HEP OPERATOR DISTRIBUCIJSKOG SUSTAVA d.o.o.

Smart Grids
current and future activities

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Workshop for Preparation of Croatian Technology Platform for Cooperative Renewable Energy Systems and Smart Grids, 2nd July 2013. Zagreb, Croatia

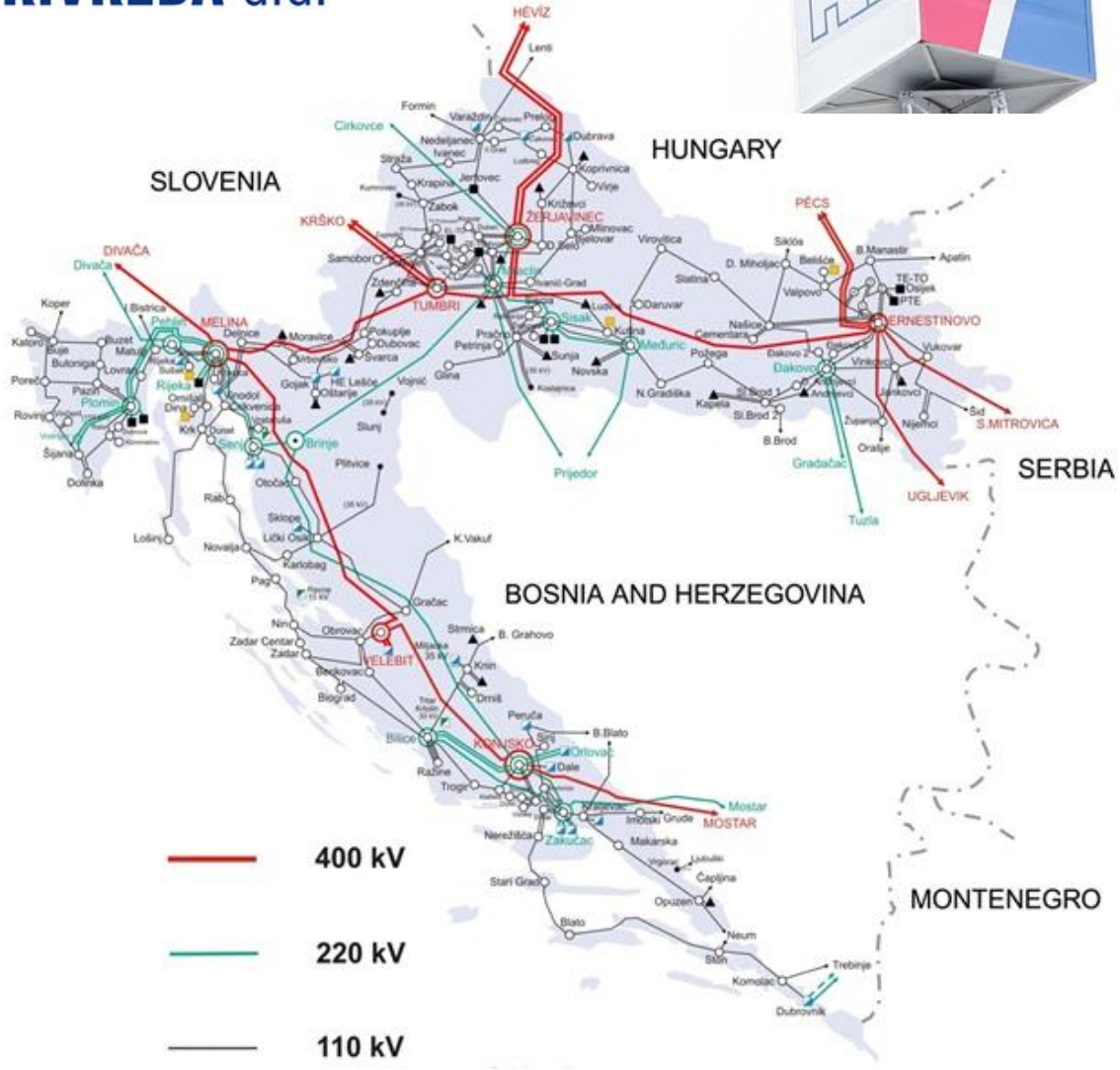
HRVATSKA ELEKTROPRIVREDA d.d.

