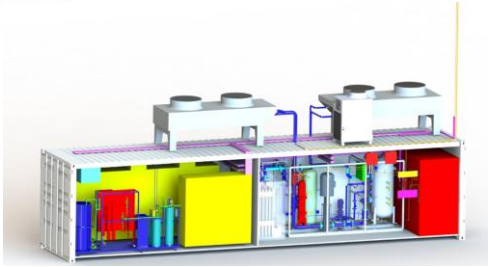
Afección de la falta de regulación en la producción de hidrógeno desde la perspectiva industrial

18/09/2018

Cabinets
0.5-3 Nm³/h

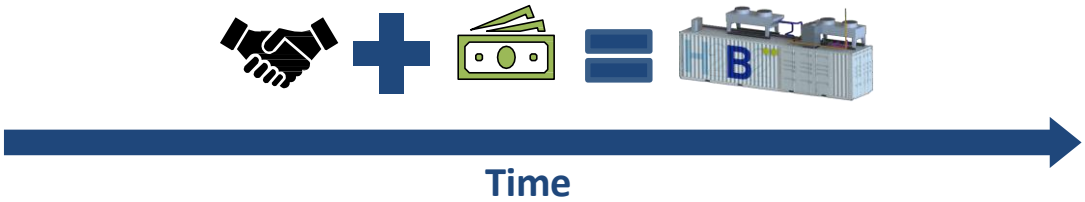


10/20/40 ft
Containers
5-400 Nm³/h

Modular & Integrated multi MW Plant

Solution provider

1. Conventional Product



Purchase order to buy an electrolyser

2. Integrated Product

(The client wants to avoid the investment)

Off-take agreement to buy hydrogen

Is regulation the main **challenge**?

- ❑ Hydrogen off-take agreement
- ❑ Hydrogen (use) market

Can be regulation a **solution**?

- ❑ Bottleneck avoidance
- ❑ Market fostering (i.e. time)
- ❑ Market growth (i.e. %)

Industrial

- Cost-effective on-site production, enhancing **availability**
- Meets critical hydrogen **purity requirements**
- Meets environmental **regulations**

Mobility

- Alternative fuels to solve urban **pollution problems**
- Zero emissions; **range** and **refueling time** same as a conventional vehicle
- It is a **renewable fuel** that just emits **watervapor** when used in a vehicle

Energy Storage: P2P

- Meets grid **ancillary services** needs (discharge time, response time)
- Manages **surplus** renewable energy
- Future proofing needs of **seasonal** and **large** storage capacities

Energy Storage: P2G

- **Security of supply** for countries dependent on natural gas imports
- **No exposure to natural gas price** fluctuations
- Limitation of current **infrastructure varies by country**
- Local **TSO now developing** projects using this technology

