

P  A R L P V

# Data monitoring & analytics for better PV performance and grid integration

COST Action CA16235 Pearl PV

Working Group 5

## Workshop introduction

Jonathan Leloux (Polytechnic University of Madrid)

Sonia Pinto (University of Lisbon)

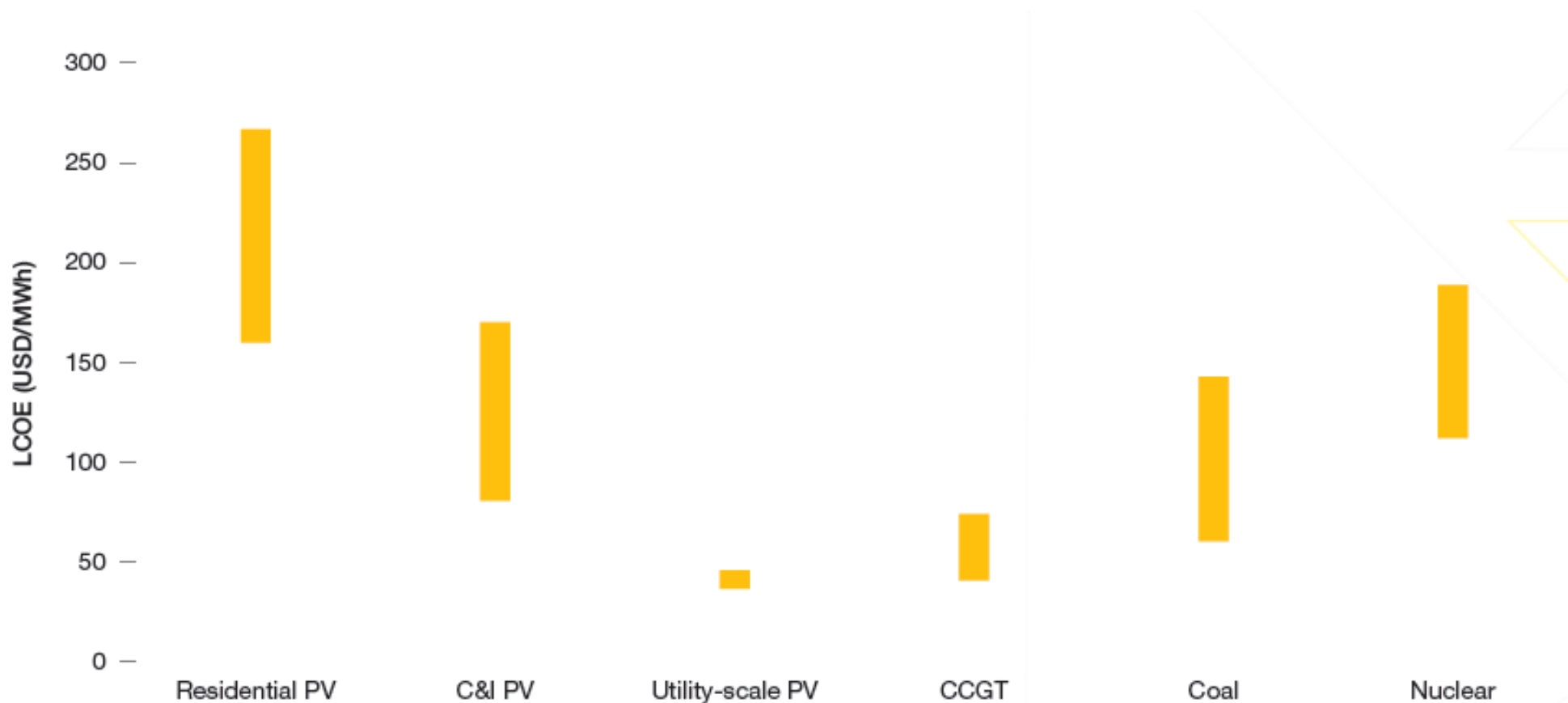
12 January 2021

Online

## ❖ **Two main challenges of PV: LCOE and grid integration**

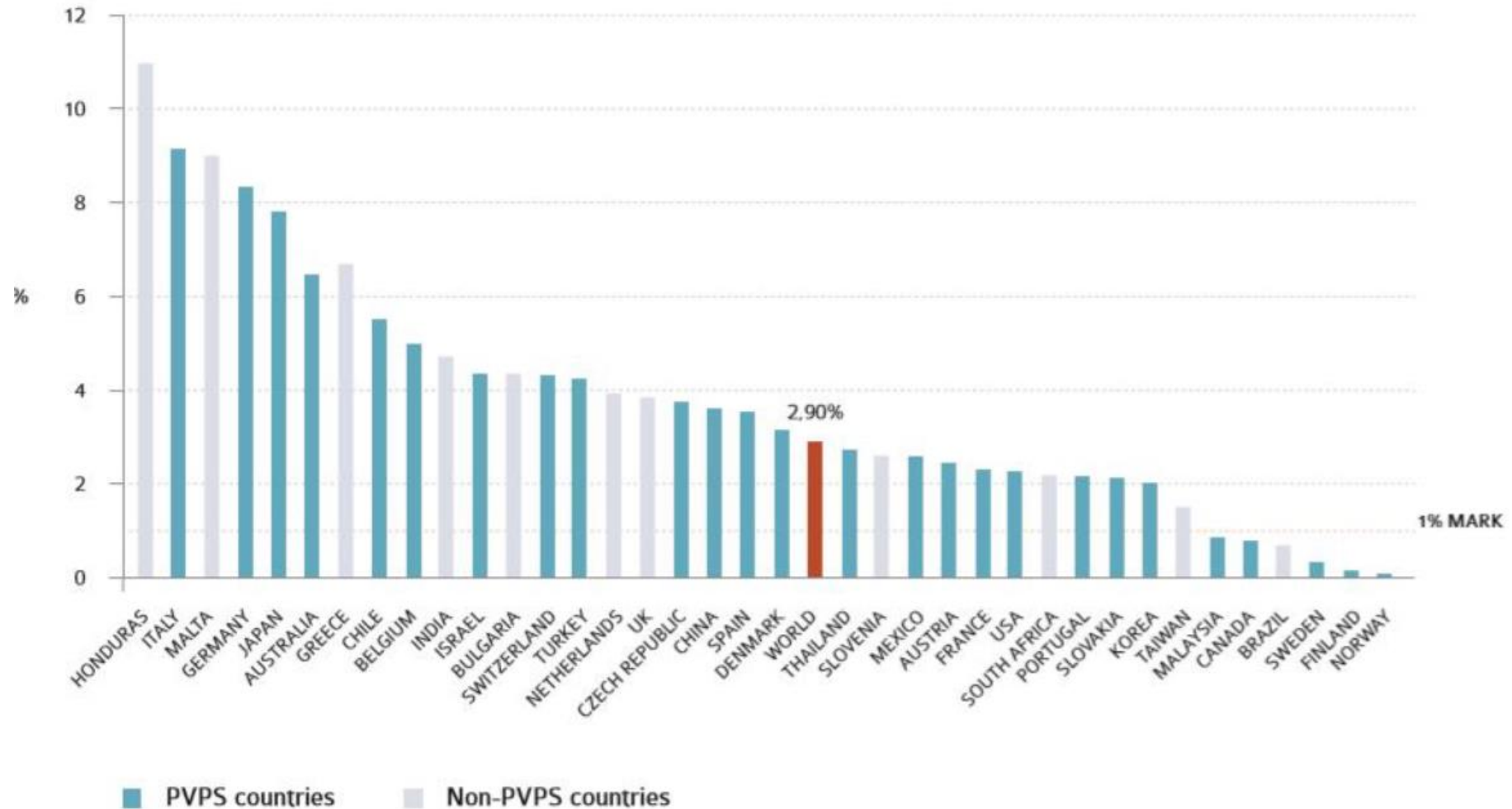


