



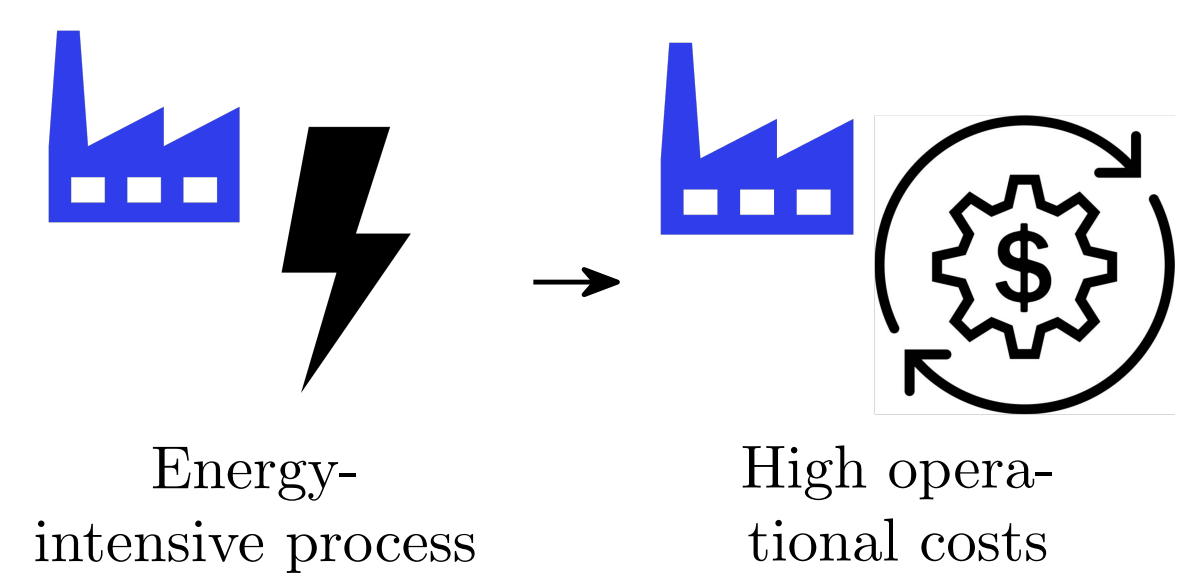
DEMONSTRATION OF ECONOMIC MODEL PREDICTIVE CONTROL FOR A SOLVENT-BASED CARBON CAPTURE PILOT PLANT

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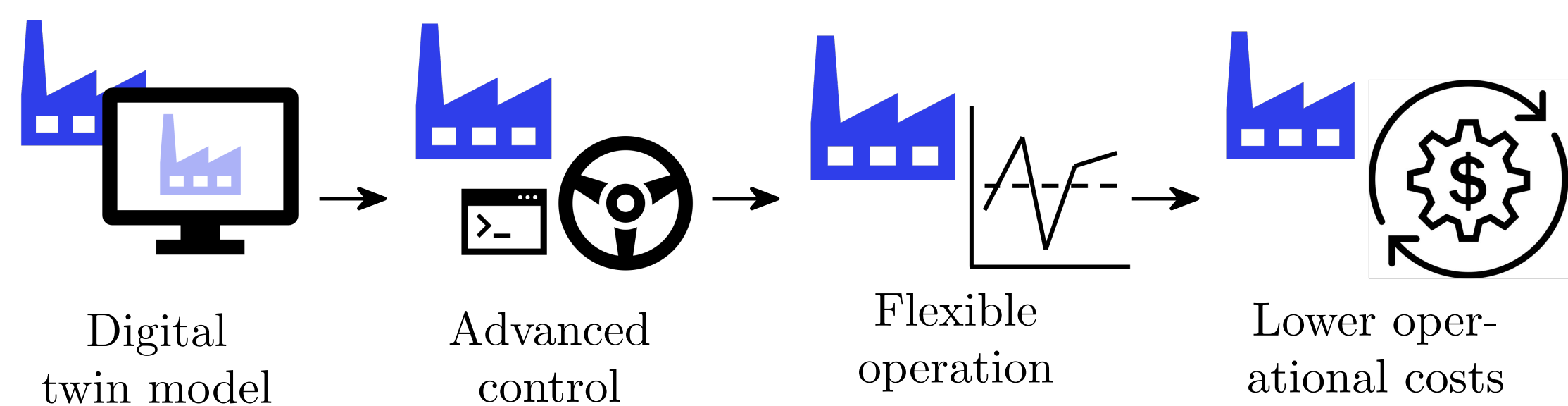
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Motivation

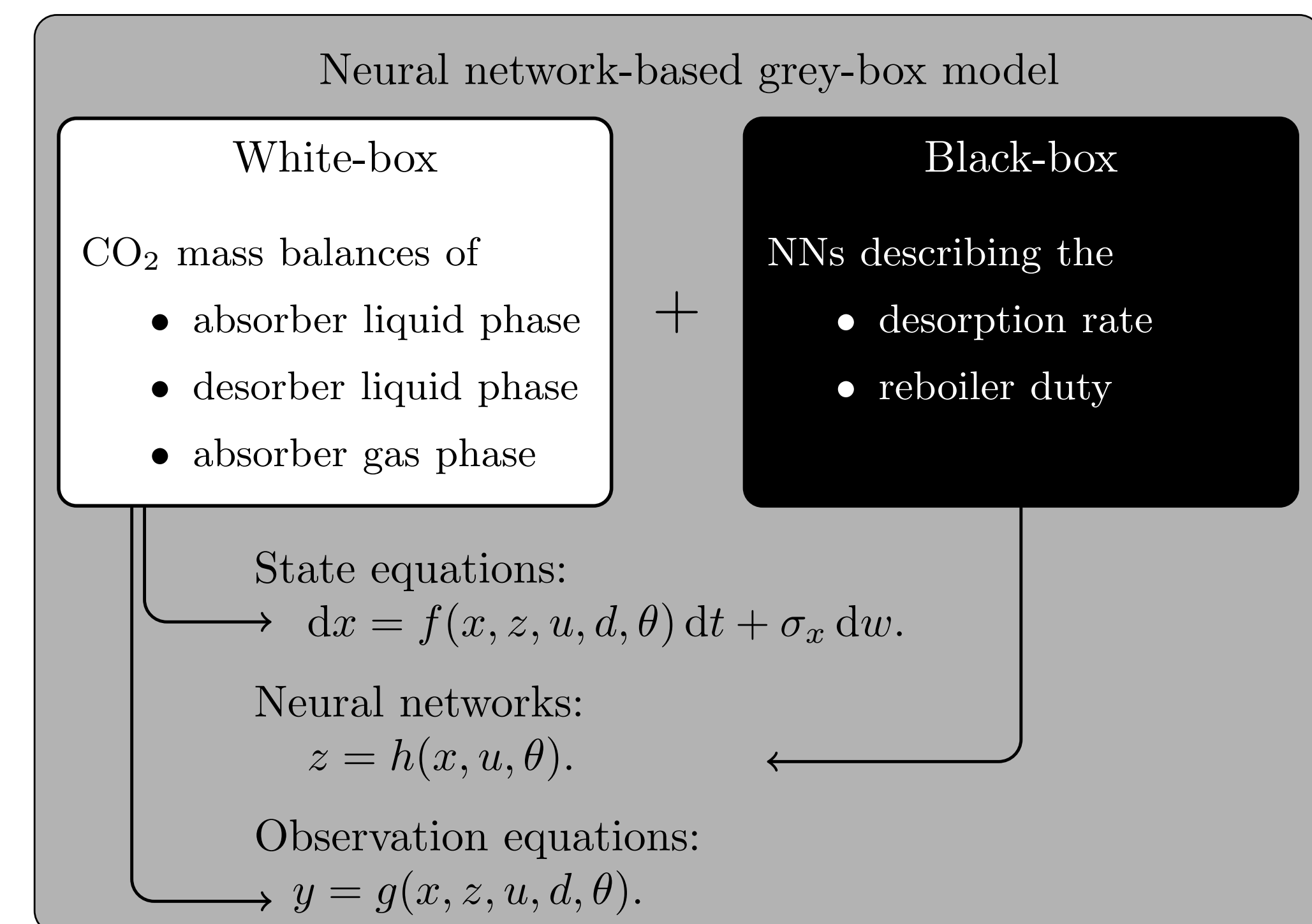
The challenge of solvent-based carbon capture:



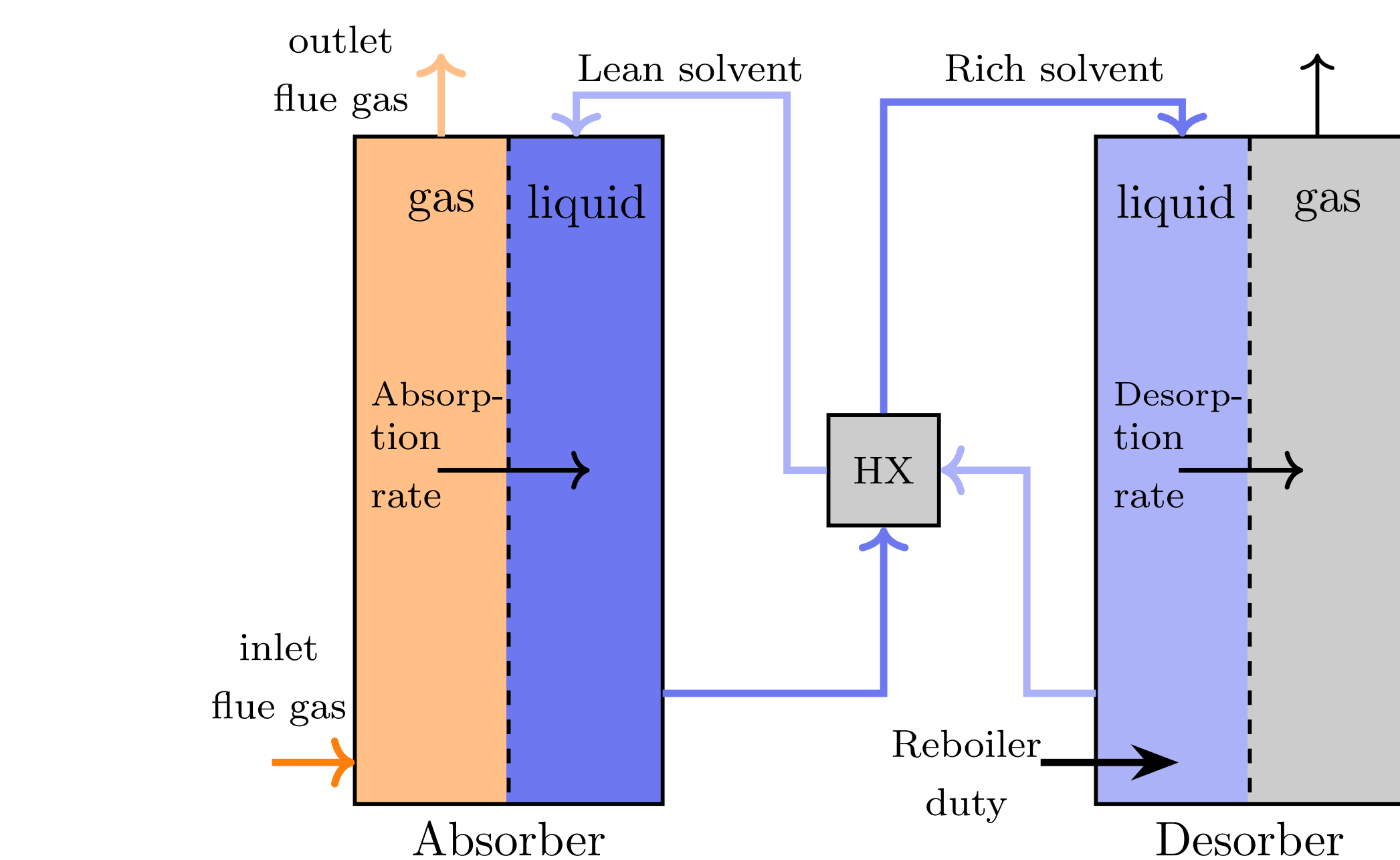
The solution:



