

Practical Challenges to Scaling Hydrogen Infrastructure



LIFTE H₂TM

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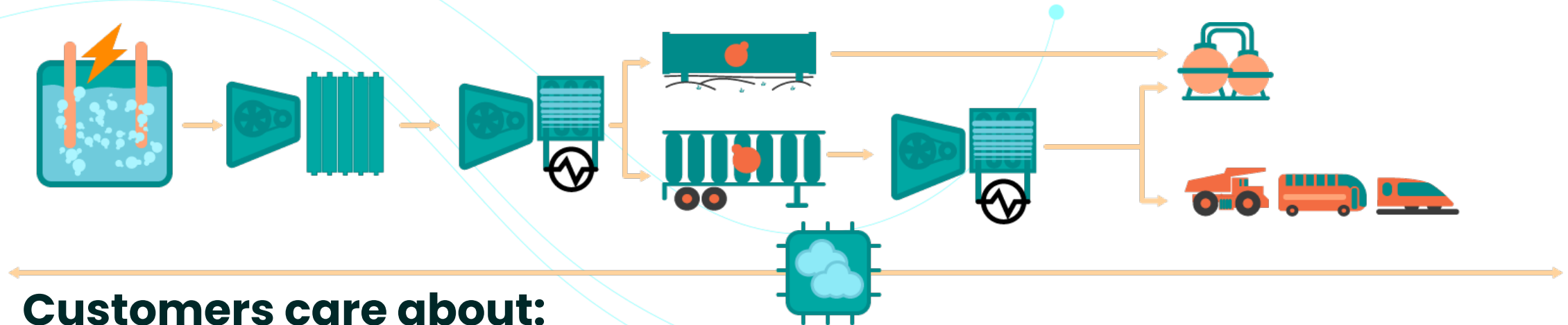
Scaling Hydrogen Infrastructure is not just about cost reduction



Why do supply chains require investment?

It is at the supply chain level that customer value is delivered, **individual technologies have no value by themselves**. Optimization at this level creates cascading impact to:

- Interfaces
- Product specifications
- New operations
- Regulations, codes, standards



\$/kg that is competitive

Reliability that delights customers

Safety that the public deserves

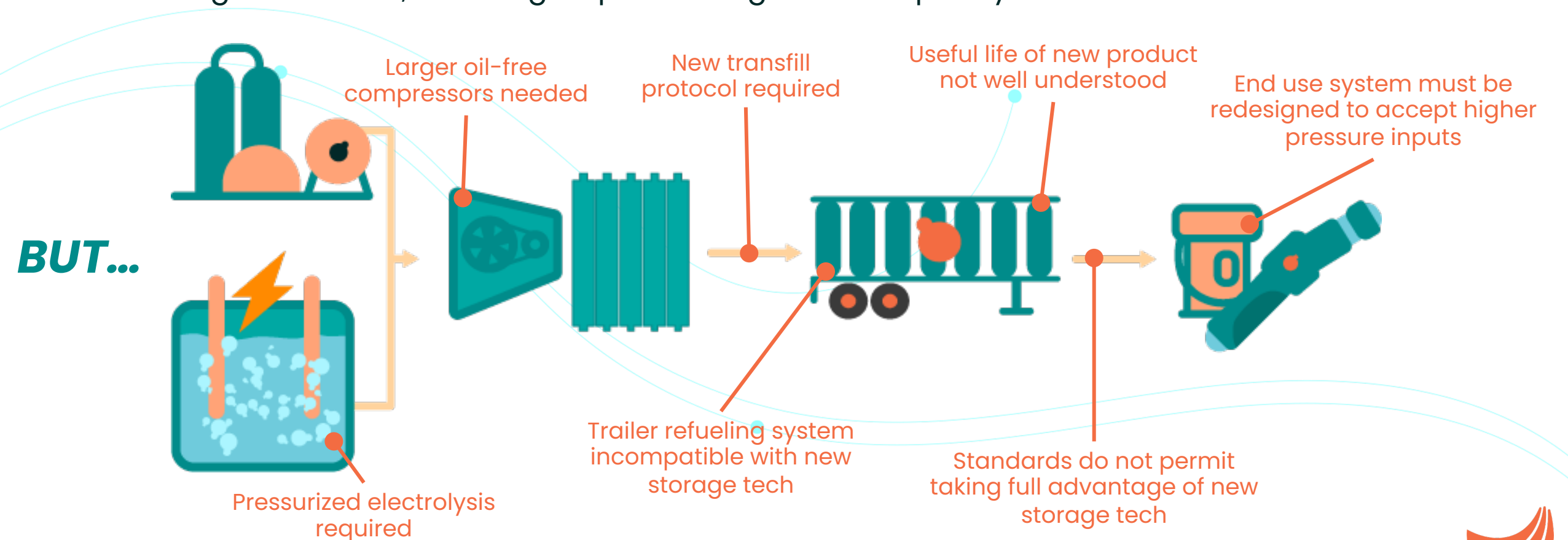
Performance that meets the needs of operations



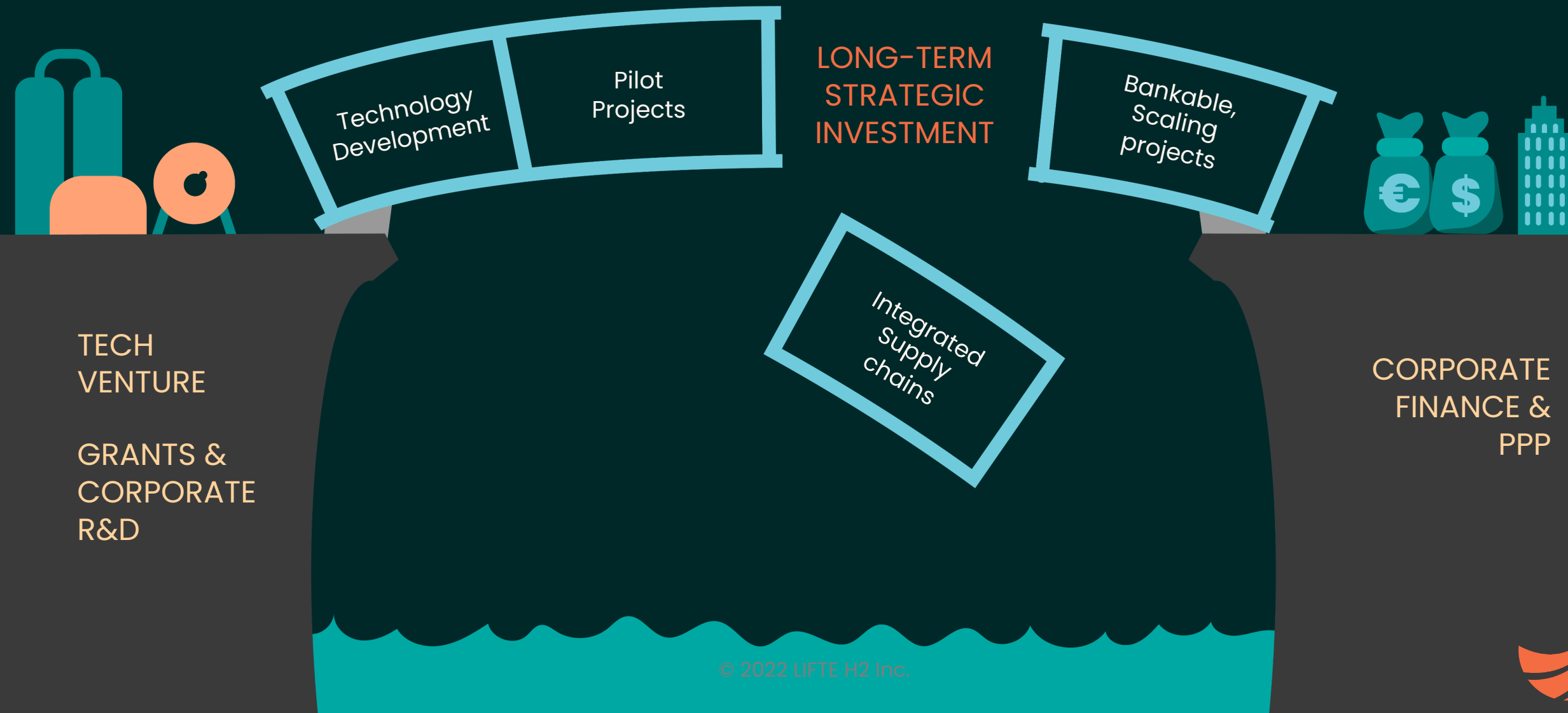
Example: Trailer Export of gaseous hydrogen

PROBLEM: Current trailer distribution systems result in very high distribution cost (2.50–4.00 USD/kg), due to low kg per load and low pressure.

