SoCalGas

SoCalGas® provides natural gas to **21 Million Customers**

5.8 million meters

1 Trillion cubic feet (Tcf) of natural gas delivered annually

5% of US gas deliveries

135 Billion cubic feet (Bcf) of natural gas storage capacity

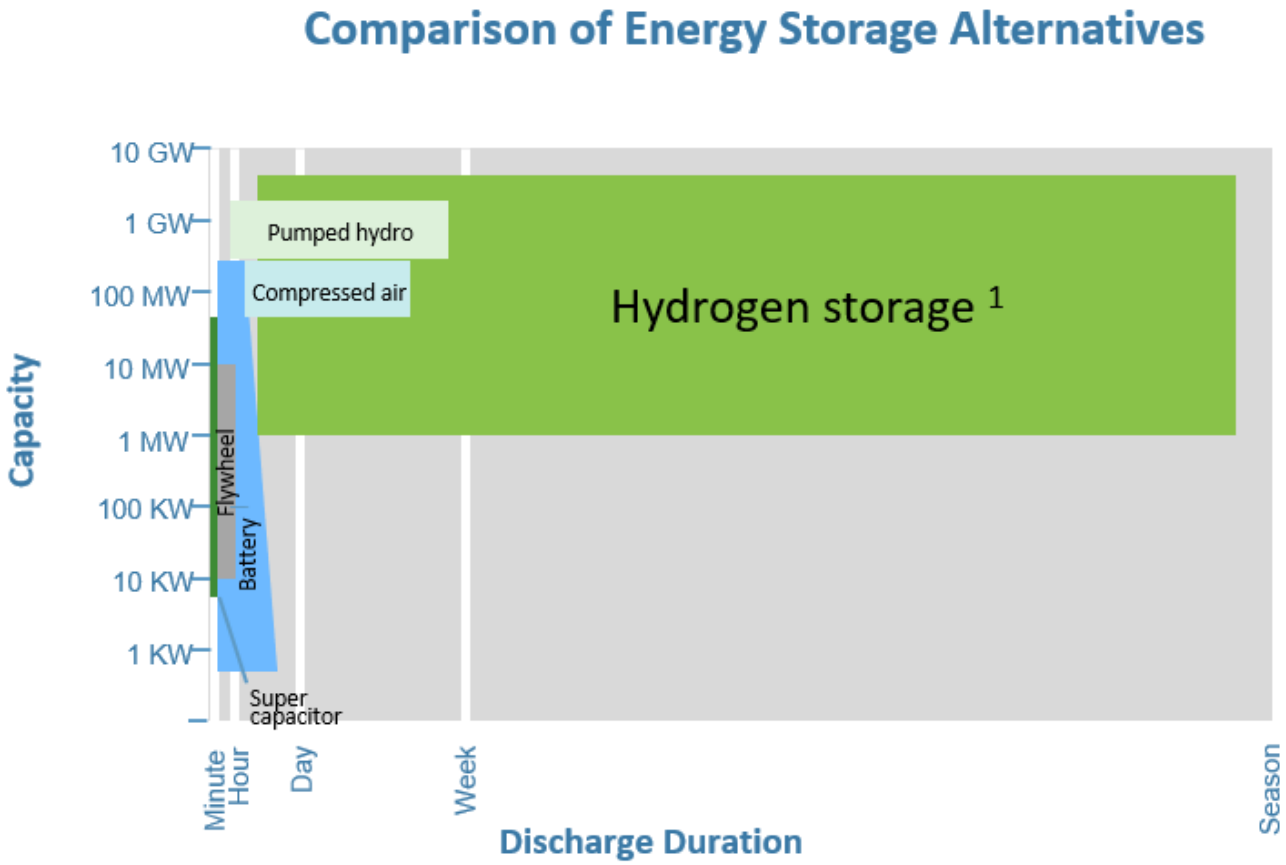
3% of US storage capacity

Serving customers for over **140 Years**

Nearly **100,000 Miles** of distributions mains and service lines

Over **3,500 Miles** of natural gas transmission lines

Why Store Hydrogen?