## ≡ PV LCoE: utility-scale PV vs residential PV → BoS is key

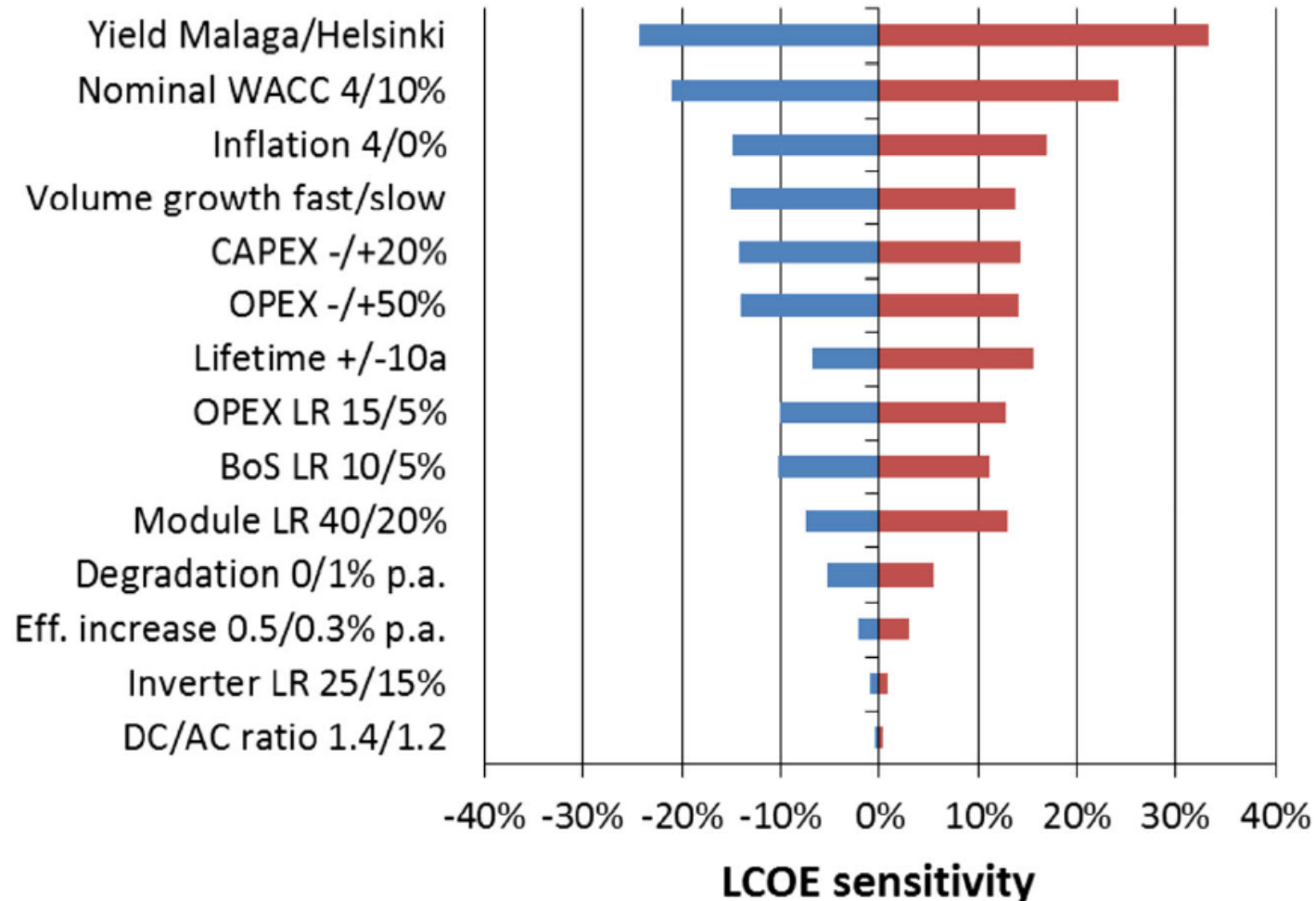


Levelized Cost of Energy (LCoE) for PV and conventional power. Source: Solar Power Europe, 2019

