IEA PVPS

Activities in Task 12 and beyond

R. Frischknecht

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Technology Collaboration Programme by iea

Task 12 activities, state October 2021

Subtask	Description	
1	Recycling and end-of-life management of PV Systems	
1.1	LCA-TEA of current generation recycling	ongoing
1.2	Lessons from e-waste management	completed
1.3	End-of-life decision support tool	ongoing
2	Life cycle assessment	
2.1	Update of the methodological LCA guidelines on Photovoltaic Electricity (4th / 5th edition)	completed
2.2	Net energy analysis methodological guidelines (2nd edition)	completed
2.3	Primary Mineral Resource intensity of PV	under ExCo review
2.4	Web service on environmental assessment of PV (version 2 / 3)	on hold
2.5	LCA of PV with storage	completed
2.6	LCA of recycling technologies	ongoing
2.7	LCI data and report (2 updates)	completed/ongoing
2.8	Factsheet on Environmental LCA of PV Electricity	completed/ongoing
2.9	LCA of PERC technology	started/ongoing
2.10	Carbon footprint of floating solar systems compared to land-based solar systems	started/ongoing
2.11	Review of metals supply chain criticalities	started/ongoing
3	Broader sustainability topics	
3.1	Quantifying Social and Economic Aspects of PV	completed (interim rep.)
3.2	human health risk assessment methods for PV	completed
3.3	PV sustainability standards	started/ongoing

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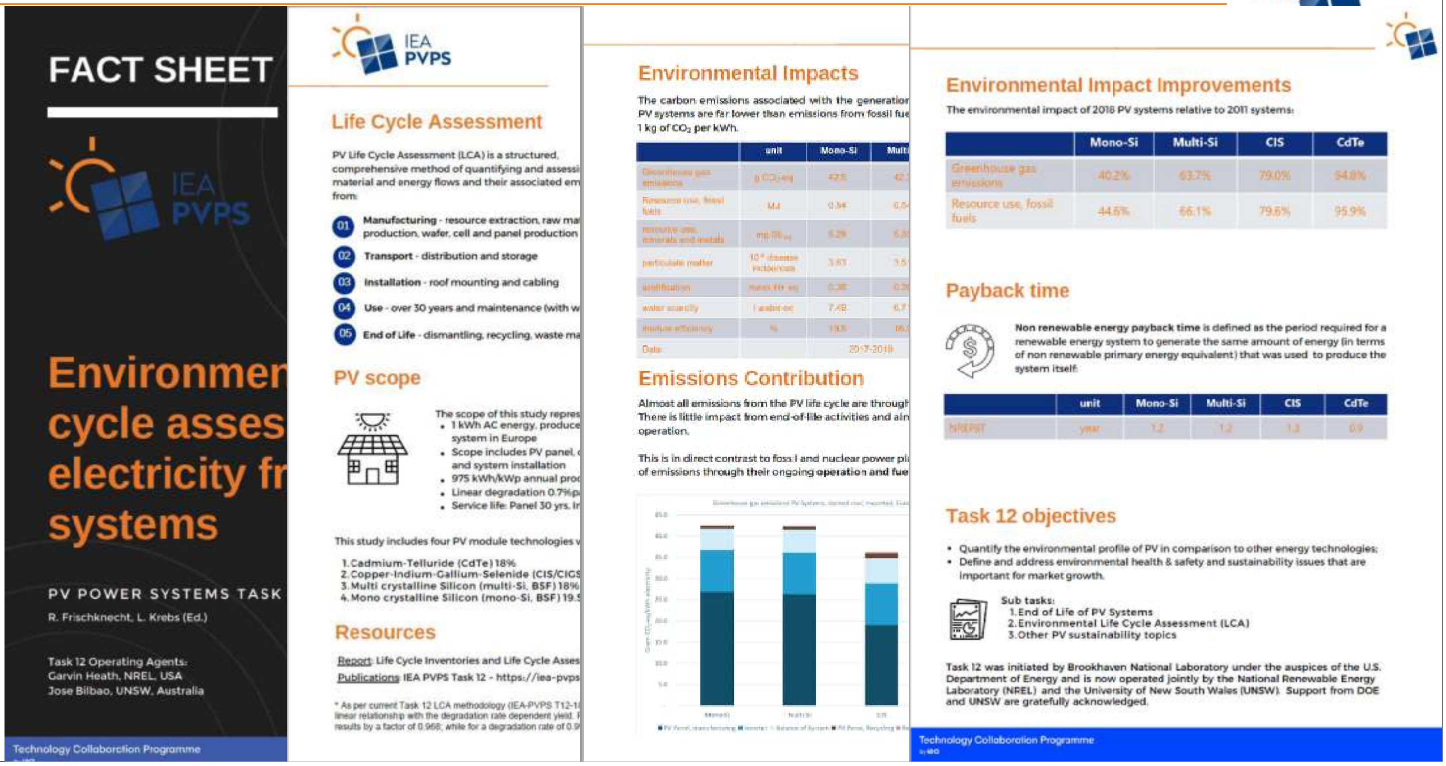
Life cycle based resource use of PV electricity



