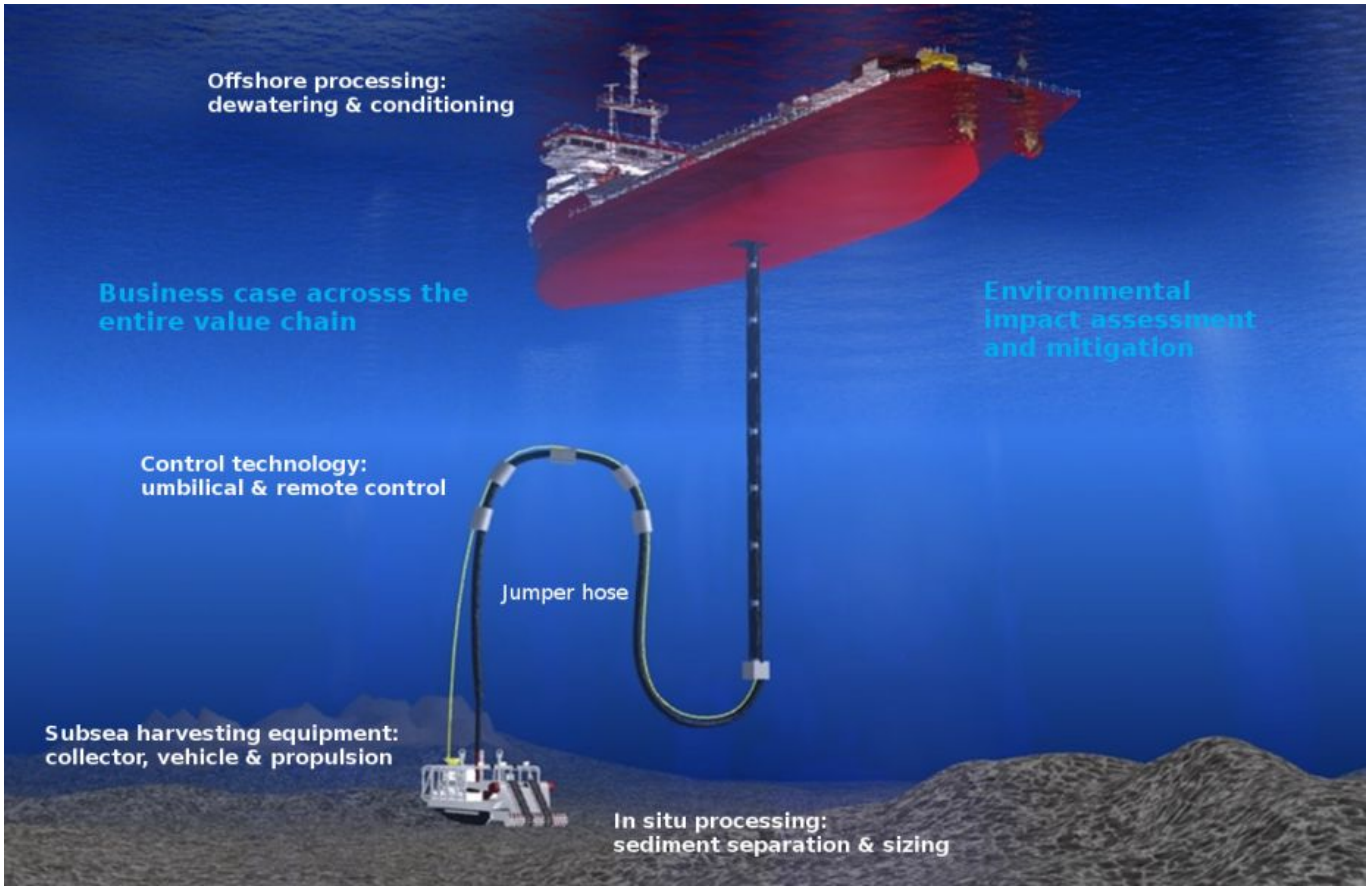
Blue Harvesting

It is known that underwater collectors produce large clouds of particulate matter that severely affect seabed life in the areas around the mine sites and possibly a few miles away. Currently, the preferred technology developed for mining manganese nodules uses hydraulic separation of the nodules from the sediment. This process generates a sediment cloud. The Blue Harvesting project focuses on developing and improving the collector to ensure reduced environmental impact, production rate and efficiency.

Based on the development of the collector from the Blue Nodules (H2020) project, an improved prototype was developed to reduce the volume of the sediment cloud. Extensive simulations of the flow dynamics of the collector as a whole, both the inlet, the processing and the outlet of the water flow carrying the manganese nodules and sediments were analysed and validated in laboratory and field experiments. These results are used to optimize the overall system design and to limit the production and dispersion of suspended solids. The achieved optimisations were tested in the laboratory and in a fully functional environment in a real polymetallic tuber field at several kilometres water depth in the Atlantic.

The AMT controls the material flows in the hydraulic collector using Acousitc Emission Technology. Thus the main task is the development of a sensor chain which can be used in this new and special working atmosphere. In this way, a contribution is to be made to achieving technical efficiency and environmental protection.

Building on the Blue Nodules Project (H2020), the Blue Harvesting Project will design and manufacture a prototype of a hydraulic collector for the extraction of manganese nodules from the deep sea. After several different test phases, the collector will be prepared for its final test under real conditions. The Institute for Advanced Mining Technologies will use the acoustic emission technology for material flow characterization in the course of the project. An Acoustic Emission measurement chain will be designed to withstand the environmental conditions prevailing during manganese nodule mining and attached to the hydraulic collector.


Offshore processing:
dewatering & conditioning
Business case acrosss the
entire value chain
Environmental
impact assessment
and mitigation
Control technology:
umbilical & remote control
Jumper hose
Subsea harvesting equipment:
collector, vehicle & propulsion
In situ processing:
sediment separation & sizing

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