HEP Group

- Group of 15 companies:
  - – electricity production, transmission, distribution and supply
  - – gas distribution
  - – heat supply
- Number of employees

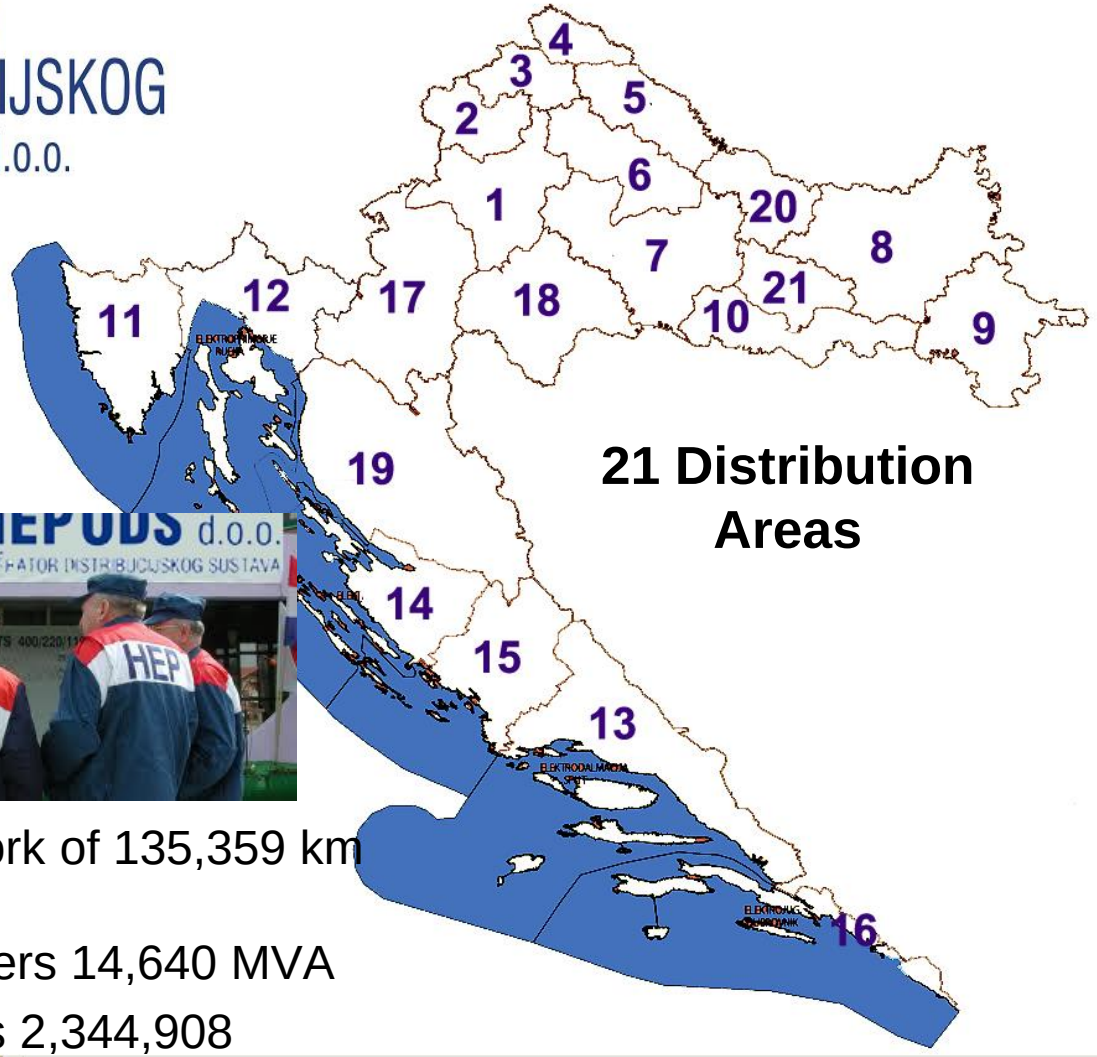
  12.880
- Total operating income

  1,7 bil. EUR



HEP OPERATOR DISTRIBUCIJSKOG SUSTAVA d.o.o.

- Distribution System Operator is responsible for:
  - – energy distribution
  - – tariff customer supply
  - – last resort supply



21 Distribution Areas

- Distribution Network:

- length of the distribution network of 135,359 km
- number of substations 27,155
- installed capacity of transformers 14,640 MVA
- number of measurement points 2,344,908

The 25 DSOs service approximately three quarters of the connections in EU23+2. HEP ODS holds 20th position with 2,3 mill. connections.

The users of the distribution network

Within the distribution network its about 2.3 million electricity customers and about 252 electricity producers.