Life cycle based Resource Use of PV electricity

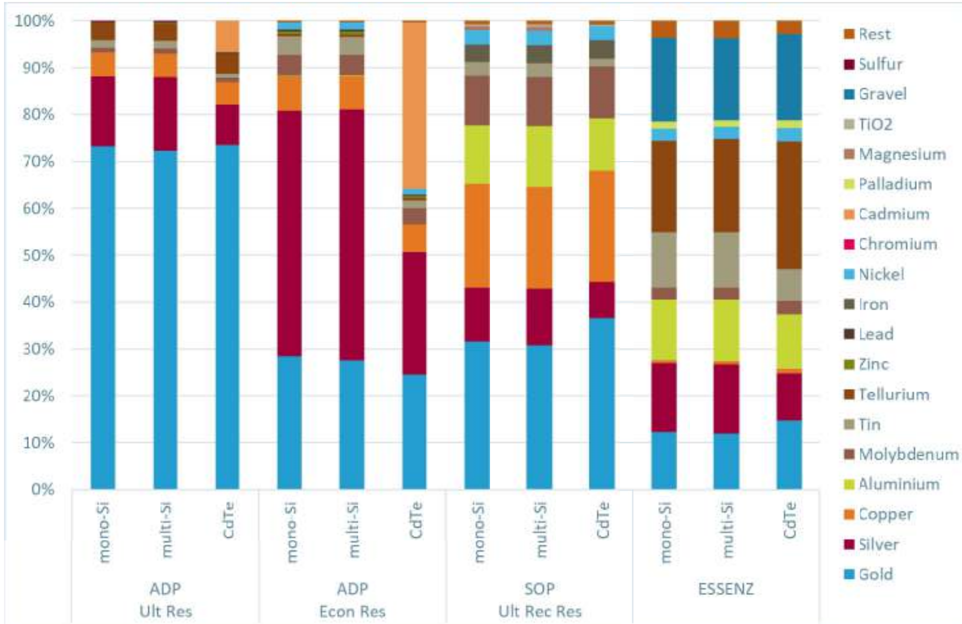
- Goal and Scope
  - Assess life cycle based resource use impacts of PV electricity
  - 1 kWh PV electricity, produced with residential scale PV system installed on a pitched roof in Europe
  - Panel technologies: crystalline Silicon (mono, multi), CdTe
  - Cradle to grave (resource extraction, panel manufacture, operation, end of life)
- Indicators:
  - *Abiotic Resource Depletion Potential, ultimate reserves* (recommended): relative contribution to the depletion of resources.
  - *Abiotic Resource Depletion Potential, economic reserves* (suggested): potential resource availability issues related to resource scarcity.
  - *Surplus Ore Potential* (interim recommended): relative consequences of the contribution to changing resource quality.
  - *ESSENZ* (integrated method to assess resource efficiency; interim recommended): potential resource accessibility issues related to short-term geopolitical and socio-economic aspects.