[1] As hydrogen or synthetic methane
Source: IEA Energy Technology Roadmap, Hydrogen and Fuel Cells

Energy storage is emerging as a critical element of transition to low-carbon energy mix:

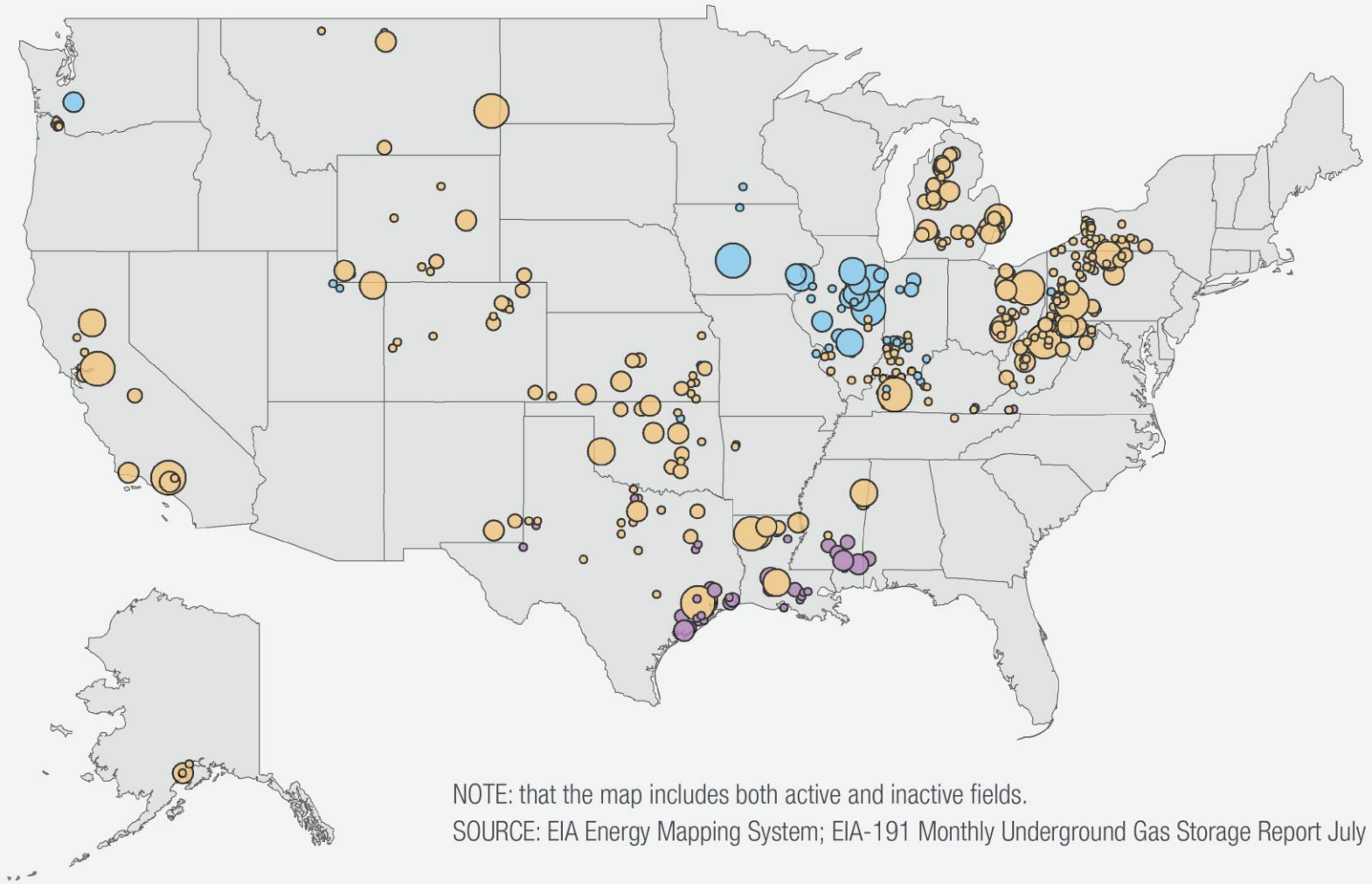
- Provides grid stability
- Avoids economic disruption of power market
- Provides benefits to rate- and taxpayers

Hydrogen may be the only scalable solution to address long-term energy storage need

- Batteries are mostly limited to duration of four hours
- Pumped hydro lacks scalability due to shortage of suitable sites and environmental permitting challenges
- Storing energy in chemical form as hydrogen or synthetic methane is scalable

Where Natural Gas Underground Storage Fields are Located

Type of Storage and Total Field Capacity, July 2014



Type of Storage

- Depleted Fields
- Salt Formations
- Depleted Aquifers

Total Field Capacity
(Billion Cubic Feet)

- Less than 14.5
- 14.5 to 37.8
- 37.8 to 73
- 73 to 122
- Greater than 122

NOTE: that the map includes both active and inactive fields.
SOURCE: EIA Energy Mapping System; EIA-191 Monthly Underground Gas Storage Report July 2014.

