ENABLING THE HYDROGEN ECONOMY

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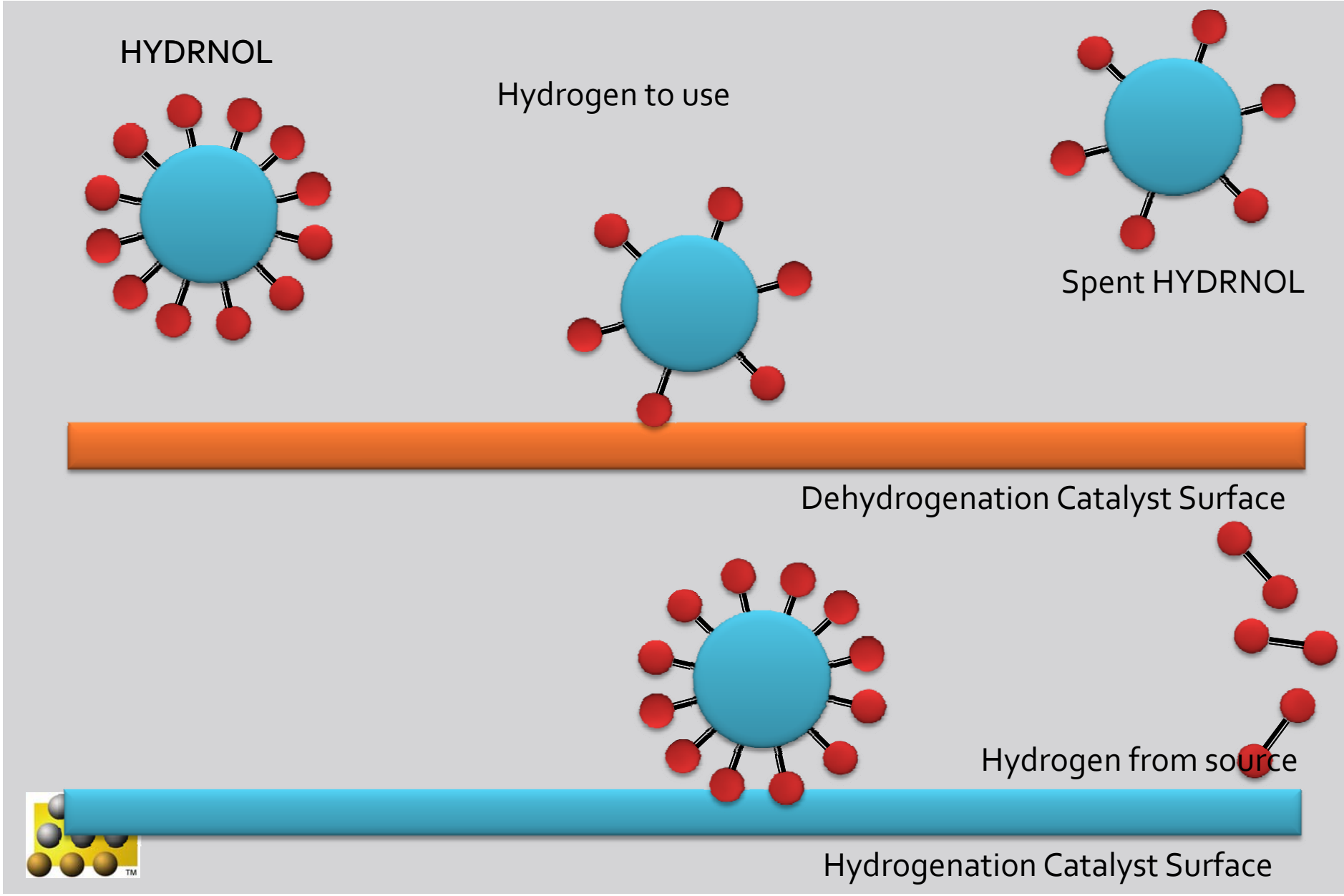
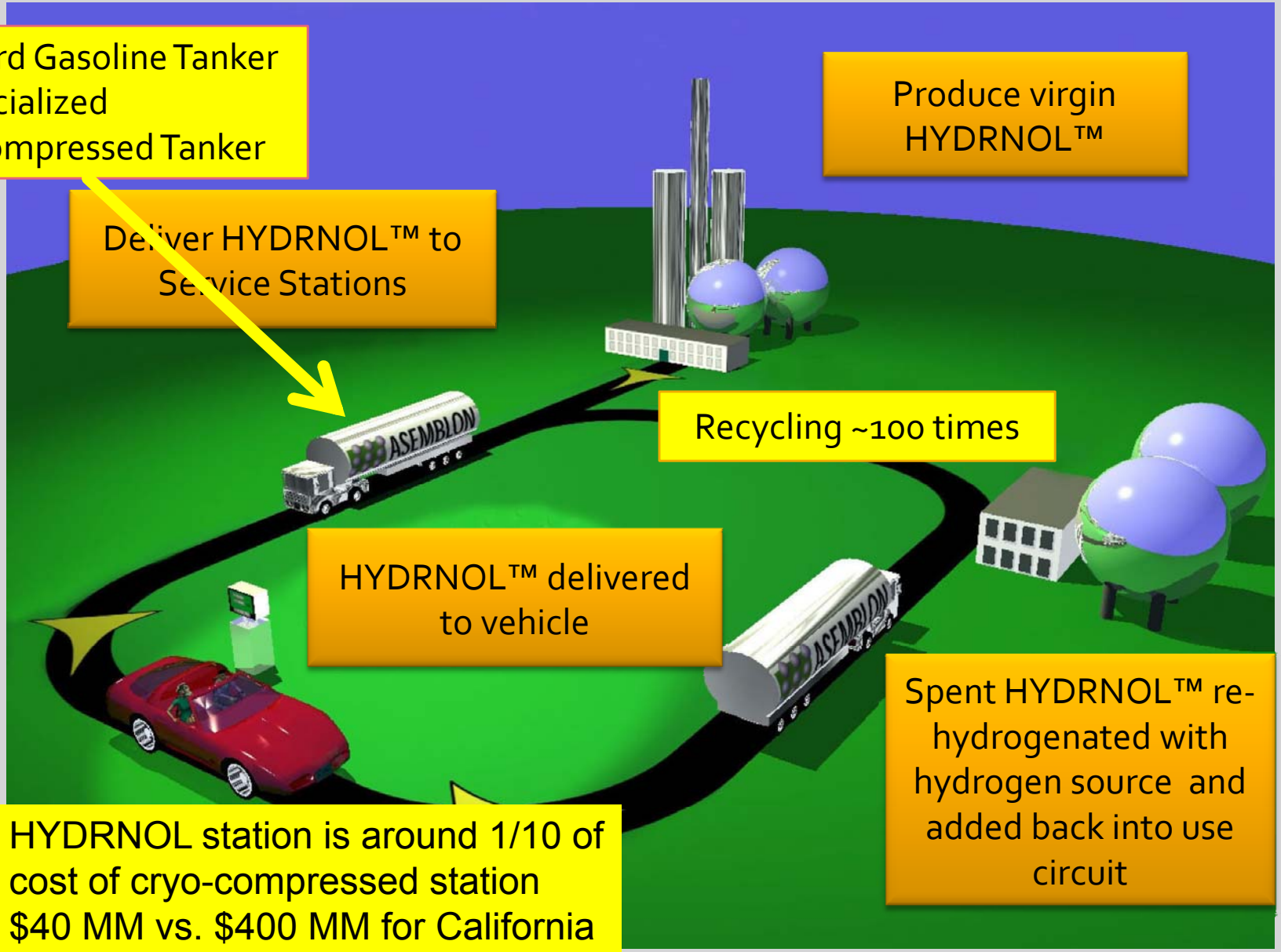
HYDRNOL Carrier