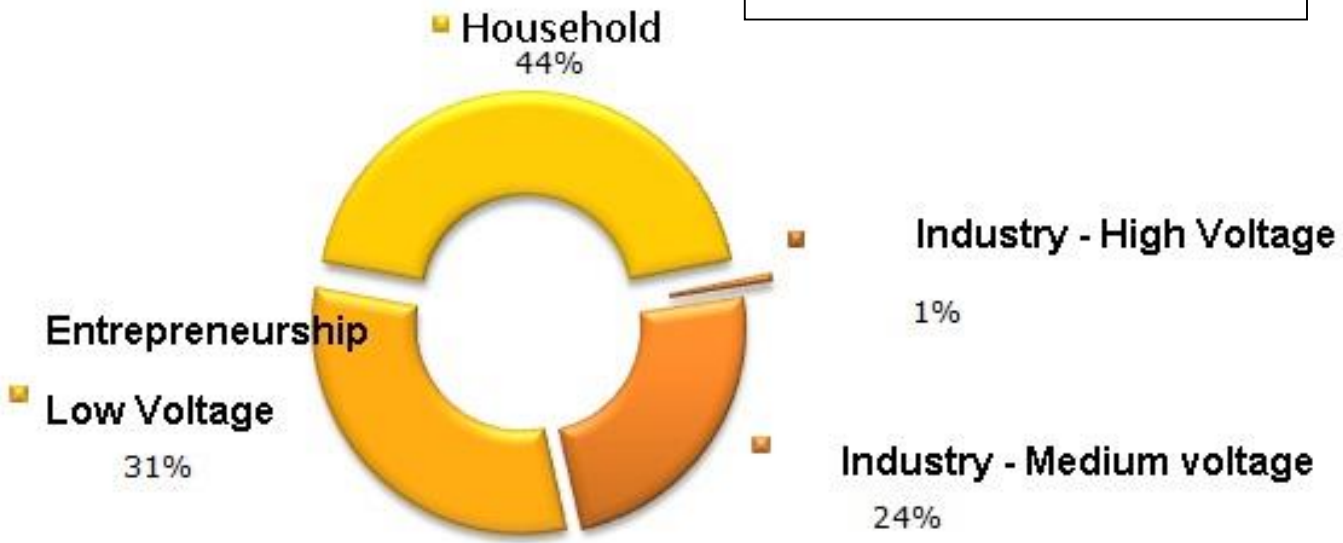
- Customers

high and medium voltage	2.128
commercial	212.533
public lighting	21.351
residential	2.130.247

