



Building a Paris Agreement Compatible (PAC) energy scenario

CAN Europe/EEB technical summary of key elements

June 2020



2.7 Mobilising solar energy

Key assumptions

- Solar photovoltaic (PV) is the cheapest and easiest to scale up renewable technology. Further decreases in installation costs turn solar self-consumption into a major driver for electrification. The PAC scenario largely takes over assumptions on solar PV potentials from the Energy Watch Group (EWG)/LUT model.¹
- Solar thermal heat grows less strongly than solar PV. Its shares in district heating play an increasing role. The PAC scenario takes over assumptions on solar thermal potentials from the Heat Roadmap Europe.²
- Concentrated solar thermal power (CSP) remains limited to a few southern European countries with sufficient solar irradiation and suitable locations.

Evolution of energy supply

The solar PV electricity generation increases more than ten-fold from 103 TWh equalling a 3% share in electricity generation in 2015 to 1,368 TWh (30%) in 2030. Just after wind energy, it becomes the EU's second electricity source with 2,360 TWh representing 37% of electricity generation in 2040.

Solar thermal heat remains an energy source used for individual heating in the residential and tertiary sector. Building renovation and replacement of inefficient fossil heating systems triggers a switch to solar thermal installations. They double their supply from 25 TWh in 2015 to 58 TWh in 2050. In addition, solar thermal heat is increasingly supplied through expanding district heat networks with a maximum of 21 TWh reached in 2040.

Electricity generation from CSP increases from 5 TWh in 2015 to 17 TWh in 2030 and 24 TWh in 2040. Its contribution to European electricity generation however is marginal and does not exceed 0.5%.

Integration of members' and experts' feedback

In a number of countries short-term market forecasts indicate a slower uptake than projected by the EWG/LUT model.³ Solar PV growth rates during the 2020s consequently were reduced and further uptake was delayed.

Sensitivities and limitations

Neither the share of ground-mounted solar PV nor its space demand have been assessed more in detail. While environmental risks are negligible, potential synergies and conflicts with agriculture's needs have to be clarified.

Key results

- Solar PV makes solar energy the second most important electricity source of the PAC scenario by 2030. After a quick ramp-up until 2030, it covers up to 38% of electricity generation in 2050.
- Solar thermal heat supply more than doubles until 2050. It reaches new consumers in the tertiary sector and in industries with low temperature demand thanks to the expansion of district heat networks.

¹ EWG/LUT: Global Energy System based on 100% Renewable Energy. Energy Transition in Europe across Power, Heat, Transport and Desalination Sectors, December 2018.

² Aalborg University: Heat Roadmap Europe 4.

³ Solar Power Europe: Global Market Outlook for Solar Power 2019-2023, July 2019; Euroobserver: PV barometer 2020, April 2020.

