

# ADINE – Active Distribution Network

## ADINE PROJECT

October 2007 – November 2010

Financed by the FP6, Priority 6.1 Sustainable Energy Systems, STREP

Total cost about 3,2 MEUR, community grant about 2,1 MEUR

Aim to develop, demonstrate and validate a new Active Network Management (ANM) method of distribution network including DG and enabling technical solutions

ADINE project develops new methods for the electric distribution network management including distributed energy resources (DER). When the distribution network is managed according to the ANM method the interactions of different active network devices, like generation units and reactive power compensators, can be planned and controlled to benefit the operation and stability of the network. With proper interaction of devices the overall system performance can be improved from presently used practices. The new methods for planning and control developed in the project are maximising the use of existing electricity net-

works and reduces the need for installing new power lines. The project provides better understanding of the potential benefits and problems when different DER units are in active interconnection and participating in the management of the network.

To make Active Network Management possible, a set of technical solutions are developed and demonstrated in real-life environment. The ANM method needs technical solutions such as protection, voltage and reactive power control and planning and information systems of networks.

### Production



traditional power plants



solar generation



wind farms



distributed generation

### Smart Grid

Open for all types and sizes of generation

Interaction between demand side and operation

Efficient, reliable and self-healing transmission and distribution

Most cost efficient solution to future requirements

### Consumption



smart meters



smart house



plug-in vehicles



industry

Active distribution network is a part of a smart grid which integrates supply to demand.



## ANM METHOD ADDS VALUE BY

Increasing the potential for renewable energy

Efficient management of distribution network assets

Supporting distribution network by ancillary services

## RESEARCH AND DEMONSTRATION METHOD

Real-life demonstrations

Real-time interaction simulations

## ACTIVITY FOR NETWORK MANAGEMENT

Active resources like DG units are integrated into the network

Customer-owned active resources are participating in network management

Synergy benefits by co-operation of individual resources

The intelligence is simply investments in controllability and ICT

Area control level is introduced to co-ordinate individual devices

Integration of distribution network automation (DMS - SCADA - substation and feeder automation - AMI)

## ACTIVITIES

Following enabling solutions are developed and demonstrated in order to support ANM method:

Protection relay and fault location applications in distribution networks

Coordinated protection planning on Network Information System

Voltage control of small-scale microturbine

Centralized voltage control on SCADA/DMS

New-generation STATCOM on wind park



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