

## Examples of further collaborations through third party funding to mitigate climate change

### Focus on membrane and hydrogen technologies

Project	Funding Agency	Focus Area	Partners	Additional Information
MemKoWI	BMWK	CO <sub>2</sub> and hydrogen separation on a pilot scale	FZJ, Dillinger Hüttenwerke, thyssenkrupp Polysius, DVGW, Linde, atech innovations, VDEh BFI, iqony	Investigates innovative gas separation processes for a sustainable industrial society
MACBETH	EU Horizon 2020	Catalytic membrane reactors for industrial applications	Various European partners	Aims to reduce GHG emissions and increase resource and energy efficiency in large-scale industrial processes
BIOCOMEM	EU Horizon 2020	Bio-based membranes for gas separations	Various European partners	Develops new membranes for CO <sub>2</sub> separation starting from biopolymers
INNO-MEM	EU Horizon 2020	Nano-enabled membranes for industrial applications	Various European partners	Focuses on the deployment and scale-up of innovative nano-enabled membranes as well as access to European pilot scale membrane research infrastructure
COBRA	BMBF	Complex membrane separations in the chemical industry	Various German partners	Develops innovative catalyst and membrane materials for efficient and sustainable processes
Plasma2X	BMDV	Integration of membrane separations into regenerative production routes for methanol and liquid fuels	KIT, FZJ, and other partners	Uses modern membrane separation technology for syngas production
DACstorE	Helmholtz	Direct air capture and storage techniques for CO <sub>2</sub> removal	KIT, FZJ, and other Helmholtz centers	Investigates technical solutions for CO <sub>2</sub> capture from ambient air and its storage
CMWS	DESY	Water purification membrane technologies	Over 45 institutions from Europe and worldwide	Advances water purification membrane technologies
DigiHyPro	EU-DARP DTEC.bw	Digitized hydrogen process chain	HSU, Hereon, DLR-VE, TUHH	Intelligent coupling the sectors electrical grid – gas grid – heat – mobility via hydrogen
DigiMatMan	EU-DARP DTEC.bw	Digital materials manufacture	HSU, Hereon	Rapid throughput materials combination tool for thermophotovoltaics and metal hydride materials
H2HybridTank	B MWI	Demonstration of a cost-efficient hybrid pressure-solid state hydrogen storage functional model for automotive application	Hereon, Stühff, Volkswagen	Metal-hydride based hydrogen storage tanks in an Audi SUV
HyCARE	EU H2020-JTI-FCH-2018-1	Hydrogen CARRIER for Renewable Energy storage	Various European partners	Integrated metal hydride hydrogen and heat storage for stationary applications
HySCore	BMBF	Efficient H <sub>2</sub> -storage by novel hierarchical porous core shell structures with embedded light metal hydrides	UniHH, Hereon, TUHH	Core-shell particulate materials consisting of polymer membranes, carbon based catalysts, and metal hydrides
HyPoKo	BMBF	Metal Hydride-Polymer Composites	UniHH, Hereon, TUHH	Polymer membrane encapsulated metal hydrides for more dynamic and impurity resistant hydrogen storage
HyReflexS	BMVI	Digitally controlled Hydrogen based emergency power supply	HSU, Hereon, Capgemini	Emergency power supply for public transport combined with flexible grid balancing
ReMedHyS	EU	Recycled Metals for Aboveground Hydrogen Storage	Various European partners	Integrating a 100 kg hydrogen storage system with a 2 MW PEM electrolyzer in Cuxhaven,

				Germany, supporting offshore hydrogen operations
<b>MUSE</b>	HGF	Marine robotics and -sensor technology	Hereon, AWI, Geomar	Hydrogen-powered offshore energy supply
<b>KomPrHy</b>	PJ	Hydrogen compression based on metal hydrides	Hereon, Stühff GmbH	Maintainance-free new compressor technology based on temperature swing absorption of different metal hydrides.
<b>Green Aviation</b>	Hamburg	Conversion of the complete energy supply to renewables and hydrogen for the example of a production site of aircraft industry in Finkenwerder	Hereon, TUHH, Airbus	Feasibility study, future concept and route including critical milestones to completely defossilize the production site of Airbus in Hamburg
<b>German New Zealand Green Hydrogen Centre</b>	BMBF	Cooperation on the topic of green hydrogen with the south pacific region	Hereon, GKN Hydrogen Systems, University of Otago, New Zealand	Networking and scientific exchange programme between Germany and New Zealand
<b>NZMat4H2Sto</b>	BMBF	Exploring New Zealand resources for the production of metal hydrides	Hereon, University of Otago and several other partners, New Zealand	Plentiful New Zealand black sand ores for hydrogen storage materials
<b>GreenH2Metals</b>	BMBF	Reducing FeTi oxides via a novel hydrogen route to produce solid hydrogen storage materials	Hereon, University of Otago and several other partners, New Zealand	Reducing FeTi oxides via a novel hydrogen route to produce solid hydrogen storage materials