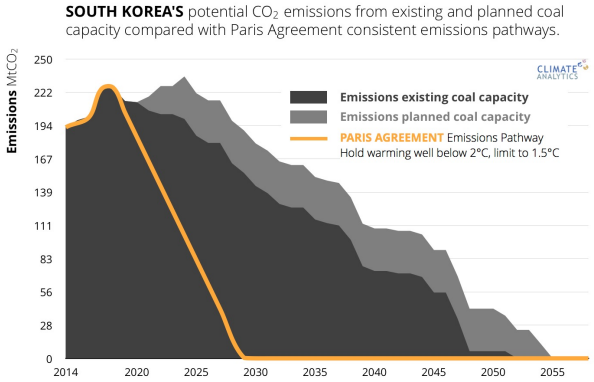
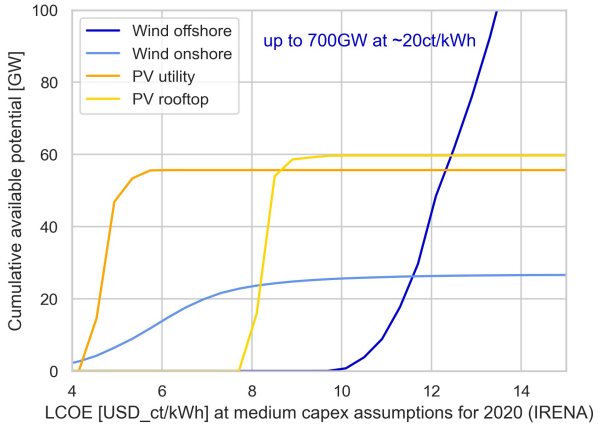
Replacing Coal with Wind and Solar in South Korea's electricity system

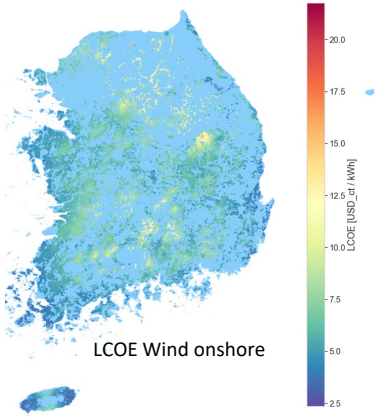
Tina Aboumahboub[1], Gaurav Ganti[1], Matthew Gidden[1], Jonas Hörsch[1], Severin Ryberg, Himalaya Bir Shrestha[1], Lara Welder[1] and Anne Zimmer[1]
[1]*ClimateAnalytics gGmbH, Berlin, Germany*

1 Paris Agreement-compatible coal-phase out schedule derived from global IEA B2DS scenario



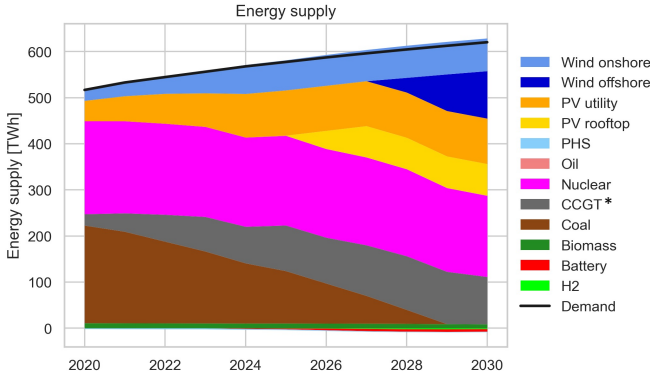
2 Assessment of renewable potential based on geographical exclusion maps and simulations with historical weather data (ERA-5)

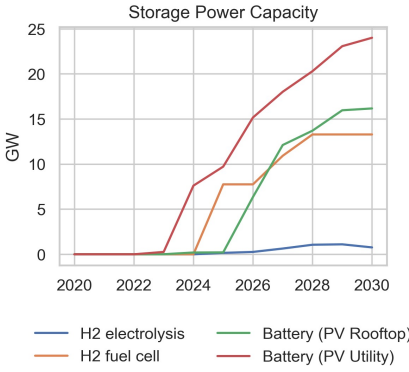




3 Techno-economic optimisation of renewable and long- and short-term storage capacities in each of the 16 regions, under:

- fixed thermal generation fleet, and
- CO_2 budget





*CCGT capacity is fixed. Capacity factor increases to 0.3.

Difficult situation for continuous optimisation:

1. Firm capacity (w/o storage) covers about 2/3 of peak demand.
2. Nuclear ramp cycling (w/o costing)

Needs considering reserve requirements, and maybe unit commitment!

4 Estimation of the employment impacts of the accelerated coal phase out,

based on the capacity additions and retirements in the individual regions.

jonas.hoersch@climateanalytics.org

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