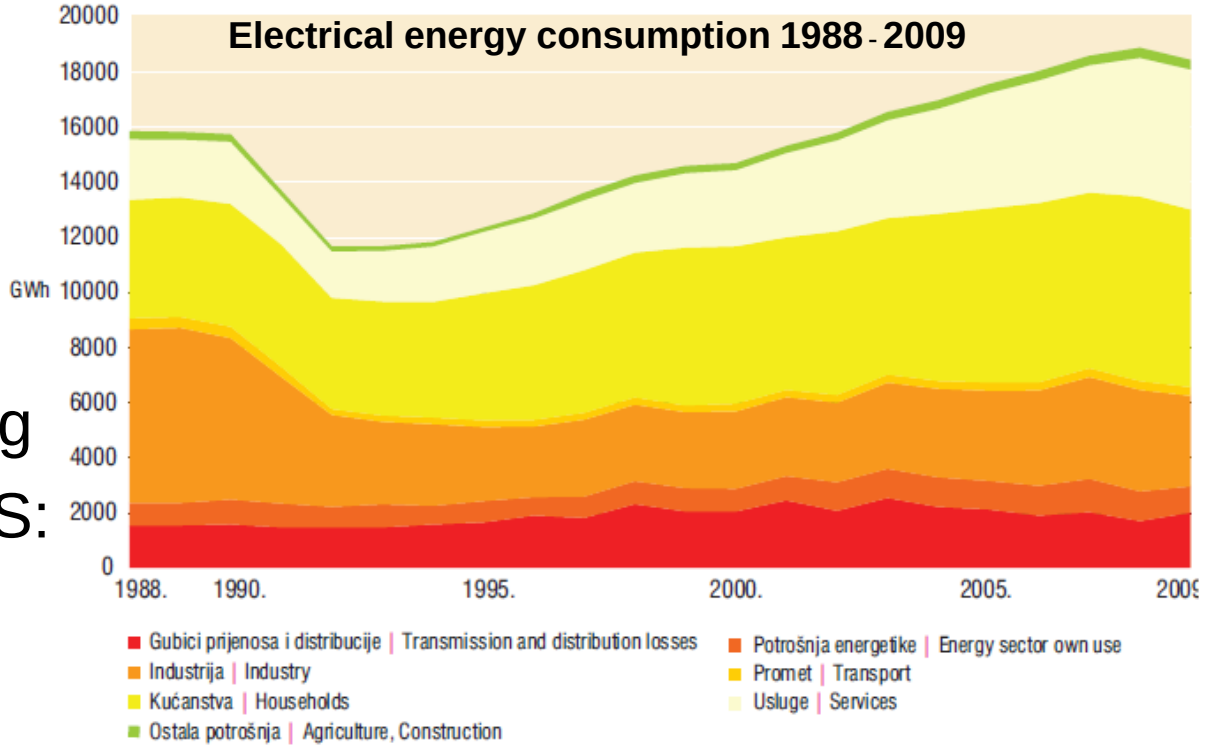
Average Household Consumption

3.100 kWh

- Total energy consumption 14.850 GWh



Why Smart Grid?

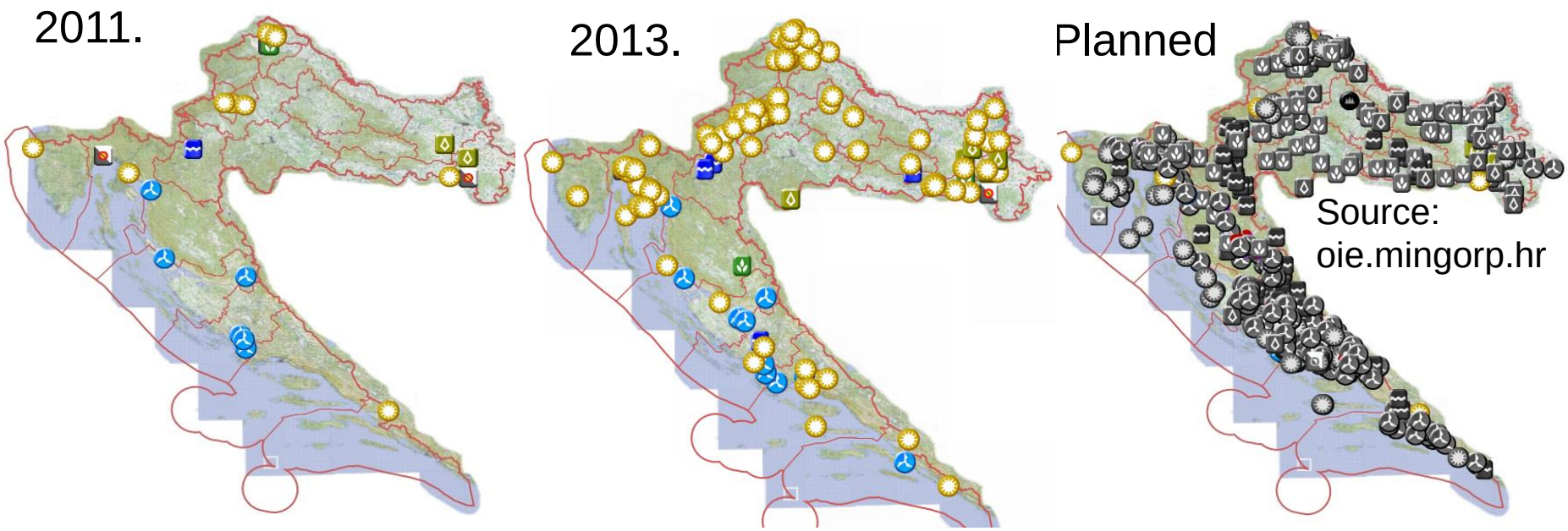


Reasons for accepting SG ideas in HEP ODS:

- Increase in consumption
- Integration of renewable energy (distributed) sources
- Creating the preconditions for the active role of customers on electricity market
- Caring for the environment
- Age of distribution networks (aging infrastructure)
- Increase in price of fossil fuels

Renewable Energy

Within the distribution network currently is a total of 252 renewable energy sources with a total power of 63 MW: 19 of them are on medium voltage with connected power of 56 MW and 233 are at low voltage with connection capacity 6.5 MW.

