

Development of a big data bank for PV monitoring data, analysis and simulation in COST Action 'PEARL PV'

Angele Reinders^a, Fjodor van Slooten^a, David Moser^b, Wilfried Van Sark^c, Gernot Oreski^d, Bettina Ottersboeck^d, Nicola Pearsall^e, Mirjana Devetaković^f, Jonathan Leloux^g, Dijana Capeska Bogatinoska^h, Christian Braunⁱ, Anne Gerd Imenes^j, Anton Driesse^k

a) ARISE, University of Twente, Enschede, 7500AE, The Netherlands, b) Institute for Renewable Energy, EURAC, Bolzano, 39100, Italy, c) Copernicus Institute of Sustainable Development, Utrecht University, Utrecht, 3584 CB, The Netherlands, d) Polymer Competence Center Leoben GmbH, Leoben, A-8700, Austria, e) NPAG, Northumbria University, Newcastle upon Tyne, NE1 8ST, UK, f) University of Belgrade, Faculty of Architecture, Belgrade, 11000, Serbia, g) Polytechnic University of Madrid, Madrid, 28040, Spain, h) University of Information Science and Technology "St. Paul the Apostle", Ohrid, 6000, Macedonia, i) Fraunhofer Institute for Solar Energy Systems ISE, Freiburg, 79110, Germany, j) University of Agder, Grimstad, 4879, Norway, k) PV Performance Labs, Freiburg, 79110, Germany

Introduction

COST Action entitled PEARL PV aims at analyzing data of monitored PV systems installed all over Europe to quantitatively evaluate the long-term performance and reliability of these PV systems. For this purpose, a data bank is being implemented that can contain vast amounts of data, which will enable systematic performance analyses in combination with simulations. This paper presents the development process of this data bank.

Aims

PEARL-PV aims to increase performance and lower costs of electricity produced by photovoltaic (PV) solar electricity systems in Europe via: (i) obtaining higher energy yields, (ii) achieving longer operational life time (beyond the 20 years usually guaranteed by manufacturers), and (iii) lowering the perceived investment risk in PV projects. To this end five working groups are active, see Fig. 1.

Databank considerations

- Main users will be researchers
- A major decision factor from the user point of view: data do not have to be of a uniform format, which helps to lower the barrier for contributors
- expected data size will be approximately 4TB to be used by 200-500 users from more than 30 European countries
- data uploads must be accompanied with meta-data
- search functionality, also on metadata

Databank choice

- CKAN platform, see www.ckan.org
- Proof-of-concept made and tested (Fig. 2)
- Meta-data defined
- Server purchased and installed
- URL: ckan.pearl-pv-cost.eu
- Participation after signed NDA

Key research questions

- WG1: how does PV performance vary over Europe?
- WG2: which data is relevant to measure reliability and durability of PV systems?
- WG3: which models do best predict and assess PV performance?
- WG4: how to link performance data with BIPV system design and 3D surroundings?
- WG5: how to best integrate PV considering smart grid systems and forecasting?

Conclusions

- Data bank potentially holding large amount of PV performance data has been realized
- Without proper data, PV performance and reliability cannot be assessed

