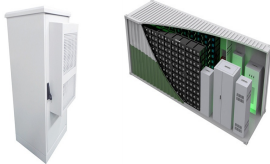
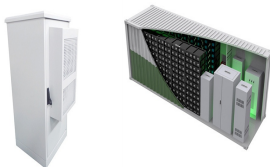


# SUBMARINE HIGH PRESSURE ENERGY STORAGE

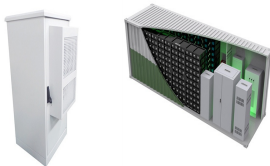


Which hydride storage systems are suitable for small submarines?

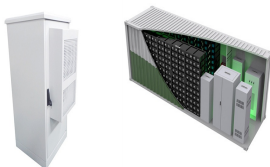
Compressed, and metal hydride-based  $H_2$  storages are suitable for small to medium submarines. The most critical development in conventional underwater applications in recent years is to use hydrogen energy systems, including Air Independent Propulsion (AIP) systems.



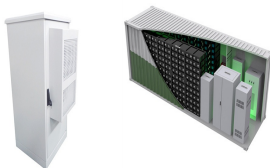
Is Subsea energy storage a viable alternative to floating onboard energy storage? Subsea energy storage is an emerging and promising alternative to conventional floating onboard energy storage. In this review, various potential subsea electricity and hydrogen energy storage solutions for ???floating offshore wind +hydrogen??? are examined and compared.



Should subsea compressed gaseous hydrogen storage be deployed on the seabed? Nevertheless, subsea compressed gaseous hydrogen storage with pressure vessels remains a preferable option over floating storage as long as significant unresolved security challenges exist. This concept would be more appealing if the compression system could also be deployed on the seabed.

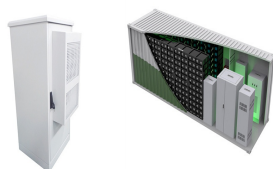


What is underwater compressed air energy storage? Underwater compressed air energy storage In a conventional onshore compressed air energy storage (CAES) system, compressed air is typically stored in a rigid reservoir with constant volume, such as steel pressure vessels, salt caverns, and artificial hard rock chambers.



What is subsea Hydro-Pneumatic energy storage? Subsea hydro-pneumatic energy storage Hydro-pneumatic energy storage can be viewed as a variant of pumped hydro energy storage. In conventional pumped hydro storage systems, the high pressure head of water is provided by the gravity of the water column.

# SUBMARINE HIGH PRESSURE ENERGY STORAGE



What is the volumetric energy density of subsea hydrogen storage? The volumetric energy density of subsea hydrogen storage with non-pressure vessels depends on the water depth of storage and may be significantly lower than that of high-pressure compressed hydrogen storage with pressure vessels and cryogenic liquid hydrogen storage.



Hydrogen storage. For hydrogen storage, high pressure bottles are used with a volumetric storage capacity of 35 grammes per litre. This is currently the technology of choice in the automotive industry. For safety reasons, the ???



For compressed air energy storage (CAES) caverns, the artificially excavated tunnel is flexible in site selection but high in sealing cost. A novel concept of building a water ???



Underwater compressed air energy storage was developed from its terrestrial counterpart. It has also evolved to underwater compressed natural gas and hydrogen energy storage in recent years. UWCGES is a promising ???



The refueling pressure is set at 70 MPa in this study. Consequently, hydrogen coming from high-pressure trailers (35 MPa) and pipelines needs to be compressed again to satisfy the higher pressure ???

# SUBMARINE HIGH PRESSURE ENERGY STORAGE



For future submarines, oxygen storage inside the pressure hull is foreseen. Storage inside the pressure hull allows improved flexibility for integrating LOX tanks in different ???