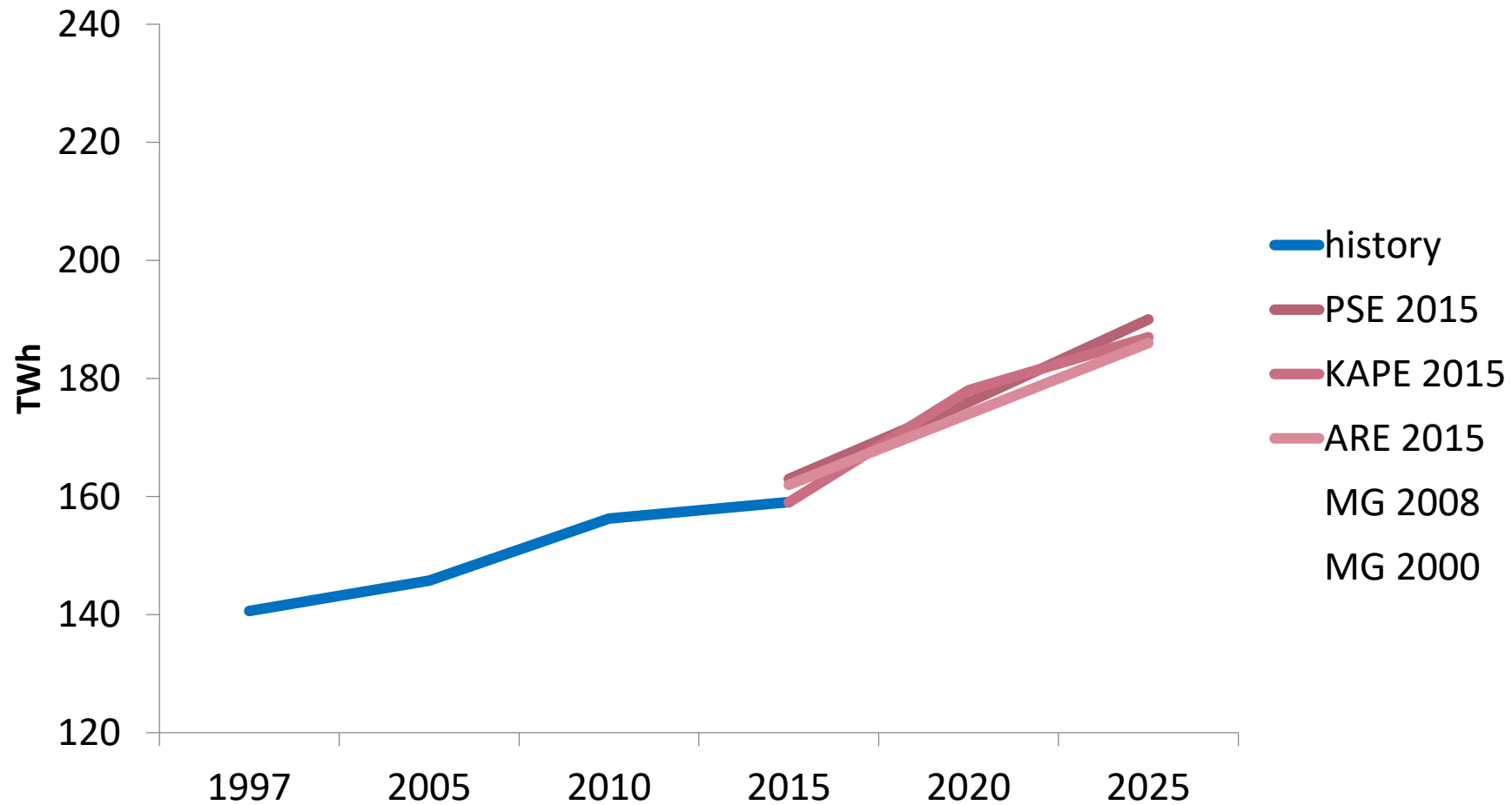


Green Technologies for Polish Energy Sector

Dr Jan Witajewski-Baltvilks

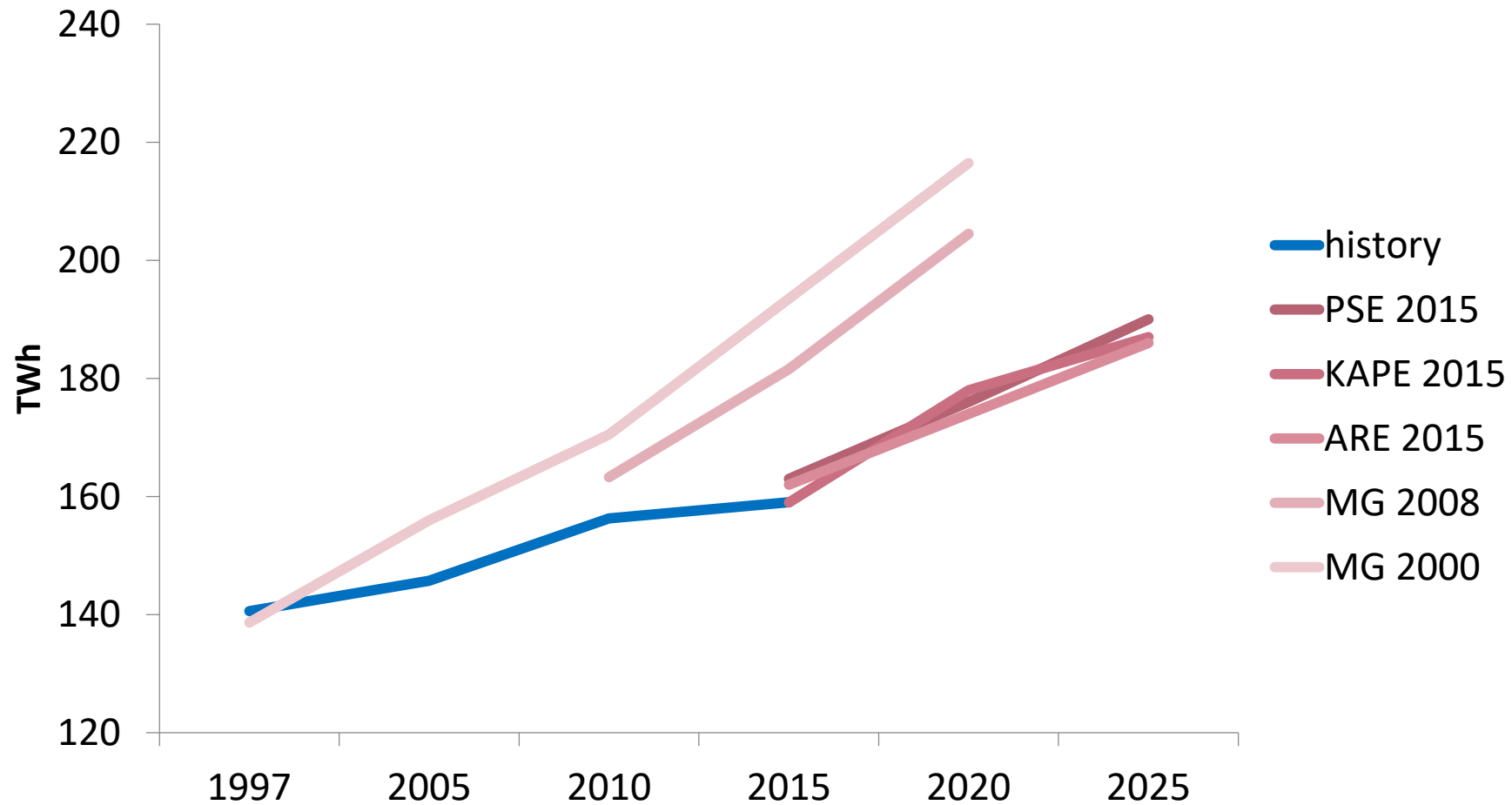
WIEM 2017

Electricity Demand Projections



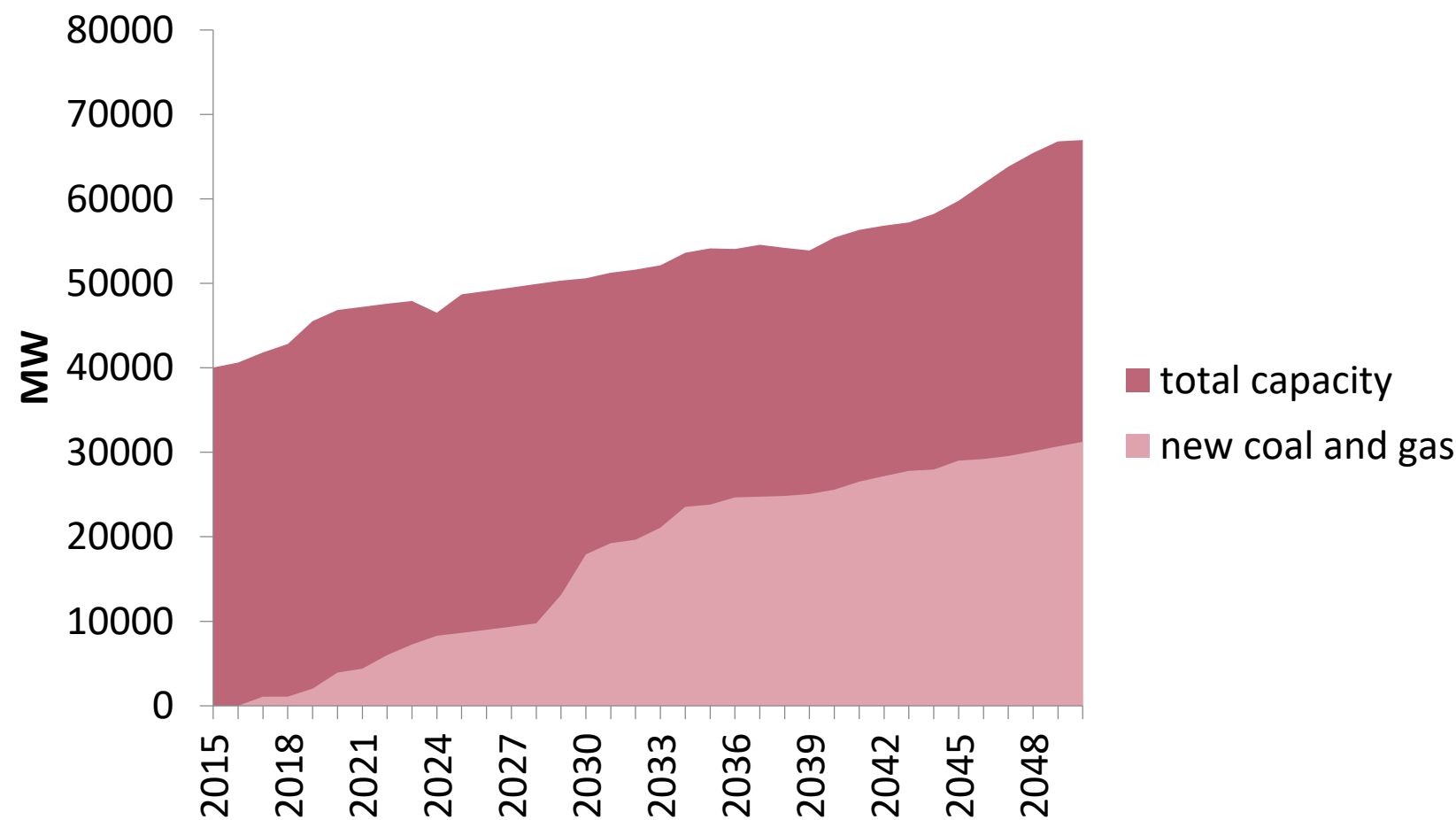
Source: own elaboration based on IEA data (history) and MG and PSE reports

Electricity Demand Projections



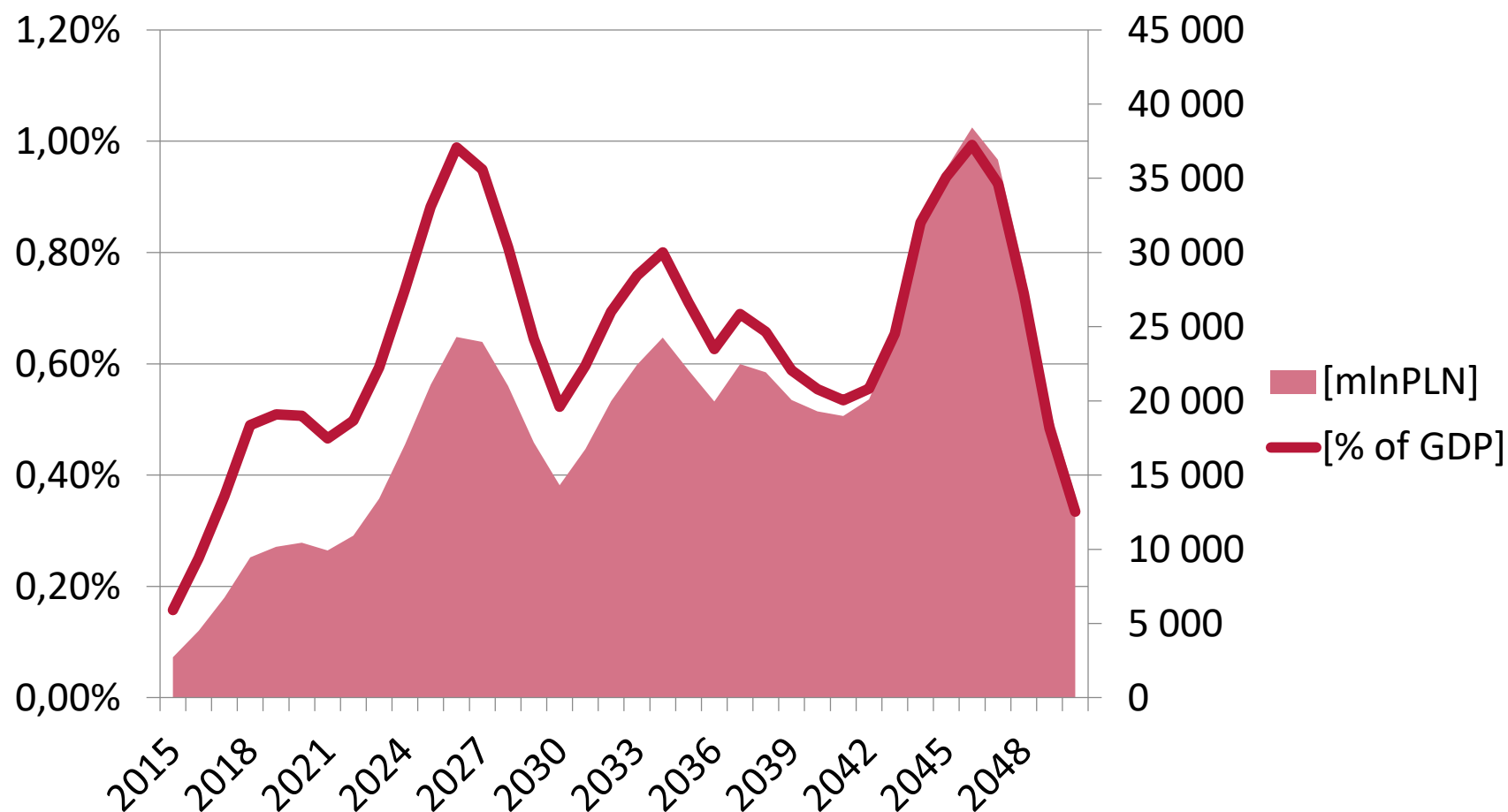
Source: own elaboration based on IEA data (history) and MG and PSE reports

Capacity Demand Projections



Source: Own Elaboration based on Model of Optimal Energy Mix for Poland until 2060
(Department of Strategic Analysis, Prime Minister Office)

Projections on Required Investment



Source: Own Elaboration based on Model of Optimal Energy Mix for Poland until 2060
(Department of Strategic Analysis, Prime Minister Office)

The role of Polish innovations (theory)



- The purpose of innovation: to reduce investment costs in power sector
- The role of Polish green research is pivotal only if Polish suppliers of green technologies are responsible for a major share of total investment in power sector
- The share depends on competition:
 - renewable vs. other electricity sources
 - domestic vs. foreign technologies

Wind Installation Costs

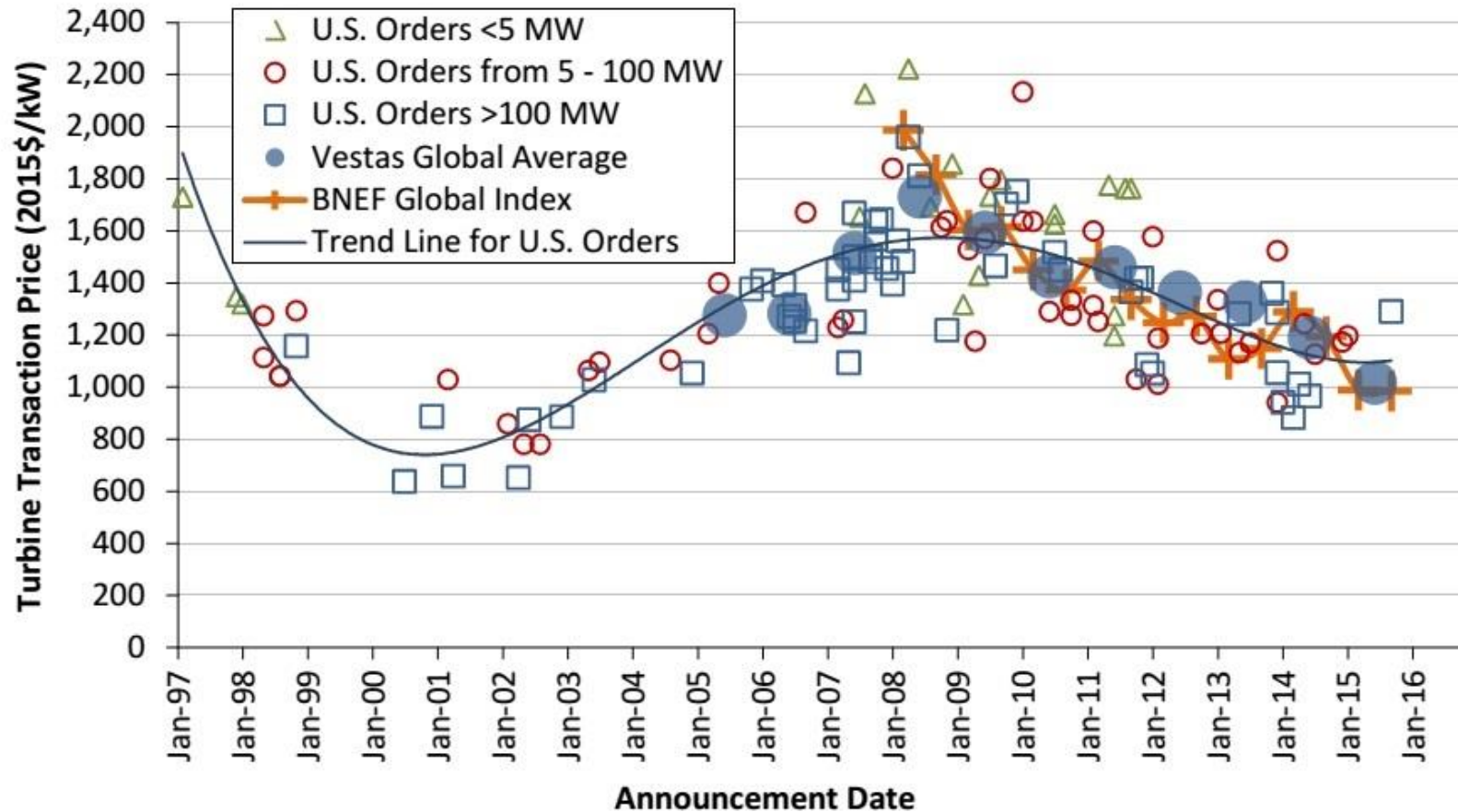
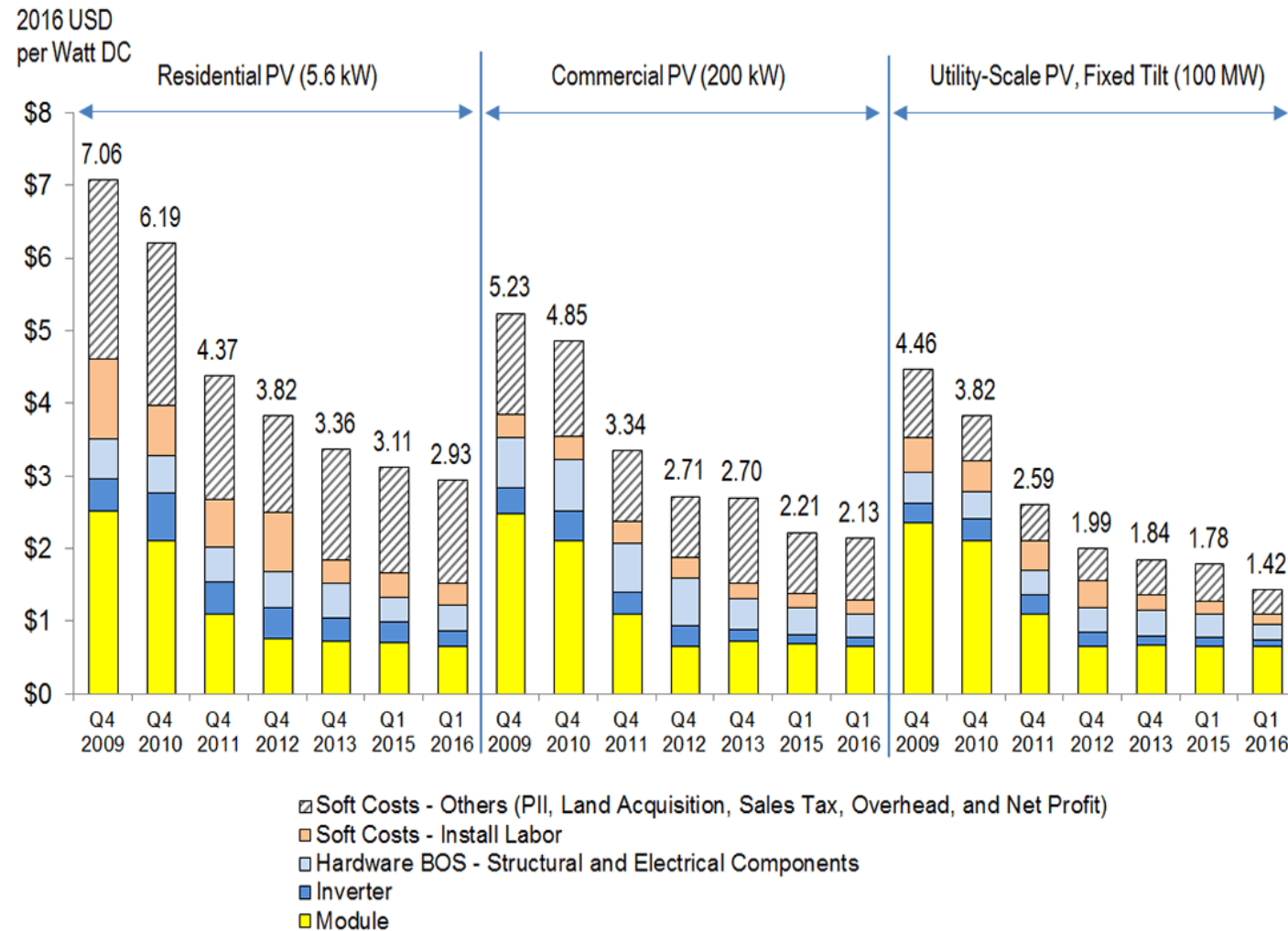