Resource use of PV electricity: main contributing metals and minerals

Relative contribution of different metals and minerals to the resource use impacts of 1kWh PV electricity, quanti¬fied with the Abiotic Depletion Potential (ADP), ultimate reserves, the Abiotic Depletion Potential (ADP), economic reserves, the Surplus Ore Potential (SOP) and the resource criticality indicator ESSENZ, per kWh AC electricity produced with residential scale PV systems operated in central Europe;

Characteristics of the PV system:

residential scale, pitched roof; average annual yield over lifetime: 975 kWh/kWp (incl. degradation);
Lifetime:
panel: 30 years;
inverter: 15 years.



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Swiss research project: Active glass façades

Stolz P., Krebs L., Frischknecht R., Urena Hunziker D. and Muntwyler U. (2021) Life Cycle Assessment of Active Glass Façades. Commissioned by the Federal Office for the Environment (FOEN), the Federal Office of Energy (SFOE) and the City of Zurich, Office of Building Construction (AHB), Uster and Burgdorf, Switzerland.

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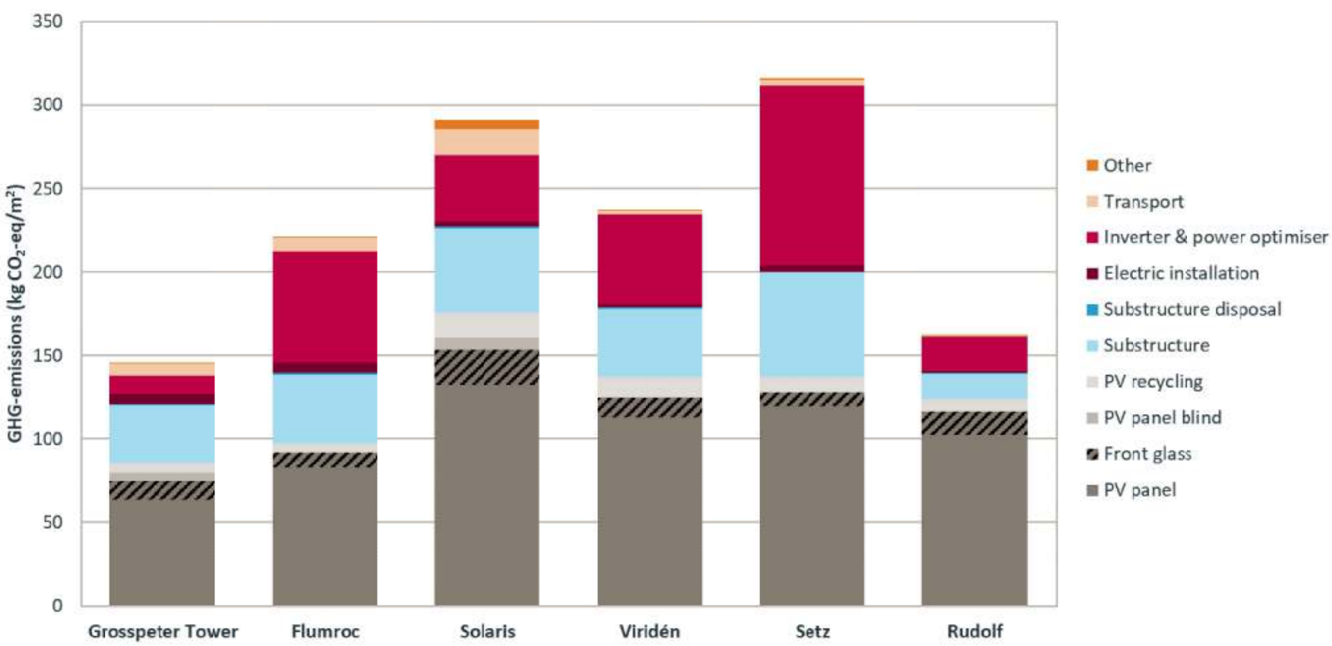
Goal and scope

