Wilfried van Sark, J Fundam Renewable Energy Appl 2017, 7:5 (Suppl)
DOI: 10.4172/2090-4541-C1-031

International Conference on
RENEWABLE ENERGY AND RESOURCES
July 24-25, 2017 Vancouver, Canada

Wilfried van Sark

Utrecht University, Netherlands

Smart solar charging to support widespread deployment of photovoltaic systems and electric mobility

Statement of the Problem: The transition to low carbon energy and transport systems requires not only the large-scale adoption of clean technologies and efficiency measures, but also new energy management strategies to efficiently incorporate these innovations. Grid integration of supply side technologies such as photovoltaics (PV) and demand side ones such as electric vehicles (EV) requires proper strategies for energy management. Smart solar charging using vehicle to grid (V2G) technology is a key element in matching supply and demand on a local level. Optimization of self-consumption and self-sufficiency would lead to lower stress levels on the local distributions grid.

Methodology & Theoretical Orientation: The smart solar charging concept has been pioneered in Utrecht and now will be extended in other pilot areas with different demographic characteristics. Analysis of PV generation and EV charging behavior will be combined with algorithm development, in order to optimize self-consumption and self-sufficiency.

Findings: Increased self-consumption of PV can be reached only if car use agendas are known in combination with perfect solar forecasting.

Conclusion & Significance: Smart solar charging has benefits in many ways: More EVs powered with clean energy, better local air quality, increased social cohesion due to the sharing aspect, lower amount of cars in the streets. Investment in local grid extension can be postponed, leading to economical benefits for distribution system operators and consumers.

Biography

Wilfried van Sark is an Associate Professor at the Copernicus Institute of Utrecht University, Netherlands. He has over 30 years of experience in the field of photovoltaics, ranging from thin film silicon and III-V solar cell experimental and modeling development and testing to solar cell processing development, outdoor and indoor performance of solar cells, policy and cost development. His current activities focus on employing spectrum conversion (down/up conversion) using nanocrystals to increase solar cell conversion efficiency for next-generation photovoltaic energy converters as well as performance analysis of (BI)PV systems in the field, in particular linked to the development of smart grid systems in the built environment.

w.g.j.h.m.vansark@uu.nl

Notes: