

DTU



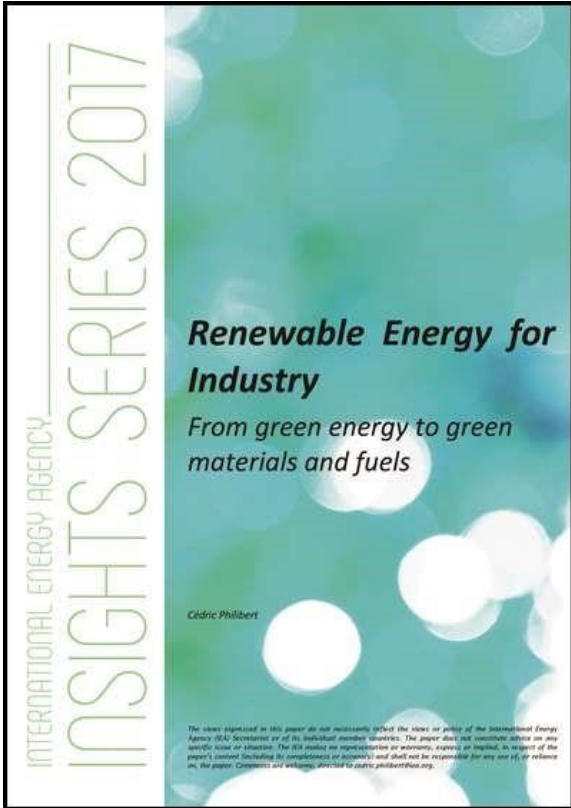
Unlocking wind energy potential in 'Power to X'

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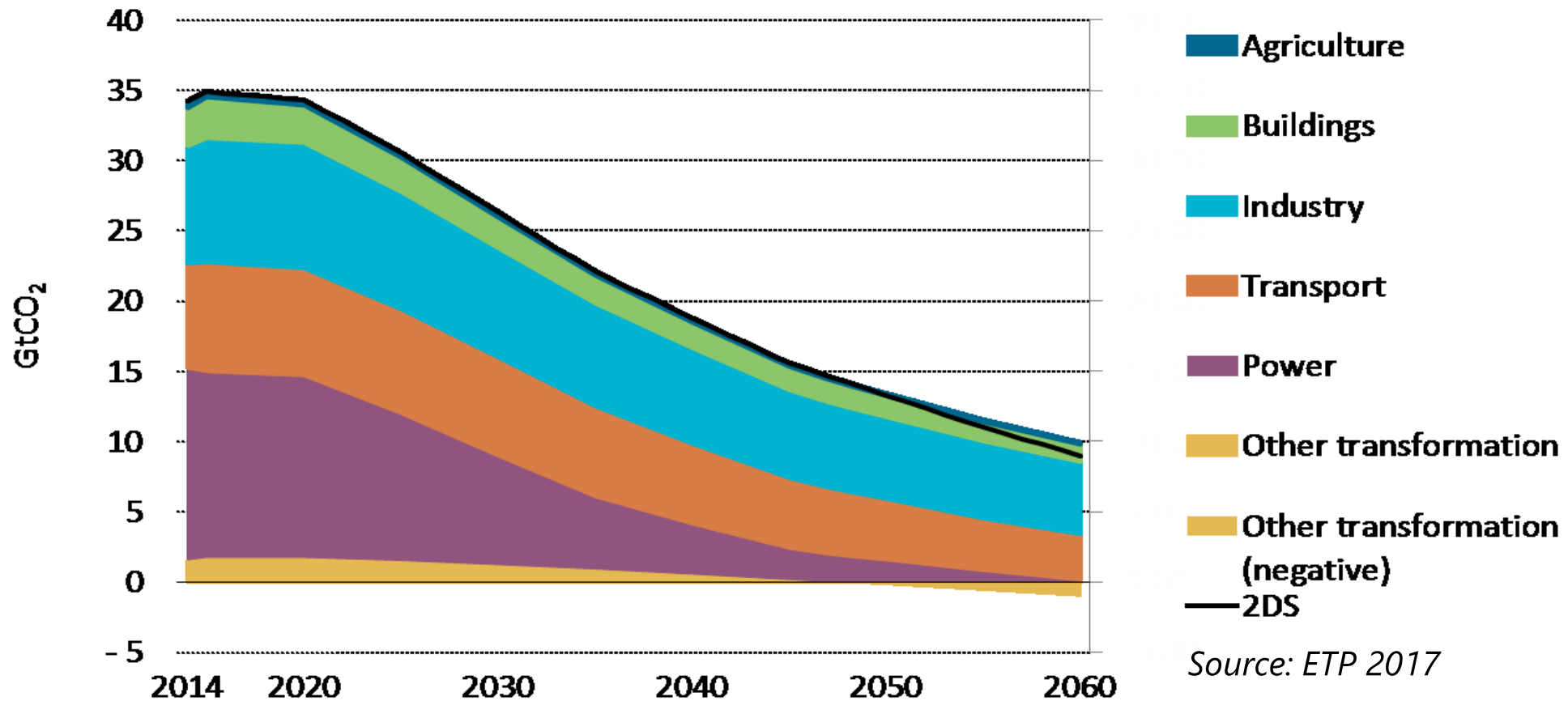
Executive Secretary IEA Wind TCP

