



Building a Paris Agreement Compatible (PAC) energy scenario

CAN Europe/EEB technical summary of key elements

June 2020



2.9 Mobilising hydropower

Key assumptions

- Capacities of run-of-river, reservoir or mixed hydro¹ power will not increase from 2020 onwards.
- A slight linear increase for all hydro power capacities from 2015 to 2020 is integrated into the PAC scenario to mirror power plants already in construction.
- The PAC scenario assumes a 10% loss in electricity production due to environmental requirements and climate change. Capacity factors are taken over from the EWG/LUT model.²

Evolution of energy supply

Even under keeping a constant level of hydropower capacity, its electricity generation decreases. Climate change will affect water availability for hydropower. Depending on the temperature increase, hydropower production in Europe could go down by around 6% under a moderate warming scenario and by 13% under high warming scenarios³. Additionally, the implementation of the Water Framework Directive (WFD) through minimum flow requirements and other mitigation measures might affect the overall hydropower production by around 3%⁴. Therefore, the PAC project shows a slight decrease in hydropower production, even with constant capacities.

Integration of members' and experts' feedback

In general, feedback from members and experts has been supportive on PAC scenario's assumption not to increase hydropower capacity beyond 2020. Some EU28 countries have already increased their installed capacity between 2010 and 2015 and are planning additional increase by 2020⁵. Therefore, when possible, figures have been updated with most recent data from Eurostat, and installation rates have been extrapolated until 2020.

Sensitivities and limitations

The PAC scenario has chosen deliberately conservative assumptions on new hydropower projects. Actual post-2020 installed capacity might be higher.

Key results

- Unless upgrade of existing facility, no further hydropower expansion happens beyond 2020.
- Hydropower production will drop by 10% due to climate change and environmental requirements.

¹ Hydro plants with natural water inflow into an upper reservoir where part or all equipment can be used for pumping water uphill

² EWG/LUT.

³ COACCH: The economic cost of climate change in Europe: Synthesis report on COACCH interim results, November 2019.

⁴ Arcadis/Ingenieurbüro Floecksmühle: Hydropower generation in the context of the EU water framework directive, May 2011.

⁵ ECN: NREAP database, <https://ec.nl/collaboration/nreap/2010/data/index.html>.

