

## TECHNICAL PROGRESS REPORT FOR THE PERIOD 1.1.2002-30.6.2002 OF SOLPROS AY

WP 4 comprises two tasks: Task 1 (Financing) and Task 2 (Management and ICT). Solpros is working package coordinator and Task 2 leader. KanEnergi is responsible for Task 1 and reporting separately on its task.

During the reporting period 1.1-30.6.2002, Partner Nr 8 SOLPROS AY has carried out the following work:

### WP 4 coordination:

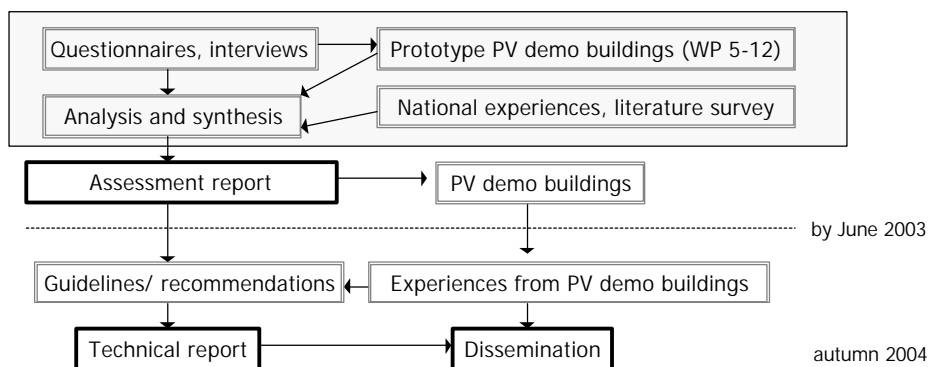
A questionnaire investigating the input-possibilities from the WP 4 participants into the two tasks was sent out and analysed. Based on the input received, it was decided that all WP4 participants will provide input to both tasks.

When starting the more detailed analysis work in the two tasks of WP4, it became clear that the questions and issues of both tasks are going to be quite different. Keeping ICT and Financing together during the detailed analysis work of both tasks would be logistically difficult and would complicate the necessary person-to person contacts necessary. Therefore it was agreed with Task 1 leader of WP4 that the two tasks proceed separately with their individual work, WP4 participants will be contacted and interviewed separately on Task 1 and Task2 issues, and task leaders check the outcomes of both tasks before next milestone.

### WP4/Task 2 (Management and ICT)

PV-NORD Task 4.2 "Management and ICT" focuses on how operation and maintenance of PV systems is solved in the demonstration buildings. Emphasis is put on ICT approaches.

The structure of Task 4.2 is illustrated in the figure below. The first phase of the Task comprises the four steps shown within the grey box. This phase is underway as planned.



In the first phase, participants of Task 4.2 will analyze participating demonstration building's qualities in management structure and use of ICT for operation monitoring; review the lessons learned on management and ICT of PV systems in their respective countries (national experiences, literature).

To accomplish these objectives, SOLPROS has prepared three review questionnaires:

- identify national information sources
- review national experiences and documents
- review the demonstration building and PV system participating in the PV-Nord

The 1-2 are mainly literature surveys and the 3 review an analysis of the PV demonstration buildings. First review is anticipated to be finished by end of June 2002, second one by end of August 2002 and the third one by the end of 2002 depending on the schedule of the demo buildings.

In addition, SOLPROS is analyzing the different ICT&Management approaches identified. The final assessment report of the state-of-the-art is planned for spring 2003 providing then recommendation to the PV demonstration buildings of the projects.

### Preliminary results

The survey indicates already at this stage that the range of possibilities for ICT and PV are ample as demonstrated by the picture below. ICT will not only mean management of PV but includes functional features that make simultaneously possible EMS & DSM, marketing, information services, home security and automation, information network services.

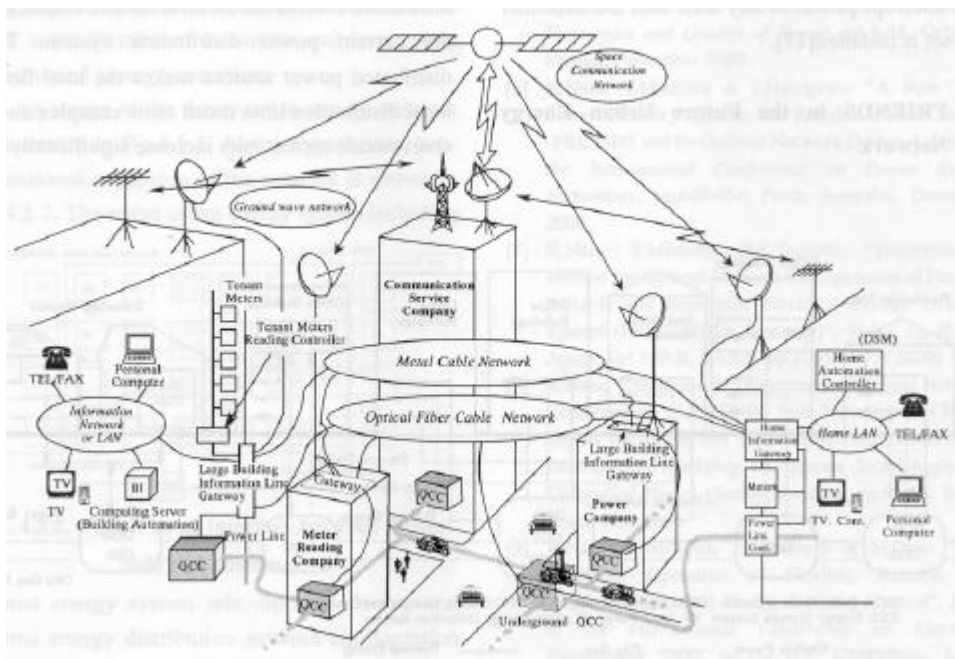


Figure : Japanese visions on the different ICT possibilities (source:CRIEPI).