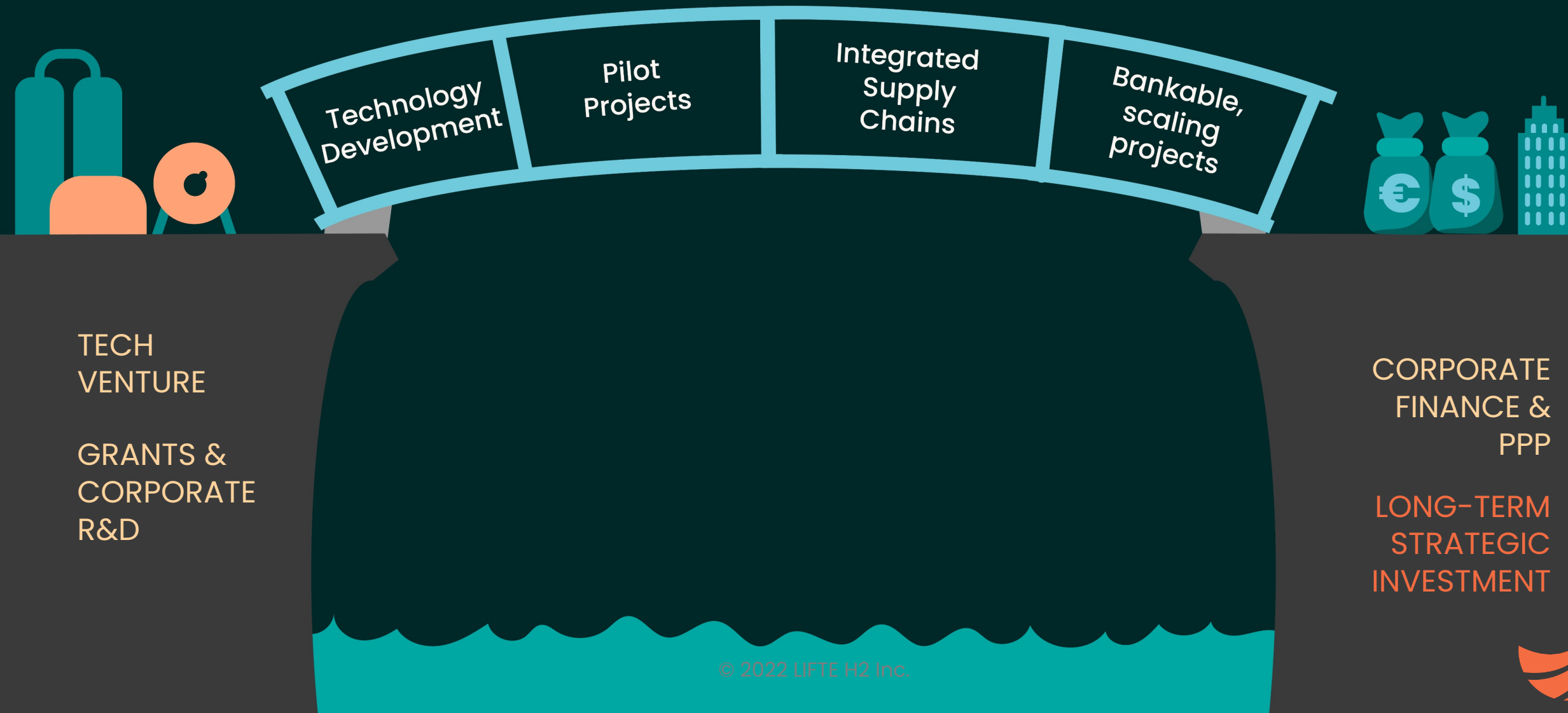
ONE SOLUTION: New storage technologies can dramatically increase the volumetric density of storage on trailers, reducing CapEx and logistics complexity



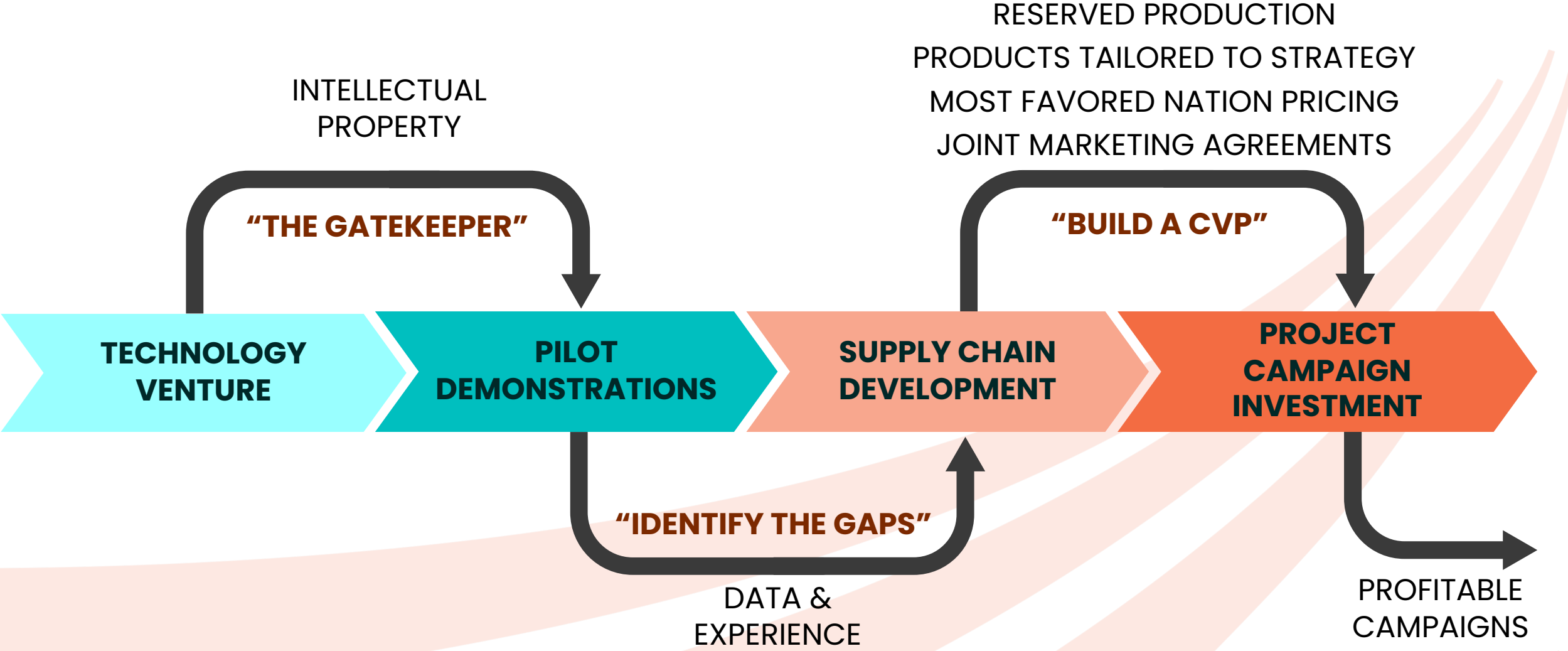
Investing in Supply Chain Development Doesn't Fit Traditional Investment Archetypes