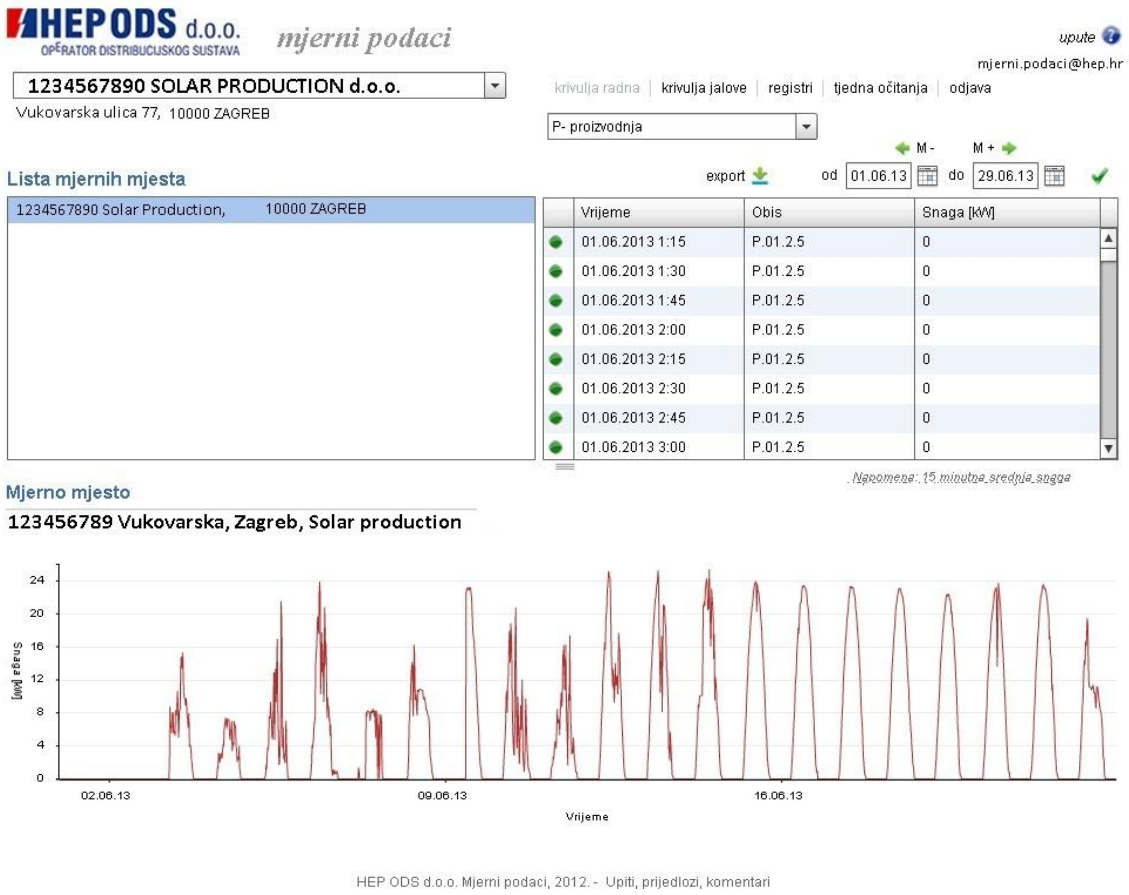


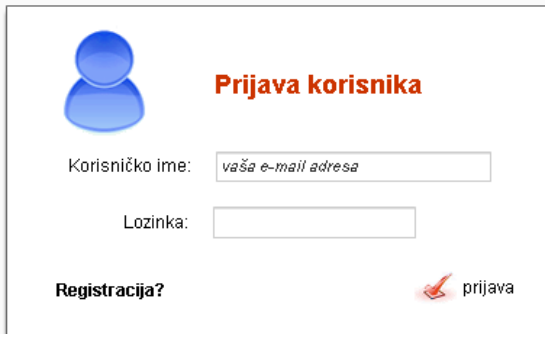
- Balancing production and consumption in an efficient manner requires advanced network and advanced users.

Preconditions for the active role of producers and customers on electricity market

Grid users can track their consumption or production and download metering data for their analysis and energy efficiency.