Model

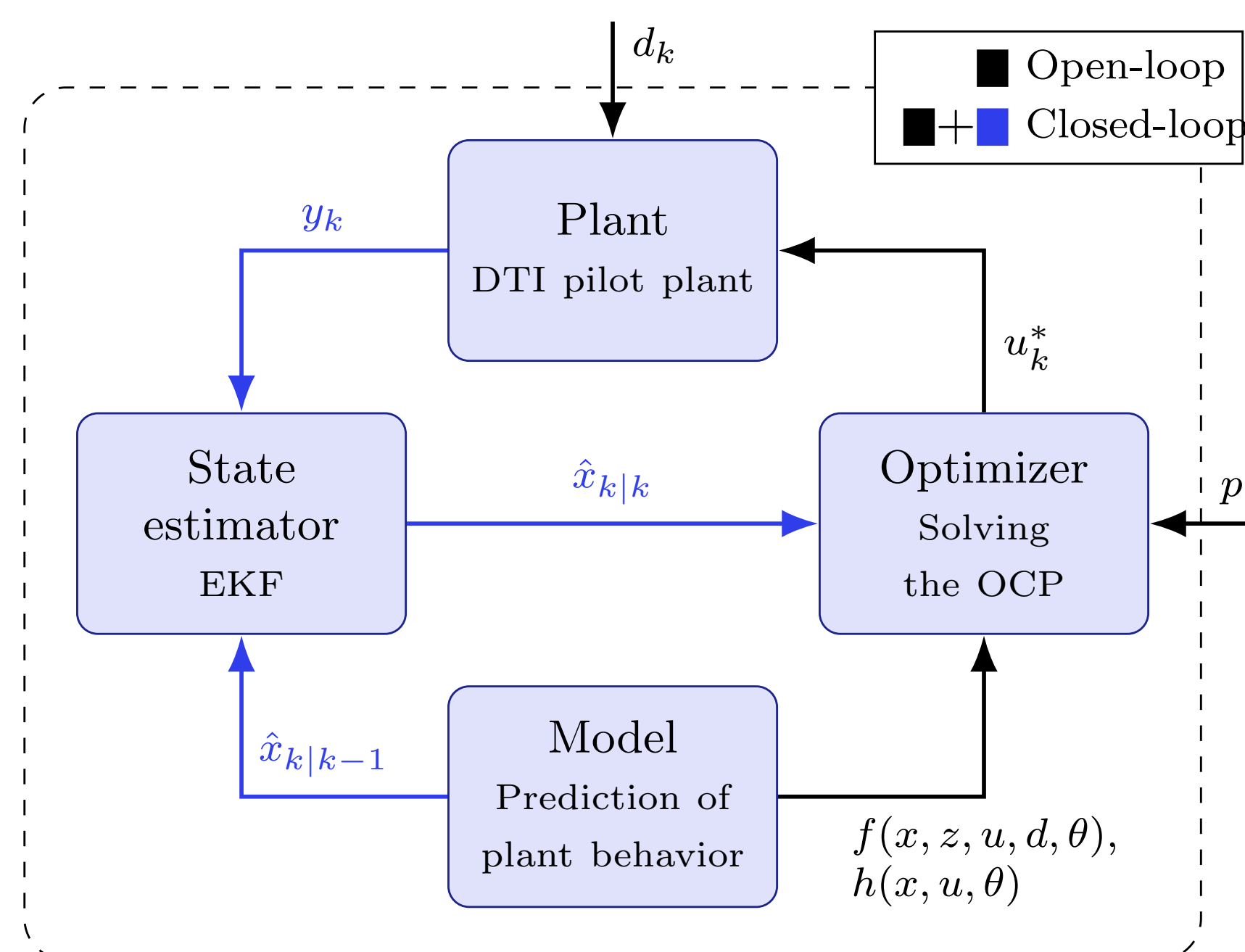


System

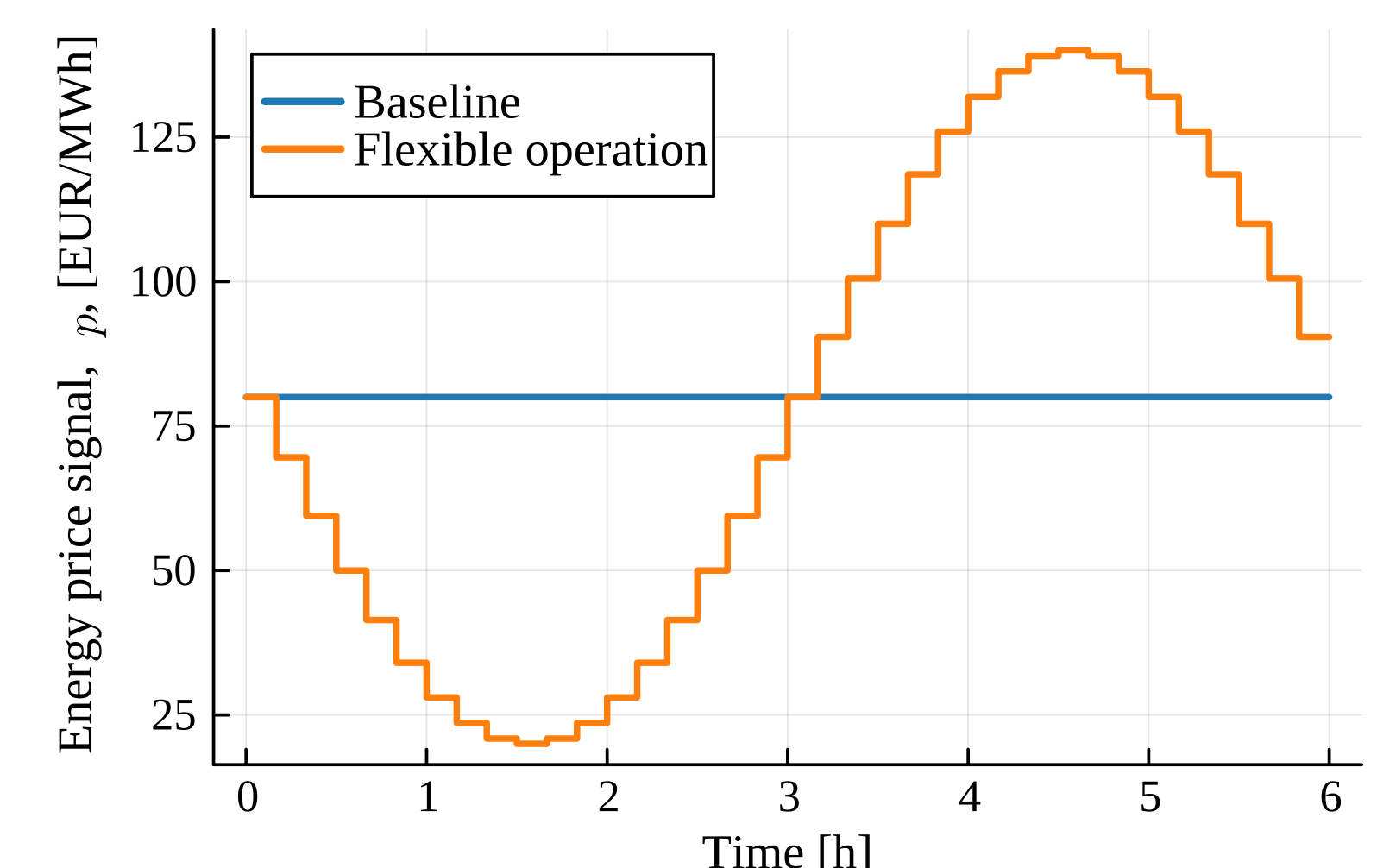


System diagram of the solvent-based carbon capture pilot plant at the Danish Technological Institute (DTI), Aarhus, Denmark.

