Future Energy Exports (FEnEx) CRC

MILESTONE SUMMARY TABLE

Research Program	Output	Milestone Number	Milestone Description	Milestone Start Date (Grant Agreement)	Milestone End Date (Grant Agreement)
Research Program 2: Hydrogen Exports & Value Chains					
RP2 Hydrogen Exports & Value Chains	Significant contribution to the objectives of RP2 Hydrogen Exports & Value Chains	2.0	Generally aligned with the goal of developing Hydrogen Exports & Value Chains (including Utilisation) but not specifically aligned with any of the other RP1 Milestones	1/7/2020	30/6/2022
RP2 Hydrogen Exports & Value Chains	Optimised production & use of liquid carriers enabling efficient long-distance transport of hydrogen, such as: liquid hydrogen (LH2), methyl-cyclohexane (MCH), liquid organic hydrogen carriers (LOHCs), methanol (MeOH), & ammonia (NH3).	2.1.1	Detailed design of a liquid hydrogen production and storage plant at the scale required for export	1/7/2021	30/6/2022
RP2 Hydrogen Exports & Value Chains	Optimised production & use of liquid carriers enabling efficient long-distance transport of hydrogen, such as: liquid hydrogen (LH2), methyl-cyclohexane (MCH), liquid organic hydrogen carriers (LOHCs), methanol (MeOH), & ammonia (NH3).	2.1.2	Identify optimum integration and recovery of hydrogen from selected liquid organic carriers	1/7/2025	30/6/2027
RP2 Hydrogen Exports & Value Chains	Novel and improved materials for hydrogen containment that enable storage and transport while minimising hydrogen embrittlement and/or reduce boil-off gas (BOG) in cryogenic applications; codes and standards for safer handling; as well as accurate models for predicting liquid hydrogen (LH2) boil-off	2.2.1	Develop and test a liquid hydrogen boil-off gas model as a user-friendly software tool	1/7/2021	30/6/2023
RP2 Hydrogen Exports & Value Chains	Novel and improved materials for hydrogen containment that enable storage and transport while minimising hydrogen embrittlement and/or reduce boil-off gas (BOG) in cryogenic applications; codes and standards for safer handling; as well as accurate models for predicting liquid hydrogen (LH2) boil-off	2.2.2	Report detailing technical requirements for scale up of electrolysis methods relevant to production at export-scale	1/7/2023	30/6/2024

RP2 Hydrogen Exports & Value Chains	Novel and improved materials for hydrogen containment that enable storage and transport while minimising hydrogen embrittlement and/or reduce boil-off gas (BOG) in cryogenic applications; codes and standards for safer handling; as well as accurate models for predicting liquid hydrogen (LH2) boil-off	2.2.3	Optimal containment material identified for large-scale hydrogen storage accompanied by required operation data for its inclusion in system design	1/7/2028	30/6/2030
RP2 Hydrogen Exports & Value Chains	Advanced and robust electrolysis technologies and processes, including proton exchange membrane (PEM) and alkaline electrolysis (AE) systems, for large scale production of green hydrogen	2.3.1	Final design of integrated renewable energy co-electrolysis (power-to-gas, gas-to-power) with energy storage and heat integration to produce and transport hydrogen	1/7/2026	30/6/2028
RP2 Hydrogen Exports & Value Chains	Efficient integration of carbon capture & use (CCU) with steam reformation of methane (C1) and novel pyrolysis reforming technologies for the sustainable production of blue hydrogen, and production methods for value added synthetic carbon fuels using green hydrogen.	2.4.1	Report detailed options for (i) closed loop carbon economies and (ii) coupled methane reforming and carbon capture and storage for the delivery of hydrogen	1/7/2020	30/6/2021
RP2 Hydrogen Exports & Value Chains	Efficient integration of carbon capture & use (CCU) with steam reformation of methane (C1) and novel pyrolysis reforming technologies for the sustainable production of blue hydrogen, and production methods for value added synthetic carbon fuels using green hydrogen.	2.4.2	Pilot-scale testing demonstration of a closed loop carbon cycle for the provision of hydrogen	1/7/2022	30/6/2025
RP2 Hydrogen Exports & Value Chains	Integrated systems with solid-phase hydrogen storage materials (such as metal hydrides, metal organic frameworks, & adsorbents) and thermal 'thermal batteries' able to efficiently store and release energy, including on time and length scales relevant to export	2.5.1	Experimental design and construction of test rig for technical evaluation of solid-state hydrogen storage and thermal batteries	1/7/2023	30/6/2026
RP2 Hydrogen Exports & Value Chains	Integrated systems with solid-phase hydrogen storage materials (such as metal hydrides, metal organic frameworks, & adsorbents) and thermal 'thermal batteries' able to efficiently store and release energy, including on time and length scales relevant to export	2.5.2	Integrate optimum hydrogen export method (solid state hydrogen, liquid organic hydrogen carriers or liquid hydrogen) into co-electrolysis pilot plant	1/7/2027	30/6/2029