

KEY MESSAGES FRAUNHOFER ISE

Manufacturing and labour in PV



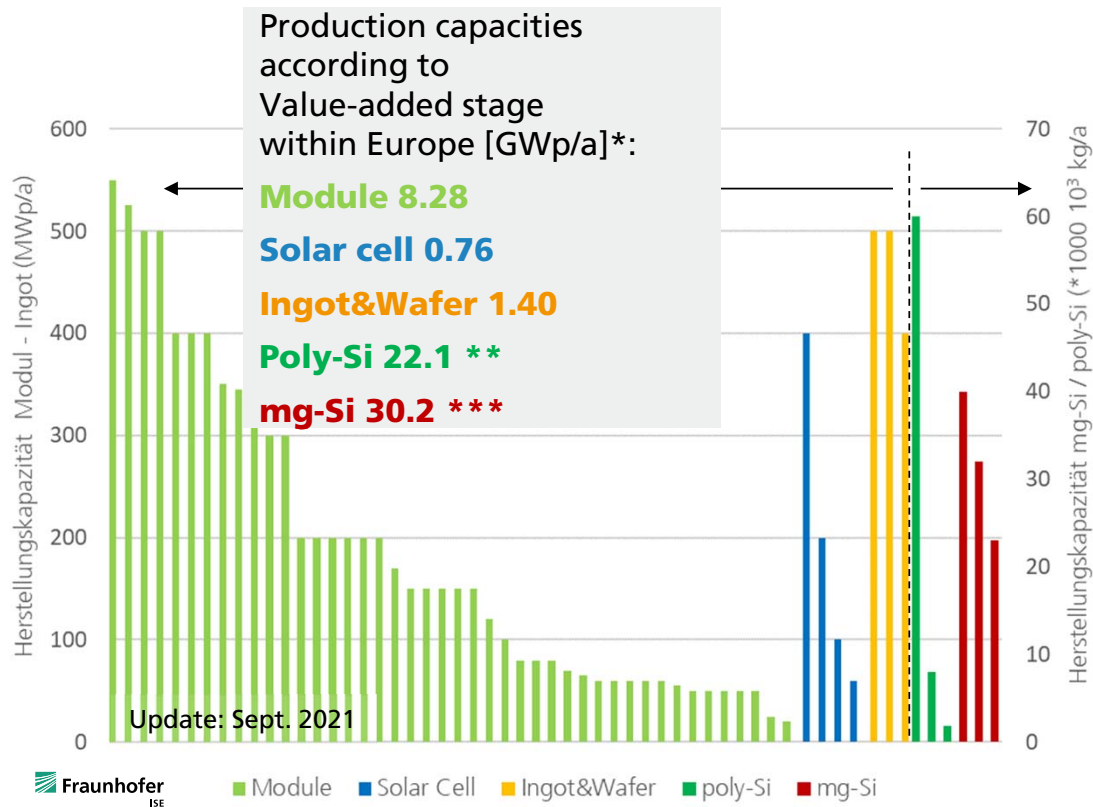
ESMC/EU Commission workshop

Ralf Preu

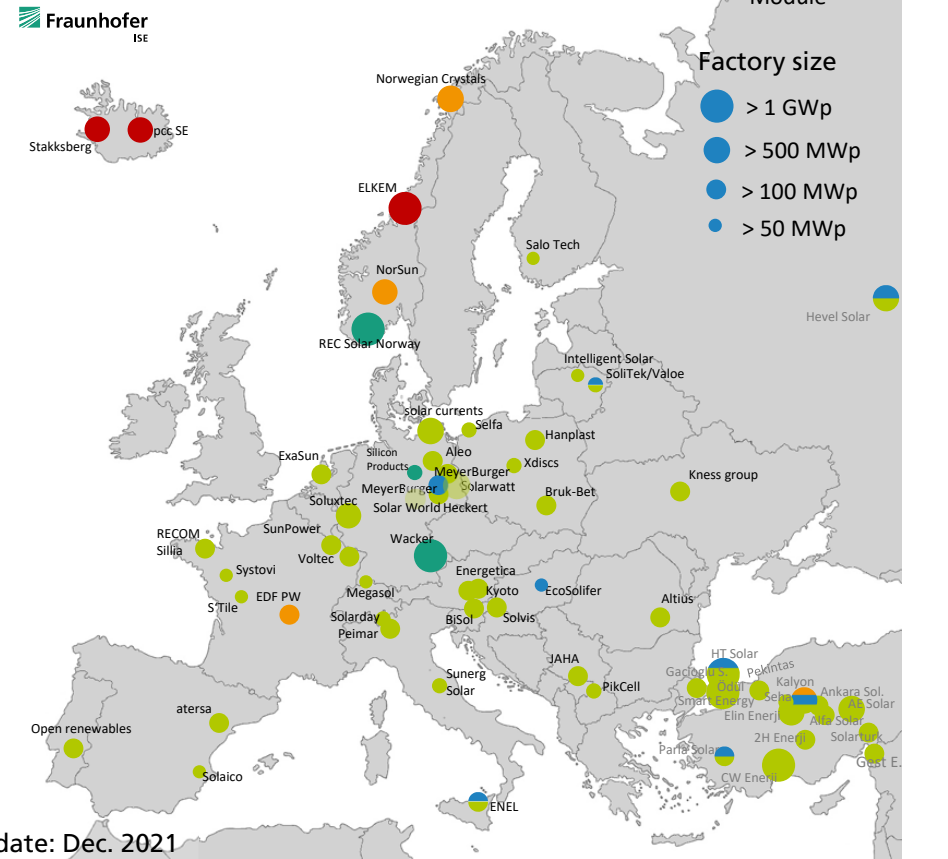