## Increasing PV grid penetration → Increasing grid challenges



# How do we keep decreasing LCoE?



# ❖ **Decrease WACC = Increase bankability of PV**

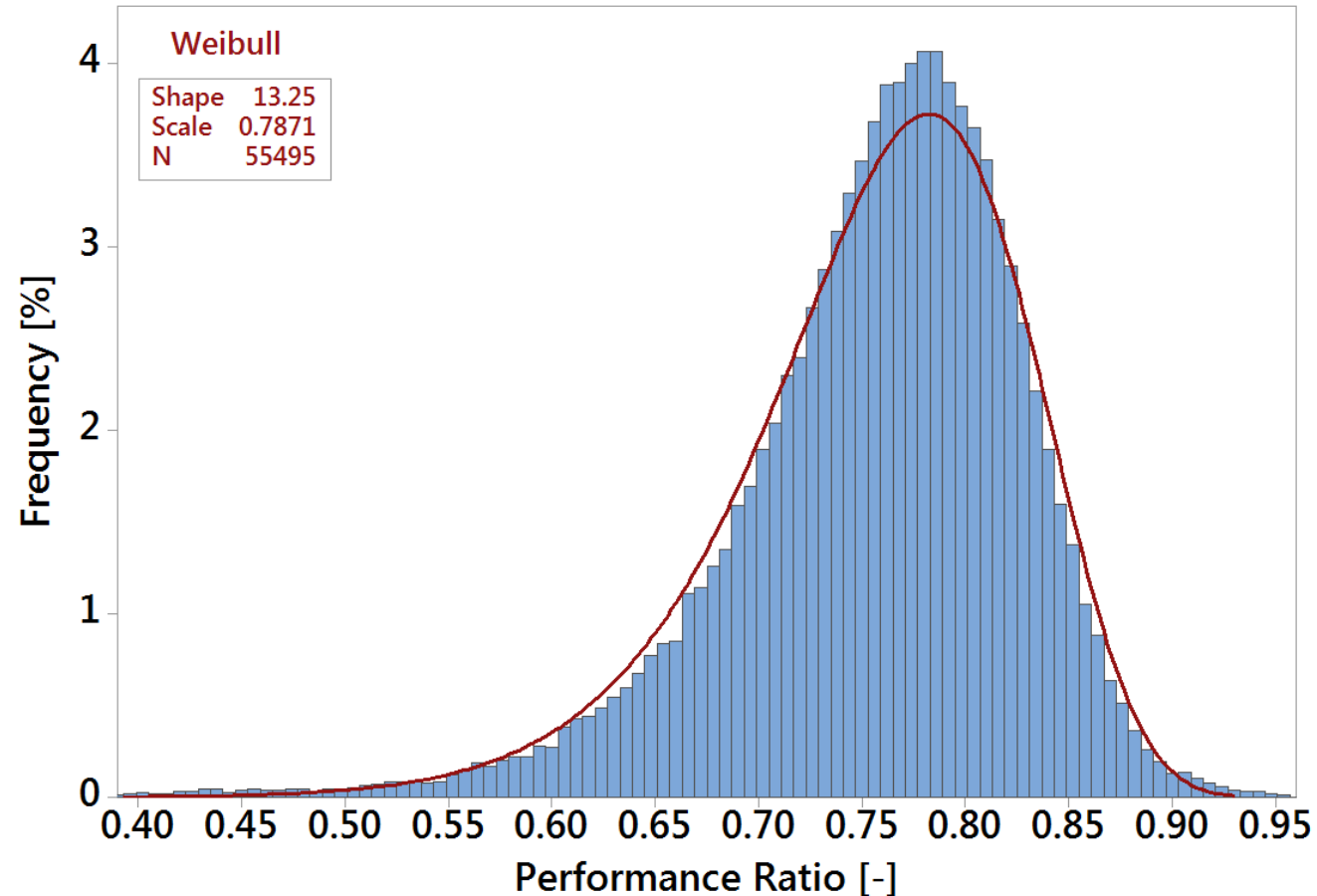
How to increase the bankability of PV?

- ❖ Better quality controls
- ❖ Better component reliability
- ❖ Better system reliability
- ❖ Better energy yield assessments (lower uncertainty)
- ❖ Increase the lifetime of PV systems and components
- ❖ Increase the performance of PV systems