EMPC framework

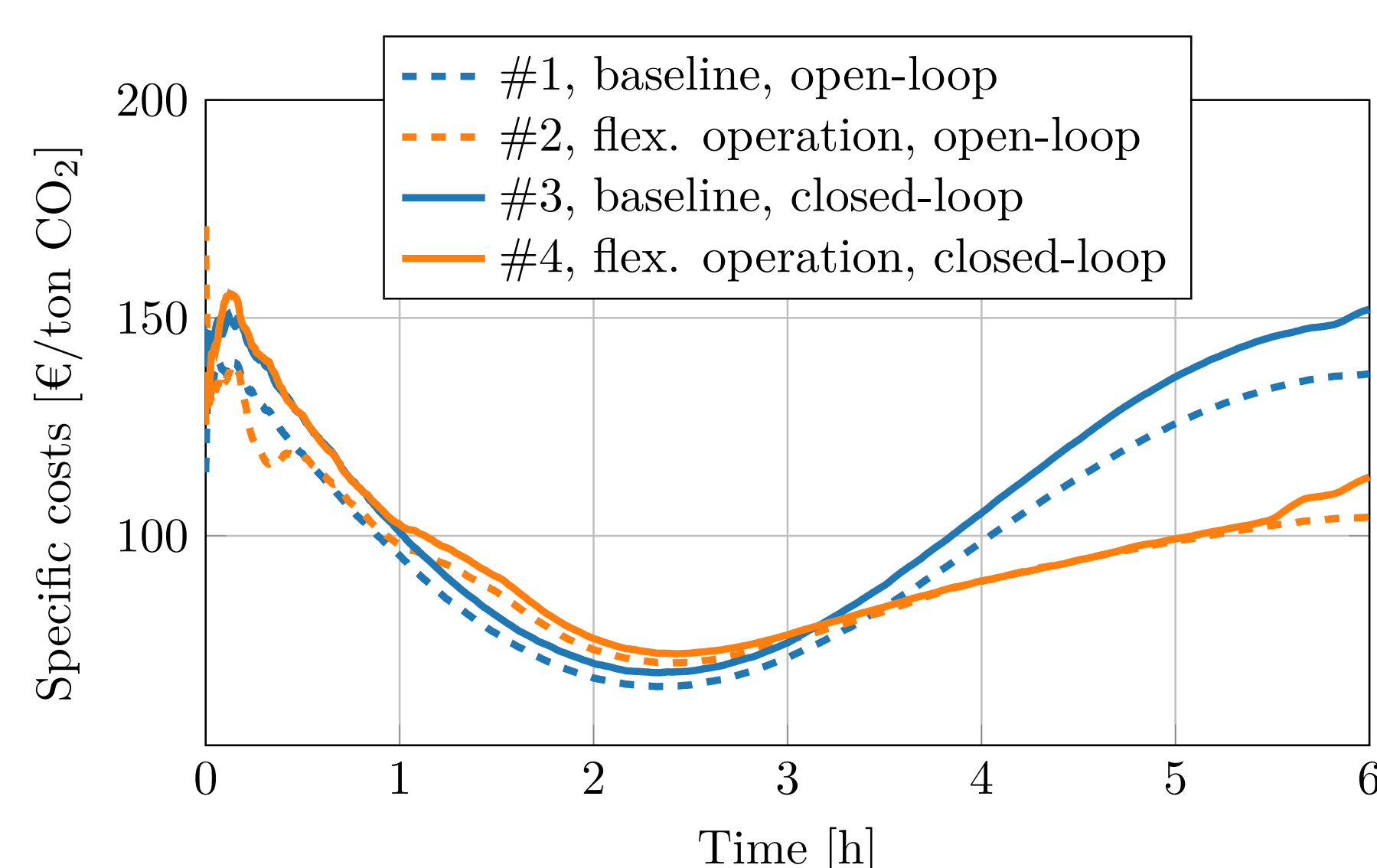


The Economic Model Predictive Control (EMPC) framework.