http://mjerenje.hep.hr/





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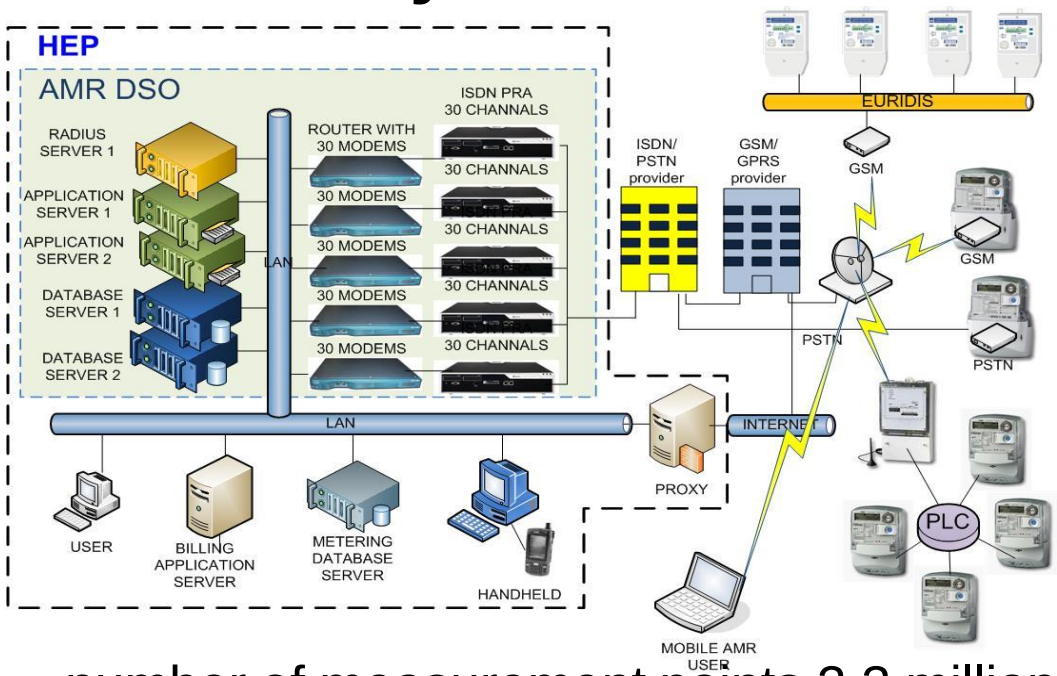
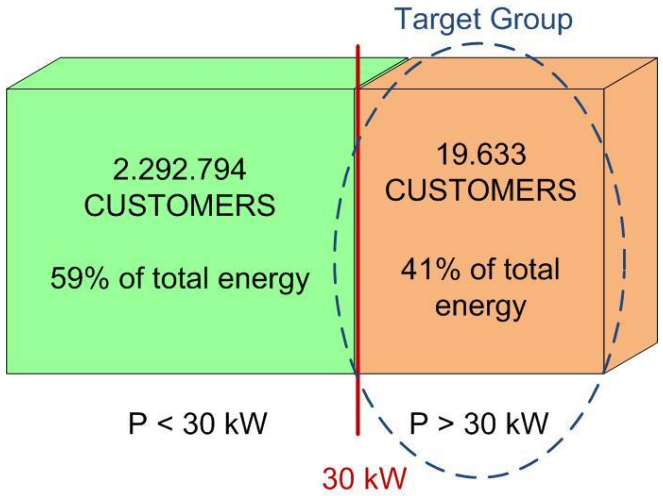
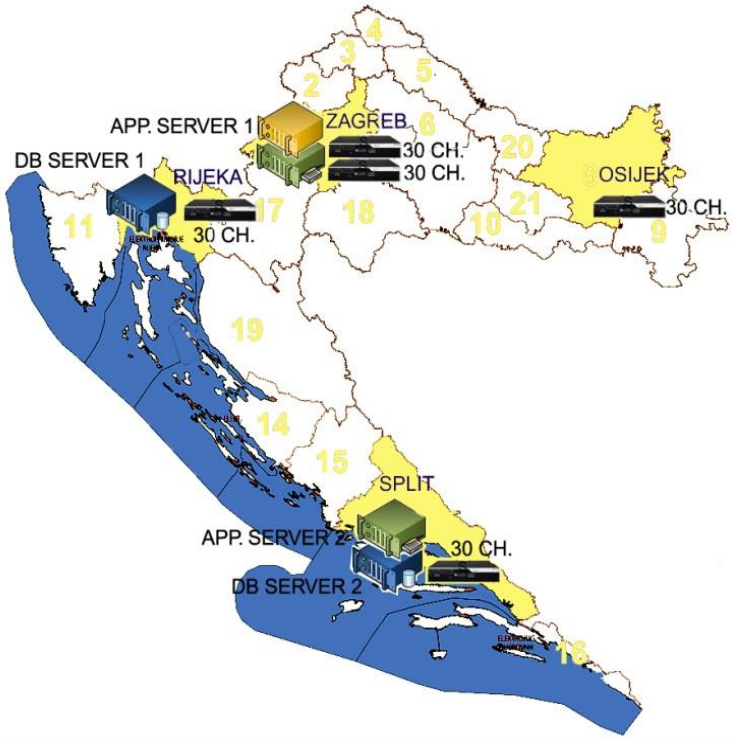
AMR/AMI System





