

## MODULE 2

# COMPARISON OF STORAGE TECHNOLOGIES

### COMPRESSED HYDROGEN

High-pressure storage (up to 700 bar).

#### Cons/Challenges:

- **High Pressure:** Necessitates robust, thick-walled tanks.
- **Energy consumption:** Compression requires a substantial amount of energy.
- **Low bulk density:** Reduced hydrogen content per unit volume.



### LIQUEFIED HYDROGEN

Storage at extremely low temperatures (-253°C).

#### Cons/Challenges:

- **Extreme Temperature:** Necessitates cryogenic tanks equipped with insulation.
- **Boil-off:** Ongoing evaporation and gradual loss of hydrogen over time (minor).
- **Significant energy consumption:** The condensation process requires substantial energy.



### METAL HYDRIDES

Hydrogen is stored in a solid state through chemical bonding with the metal.

#### Cons/Challenges:

- **Safety:** Generally safer for storage (reduced pressure).
- **High Bulk Density:** The potential for a significant amount of hydrogen within a compact volume.
- **Weight:** Materials frequently possess significant mass.
- **Charge/discharge duration:** May be gradual, necessitates temperature regulation.

