Hydrogen Infrastructure in California

Launching a private-sector led infrastructure market
Question:
Can we change incentive structure to generate market-lead investment?
- Drive costs down
- Attract diversity of early adopters
- Create self sustaining system

Current Approach:
State Pays Majority of Capital Cost
Understanding Station Cash Flows

- EIN Model Offers a Station Level Economic View
  - Allows user to consider multiple scenarios

Gross Margin
Revenues
- Cost of H2
- Taxes & fees

500kg (Fast -Like 2015 Cluster)

Break-even point

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<th>Loan Payments - Total</th>
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Why Sell Hydrogen?

Cost Breakdown - High Utilization Example Station:

Per kg revenues at 425 kg/day

- Sales Tax
- Infrastructure Fee
- Gross Margin
- Cost of Wholesale Hydrogen

Gross Margin Covers Costs

- Profit /(Loss)
- Loan Payments
- Credit Card Expenses
- O&M Costs
- Other Exp (Rent, Ins, etc)

High Profit Potential
Getting Investors to Build the Hen House

First Mover Benefits:

Financial Incentive:
Cover Negative Cash Flows

Strategic Incentives:
- Geographic Buffer
- Support for Next Station ( Tradable)

Risk Management:
Guarantee against market failure (loan paid off)

Requirements:
- Right Location
- Built on time
- Pay into infrastructure fund with sales

Followers:
- Limited incentive (less $ - only available for operational expenses support)
- No geographic buffer
- No guarantees
How Much Do We Need to Start the Market?

- Cover Cash Flow shortfalls during initial years
  - Incentives paid until station is cash flow positive (with per-station limit)

$65m needed to enable commercial launch in California (68 Stations*):

- 31 New Stations (Cash Flow Support)
- 37 Existing or Planned Stations (O&M)

*68 Stations provides the “coverage” needed to support customers in early launch markets.
Getting off the Government Dole

Incentive Fund self-replenishing

With $1/kg infrastructure fee, the incentive fund quickly becomes self financing
Take-Aways

1. Cash flow modeling takes the view of a station owner, which helps understand risk & business motivation
2. Cash flow support may be effective way to attract first movers
3. Amount needed for California to start the market is small
4. The key is attracting the right market players
Thank You

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