14.3.2022

Status Quo - PV Production

Overview of PV Production along the Value Chain

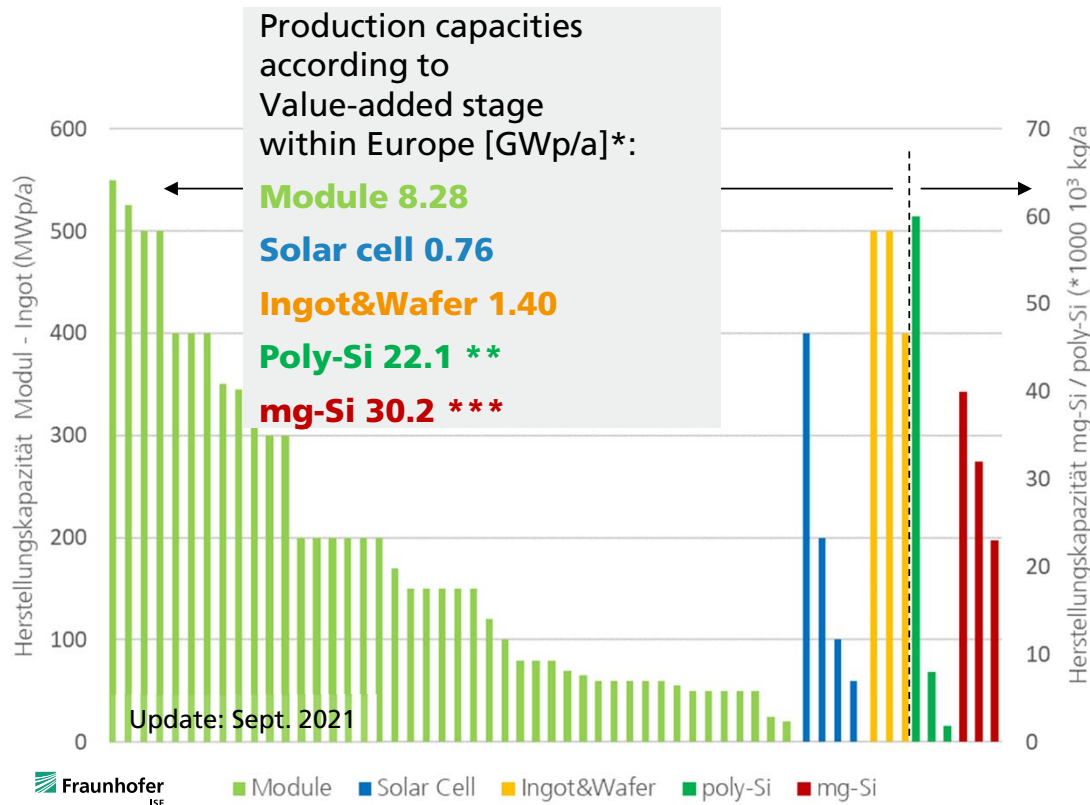


Source: Map material: kartoxjm (fotolia) / europakarte.org

