SYN-Energy: The application of photovoltaic (PV) cell – energy storage combinations as power sources in consumer and professional products at both outdoor and indoor utilizations

Coordinator:
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Involved organisations:
Technische Universiteit Delft
Universiteit Utrecht
Energieonderzoek Centrum Nederland
Universiteit Twente

Program term:
2003-2009

Summary of problem definition:
The use of photo voltaic cells in the energy chain of consumer products, in both outdoor and indoor applications, has been analysed in a former NWO/SenterNovem-project. Although consumer products powered by PV cells are already on the market, the synergy pursued by these examples is not yet significant enough to force a breakthrough of this approach. The objective of this programme is to obtain more insight by testing a number of research hypothesises in indoor/outdoor experiments and in a pilot project, involving with-PV-designed electronic products and simulating a real user context. Particularly, the research should focus on the following five fields: (1) Market Potentials of products, (2) Electro-technical design of products: PV technology, energy and power management for products, (3) Environmental and life Cycle Cost of products, (4) Design and Development of integrated PV-Energy storage Media, (5) Human application and acceptance of products.
The programme can provide an important contribution in the transition towards more sustainable product systems by:

- Providing sustainable solutions to power the growing amount of mobile & wireless products both in the professional and consumer market.
- Developing a new paradigm for integral sustainable product-design, -development, and -marketing.
- Providing possibilities for sustainable (new) business development not only for the Western World but also for the developing countries.
- Providing input in curricula of Dutch Universities and International Educational Programmes.

This programme is fitting within policy formulate by the Dutch Government as stated for example in the National Environmental Policy Plan 4 (NMP4) and in the recently started transition program Advanced Energy Efficiency of the Dutch Ministry of Economic Affairs.

Subprojects:

- Electro-technical design of products and Design and Development of integrated PV-Energy storage Media, S.Y. Kan.
- Electro-technical design of products and Environmental and Life Cycle Cost Assessment of products, N.H.Reich.
- Market potentials of products, human applications and acceptance of products, B. Elzen.

Results:

- Kan, S.Y. (2006), Energy Matching – Key concepts for the design of sustainable photovoltaic powered products. PhD thesis. Technische Universiteit Delft.
- See the NWO-website for a full list op publications, www.nwo.nl/energieonderzoek