

## **TARGETED FUNDAMENTAL RESEARCH AS AN IMPORTANT ELEMENT OF HIGH TRL PROJECTS**

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Climate change and energy transition are among the main challenges the European Union faces. Time is running short – effective measures have to be taken very soon, technologies need to be pushed forward that can result in a significant reduction of CO<sub>2</sub> emissions within the next decade. Therefore, it is only consequent that the European Commission supports the demonstration of technologies that are available in principle and that it primarily funds projects focussing on high TRL technologies.

Carbon Capture and Storage for the reduction of CO<sub>2</sub> emissions that are otherwise hard to abate and hydrogen liquefaction for the development of global hydrogen markets are such technologies. However, by using these technologies and the relevant thermodynamic property models as examples, the talk will show that the optimisation of technologies that are in principle available still requires elements of fundamental research to come to optimized solutions. And while (close to) optimal technical solutions are typically developed by slow scale up over generations of plants or systems, the urgency of the energy transition and the scale of the challenge call for systematic work on optimized solutions in parallel to the demonstration of the principle feasibility. The presentation intends to show that targeted fundamental research should be considered in parallel to the practical demonstration of promising technologies and process chains to establish the basis for optimised solutions.