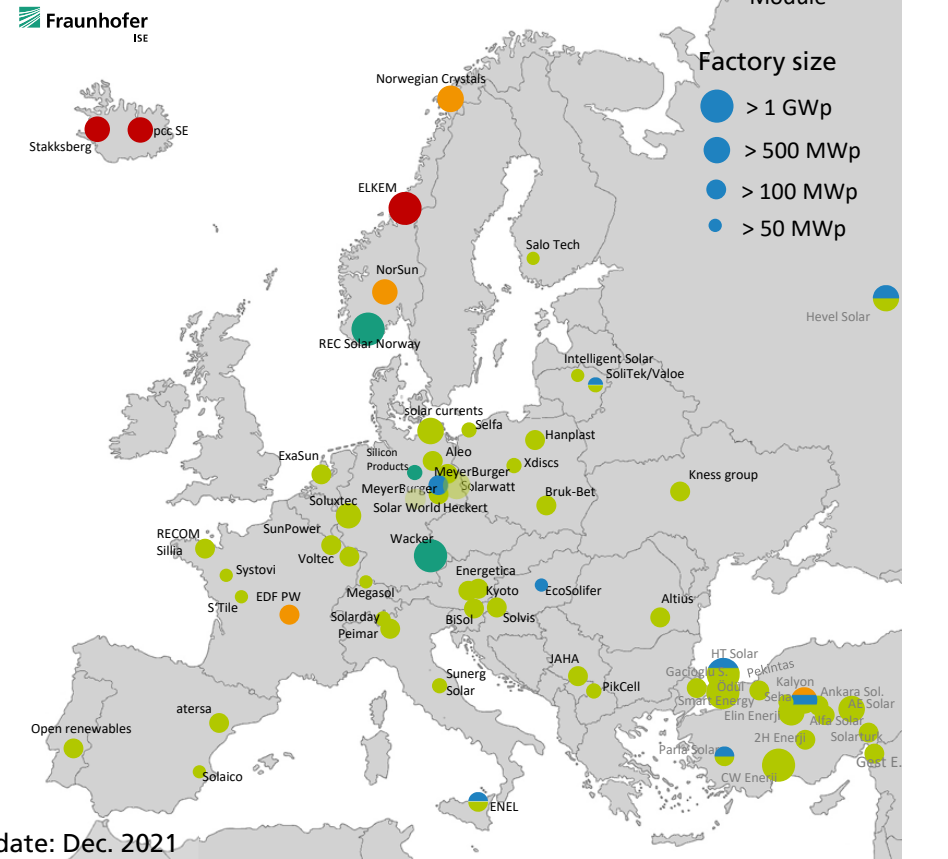


Status Quo - PV Production

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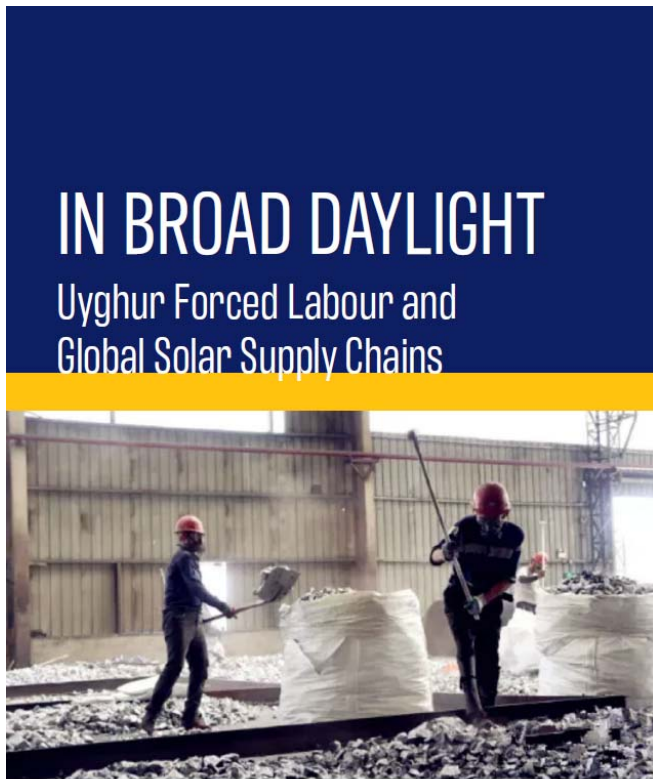


