fenix
Flexible Electricity Networks to Integrate the eXpected 'energy evolution'
... a step towards the future of electricity network

Bulletin 3
04/2008

The FENIX Scenarios – Part 1, The Northern Scenario

Editorial

by Peter Lang,

EDF Energy
FENIX Workpackage 4

Welcome to the third edition of the FENIX project bulletin. FENIX is a European funded integrated project where the demonstration phase of the project is just as important as the research phase. So, in this issue we present a description of one of the FENIX demonstrations to show the value of the Virtual Power Plant concepts.

There are two demonstrations being hosted by EDF Energy in the UK and Iberdrola in Spain referred to as the Northern scenario and Southern scenario respectively. They are designed to complement one another so the maximum number of benefits can be demonstrated. The Northern scenario will demonstrate the value of market participation in the Commercial Virtual Power Plant (CVPP), as described in Bulletin 2, for smaller scale generation such as domestic and community scale CHP and PV connected to low voltage networks. Whereas the Southern scenario will consider the opportunities for distributed generation connected to medium voltage networks to deliver ancillary services to Transmission System Operators (TSO) and Distribution System Operators (DSO).

The challenge for both scenarios is to adapt the generic FENIX architecture as shown below into a realisable architecture so the benefits can be demonstrated.

This bulletin will describe the Northern scenario in more detail.

Peter Lang

The Northern Scenario

The Northern Scenario demonstration is being carried out by a number of FENIX project partners (Areva T&D, ZIV, EDF Energy Networks, National Grid and Imperial College London) working together with Woking Borough Council and EDF Energy, to accommodate the VPP vision in a number of test sites. The business case under development in the demonstration will identify value for several key market participants outlined below:

National Grid: The TSO in the UK. They have the responsibility to ensure system security. They also procure ancillary services to balance supply and demand.

EDF Energy: A supply business with access to the energy market. EDF Energy will operate a portfolio of generation and attempt to minimise its exposure to imbalance. The supply business will fulfil the role of Commercial Virtual Power Plant (CVPP).

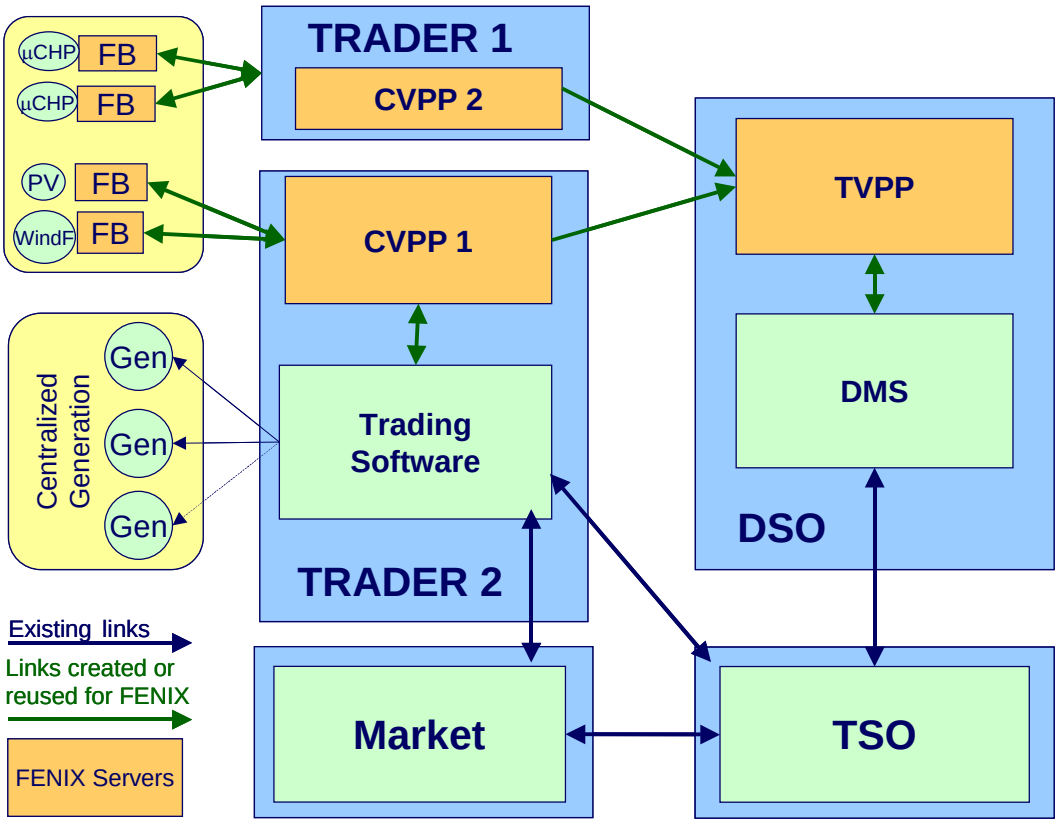

Figure 1: The Generic Fenix Architecture

CIRED Seminar 2008: SmartGrids for Distribution
23 - 24 June 2008, Frankfurt, Germany

Stop-press: FENIX will be present at CIRED Seminar 2008 „Smartgrids for distribution"

Where: Frankfurt / DE
When: June 23-24, 2008
Info: www.ciredsmartgrids.org

Side event: 1st meeting of FENIX Stakeholders Advisory Group June 24, 2008 afternoon

Mark your diary !!!