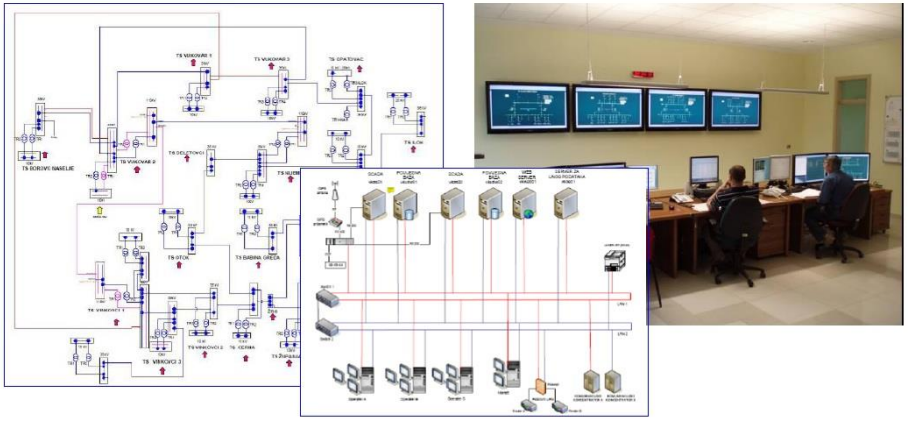


- number of measurement points 2.3 million
- 300.000 electronic meters 11%
- **41.800 meters with remote reading:**

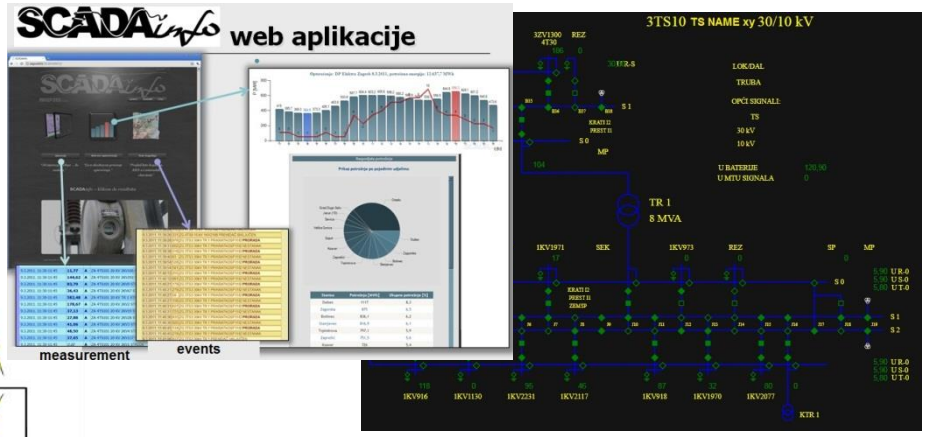
HV, MV	100%
Enterprise P > 30kW	100%
Enterprise P <= 30kW	1%
Household	0.3%

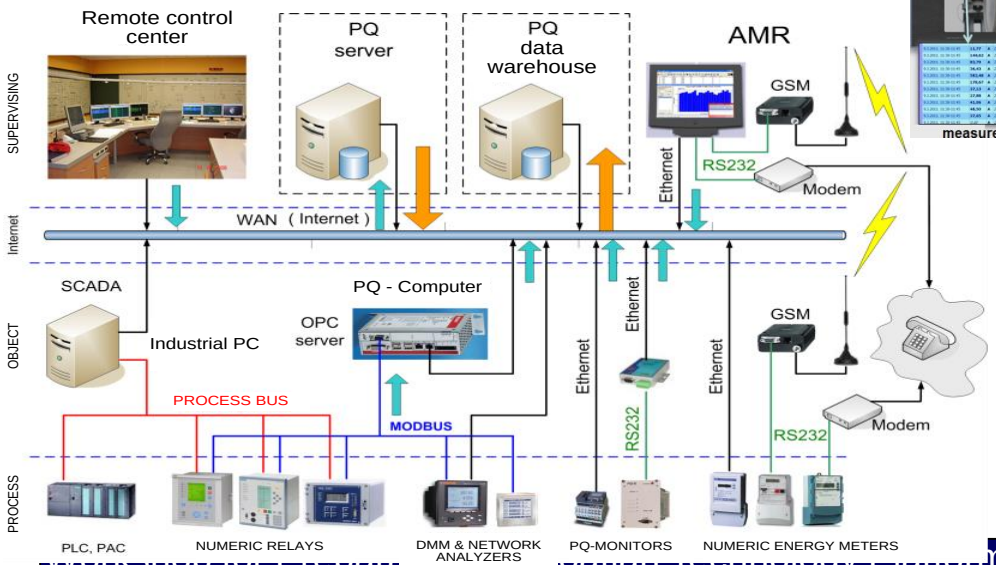
Network Control and Automation

Continued investment in network and involvement of all remotely controlled and monitored facilities in new SCADA system.