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Supply Chain Investment Delivers Commercial Advantage For Follow-On Project Campaigns



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Why do supply chains need to be localized, and why is this a barrier to scaling?

Regional Product Compliance



Local Operational Compliance



Customer-specific compliance



High Cost:

Custom product iterations

Longer Lead Times:

Product design time

Major Schedule delays:

Barriers are realized later in project



Scaling Hydrogen Infrastructure is not just about cost reduction



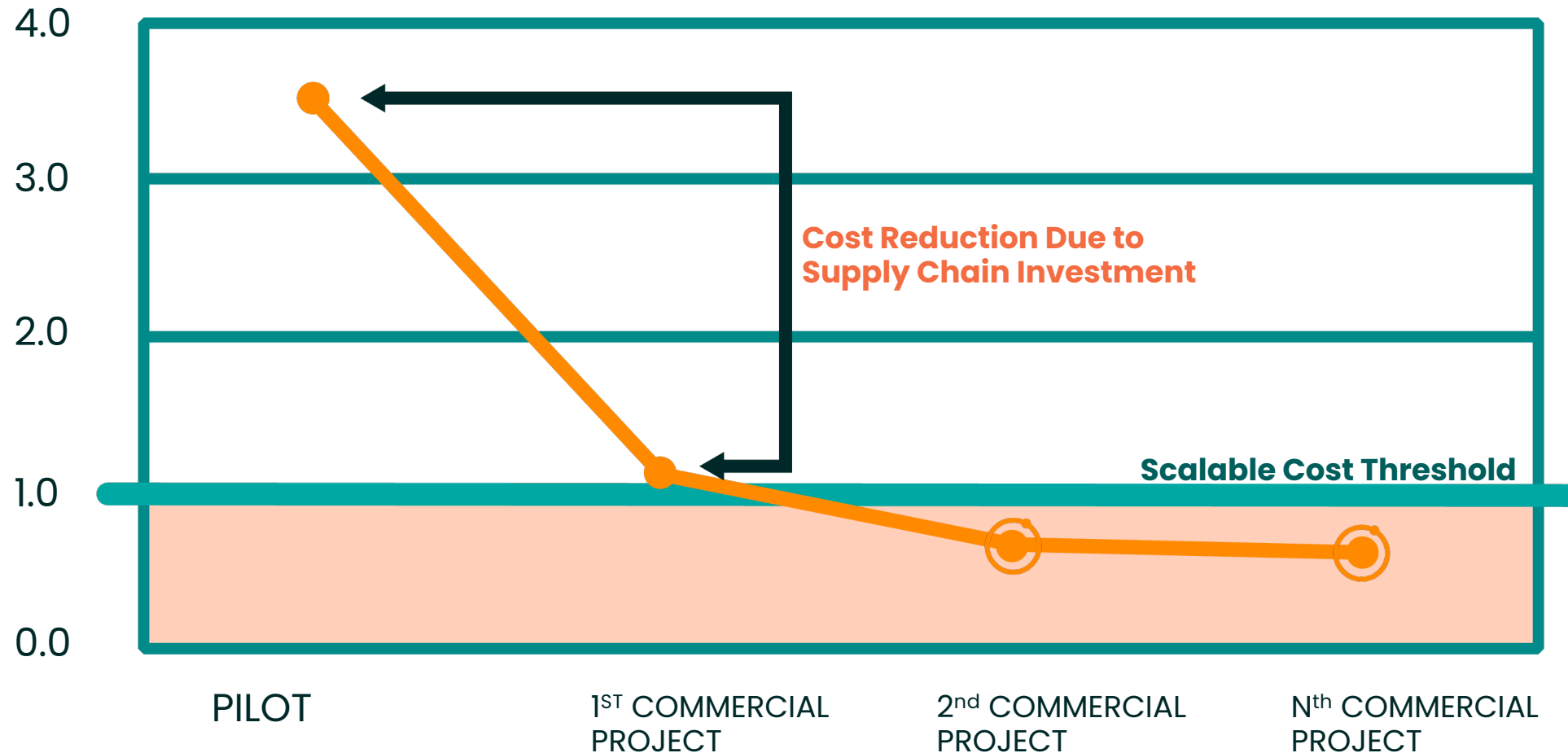
**PROFITABLE
HYDROGEN
PROJECTS**

**Regional
Campaigns**

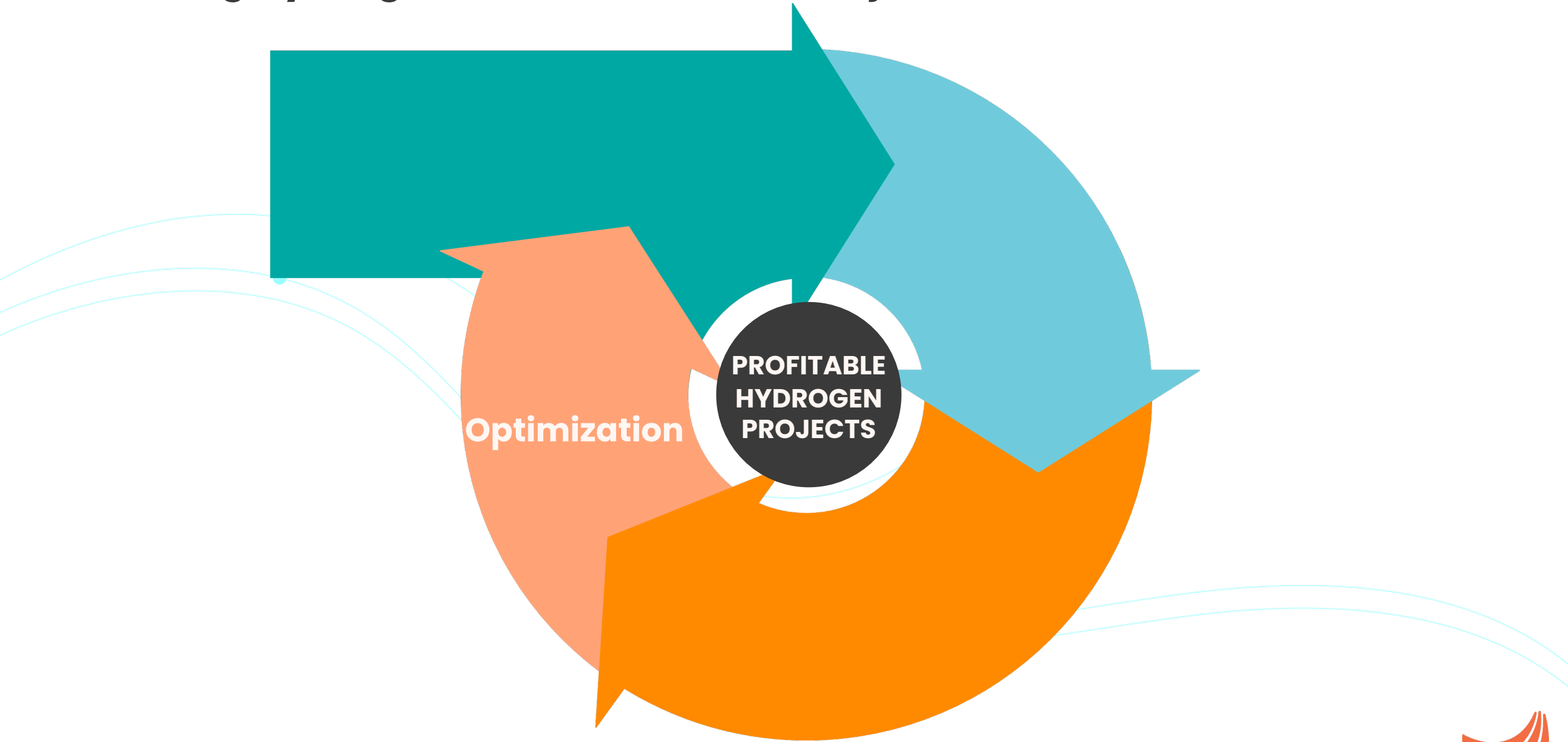


Regional campaigns create the market pull to justify supply chain investment & localization, individual projects do not.

