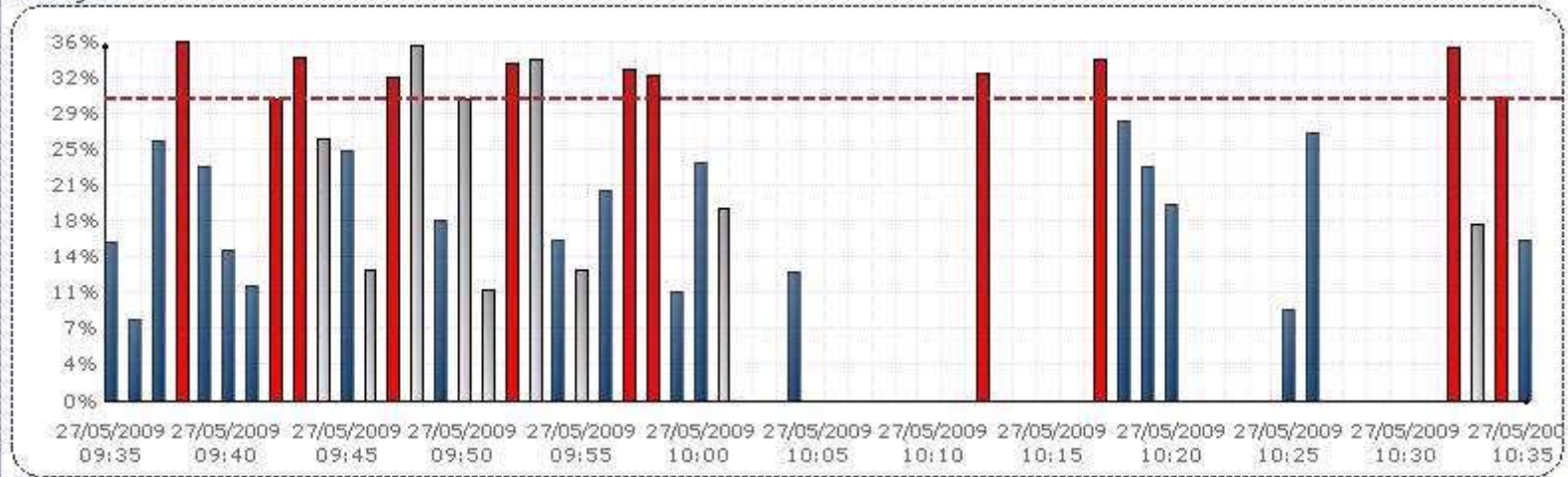
DISCONNECTION RULES / METHODS

MANUAL

- Alerts generated if threshold exceeded
- From ITRON Total Data Base, recommended list of producers to disconnect.
- Warning msgs sent (email, sms, phone..)
- Monitoring of metering data at next intervals to check disconnection has been performed.

SEMI AUTOMATIC

- Operator selects generating units proposed by the system
- Disconnection command by via one meter Output. Disconnection is confirmed using meter inputs.

Note: More recent producers (most recent supply contracts) get disconnected first

MANAGEMENT OF A PRODUCTION SITE

DC Electrical energy

Inverter

AC Electrical energy

Motorized breaker

SL7000 *Itron*
SMART Commercial & Industrial Meter

Producer disconnected

ACEVISION Software

SMS

Meter selection

Sending a command from ITRON Total system

Sending a control trigger

Voltage monitoring for validation

Notifying producer

Electrical Network

THANK YOU