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Figure 2: Woking Borough Council Town Centre Combined Heat and Power Plant

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EDF Energy Networks: The owner and operator of the distribution networks that connects demand and generation customers. The distribution business will fulfil the role of DSO and operate the Technical Virtual Power Plant (TVPP) to manage network constraints. The CVPP and TVPP are described in Bulletin 2.

Woking Borough Council: The DER owner that operates to optimise its generation and deliver services to system operators through the CVPP.

In addition to these market participants, other FENIX partners will also be providing advanced market interface functionality (Areva T&D), metering (ZIV) and laboratory facilities (Imperial College). **ZIV** is the manufacturer of the monitoring hardware that will be used to measure the output of the small scale generation. **Areva T&D** is the manufacturer who is developing the systems to aggregate the output of the generation. **Imperial College London** will provide the laboratory facilities to demonstrate concepts that cannot be readily demonstrated in the real network.

One challenge for the Northern scenario is to demonstrate a FENIX future in today's network environment. The first requirement was to identify a cluster of small scale generators linked to a common low voltage network. In today's low voltage distribution networks very few clusters of generation can be found. One exists in the privately owned network of Woking Borough Council (WBC). WBC owns a portfolio generation that has allowed it to meet the energy requirements of its civic centre, conference centre and other municipal facilities at the Pool in the Park. The portfolio includes small and medium sized CHP, a fuel cell and PV.

Fenix will allow WBC near real-time visibility of their generation as well as their demand. WBC also owns a number of loads that can be switched for short periods of time with very little impact on users of their facilities.

The EDF Energy supply business will have visibility of the flexibility that can be provided by WBC. The diagram below illustrates how the Northern scenario will be arranged. The Woking Fenix box will provide visibility of generation available and the current demand. This availability or flexibility will be sent to the distributed management e-terra system hosted by Areva T&D which provides information to the CVPP on how best to dispatch the generation in its portfolio. In a FENIX future with high penetration of DER and active management of distribution networks the DSO will be involved in management of local network constraints. To undertake this activity (potentially re-dispatching DER to manage the network) the DSO needs visibility of all DER in the network and communication from the CVPP on activity in the energy markets. The distribution network around Woking is not constrained, but the demonstration will begin to build these links by increasing real-time DER visibility for the DSO.

WBC has allowed their generation to be monitored only. To demonstrate the benefits of flexibility scaleable generation and demand facilities at Imperial College have been established. These facilities can be scaled to understand the impact of broadcasting messages to increase or decrease output to larger numbers of simulated DER. There is also the issue that some generators will not be able to fulfil the request e.g. the wind is not blowing, the thermal store is full, etc. The CVPP will need to be able to make up the shortfall.

From the above we hope you can understand that the Fenix demonstration is going to be exciting and above all be able to demonstrate the business case for adopting the Fenix architecture. EDF Energy is going to prepare a seminar to explain the results of this project in the UK in 2009. Keep an eye on the Fenix project website. www.fenix-project.org

The next FENIX bulletin will be prepared by FENIX partner ECN. It will introduce the approach that is currently being applied to determine the economics of DER integration applying FENIX intelligence for a range of case studies.

Acknowledgement: The Fenix partners would like to thank Woking Borough Council for their participation in making the Northern Scenario possible.

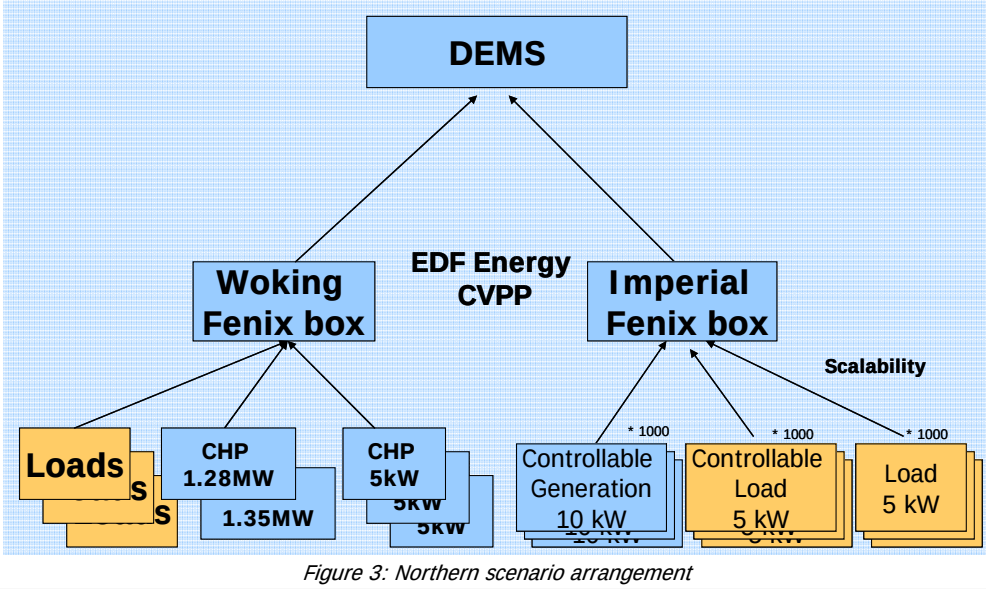

Figure 3: Northern scenario arrangement

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More information about the FENIX project is available on the FENIX homepage: **www.fenix-project.org**