- Simple organic molecule
- Liquid over a wide temperature range
- Stored and transported at normal temperature and pressure (No need for cryo or pressure treatment)
- Uses current fueling infrastructure
- Safe as gasoline or diesel
- Exceeds DOE goals
- Enables renewable energy
- Releases Hydrogen as needed

HYDRNOL – Molecular Concept

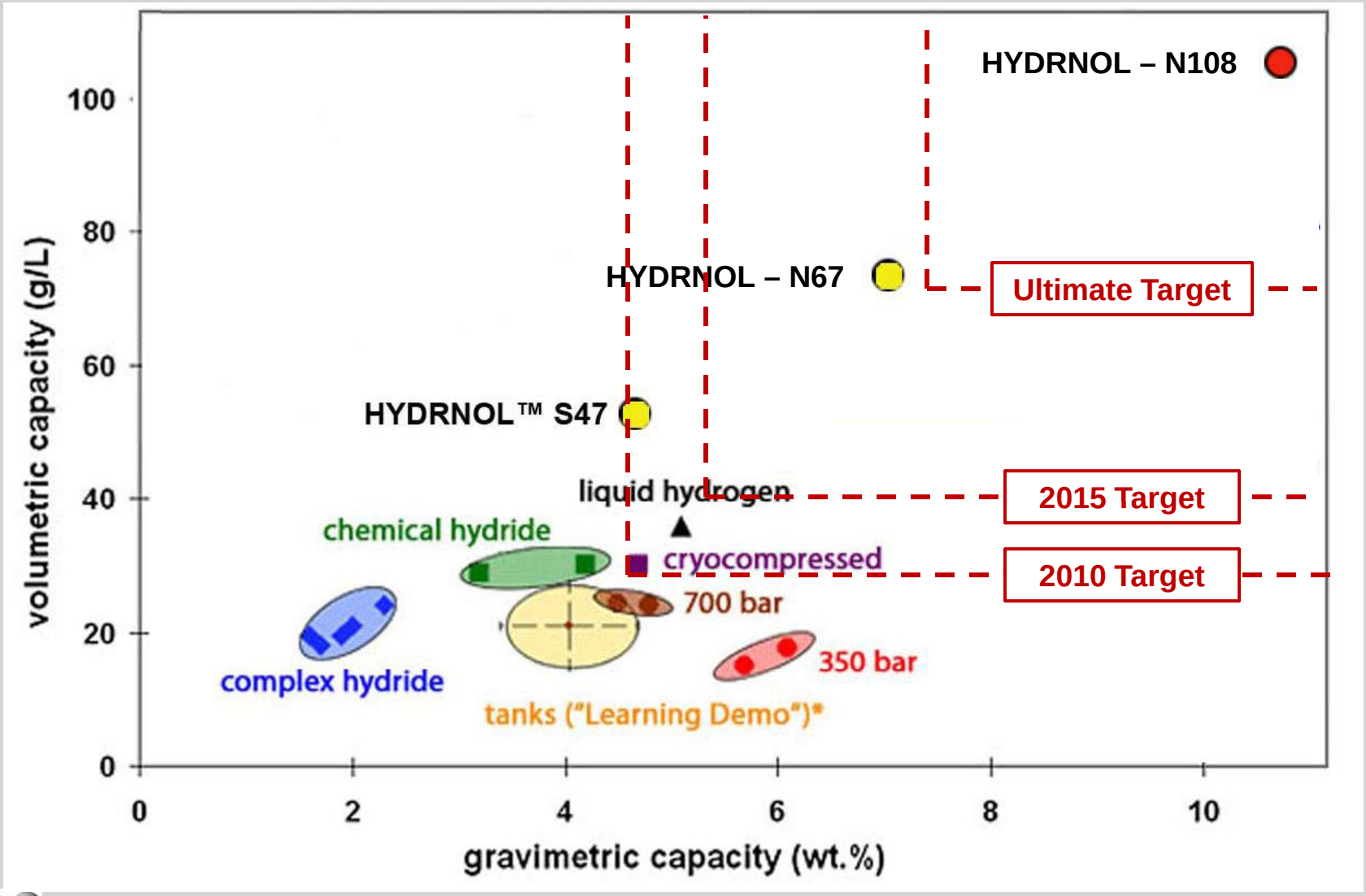


Vehicle Implementation



HYDRNOL station is around 1/10 of cost of cryo-compressed station
$40 MM vs. $400 MM for California