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Introduction – Human rights in PV

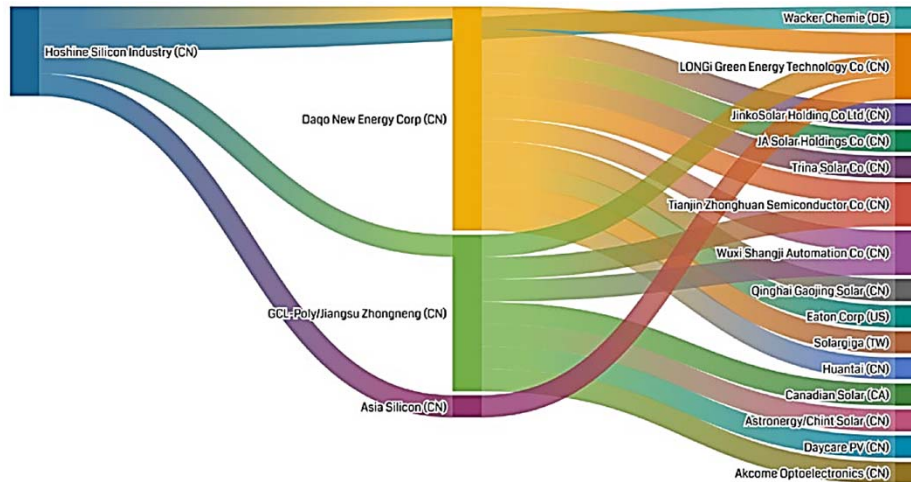
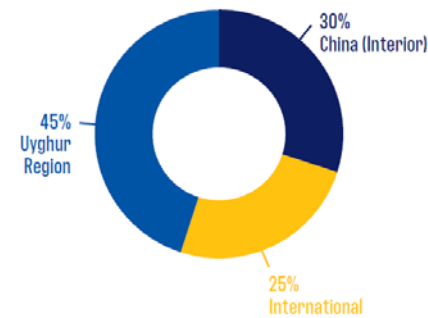
Evidences of Global Scale Ramifications



