

CASE STUDY: V.O.C PORT AUTHORITY GREEN HYDROGEN DEMONSTRATION PLANT

OBJECTIVES

To develop a demonstration plant, showcasing the green hydrogen generation and its green use case.

Plant characteristics are:

- H₂ Generation Capacity: 10 Nm³/hr
- H₂ Generation Pressure: Up to 30 bar
- H₂ Storage Capacity: 8 kg @30 bar
- Fuel Cell Generator Net Output: 10 kW



SOLUTIONS

Rhizome Energy completed a detailed design for the complete hydrogen plant, including integration of 50kW PEM Electrolyser, 30 bar hydrogen storage and a 10kW net output Fuel Cell Generator. The team carried out procurement & construction management together with essential commissioning activities to conclude a successfully running plant.

AT A GLANCE

ACHIEVEMENTS

Site Integration

Rhizome Energy Limited (RHIZOME) was contracted to design and commission a 10Nm³/hr Electrolyser (50kW) and a Fuel Cell Generator (10kW net output) for installation at V.O.Chidambaranar Port.

Hydrogen PEM Electrolyser

A PEM Electrolyser stack is used to produce hydrogen at a rate of 10Nm³/hr, utilizing demineralised/deionised water and DC electric power stabilized through a rectifier.

Storage

The ground storage system consists of a Type 1 steel cylinder bundle, with a total hydrogen storage capacity of approximately 8kg at 30 barg (low pressure). This is aligned with the nominal hydrogen generation rate of 10Nm³/hr.

Fuel Cell Generator

The hydrogen generation system supplies the hydrogen required for the fuel cell reaction. A 10kW fuel cell generator converts the produced hydrogen and ambient oxygen into electricity.



TESTIMONIAL

"The demonstration plant features a Hydrogen Electrolyser, Fuel Cell, and Hydrogen Storage System- each designed and commissioned by Rhizome Energy Limited.

We sincerely thank Rhizome Energy Limited for their dedication, technical expertise, and valuable contribution to this pioneering green hydrogen initiative undertaken by the V.O. Chidambaranar Port Authority at Tuticorin.'

V.O.Chidambaranar Port Authority