→ Many key challenges at the component and system levels

# Performance Ratio in Europe: 60%-90%

Yearly integrated Performance Ratio - Europe





## ❖ PV installations are becoming more diversified



Floating PV plant, France



Bifacial PV plant, Egypt



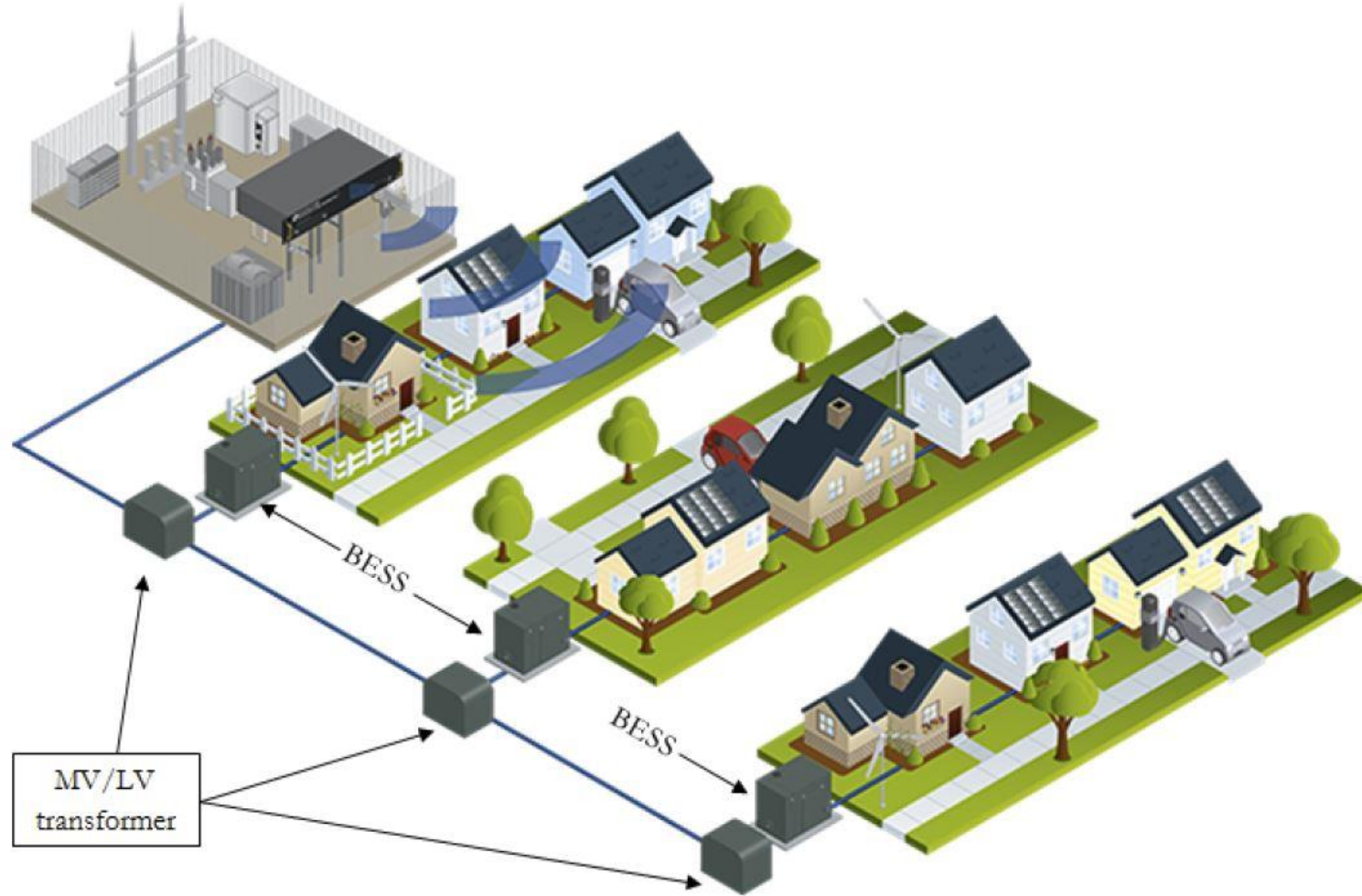
Agrivoltaics, Germany



BIPV, International School of Copenhagen



# Smart grids and collective self-consumption



The smart (local) smart grid approach  
Source: Sisoys 2016

GENERAL		
9:00	Opening of the workshop	Angele Reinders (University of Twente, Netherlands)
9:10	Workshop introduction	Jonathan Leloux (Polytechnic University of Madrid, Spain)
PV PERFORMANCE		
9:20	Impact of performance and degradation on PV plants profitability	Elina Bosch (Becquerel Institute, Belgium)
9:40	Data analytics applied to monitoring and field data for performance optimization in large PV plants	Rodrigo Moretón (QPV, Spain)
10:00	Optimization and economics of seasonal soiling mitigation for utility scale PV systems	Leonardo Micheli (University of Jaén, Spain)
10:20	PV performance assessment of a very large portfolio using minimal data	Julián Ascencio (3E)
10:40	Advanced performance assessment and shadow detection techniques for residential PV systems	Odysseas Tsafarakis (University of Utrecht, Netherlands)
PV GRID INTEGRATION		
11:20	Real-time compensation of voltage fluctuations in LV networks	John Licari (University of Malta, Malta)
11:40	Potential for collective self-consumption in local energy communities	Rodrigo Amaro e Silva (University of Lisbon, Portugal)
12:00	PV as an element in a larger (smart) energy system	Gerwin Hoogsteen (University of Twente, Netherlands)
CLOSING		
12:20	Plenary summary and future work	Jonathan Leloux (Polytechnic University of Madrid, Spain)