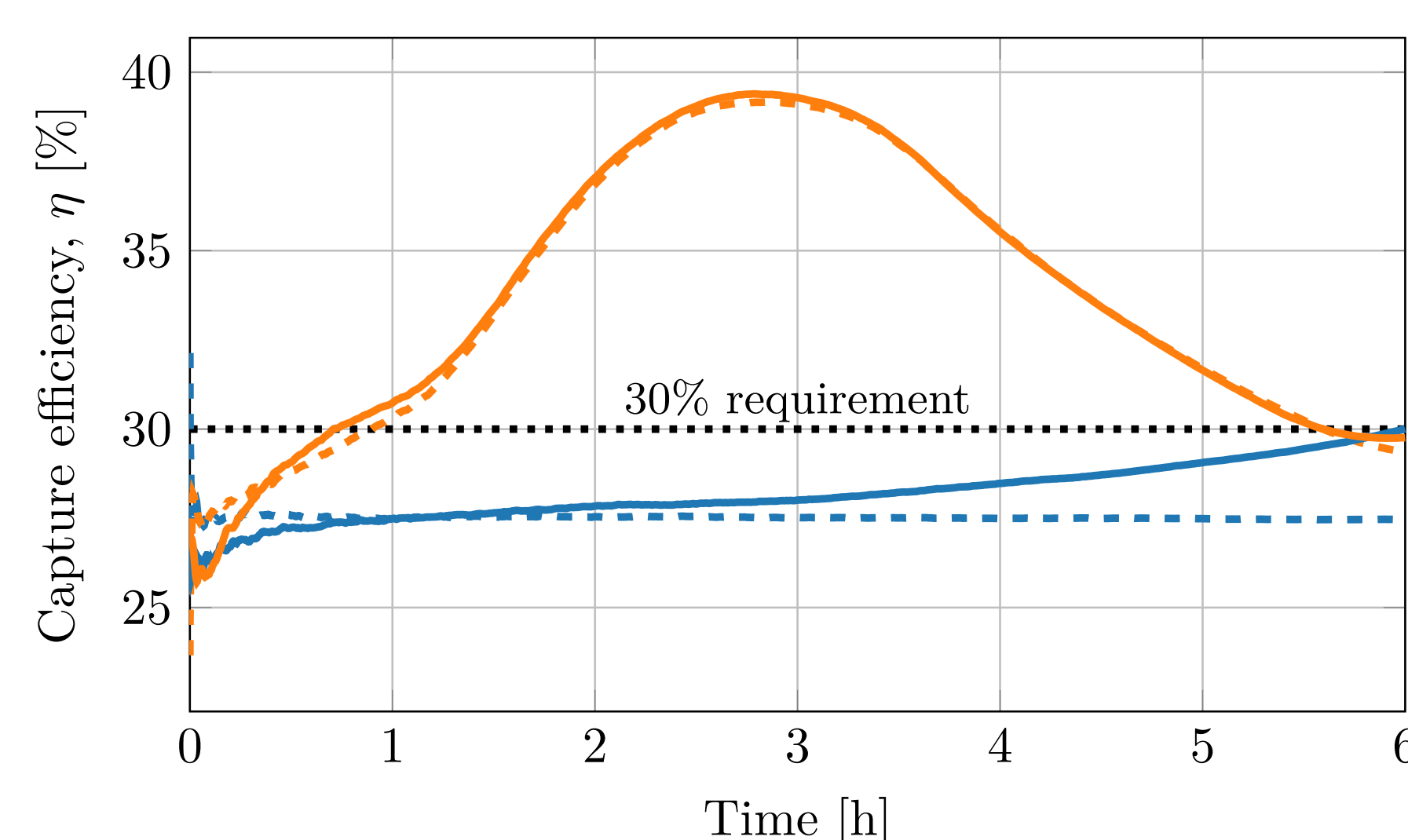


Chosen energy price signal for the baseline and flexible operation scenarios.