LAURA T. MURPHY & NYROLA ELIMÄ

Sheffield Hallam University
Helena Kennedy Centre for International Justice

2020 Polysilicon Market Share



1. Raw Materials



2. Polysilicon



3. Ingots



4. Wafers

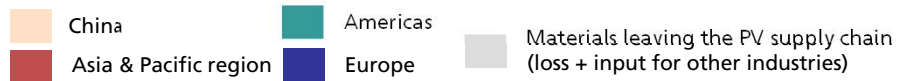
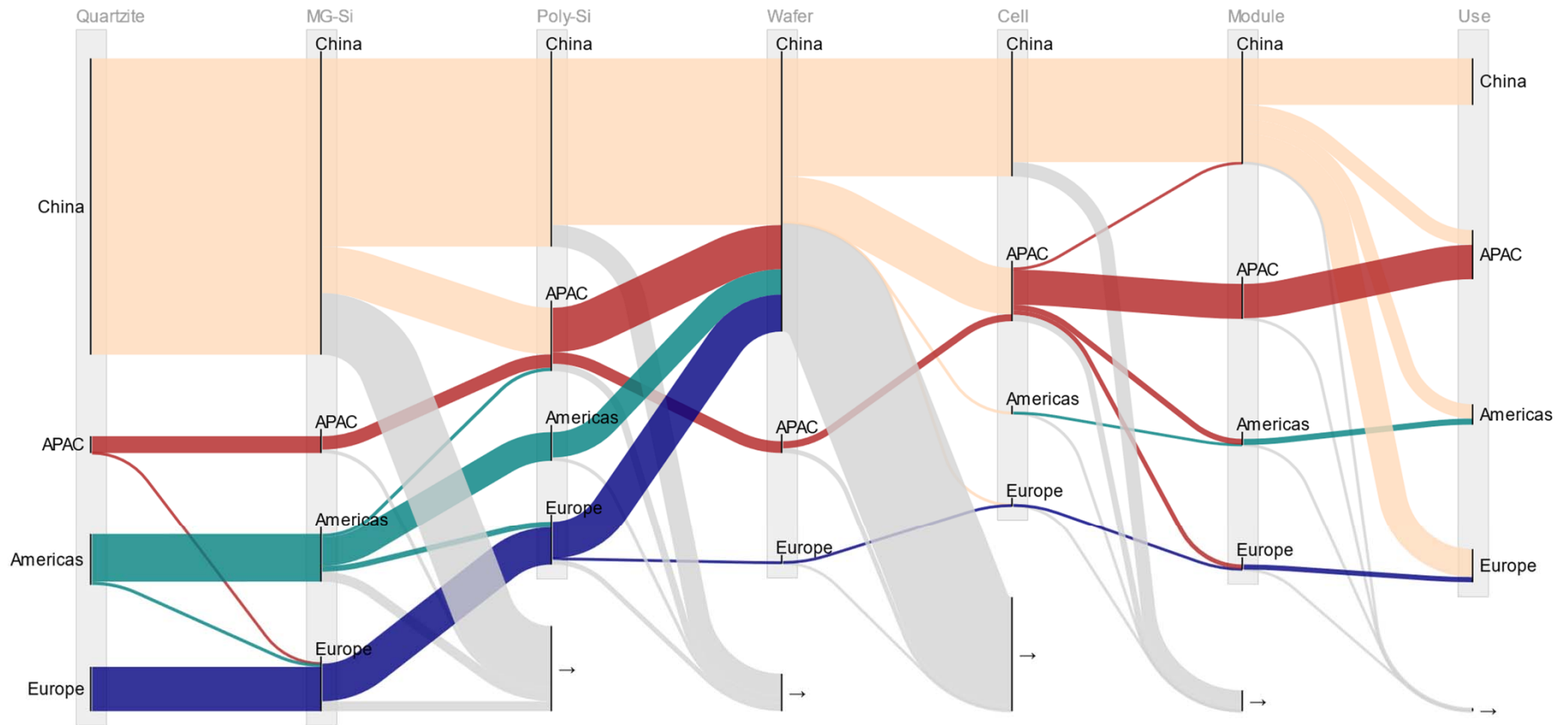


