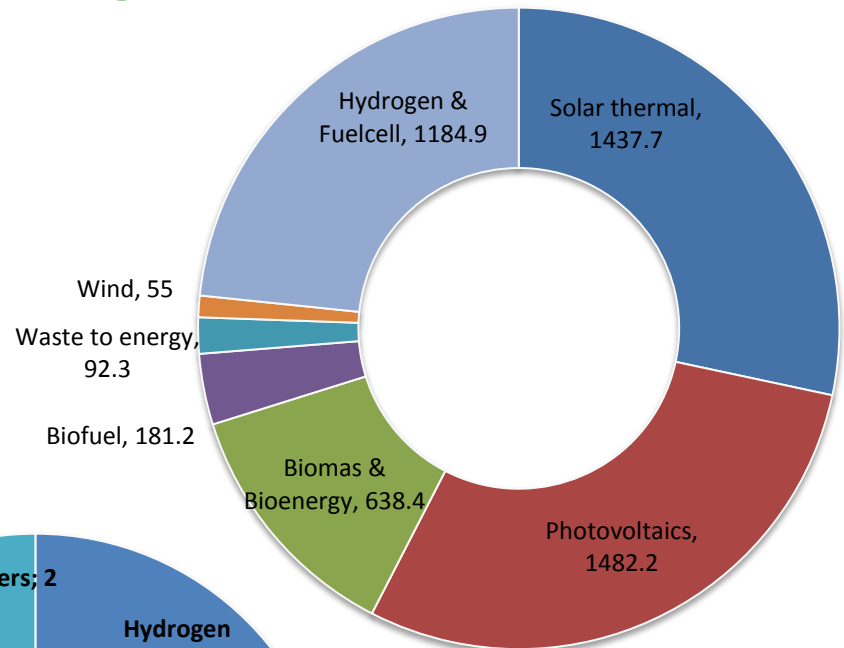
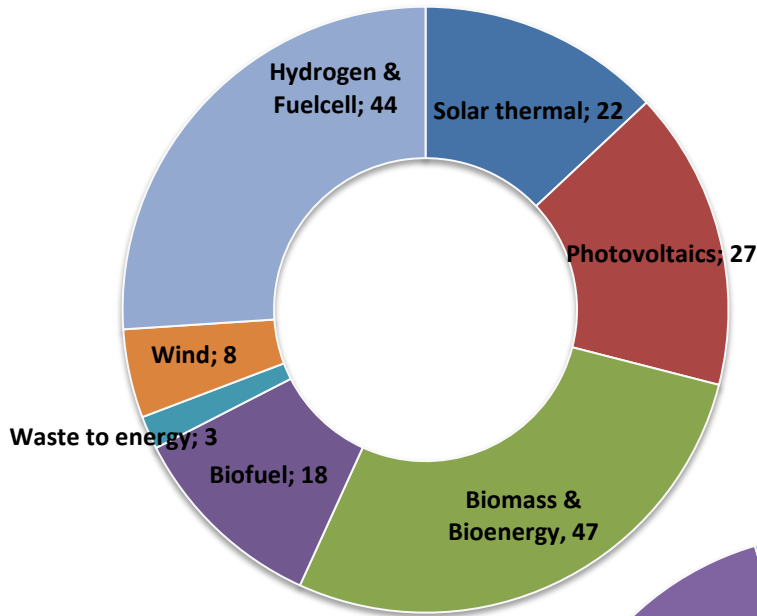


Hydrogen Energy in India

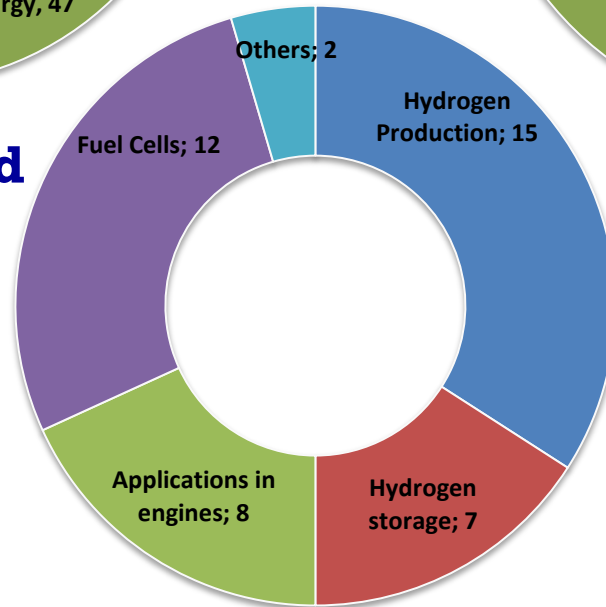
- **Activities relating to Hydrogen Energy for civilian applications in India are presently being implemented by several Ministries/Departments**
- **R&D efforts were initiated in 1982**
- **MNRE as nodal Ministry continued to support R&D efforts on business as usual mode**
- **National Hydrogen Energy Road Map was prepared with involvement of all stakeholders and adopted in 2006 to provide impetus to hydrogen and fuel cell activities**
- **Roadmap identified RD&D efforts for bridging the technological gaps in different areas of hydrogen energy & fuel cells**
- **Two initiatives for promoting use of hydrogen in automobiles and for power generation:**
 - **Green Initiative for Future Transport (GIFT)**
 - **Green Initiative for Power Generation (GIP)**