SCADA Info - HEP ODS integrated applications to access data in the revived SCADA systems via an internal web portal.



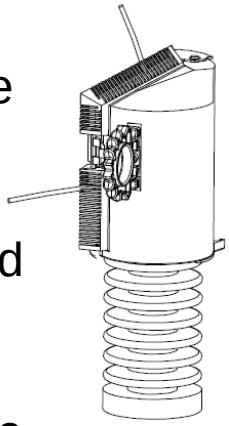


Integration of devices which have a capability to measure power quality parameters (PQ) into the ICT system.

Environment protection

2007th started the certification of distribution areas for environmental management system to ISO 14001:2004.

2011th completed important work of removing hazardous substances (PCBs) from old parts of the network.



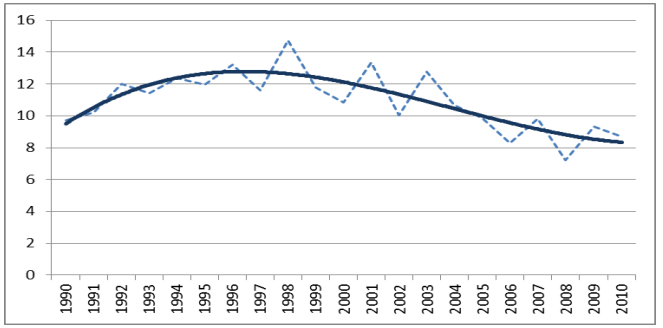
100,000 € annually investment in the protection and habitat conservation for birds and small animals.

15 million € total in HEP Group for protection nature and the environment in the 2011.

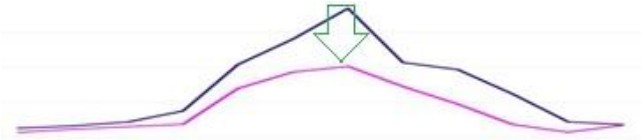
The next phase of Smart Grid implementation in HEP ODS

- increase the level of network automation
  TS 110 / x and 35 / x kV from 80% to 100%
  TS 10 (20) / 0.4 kV from 1% to 5 %

- continue to AMR/AMI and preparation for smart meter of roll-out



- continuous work on reducing technical and non-technical losses.

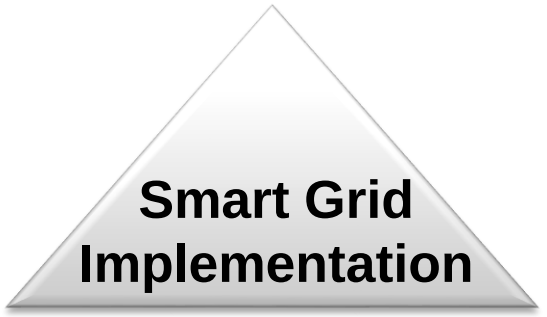


- power quality projects and new guidelines for the development of the network in order to accept distributed generation

- develop new services based on already constructed infrastructure (Demand Response, etc.)

- work on support for electric vehicle

Conclusions



The main drivers of SG technology in HEP ODS are:
•legal obligations,
•age of infrastructure,
•reduction of operating costs.

The main barrier for SG investment is the lack of adequate regulatory framework.

Preconditions for successful implementation:
•Defining the business model (roles and responsibilities of participants).
•Testing and verification technology.
•Establishing a system of incentives.

Planned investments for 2013 year by basic areas:

- automation of distribution network € 1,3 million,
- introduction of advanced metering € 3 million.

Sources of funding are the tariff items.

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Thank You for Your Attention!

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Used data, charts and pictures: HEP d.d., HEP OPS d.o.o, HEP ESCO d.o.o, HEP Opskrba d.o.o., HEP ODS Team for Meter Strategy, HEP ODS Smart Grid Team, HEP ODS AMI Team, RH Ministry of Economy, RH State Office for Metrology, Energy Institute Hrvoje Požar