Industry and transports: the hard-to-abate sectors



<https://bit.ly/2QaNIcv>

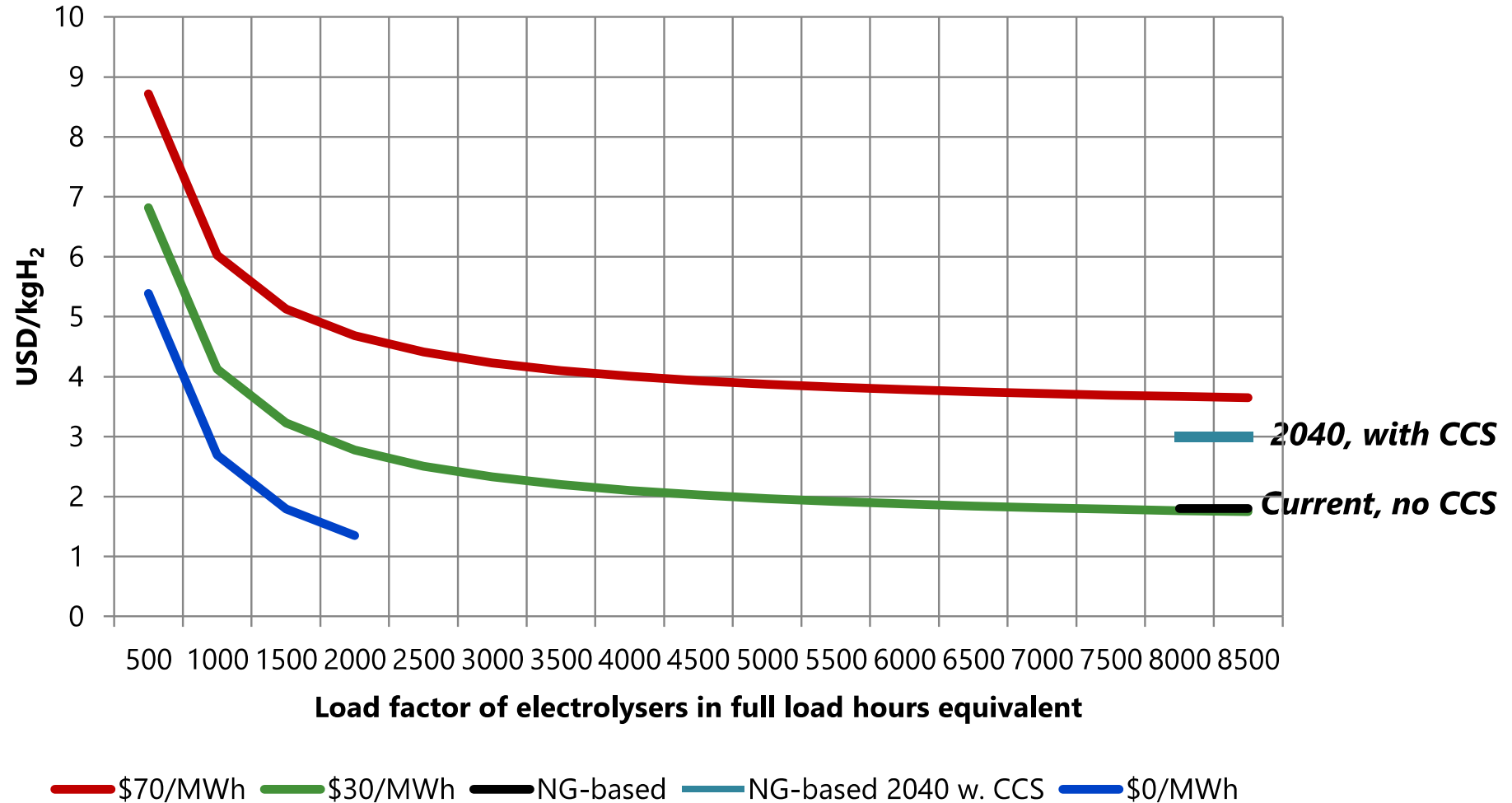
CO₂ emissions in the 2 Degree Scenario



Cement, chemicals, iron and steel... Aviation, road transports and shipping represent major challenges for climate change and air quality

Green hydrogen from water electrolysis can compete...

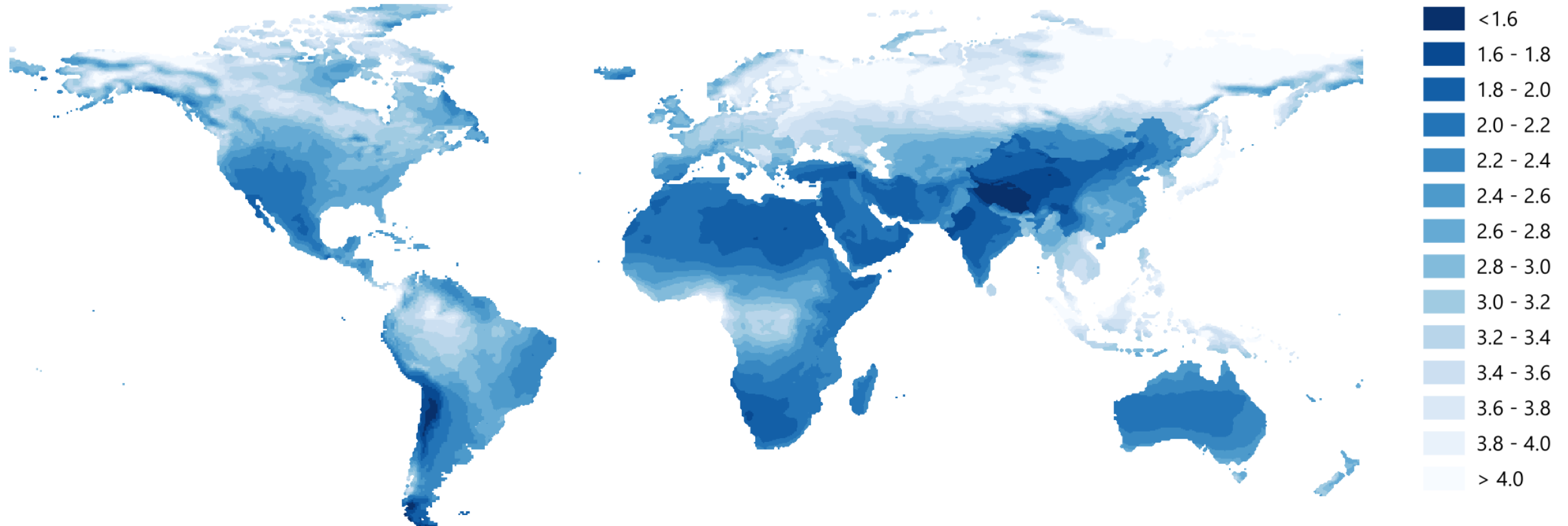
Cost of hydrogen from electrolysis for various electricity price and load factors



Beyond 20- 40% capacity factor the cost of electricity dominates the cost of hydrogen from electrolysis; With “surplus” electricity the cost of hydrogen increases rapidly if load factors fall below 3000 FLH

Renewables hydrogen costs are set to decline

Long-term hydrogen production costs from solar & wind systems



The declining costs of solar PV and wind could make them a low-cost source for hydrogen production in regions with favourable resource conditions.

How to achieve the lowest cost of fuels (power to X) with wind energy?

- Revisit wind turbine and wind farm concepts (together with fuel generation technologies)
 - Optimization of the full fuel (X) production facility including wind (and solar):
 - Adapt power curve to electrolyser needs and vice versa
 - Simplification of the wind turbine/farm (i.e. direct link with electrolysers)
 - Work off-grid or in weak grid conditions
- > Target: reduce the cost of H₂ ton, NH₃ ton, water liter, etc

Specific research, development and demonstration is needed to unlock the full potential