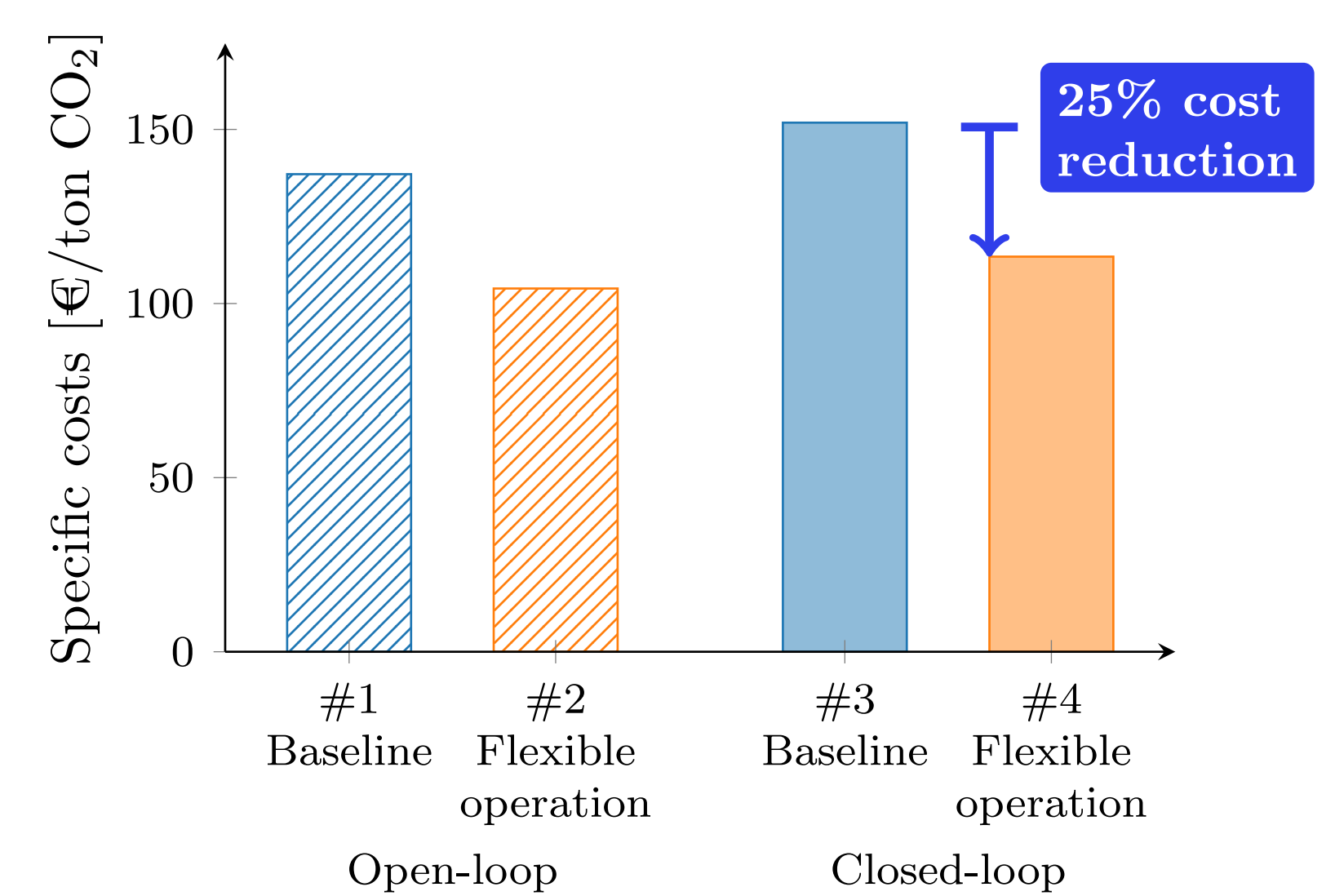
Results of the pilot plant demonstration