Geologic Storage Options for Hydrogen

Salt Caverns

- Already used for underground hydrogen storage
- Geographically limited

Depleted Oil & Gas Reservoirs

- Geographically well-dispersed
- Residual fluids will remain

Aquifers

- Large volumes
- Potential migration

Hard Rock

- High Cost
- Can store ammonia

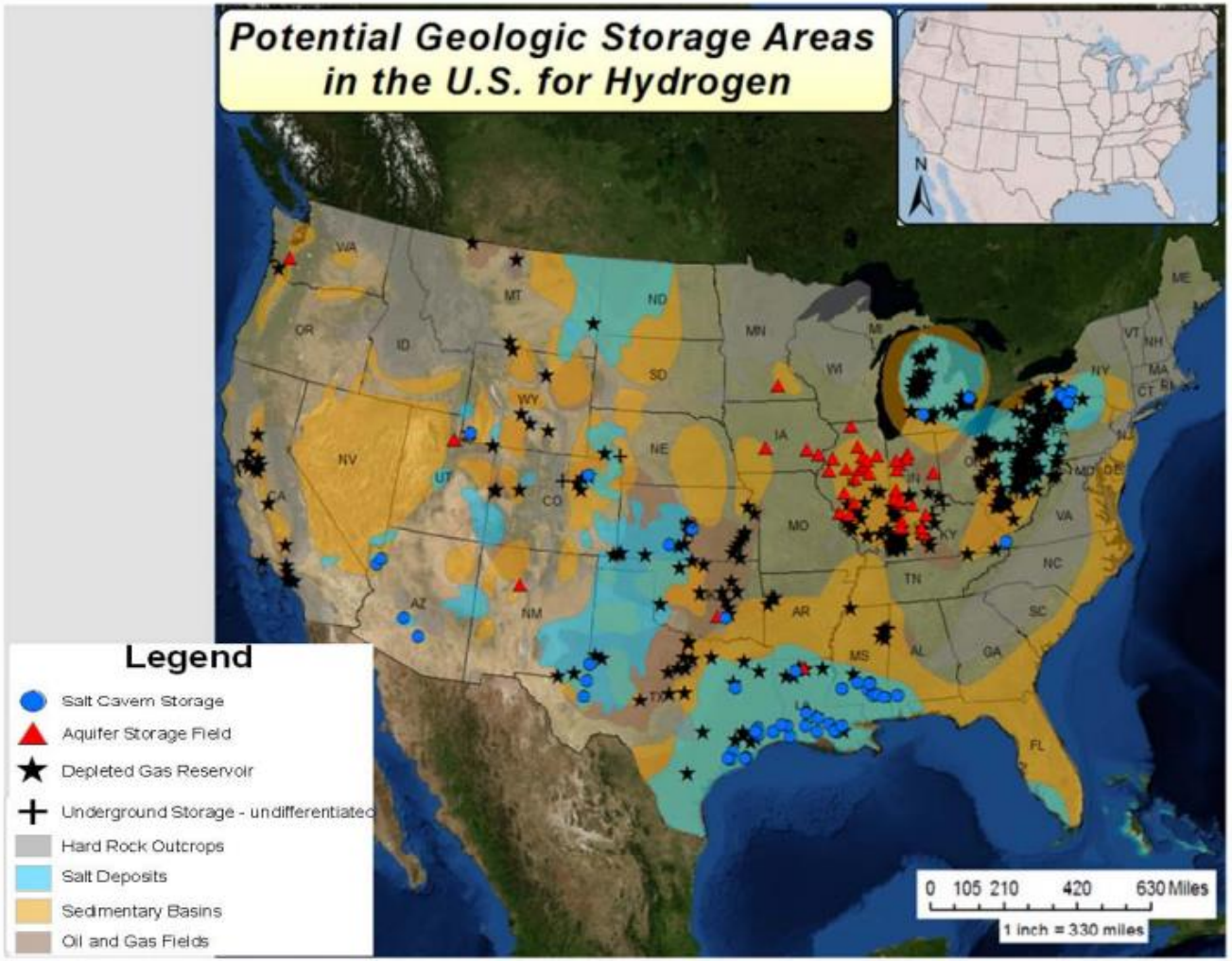


Figure 4. ArcReader map displaying U.S. geology that may have potential as underground storage as well as existing natural gas geologic storage facilities.

From Sandia National Laboratories "A Life Cycle Cost Analysis Framework for Geologic Storage of Hydrogen: A User's Tool" Anna S. Lord, Peter H. Kobos, Geoffrey T. Klise, and David J. Borns

SoCalGas A Sempra Energy utility®