Summary

Conclusions PV Focus Group Meeting

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Barcelona, September 26, 2011

Conclusions PV Focus Group Meeting

The "Green Paper" for PV systems, developed in cooperation with TTA, formulates two different scenarios, which have been developed to guide discussions. This "Green Paper" served as the main input to a focus group meeting of PV sector stakeholders in the Barcelona region on September 26, 2011. Participants at this meeting represented CINERGIA, LAVOLA, SOLARTYS, Temposolar, Catalonia Engineering Solutions, TTA and Simpple. The meeting took place at ACC1Ó premises in Barcelona and was organised by project partner TTA, moderated jointly by Karsten Schischke, Fraunhofer IZM and Maria Anzizu and Pol Arranz, TTA and with a introductory presentation on LCA by Julio Rodrigo, Simpple. This meeting informed the needs assessment of LCA to go. Key scenarios for data needs have been presented and where discussed by the participants in a workshop.

The following excerpt from Deliverable 1.1 of LCA to go outlines the Green Paper for the PV sector as a result of bilateral discussions with TTA, and complements the variants developed with an assessment by the PV focus group (outcome of the Barcelona workshop in *italics*).

Scenario 1: Environmental Label for Photovoltaic systems

A joint environmental label (environmental product declaration) scheme for the PV sector could serve as verified quality label.

The label could enable different levels of information:

- **quick comparative reference (such as LEED certification or energy class colour code, A++ to G, but potentially addressing the full product life cycle, not energy efficiency only)**
- **basic benchmark indicators (e.g. CO2 emission per kW inverter)**
- **more detailed information on specific environmental impacts (Life cycle assessment: various environmental impacts for each of the life cycle stages production / installation / use / disposal)**

The participants of the Focus Group Meeting rated these options as follows (one dot per reply):

levels of information:	*strong interest*	*moderate interest*	*not needed*
a) quick comparative reference	●●●●●		●●

b) basic benchmark indicators	●●●●● ●●
c) more detailed information on specific environmental impacts	●●● ●●●●

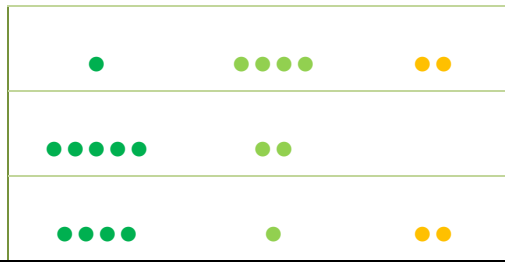
Products / systems bearing this label can be clearly distinguished from other, non-label bearing, presumably lower-quality products. Convincing, independently verified and transparent facts about the quality of your products and the lowest environmental impact can be used directly for marketing purposes.

Such an environmental label could cover either

a) Complete PV installation projects (label is granted for each project individually; similarly to the certification of buildings, such as LEED)
    a. for newly installed system (label granted at the time of installation)
    b. at regular maintenance (label renewed regularly based on technical inspection and maintenance measures undertaken)
b) Complete PV systems (label is granted for a system, label could be displayed e.g. in a product catalogue)
c) Components:
    a. PV module
    b. PV power conditioning assembly (inverter and charge controller)
    c. Batteries
    d. Data logging

The participants of the Focus Group Meeting rated these options as follows (one dot per reply):

Coverage	*strong interest*	*moderate interest*	*not needed*
a) PV installation projects			
a. Newly installed systems	●●●●●●●		
b. At regular maintenance	●●		●●●●●
b) PV systems			

a. Larger systems	
b. Smaller turn-key kits	
c) Components	

A new idea was raised at the discussions of comparing a PV system with alternative energy systems. Actually, a payback calculator as outlined as the second scenario below would calculate the effect of replaced conventional electricity from the grid.

A further distinction was deemed necessary and thus included in the above ratings: Whereas for larger PV systems the feasibility of a labeling was questioned as these systems are mostly customized and are rarely offered in a standard configuration, an a priori labeling might not be possible. However for smaller "turn-key kits", i.e. pre-configurated smaller systems a labeling would make much sense, according to the participants of the focus group meeting.

Development of the label criteria needs a joint effort of several manufacturers (type of voluntary agreement), ideally coordinated by an association. Certain level of market coverage is essential for acceptance.

Label criteria should comprise an environmental assessment of your products (manufacturing phase).

Upstream process data (component production) could be based either on

a) **real supplier data (up to a certain tier or for most relevant components) and/or**
b) **generic (parameterised) datasets**

The participants of the Focus Group Meeting rated these options as follows (one dot per reply):

Upstream process data	
a) real supplier data strongly favoured	
b) real supplier data nice to have	
c) generic datasets	-

Although finally a clear interest in real supplier data was stated in the end by most participants the points were raised in the discussion, that data acquisition might be not supported by the suppliers and that for some components (e.g. PV cells) the number of suppliers is very limited, and components largely standardized thus a distinction might not be required. The proposal was made to start with an

analysis based on generic data and to complement this generic database with real supplier data as it becomes available.

In analogy to labeling / certification in the building sector an approach was proposed to start the assessment in the planning phase with a simulation and later on to verify the simulation based on real data once the project is realized.