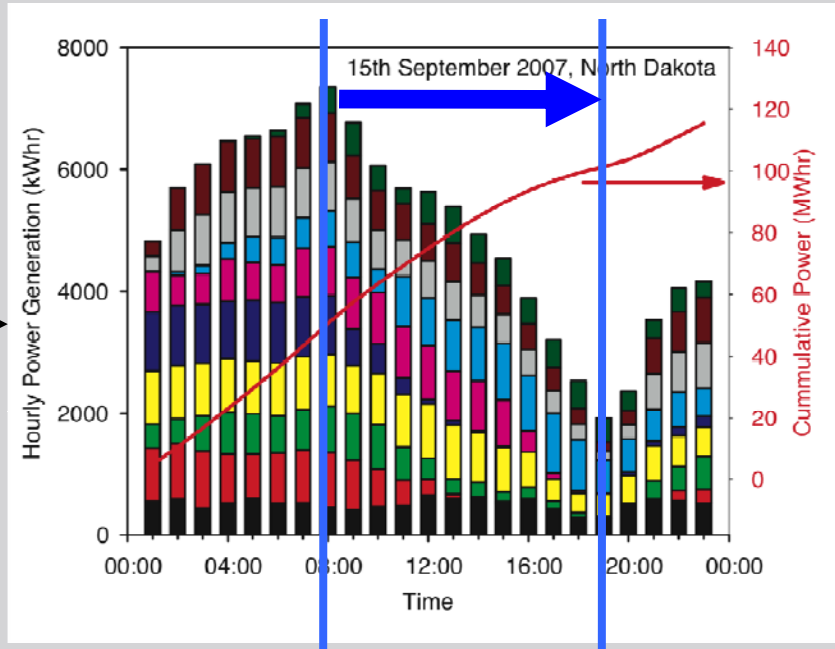
DOE Targets – Comparison with Other Storage

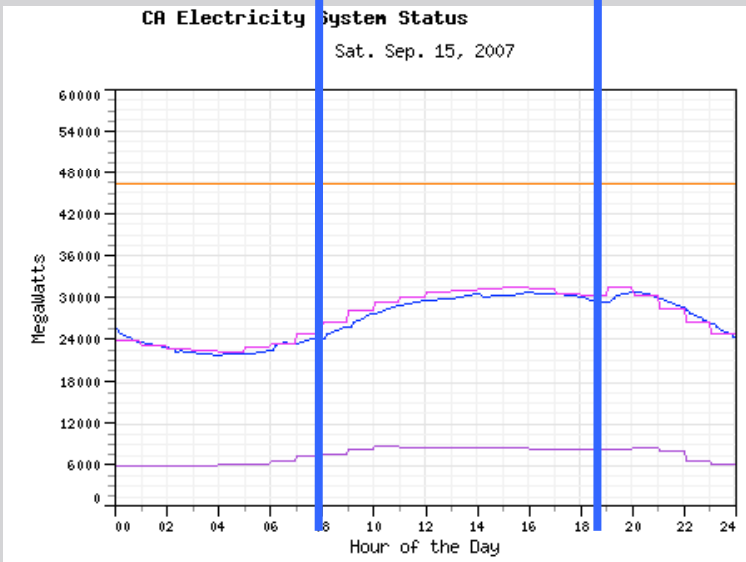


HYDRNOL as a Transitional Technology

- Hydrogen can initially be derived from Natural Gas (SMR), then renewable sources as they become available
- You build value from the first installation
- Does not require significant user re-education
- Diesel co-combustion to reduce particulates
- Low capital cost to deploy including existing vehicle retrofit
- Optimal fueling points already established for gasoline

