

The Sustainable Energy Challenge from an Innovation Perspective

Workshop at the oikos 20 years anniversary conference



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Workshop Organizer: Prof. Dr. Rolf Wüstenhagen, IWÖ-HSG
Workshop Reporter: Gian Schelling, oikos International

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Inputs: The Photovoltaic Solar Market and a Swiss CO2 Reduction Programme

Basic Challenges and Opportunities in the Alternative Energy sector

Prof. Dr. Wüstenhagen outlined the “magnitude of the challenge” when presenting Environmental quality and market share of alternative and conventional energy sources. Growth of renewables, ecologic upgrading of conventionals and gas, growth of gas and increasing energy efficiency on the demand side are the options for reaching climate goals like the EU’s triple 20% targets. Thereby a focus on measures which make sense both from an economic and ecologic point of view could be prioritized with building insulations or fuel efficiency increases in commercial vehicles leading the way.

Growth Opportunities and Challenges on the Supply Side of the Photovoltaic Market

Dr. Hubert A. Aulich, Board member of PV Crystalox Solar PLC lined out the importance of grid parity of photovoltaic electricity. The by far largest part of consumed energy in 2100 should be solar energy with other alternative energies accounting for smaller shares in the portfolio. But where lie the barriers between today and tomorrow? No bottle-neck should be expected even beyond 2040 due to both large availability of raw silicium and silicium intensity of the modules to be cut expectedly by 50% until 2015. The real challenge lies in production capacity of manufacturers, which must be fostered.

If the right political incentives for producers are (kept) in place, Aulich is confident that solar energy will cover a major part of national energy portfolios soon. In Germany, for example, based on the assumption of energy price increases of 7% per year and the current upscaling of photovoltaic electricity modules production with production costs expectedly decreasing by 5.2% p.a., photovoltaic electricity will be competitive with the standard energy price in 2014.

The Demand Side of the Solar Photovoltaic Market

Thomas Nordmann, Managing Director of TNC Consulting AG and advisor of different sustainable energy decision bodies of the Swiss Government lined out the importance and current status of a political support system for fostering demand for photovoltaic electricity on the Swiss market. His main point: While up-front subsidies for supporting private photovoltaic investments would not make sense from a cash-flow perspective, guaranteed prices per delivered kWh as provided in Germany and soon in Switzerland by a new, 130 MW capped feed-in tariff system, would support investors from the very beginning of the production phase and share the burden among all electricity consumers.

Energy Efficiency and CO2 Reduction in the Swiss Building Market – Experiences from the Climate Cent Foundation

After growth beyond limits has been discussed for the photovoltaic market, Thomas Nordmann started the discussion of the limits to growth by providing his input on CO2 reduction possibilities. As one possibility for cutting CO2 emissions he explained the Swiss model “Climate Cent” for internalizing external costs. Acting voluntarily before tax or other additional burdens would have to be applied for reaching the country’s Kyoto targets, the Swiss economy decided that approx. 1 €cent per imported liter of Gasoline and Diesel is now charged to reduce CO2 emissions for saving min. 8 Mio. tons of CO2 emissions between 2008 and 2012. The thus funded budget is spent, among others, by the foundations’ building programme. It covers 10% of insulation renovation costs. Compared to its goals, the building programme has underperformed 17%. It is questionable if 10% of support are attractive enough given that there are larger incentives provided on both national and community level.

Outcome: Most Pressing Questions to be Explored by Social Science Research Programmes

During, between and after the input sessions described above, all workshop participants raised and discussed open questions to be answered when aiming for CO2 reductions through price-competitiveness of photovoltaic solar energy or means like the “Climate Cent”:

On which market maturity level should legal obligations be applied?

- Legal obligations after 16% (pioneers and opinion leaders), 50% (early adaptors) or 84% (late majority) of the demand-side have been covered through free market mechanisms?
- In which situations are obligations (“sticks”) or incentives (“carrots”) appropriate for fostering CO2 reductions?
- In case sticks are applied: Shall only objectives be communicated which then must be to fulfilled or should means to reach the obligations be made obligatory, too?
- Cost-Benefit analyses of obligations?
- How large must incentives be to work effectively?

What effects do modifications of feed-in tariff laws have on the market?

- Do MW caps for provided feed-in tariffs or similar means cause stop- and go-effects on the market and if yes: how do market participants react?
- Cost-benefit analysis of Germany’s EEG feed-in tariff model if it would be adapted in Switzerland, too?
- International Solar firms behaviour and arbitrage in national markets?

Behavioral Finance and the Swiss Climate Foundation’s building programme

- How does the real climate cent value for investors relate to the support by Swiss cantons or national tax incentives for building renovators?
- How can the perceived value of support by the Foundation Climate Cent be increased?
- Effectiveness of political vs. private support for renewables?

How can the Swiss photovoltaic sector be transformed to an economic self-runner?

- How can we reach grid-parity?
- Long-term incentives vs. stop- and go- legislation (e.g. by capping MW size supported)?
- Is Swiss support for the Swiss photovoltaic market important or will foreign support systems like Germany’s EEG develop the sector in Switzerland?
- How does Switzerland’s renewable energy policy affect the development of the Swiss economy as a whole?