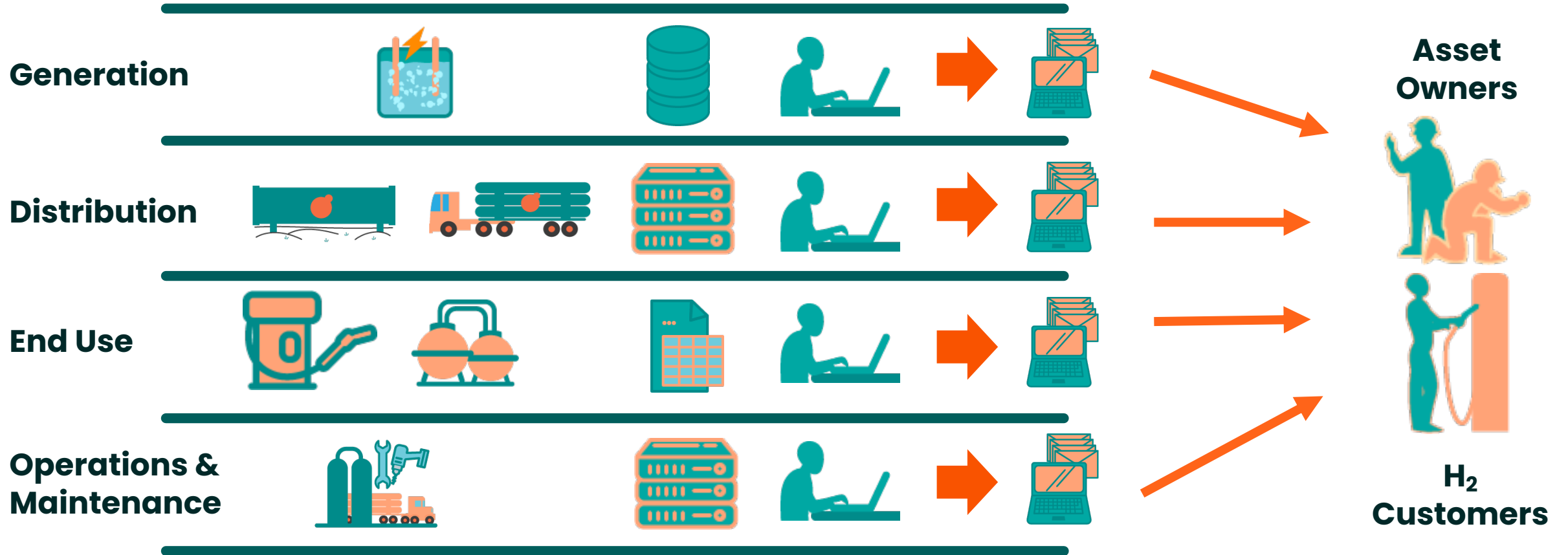
Example: Solar – H2 Production – Ultra Heavy Duty Mobility Project (>40 TPD range)



Scaling Hydrogen Infrastructure is not just about cost reduction



Breaking data silos is crucial to realizing competitive hydrogen costs as project campaigns progress