PLEASE DONATE DATA to bring PV performance understanding further

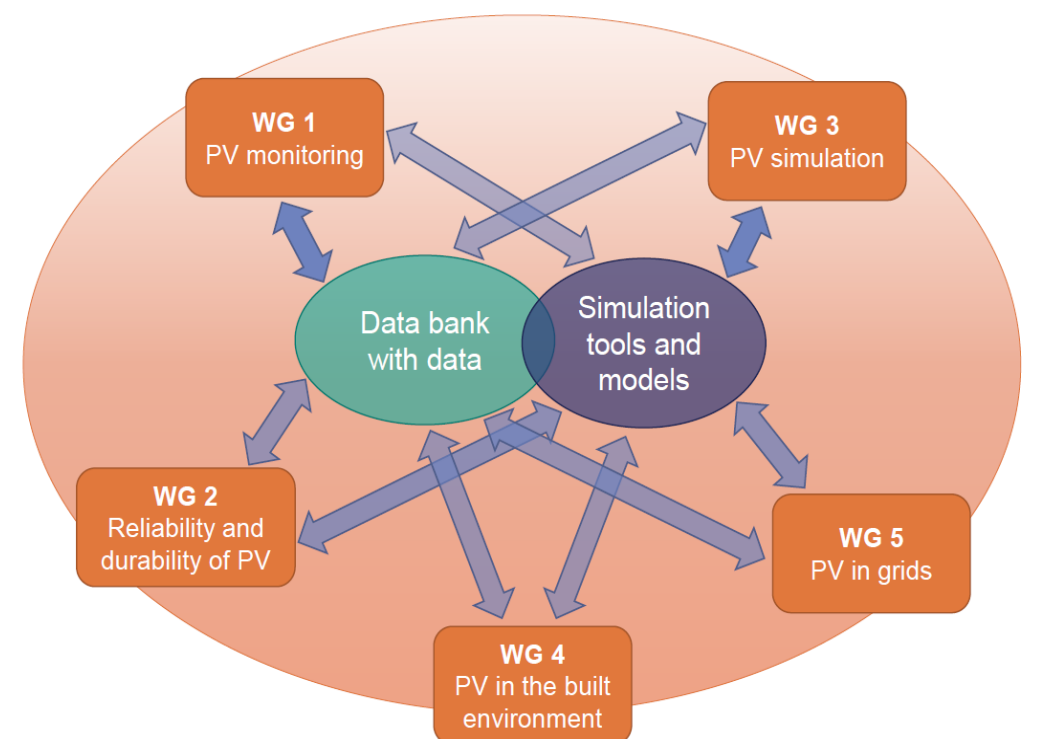


Figure 1: The 5 Working Groups of COST Action PEARL-PV in relation to the shared data bank and simulation tools.

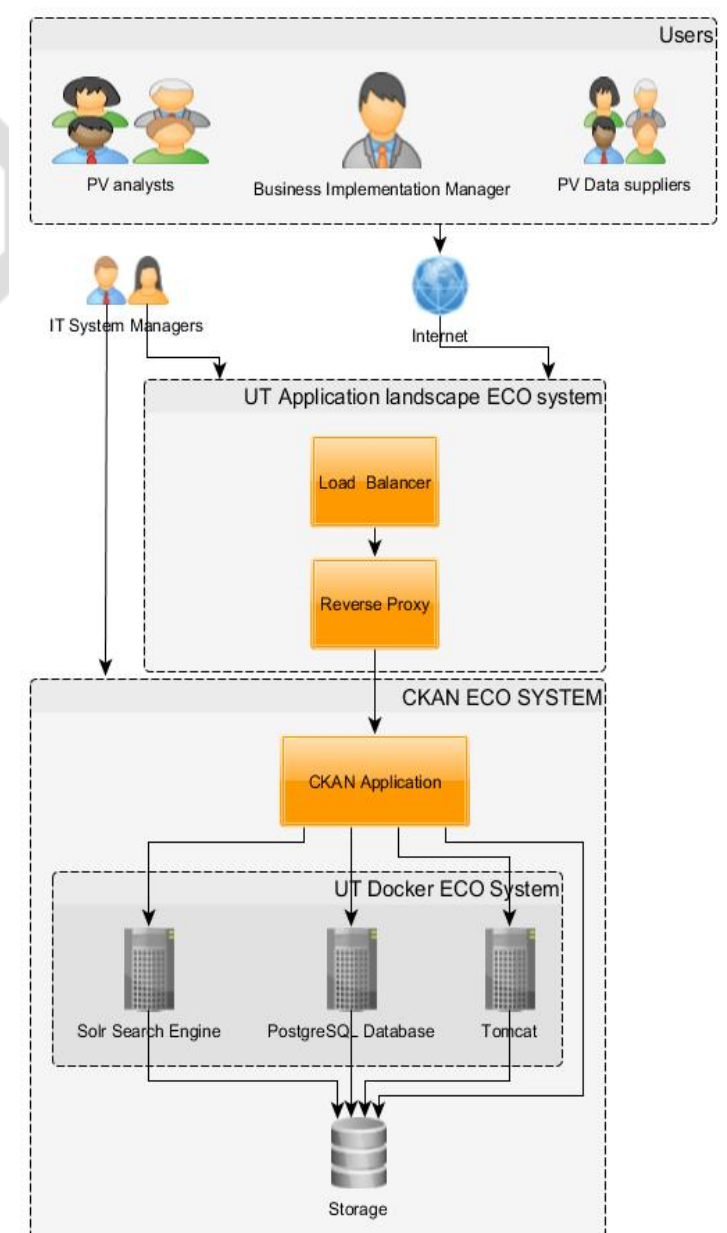


Figure 2: Data bank structure using a CKAN Eco System.

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Contact

Angele Reinders at a.h.m.e.reinders@utwente.nl

Wilfried van Sark at w.g.j.h.m.vansark@uu.nl

www.pearl-pv-cost.eu and www.cost.eu/COST_Actions/ca/CA16235