Figure 21. Reported wind turbine transaction prices over time

Source: Wiser and Bolinger (2016)

PV Installation Costs

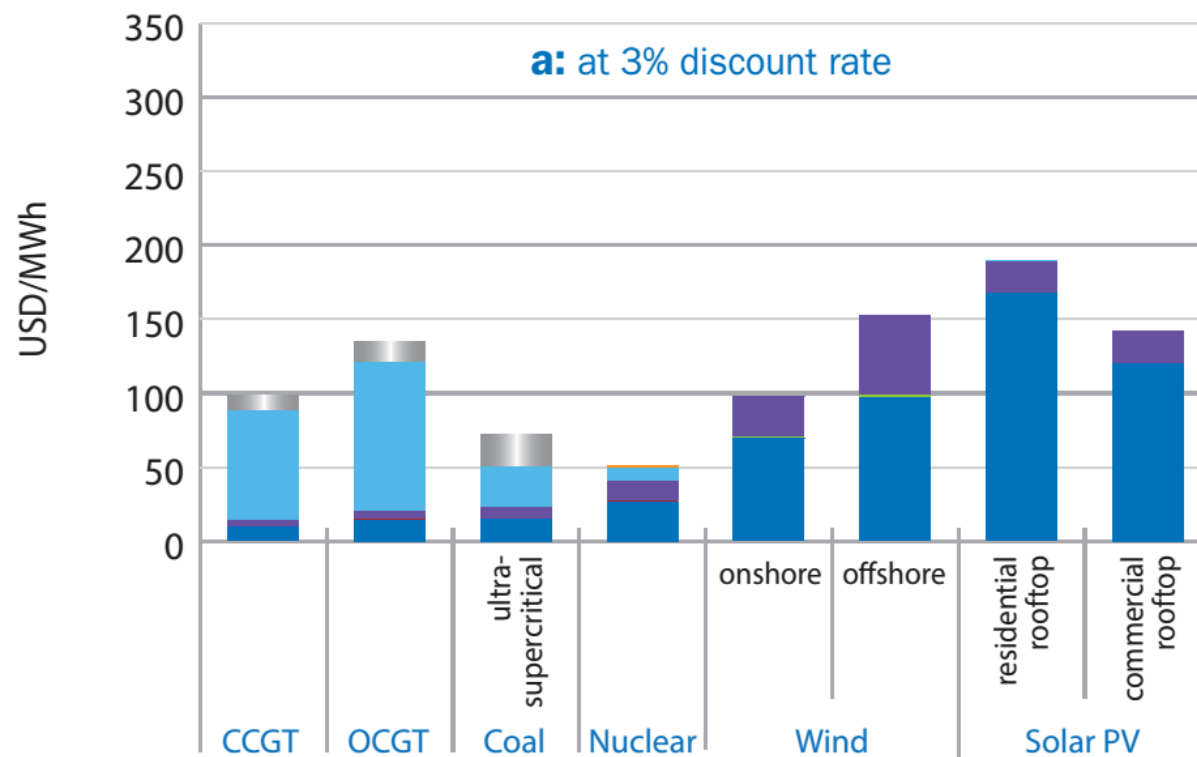


Source: NREL 2016

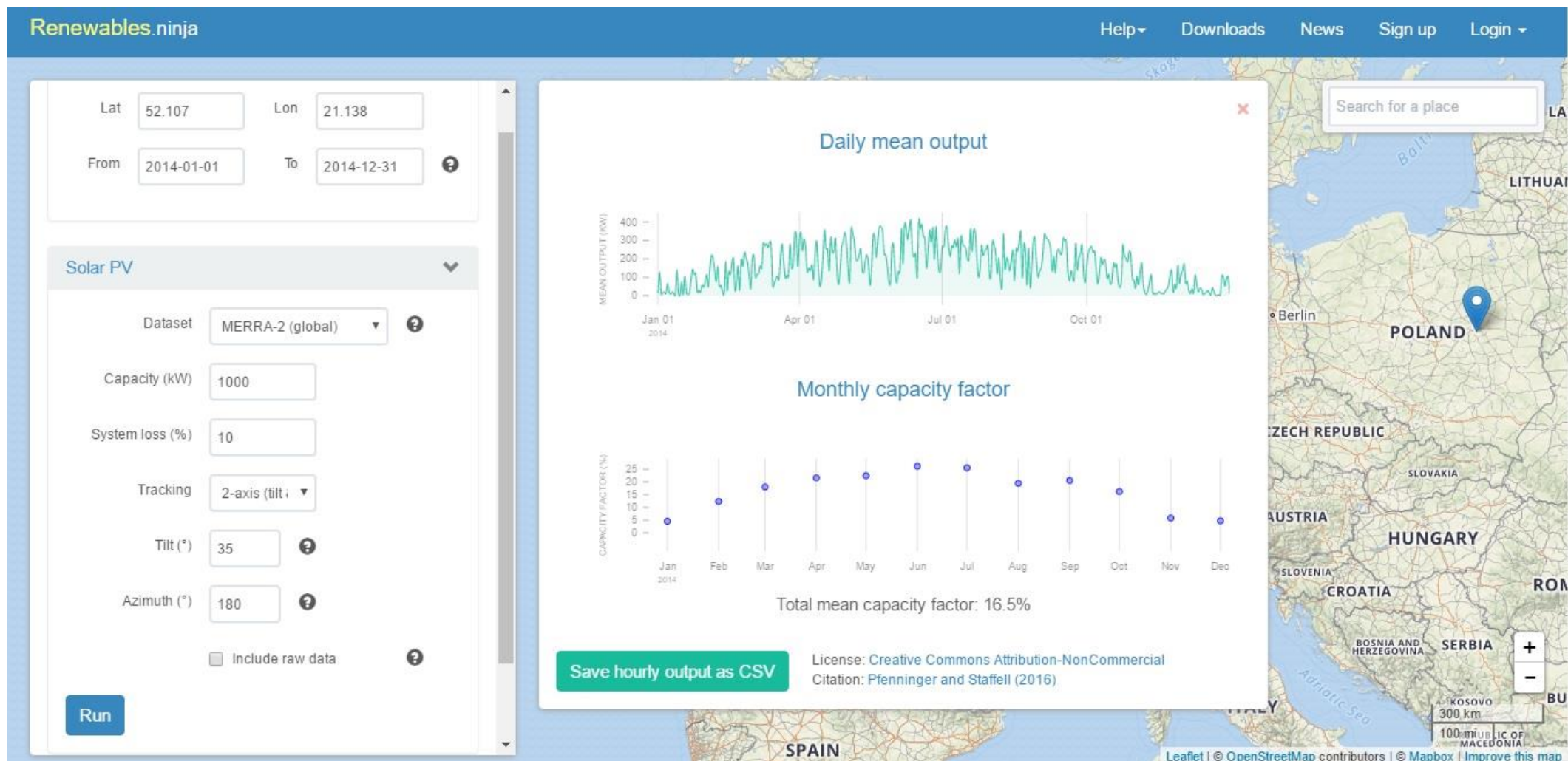