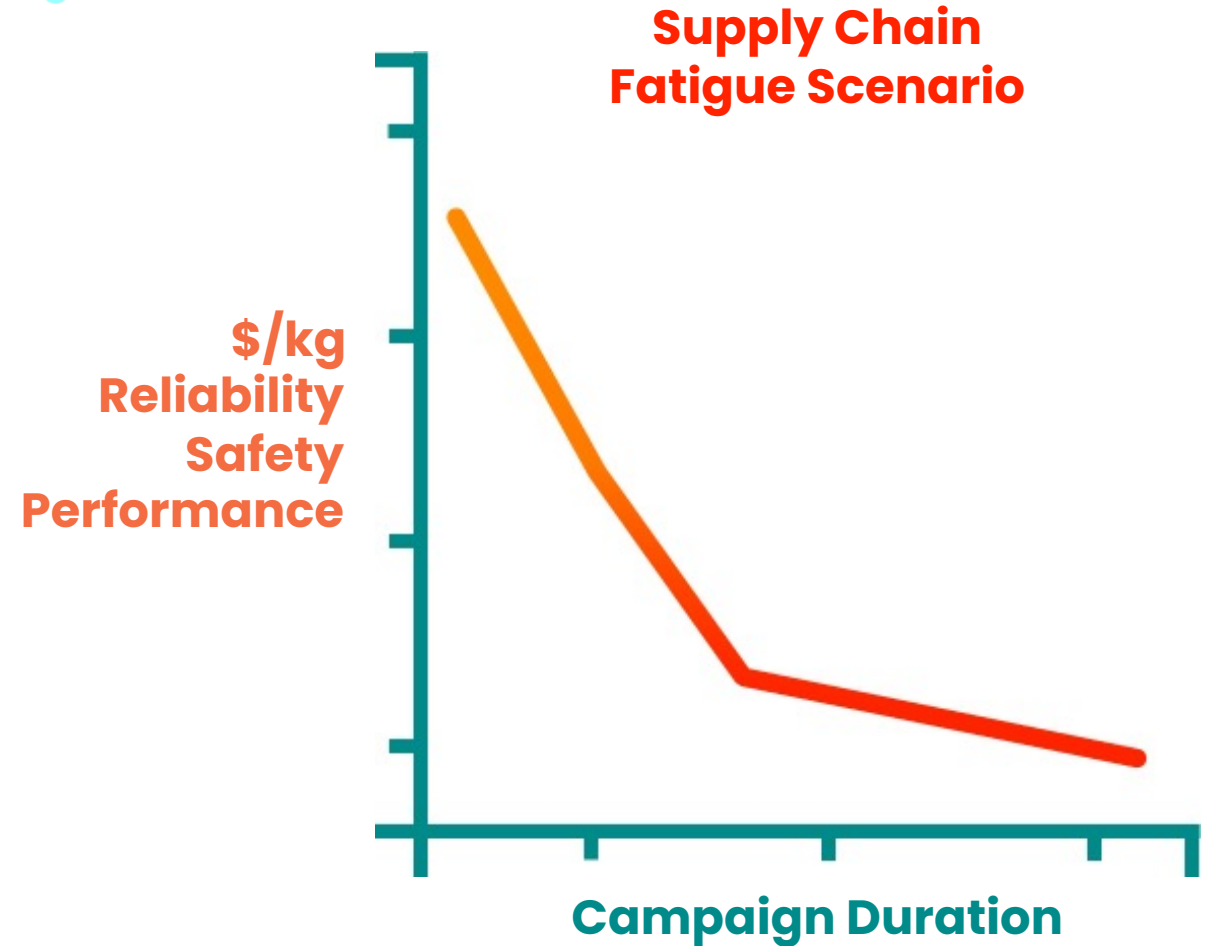


Breaking data silos is crucial to realizing competitive hydrogen costs as project campaigns progress

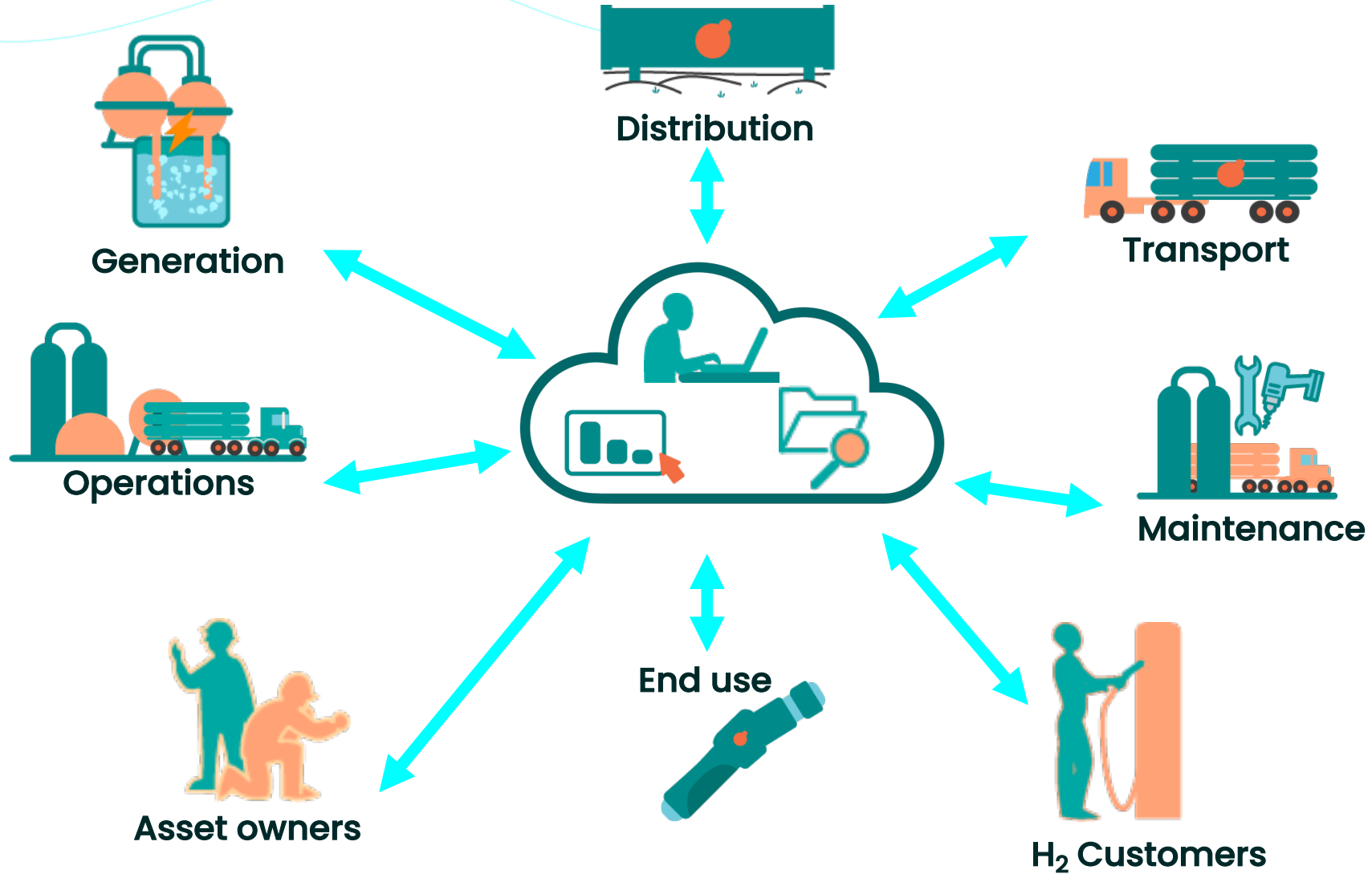
Lack of hydrogen data standards
prevent aggregation