5. Cells

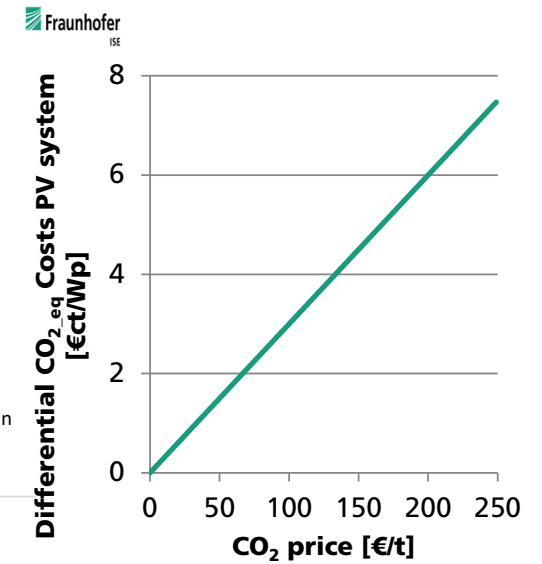
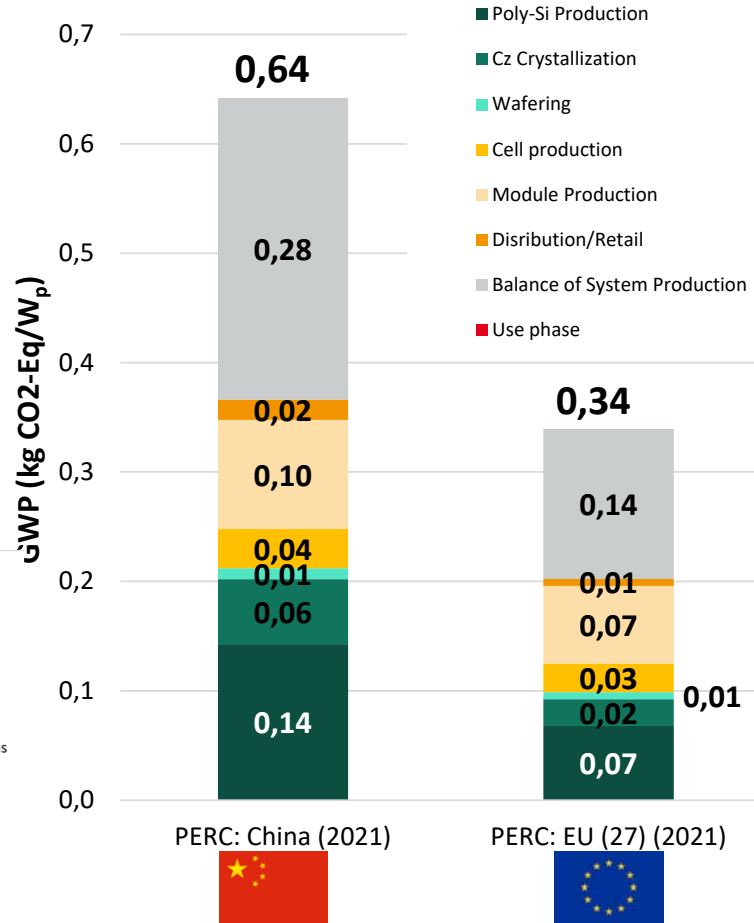
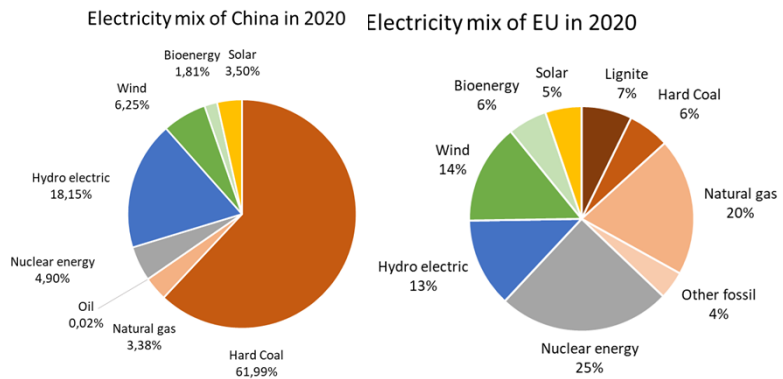
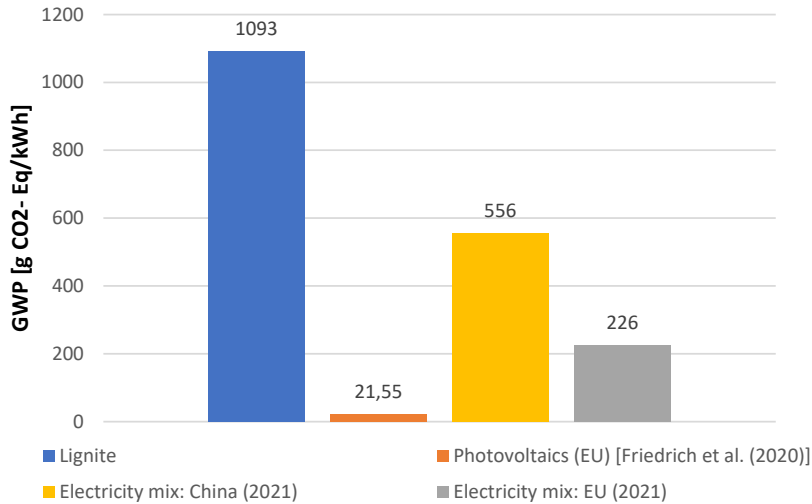