Feedstock **Fuel** **Energy**

Renewable generation
- ❑ Solar & Wind
- ❑ Governmental promotion

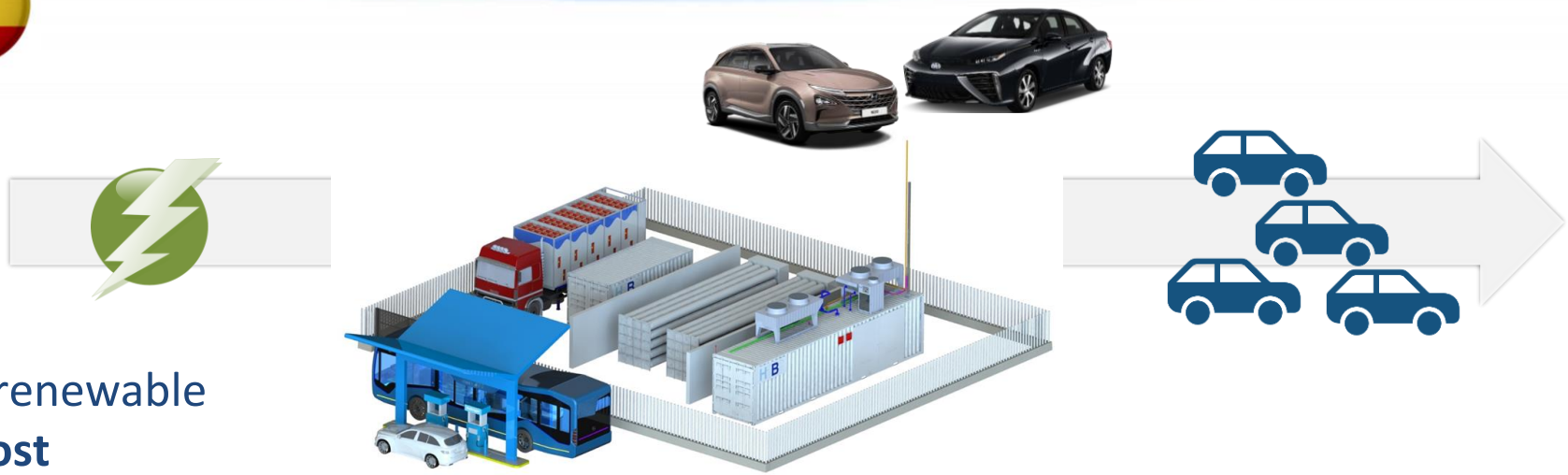
Utilization factor: Grid
- ❑ **Taxes & Levies**

- ❑ Storage needs
- ❑ **Operators qualification**
- ❑ **Ancillary services**

Regulation

Project
- ❑ Technology
- ❑ Consortium
- ❑ Financing

Cost
- ❑ **Zero-emission value**



100% renewable

- ❑ **Cost**
- ❑ PPA negotiation

Fuel production & infrastructure

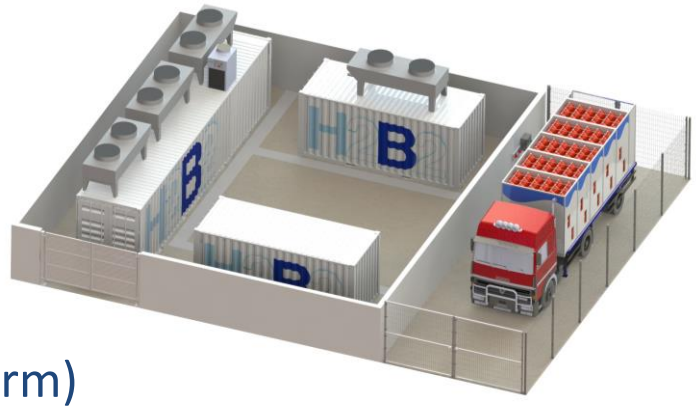
- ❑ On-site: Space restrictions
- ❑ Centralized: Volume / Transport
- ❑ **Industrial (commercial) area**
- ❑ **Permitting: min 1-yr timing** (i.e. "chemical plants", lack of reference)

Fleets

- ❑ **Urban policies (pollution)**
- ❑ **Zero-emission areas**
- ❑ Will for sustainability