Levelized Cost of Electricity - Belgium



Construction Decommissioning O&M Fuel cost Waste management Carbon cost

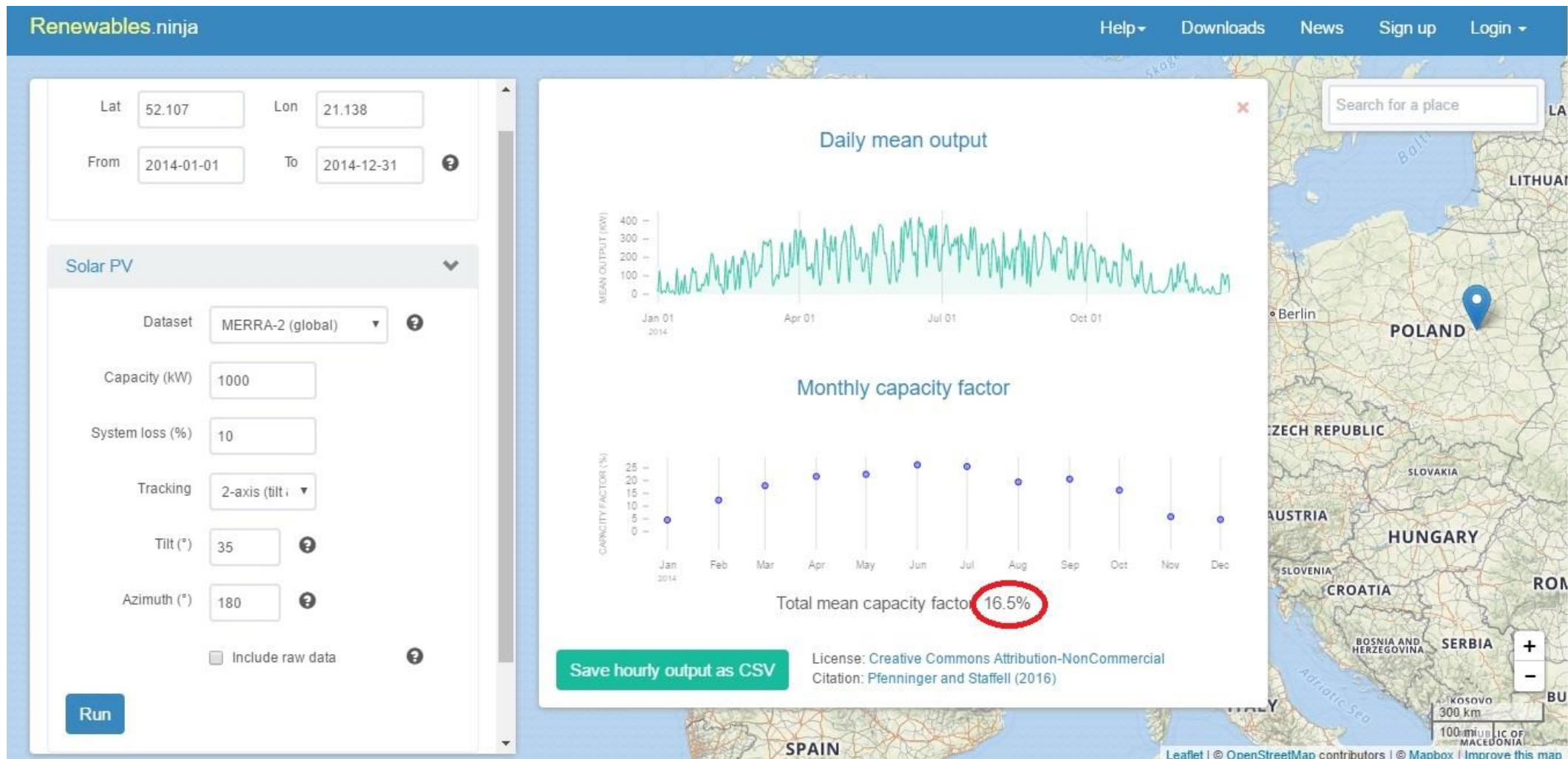


PV capacity



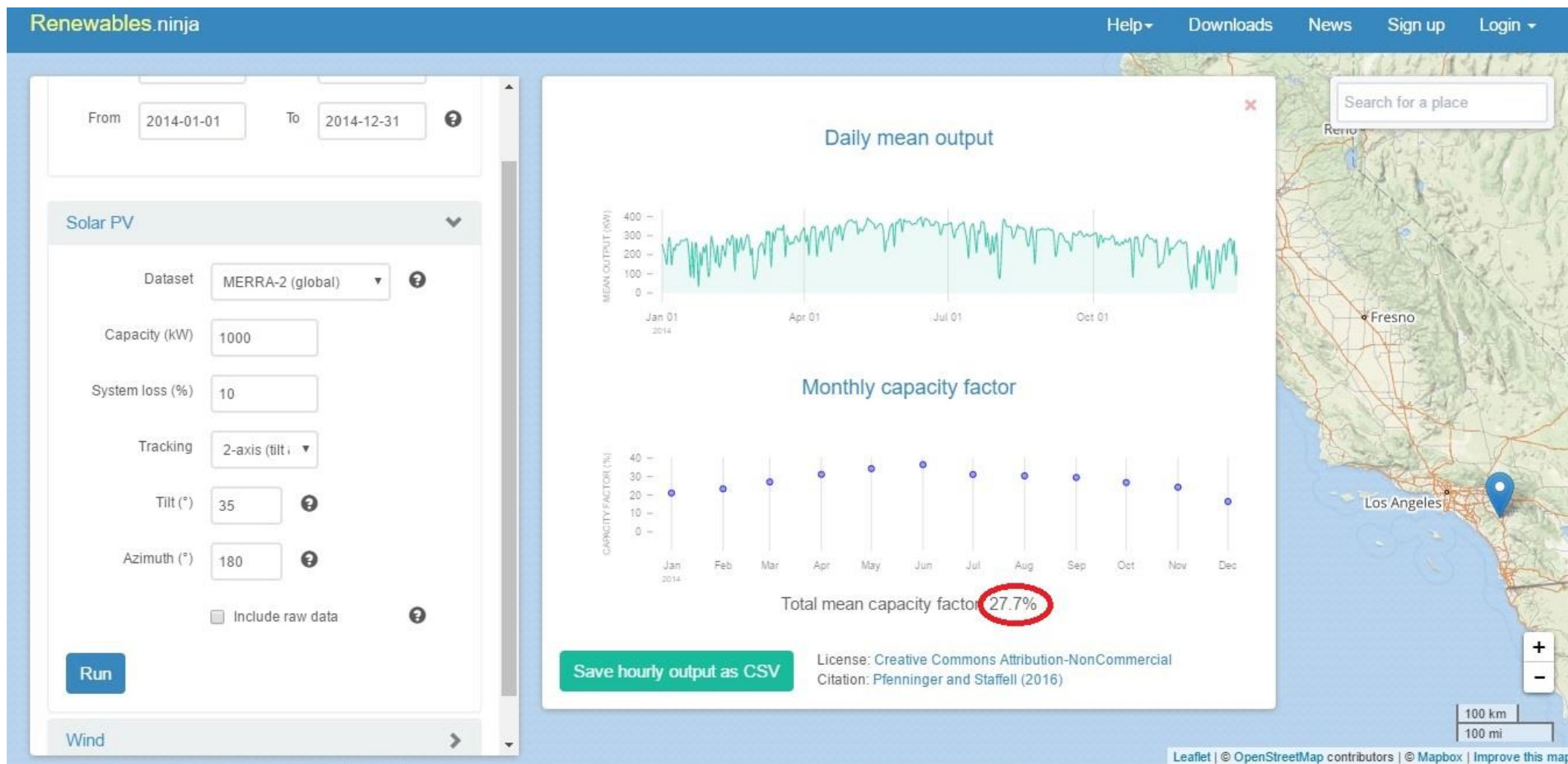
Source: Pfenninger and Staffell (2016)

PV capacity - WARSAW



Source: Pfenninger and Staffell (2016)

PV capacity – LOS ANGELES

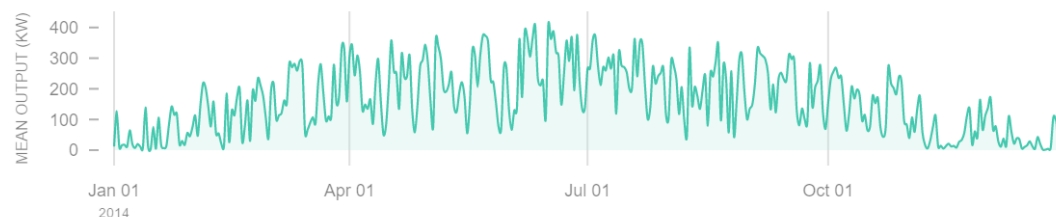


Source: Pfenninger and Staffell (2016)