6. Modules

PV Supply Chain



Global Warming Potential (GWP) for PV Analysis for PV System – EU vs China



Difference

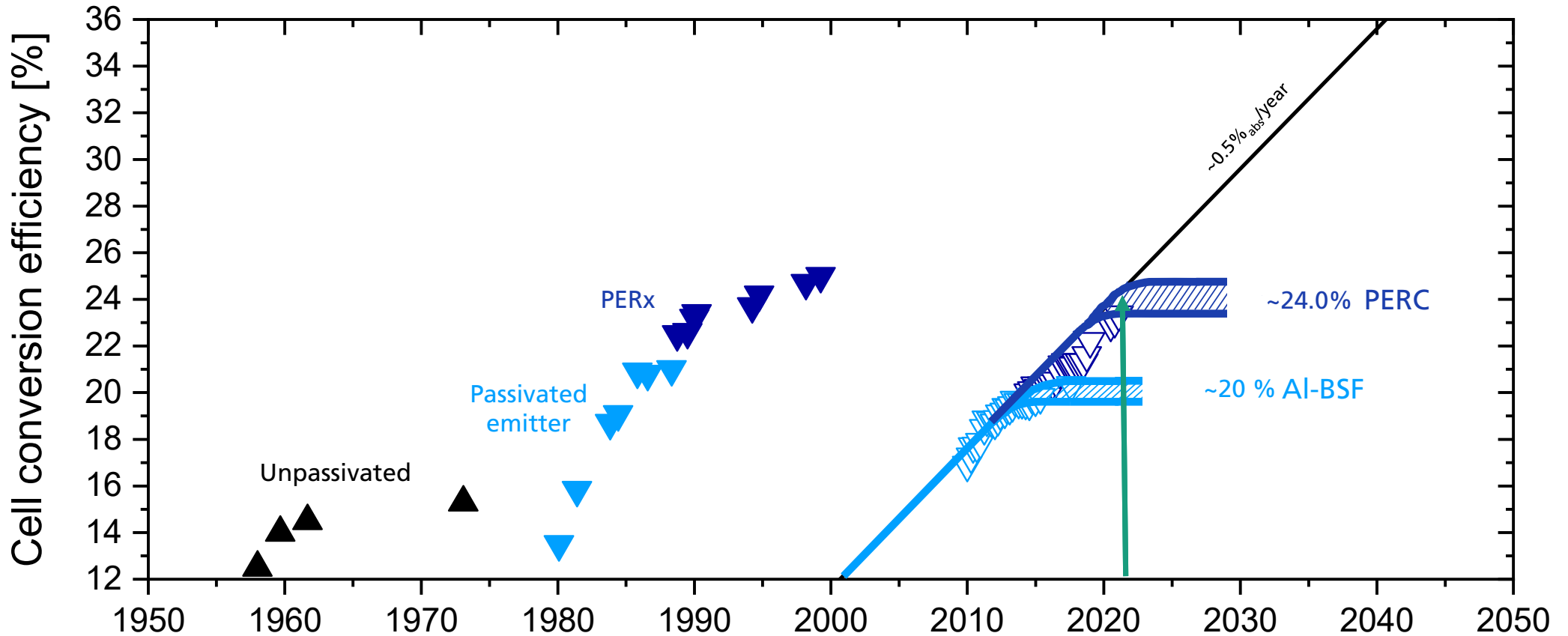
0,30 kg CO₂-eq/Wp

→ Assuming cost of 100 €/tCO₂-eq:

3,0 €ct/Wp price increase for import of all PV system components from China

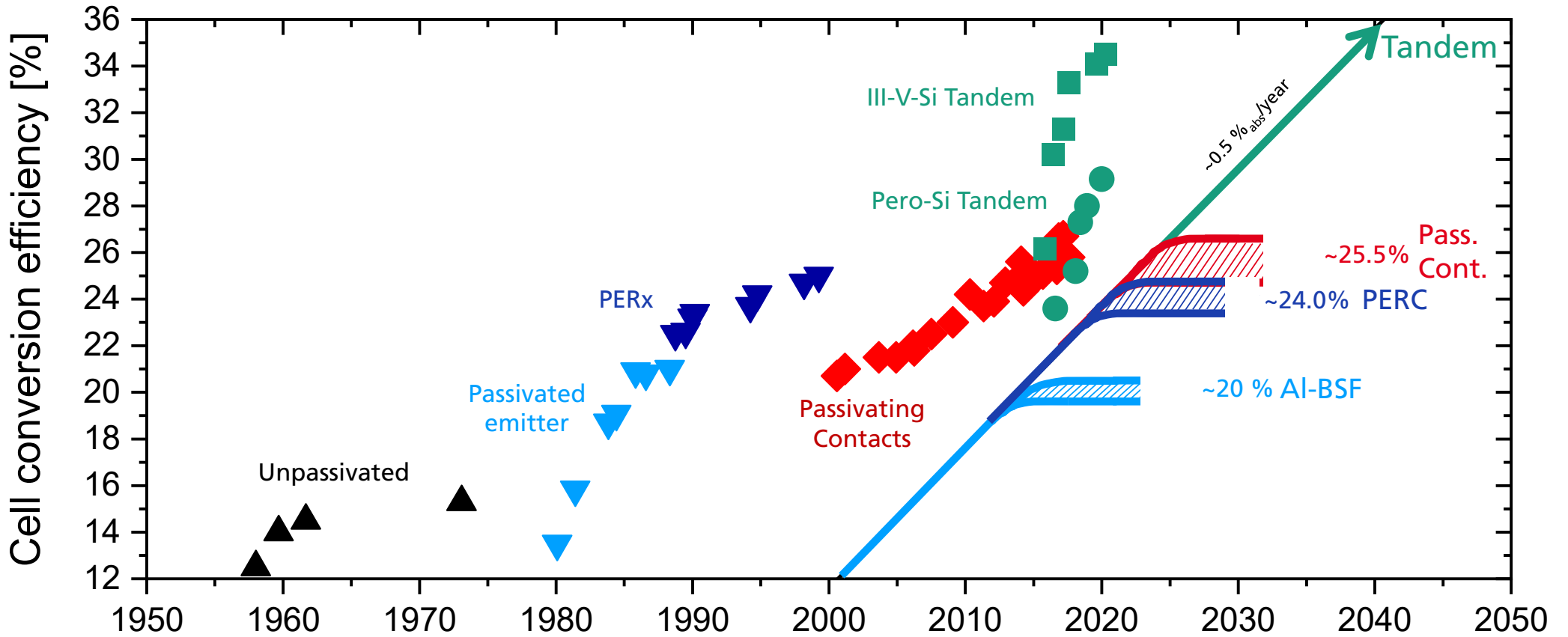
A Look Back: The Development of PV Cell Technology

Laboratory Records and Industrial Production



Higher and Highest Efficiencies

Multi-Junction Solar Cells



Summary

Situation EU PV value chain

- very fragile/vulnerable European PV value chain
- strongly improved geopolitical, environmental and social sustainability by EU PV production
- EU and national governments should ensure a secure fundament for a comprehensively sustainable:
 - investment support, e.g. PV IPCEIs
 - implementation programs with high sustainability thresholds have to be put into practice
 - labour – value chain
 - carbon border tax
 - circularity and recycling
 - Exemptions for small and medium enterprises until certification value chain is build
- technology roadmap to 35+% efficiency can further enable effective differentiation for two decades