RD&D Efforts during 11th Plan Period



R&D Projects supported by MNRE

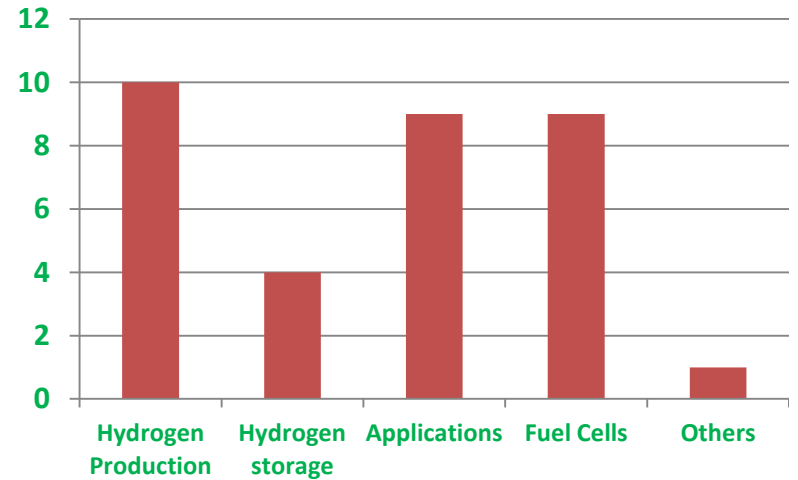
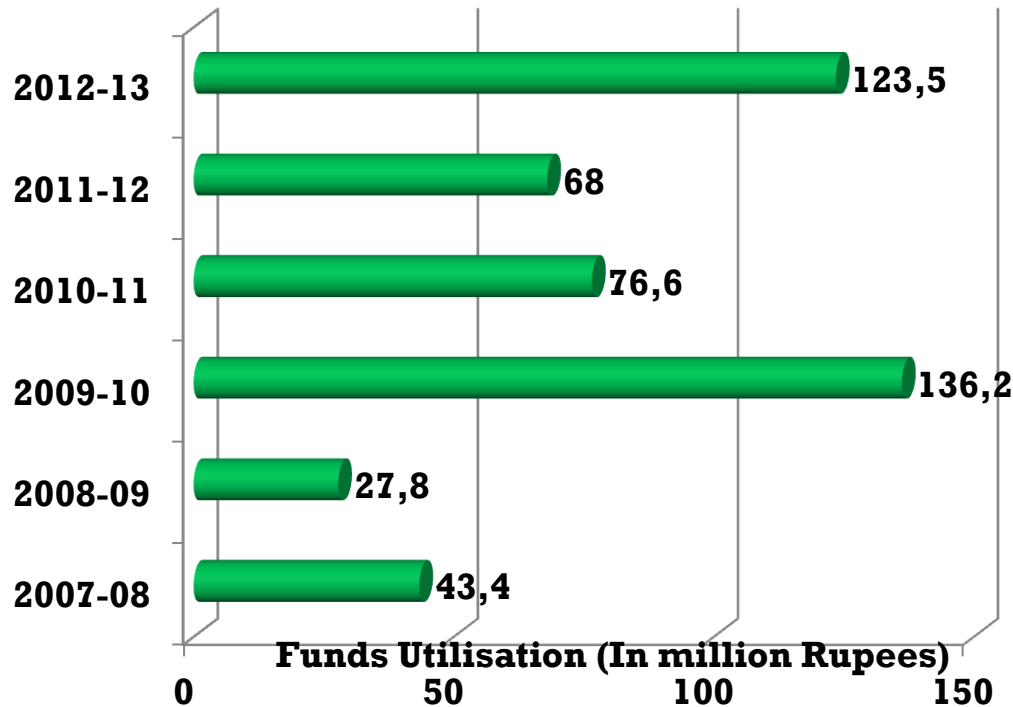
MNRE share of Project cost (In million Rupees)



R&D Projects on Hydrogen Energy & Fuel Cells Supported

Hydrogen Energy & Fuel Cells

Funds Utilisation during 11th Plan and 2012-13 & R&D projects under implementation



R&D Projects under implementation

Total 11th Plan : Rs. 352.0 million

Total 10th Plan : Rs.116.5 million

Provision for 2013-14 : Rs. 200.0 million

Hydrogen & fuel Cell Development in India



H₂ Dispensing station
in New Delhi



H-CNG fuelled 3 wheeler



Hydrogen - Diesel dual fuel SUV



H₂ fuelled 3 Wheeler



H₂ Fuel Cell Bus



Fuel Cell system as power back up
for telecom tower

Activities for 12th Plan

(2012-13 to 2017-18)

- **RD&D projects on hydrogen production, storage and applications in IC engines and fuel cells would continue to be supported**
- **Mission Mode Project on PEMFC and SOFC to be developed and supported**
- **Demonstration of hydrogen for stationary power generation and vehicular applications proposed to be supported**
- **Demonstration of H-CNG / Hydrogen fuelled vehicles based on IC engine and fuel cells**
- **National Hydrogen Energy and Fuel Cell Centre in campus of Solar Energy Centre at Gwalpahari, Gurgaon**