

# Hydrogen Production

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Bulk Storage of Gaseous Hydrogen Workshop

- **Steam-methane Reformer (thermochemical)**

- Max capacity: 150 MMSCFD
- Feed: NG and Steam

- **Autothermal Reforming(thermo chemical)**

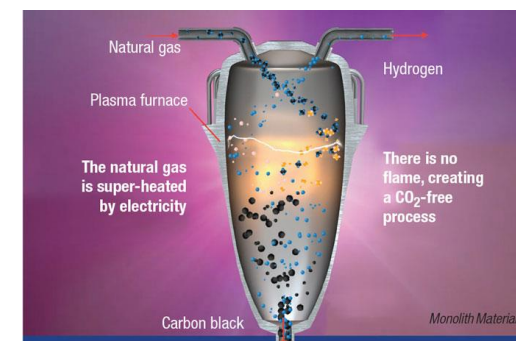
- Max capacity: 450 MMSCFD
- Feed: GOX and NG

- **Pyrolysis**

- Commercial Scale, 275, 000 metric tons per year
- 194,000 metric tones per year of Carbon black.

- **Electrolysis**

- Alkaline Electrolysis
- PEM Electrolysis
- Chloralkali Electrolysis



# Green, Blue, and Turquoise Hydrogen - Challenges

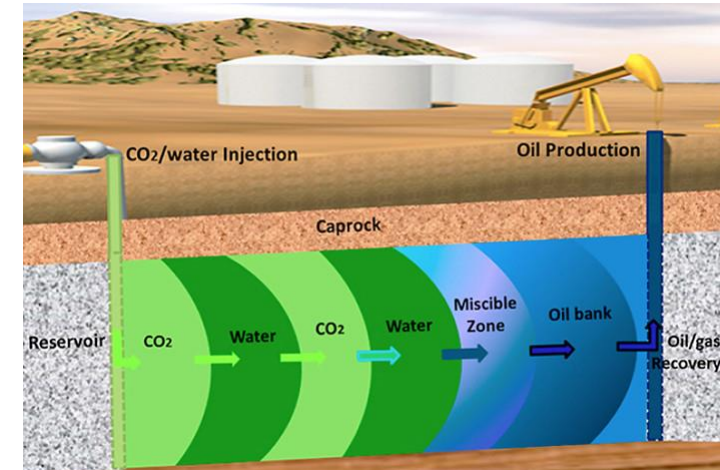
- **Green**

- Source of renewable electricity



- **Blue**

- Carbon dioxide sequestration



- **Turquoise**

- Carbon black disposal / reuse.



- **Bulk Production**

- **Advantages**

- Economy of Scale

- **Disadvantages**

- Transportation
- Delivery optimization based on demand

- **Onsite Production**

- **Advantages**

- No delivery complications

- **Disadvantages**

- Operation and Maintenance
- Cost



## PowerTap Retail Automotive



- What is changing?
  - Traditionally Industrial Gas Companies Produced and supplied Hydrogen
  - Refineries, mobile hydrogen consumers, other chemical companies started evaluating own hydrogen production
  
- Why?
  - New hydrogen users do not want to depend on IGCs.
  - Why?
    - Business models are changing.

- Old
  - Refineries
  - Hydrotreating processes
- New
  - Mobile Energy from Fuel Cells
  - Backup Energy from Fuel Cells
  - IC Engines
  - Power Stations
  - Home appliances
  - Other Combustion processes

**Thank You!  
Let us discuss!**

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