Cost

- ❑ Compromise solutions: Fleet size vs Infrastructure cost



Renewable generation

- ❑ **PPA negotiation** (term)
- ❑ Storage needs
- ❑ Site selection

Fuel distribution

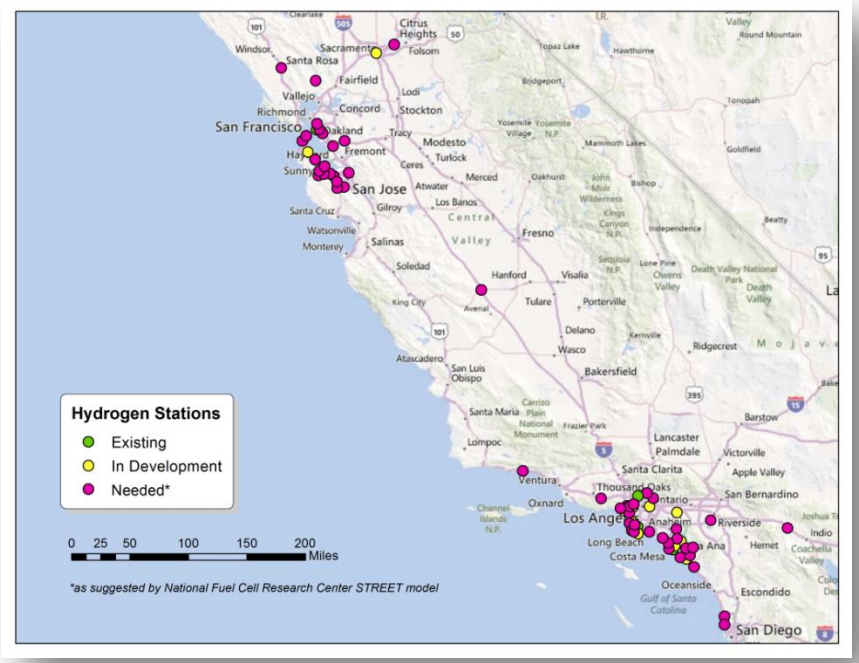
- ❑ Long distances
- ❑ Pressurized hydrogen: **500 bar**
- ❑ Liquefied hydrogen
- ❑ Gas pipeline: **H_2 as renewable electricity market?** (i.e. GOs)

Transportation sector

- ❑ **ZEV policies**
- ❑ **Min. 33% renewable H_2**

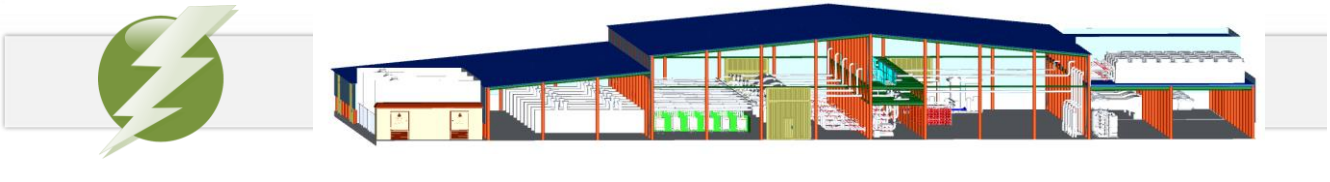
Fuel refueling infrastructure

- ❑ Significant number
- ❑ Will for controlling value chain



California: Refueling infrastructure

- ❑ Devoted organizations (ARB, CEC)
- ❑ Network development: Site selection criteria
- ❑ Support to investment (CapEx)
- ❑ Support to 3-yr operation (OpEx, “valley of death”)



Renewable generation

- ❑ Curtailment
- ❑ Seasonal storage (climate conditions; CO, AZ, NV…)
- ❑ **Regulation as accelerator (i.e. Permitting timing, Project size)**

Energy storage

- ❑ Technology
- ❑ Suitable sites

Re-electrification

- ❑ Technology issues
- ❑ Fuel cells not yet available
- ❑ Turbines (**will and capabilities, if market evolves)**

% blending in gasoline

- Negotiation lasted 3-4 yr
- Bioethanol prices moved by market forces

https://www.epure.org/

Indirect blending (i.e. ETBE)
Direct blending: % ⬆

Regulate:
+ Fuel/gas formula
+ Mandatory % blending
+ Origin: Renewable

1st large transition

- "MTBE phase out": **Prohibited** in CA
- MTBE **looses EPA approval**
- Contamination liability

2nd large transition

- **Renewable Fuel Standard** (RFS), for security of supply
- **Min %** ethanol in gasolines
- Pronounced **annual % growth**

- Current 10% blending

https://ethanolrfa.org/

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