The sophistication of ICT use in PV systems in Europe seems to vary quite much. In its simplest form, PV systems have only modest stand-alone measurement capabilities (e.g. datalogger or kWh meter) to verify manually the output and operation of the PV system. Advanced inverter manufactures provide as standard solutions data logging and measurement modules which can provide data on the PV system through a modem to a remote monitoring unit and even to internet. It seems that advanced building automation systems and so-called building e-infra could also offer interesting platforms for automated monitoring, diagnostic and management of the PV system but have not been utilized very much so far. Modern ICT solutions for the built environment employs extensively internet or other network possibilities.

In the analysis of PV demo buildings done so far, the NCC-Hammarby-Sjöstad in Sweden and YIT-Ekoviikki in Finland demonstrate advanced ICT approaches for PV. For example in Ekoviikki, fast 10 MHz broad bandwidth internet connections are available (optical cable) through which the building automation is easily linked to internet and www. In this way the whole building or PV management can be done off site. With proper diagnostic algorithms, the PV system could be easily, effectively and reliably monitored and managed. Typically, the ICT system has several functions at the same time and provides a range of services. The figure below shows a typical building automation and internet connection in Ekoviikki area (Skanska Valkoapila house).



Figure: I/NET LAN ICT approach for building automation and remote monitoring through internet at Skanska/Ekoviikki in Helsinki (source SOLPROS 2002).

Another example of a building ICT approach is the LON-technology which can easily be linked to different data transfer networks (Ethernet, TCP/IP, infrared, electric grid).

PV systems will be connected to the electric grid and therefore may involve the grid operator or electric utility as a partner. The utilities may have other type of ICT approaches than the building sector. For example at the PV-YIT site in Ekoviikki, Helsinki Energy will use a Tetra radio/Micro-Scada system in which the PV data is transmitted by a RF-system to a central monitoring system which in turn sends the data to internet.

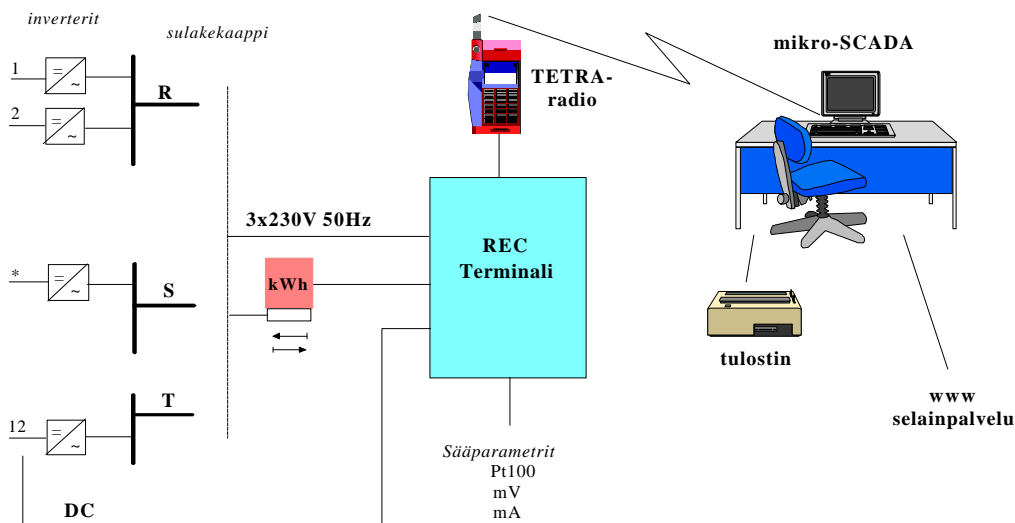


Figure: Example of utility based ICT and management approach for PV (source: Helsinki Energy).

Next steps

Task 4.2 has started and is progressing as planned. It is compiling information on ICT&Management approaches and issues for PV systems. Some indicative results have been obtained as shown above. During the next 6 months, the following work is planned:

- finish the literature survey on ICT and management
- compile the information on ICT and management approaches planned for the PV demo buildings
- continue analysis work
- communicate first experiences to the PV demo buildings yet to be built

Examples of issues to be considered in the analysis work starting in fall 2002 are the following:

- practical availability and reliability of ICT approaches
- costs of different ICT & management approaches in relation to perceived benefits
- specific needs from PV side that need to be considered and integrated to ICT
- use of existing ICT platforms (e.g. building automation) and their capabilities to handle PV versus PV specific ICT platforms

No changes in original work plan and schedule are envisioned.