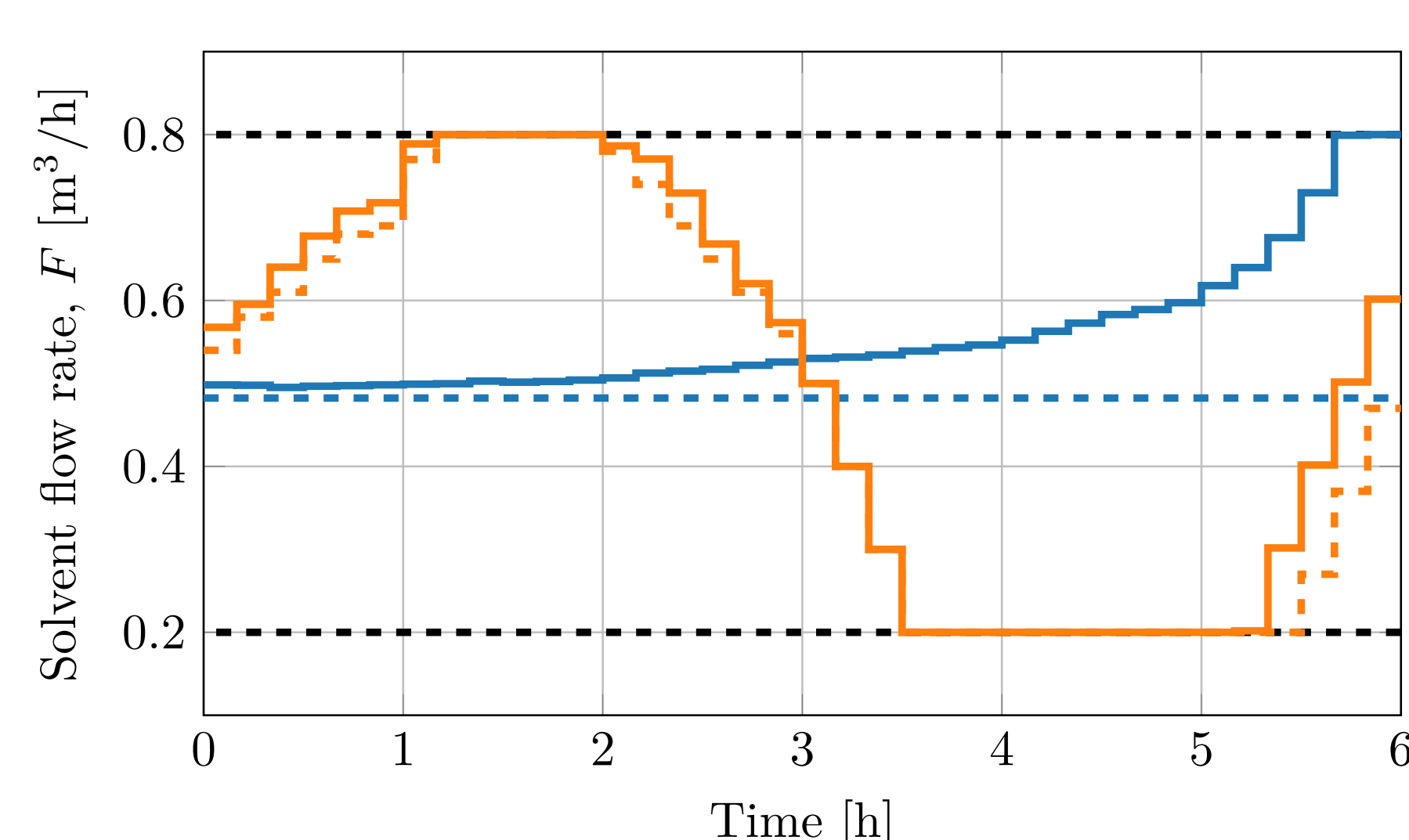
Running average of the specific capture cost [€/ton CO₂]



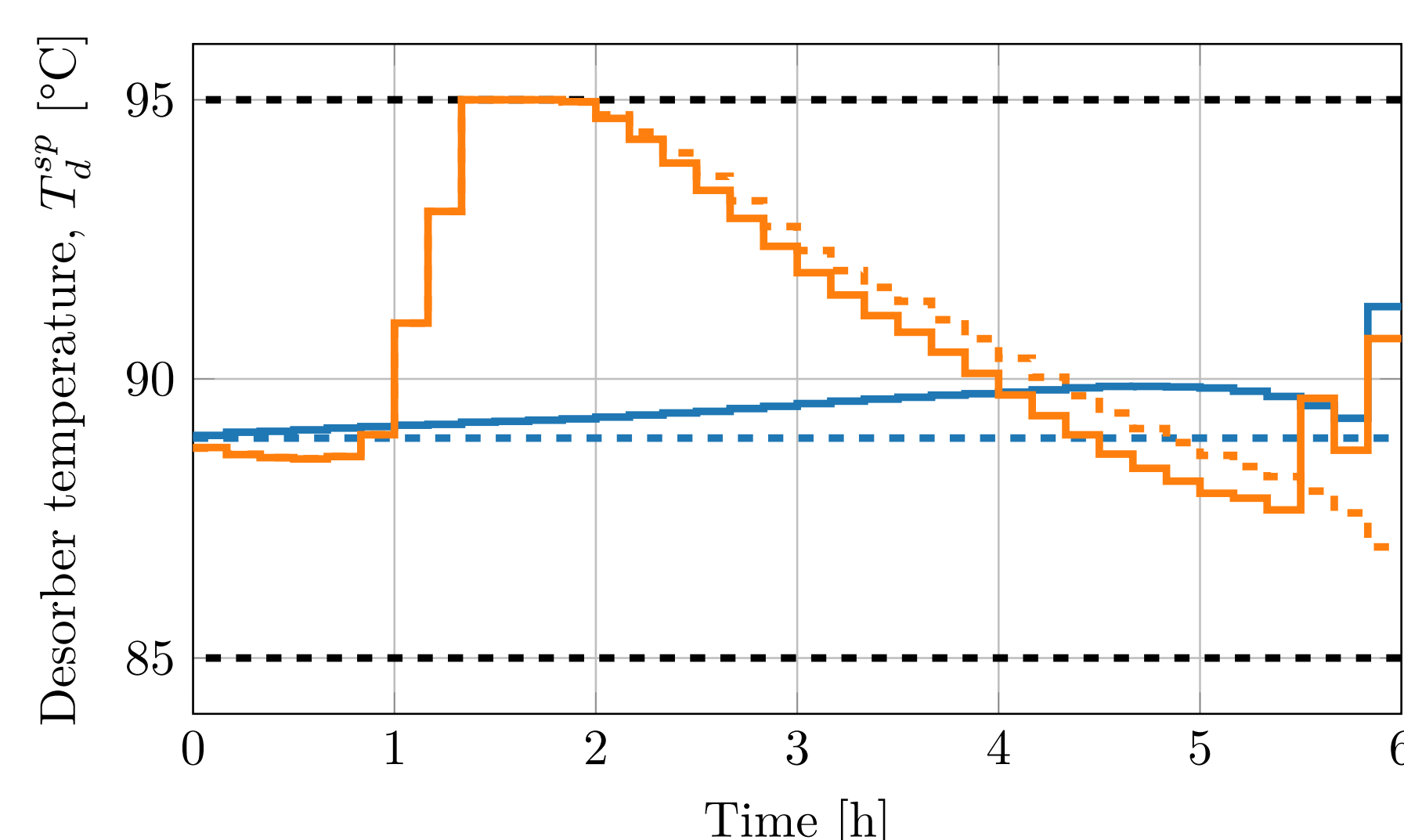
Running average of the capture efficiency [%]



