Since VTT Technical Research Centre of Finland is a multidisciplinary research institute having expertise on all proposed usage areas, the following comments presents only the views of the center of communications technologies.

1. What use case and scenario in your area would you consider the most appropriate and representative one for large-scale experimentation with the Future Internet platform to be built starting from 2013 (please refer to the documents referred to on the above websites for inspiration)?

The energy markets are in transition and efforts towards smart energy grids have already started with an increasing speed. Development toward distributed power generation, increasing automation and intelligence in the customer side, requirements for EU wide energy markets, etc., all that calls for customer-driven marketplaces for power generation, distribution and customers. All around the world, pilot projects are launched to enable customer to make more informed decisions about their energy consumption. Moreover, there are several national research programs, like Smart Grids and Energy Market SGEM (see http://www.cleen.fi/) in Finland, which bring together the main players from energy and ICT industry together with academic and research institutes. Having the same goals, co-operation between such programs and FI-PPP would be anticipated.

2. What innovative Internet functionality and technologies would you consider important for your suggested use case and scenario (e.g. context awareness, sensor networks, advanced real time processing capabilities handling huge volume of data, ad hoc service composition and mash-up, managed broadband connectivity and services, embedded media support for interfaces easing the interpretation of processed contextual data, etc.)?

In order to implement large scale smart energy grids, several innovative Internet functionalities and technologies are needed. In the following, only few examples are mentioned. Security, trust and dependability are the principal assumptions for communication and control in a smart grid. Sensor and actuator networks, seamless wireless connectivity, wireless broadband for utilities, ad hoc connectivity and context awareness provide basis for the automated and optimized control for power flow. The distributed management and control of the energy market require advanced real time processing capabilities.

3. Which of the identified functionalities would you expect the Future Internet core technology platform to deliver to support your and other usage area scenarios?

Secure connections for trust-to-trust communications. Dependable network solutions supporting reliable services. Context-aware sensor and actuator networks, possible wireless and ad hoc, providing measurements and control. Human-to-network interfaces through wireless devices supporting different network access technologies. Distributed services and control mechanism for handling the overall energy market.

4. What kind of experimentation environment would you consider necessary for broad large scale testing of the platform to be developed in your use area? What would be needed to experiment new services and applications cutting across use areas (services and application mash-up) and building a new services and application ecosystem around the prototype implementations of the platform?

The grand vision is to have an integrated system where the distributed control system is used for the whole power distribution chain, i.e., central and distributed energy generation, distribution and transmission networks, and demand/customer side management. The experimentation should define a set of interfaces and functionalities for users, power producers and power distributors. The large scale distributed control network for integrating these as a common energy market could be implemented as an overlay in the first phase. Later other solutions should also be considered.

5. How do you see the potential role of your organisation in the FI-PPP, in the context of Usage areas taking a prominent role in the Initiative, to ensure an appropriate application driven approach?

As a multidisciplinary research institute, VTT has expertise on ICT technologies as well as energy production and distribution. In FI-PPP, in the context of usage areas, our main role would be in implementation of network solutions supporting smart grid applications. This could include, e.g., broadband wireless for utilities, mechanisms for distributed control and secure trust -to-trust communications.