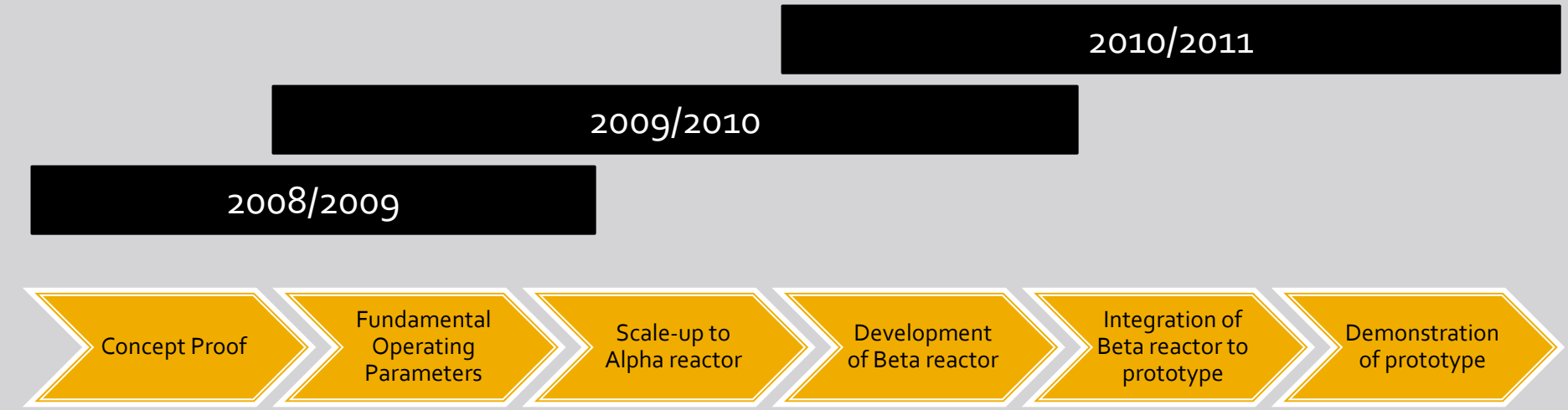
Power Shifting

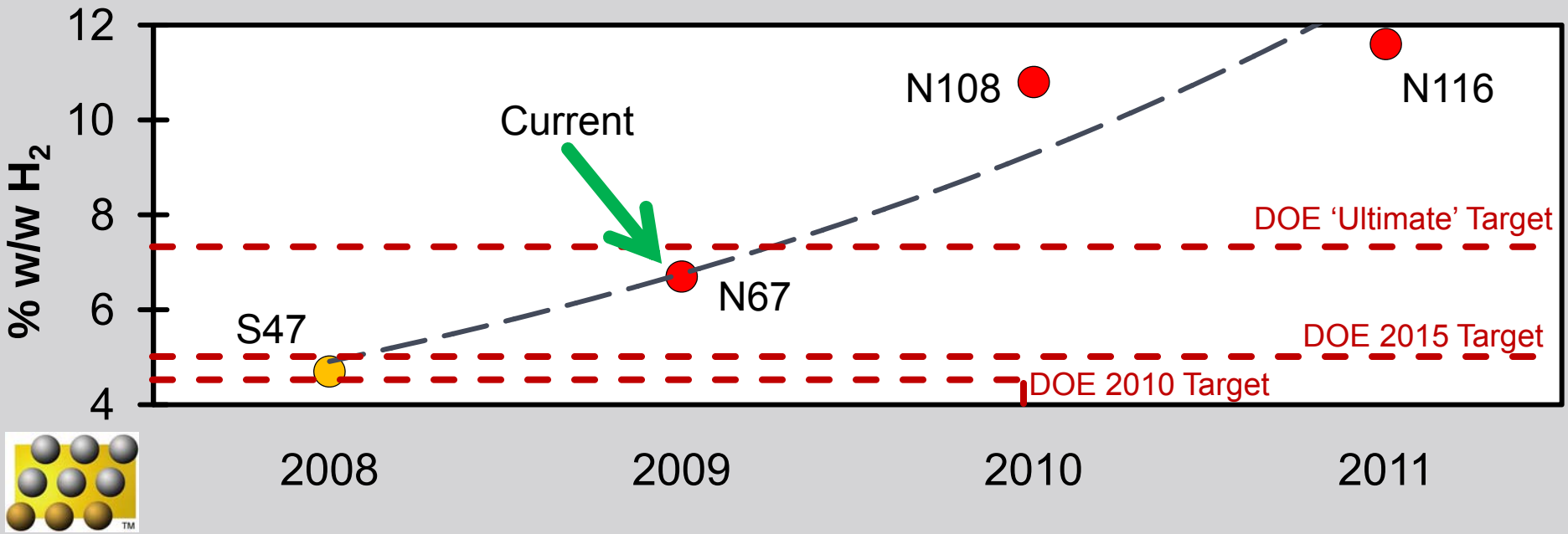




A method is needed to store the wind production until required

Asemblon – Hydrogen Technical Roadmap





Demonstration Partners

- Automobile
  - Clemson University – International Center for Automotive Research (18-24 months, H_2ICE)
    - BMW, Mazda
  - PACCAR/Kenworth (18-24 months, 32 KW Fuel Cell)
- Static
  - Basin Electric/DOE (18-24 months, H_2ICE co-combustion)
    - Wind to hydrogen
    - Footprint for HYDRNOL station
    - Co-Combustion vehicles
- Small engines (12-18 months, small consumer)
  - NREL/Clemson University – South Carolina Institute for Energy Studies

The California Opportunity

- Cost effectively meet the 30% by 2030 renewable requirement
- Reduce diesel emissions at the Ports
- Accelerate hydrogen adoption and resulting tax revenues to further supplement renewables
- Conversion of legacy ICE vehicles vs. waiting for fuel cell vehicle availability