PV capacity over a year - WARSAW

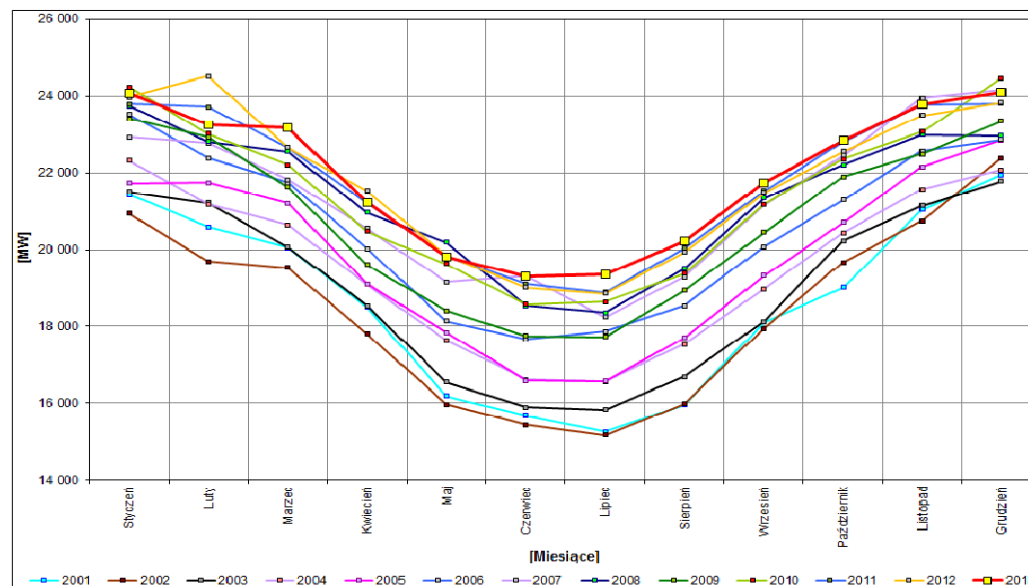


Daily mean output



PV capacity in Warsaw

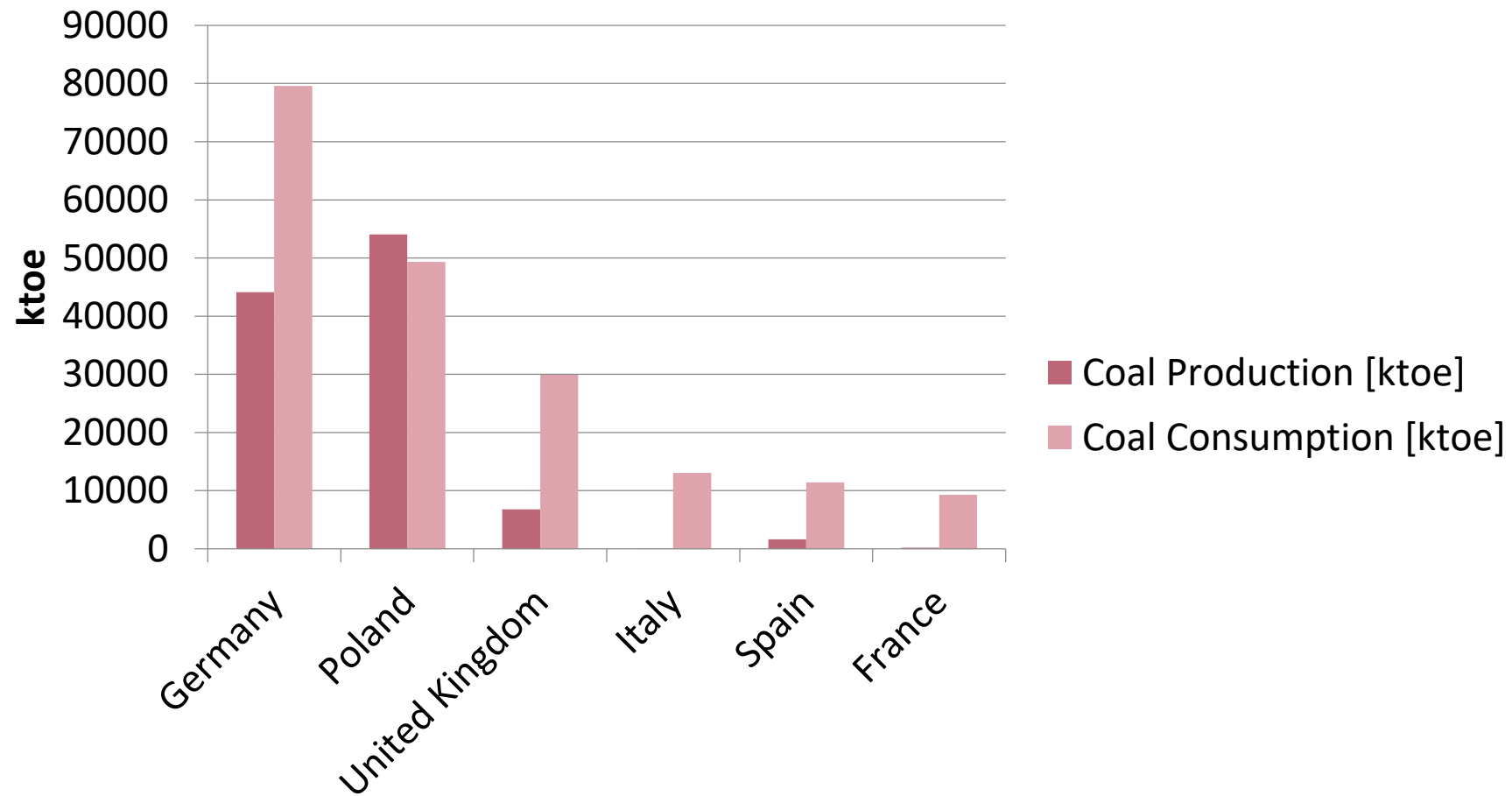
Source:
Pfenninger and Staffell (2016)



Demand for Capacity (evening peaks)

Source: Polskie Sieci
Elektroenergetyczne

Transition and the Loss of Labour Force



Source: Own Elaboration based on IEA data (2014)

Alternatives to Renewable Energy Sources



- Effort in *clean coal* technologies wasteful if cheap PVs available soon
- Green R&D in collaboration with (as opposed to competition) with major foreign suppliers
- R&D for adapting renewables to Polish conditions
 - E.g. storing electricity across seasons
- Avoid overloaded competition, look for spillovers
 - medium-size electric cars
 - Trams, trains, electric buses
 - IT for energy efficiency

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