Real supplier data either could be entered

- **into the webtool directly by the supplier – which means, data is disclosed publicly, or**
- **by the downstream company, based on inquiries made among his specific supplier(s) (anonymous data handling in the webtool possible)**

Generic or default data should be used preferably only for components / sub-assemblies of minor relevancy.

Generic data could be extracted from the comprehensive literature on PV Life Cycle Assessments and provided as standard database within the webtool.

For the use phase the label should cover

a) **output, and efficiency**
b) **reliability criteria**

In case the Environmental Product Declaration (EPD) is intended for components and/or systems, but not a given installation project, for the use phase only some technical parameters (e.g. efficiency, reliability data) or a basic, standardised use scenario will be provided, but not the calculation of a given installation project.

A reference scenario (e.g. time period 20 years, normalised metrics including level of solar radiation, etc) needs to be defined in a broader consensus seeking process.

The environmental assessment will be based on the webtool to be developed.

The Environmental Product Declaration can be generated directly from the webtool.

Third party verification of the Environmental Product Declaration (if required) will not be an integral part of the webtool.

Confronted with the latter statement the participants of the Focus Group Meeting replied as follows (one dot per reply):

"Third party verification will not be an integral part of the webtool"	

a) agreed	-
b) agreed, but webtool should facilitate third party verification	●●●●●
c) certification should be an integral part	●●

Scenario 2: Determination of the energy payback time or Net Energy Gain (NEG) of photovoltaic systems

The energy delivered by a photovoltaic system can be compared with the energy invested in production of the PV system in two ways:

a) energy payback time
b) Greenhouse Gas Emissions (CO2) payback time
c) payback time of other environmental impacts (acidification, waste generation or similar)
d) Net Energy Gain (NEG)
e) Net Greenhouse Gas Emissions (CO2) Reduction
f) Net reduction of other environmental impacts (acidification, waste generation or similar)

The participants of the Focus Group Meeting rated these options as follows (one dot per reply):

Indicator	*strong interest*	*moderate interest*	*not needed*
a) energy payback time	●●●●●●●		
b) Greenhouse Gas Emissions (CO2) payback time	●●●●●●●		
c) payback time of other environmental impacts	●●●	●●●	●
d) Net Energy Gain (NEG)	●●●●●●●		
e) Net Greenhouse Gas Emissions (CO2) Reduction	●●●●●●●		
f) Net reduction of other environmental impacts	●●●	●●●	●

Based on these discussions a clear preference can be given to energy and carbon footprint aspects, other environmental aspects should be covered only if they do not add much to the complexity of the analysis.

These indicators are suitable for:

a) optimised planning of a PV project (user of the webtool: Engineering contractor)
    a. (internal) planning tool only
    b. documentation tool to demonstrate environmental performance of the project (e.g. meeting World Bank tender requirements, qualification for CDM projects)
b) supplier selection, if differences in production efforts are taken into account (user of the webtool: Engineering contractor)
c) pre-screening for e.g. private households, to be guided towards suitable systems (user of the webtool: end-user of the PV system); less accuracy of the data required, as a rough guidance is intended only

The participants of the Focus Group Meeting rated these options as follows (one dot per reply):

Purpose	*strong interest*	*moderate interest*	*not needed*
a) optimised planning of a PV project			
• *(internal) planning tool*	●●●●●●●		
• *(external) documentation tool*	●●●●●●●		
b) supplier selection	●●●●●●●		
c) pre-screening for e.g. private households	●●●●●●	●	

The fact, that all proposed purposes got a similar high level of interest adds potentially to the complexity of the approach, as a multitude of interests has to be addressed. This involves the risk of developing a comprehensive LCA tool, which is open to guide in several decision support situations. Inevitably, LCA to go has to select appropriate purposes to be served to meet the objective of an easy-to-use tool.

This approach assesses a concrete PV installation project, which could be

a) grid-connected and/or
b) stand-alone

There are numerous commercial and freely available planning tools on the market (such as RETScreen); the "LCA to go" webtool needs to serve a complementary purpose, not duplicate already existing tools.

The webtool needs to consider multiple parameters (tentatively):

- different cell types (Monocrystalline silicon / Polycrystalline silicon / Amorphous silicon)
- production of components (inverters, batteries)
- transportation to the place of installation
- expected lifetime
- efficiency of the PV system (cell, power electronics, battery)
- grid power replaced (Greenhouse Gas Emissions of replaced grid power)
- degradation of the cell
- radiation at the place of installation
- repair / maintenance efforts over lifetime
- decommissioning at end-of-life
- ...

Advantage of the payback calculation is the circumstance, that speculative lifetime statements are not needed as long as it is likely that payback time is shorter than lifetime; the NEG approach incentivises systems with a longer (anticipated) lifetime.

Calculation could include also costs (or be linked to any cost calculation tool), as this increases acceptance of the tool.

Confronted with the latter idea the participants of the Focus Group Meeting replied as follows (one dot per reply):

"Calculation could include also costs"	
a) agreed, should be directly included	●●●
b) agreed, but link / interface to another tool is sufficient	●●●●
c) not needed, as costs are already calculated separately	-

Finally, the participants of the Focus Group Meeting gave their impression whether scenario 1 or 2 or a combination of both is the most appealing approach: As there is a lot of interest in both scenarios, no clear preference was stated and a combination of both is favored.