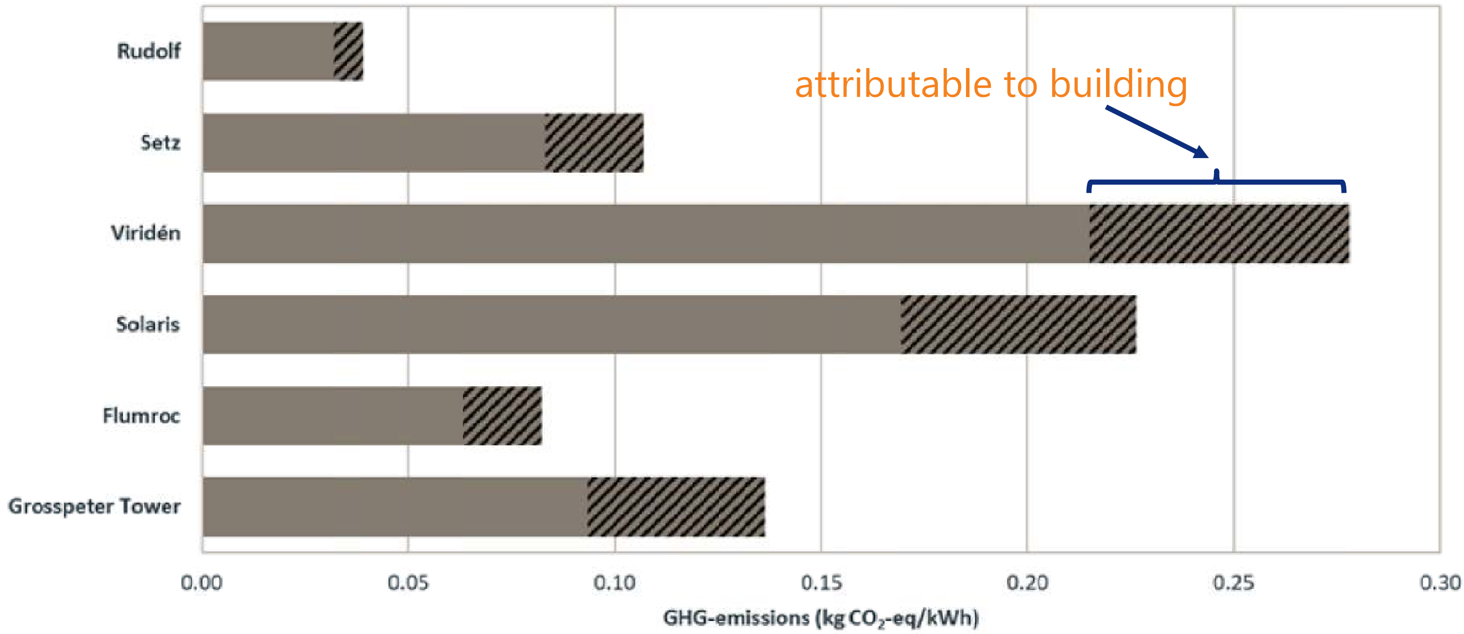
- Quantify the envireonmental impacts of active glass façades and roofs of 6 buildings and of 8 façade systems
- Reference unit: m^2 façade and kWh AC electricity (building case studies only)
- System boundary includes (*: considered in building case studies only)
  - Panel
  - Supporting structure
  - Cabling*
  - Inverter*
  - Power optimisers*
- Allocation
  - Building: panel front glass, supporting structure
  - PV electricity: panel (except front glass), cabling, inverters, power optimisers

Buildings: Greenhouse gas emissions per m^2 glass façade



Stolz et al. (2021)

Buildings: Greenhouse gas emissions per kWh electricity



Stolz et al. (2021)

Façade systems: Greenhouse gas emissions per m² glass façade