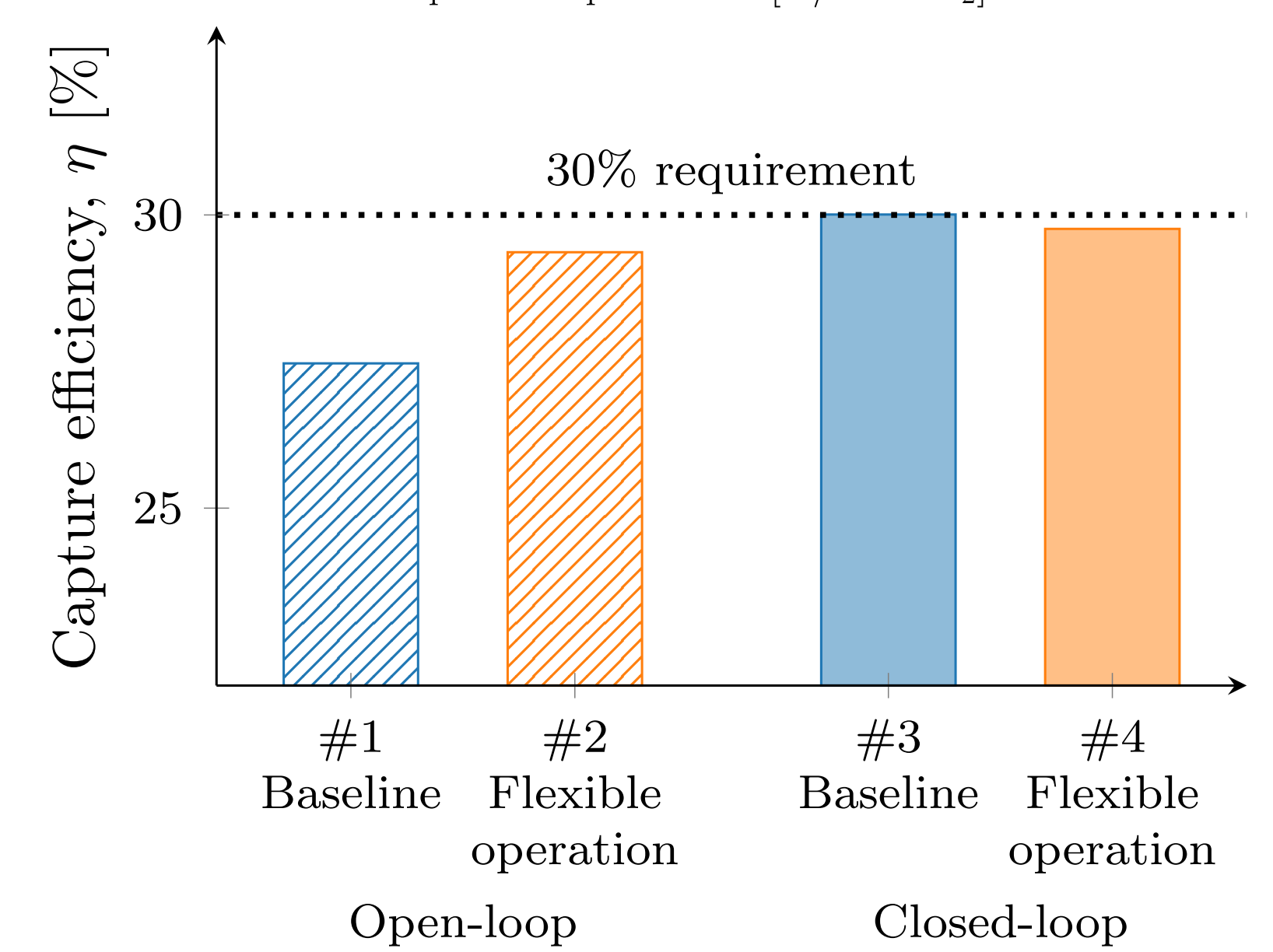
Final specific capture cost [€/ton CO₂]



Optimal solvent flow rate set point, F [m³/h]



Optimal desorber temperature set point, T_d^{sp} [°C]



Final capture efficiency [%]