Industrial 3.0 architectures &
manual data management are
costly

Security, Privacy & IP concerns
prevent collaboration



Breaking data silos is crucial to realizing competitive hydrogen costs as project campaigns progress



Breaking data silos is crucial to realizing competitive hydrogen costs as project campaigns progress

Ease of Collaboration

Standard equipment APIs

Cost Effective & Scalable

Industrial 4.0 & automated data handling

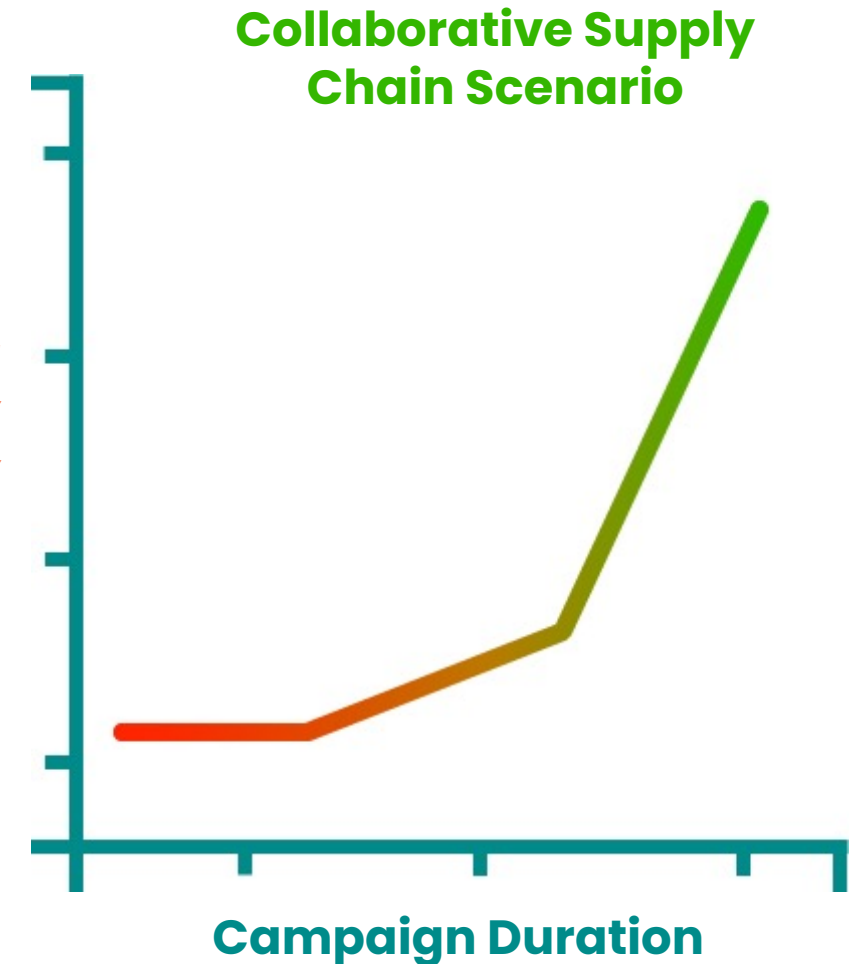
Secure

SOC & ISO compliant

Private

Multi tenancy & data sovereignty

\$/kg
Reliability
Safety
Performance



Scaling Hydrogen Infrastructure is a *continuous* virtuous cycle

Build Supply Chains Globally

- Invest in productizing technologies, and integrating supply chains
- Align system commercial & technical scopes, manage the gaps

Localization

- Harmonize regulations, codes, standards
- Train local capability
- Develop aftermarket support

Optimization

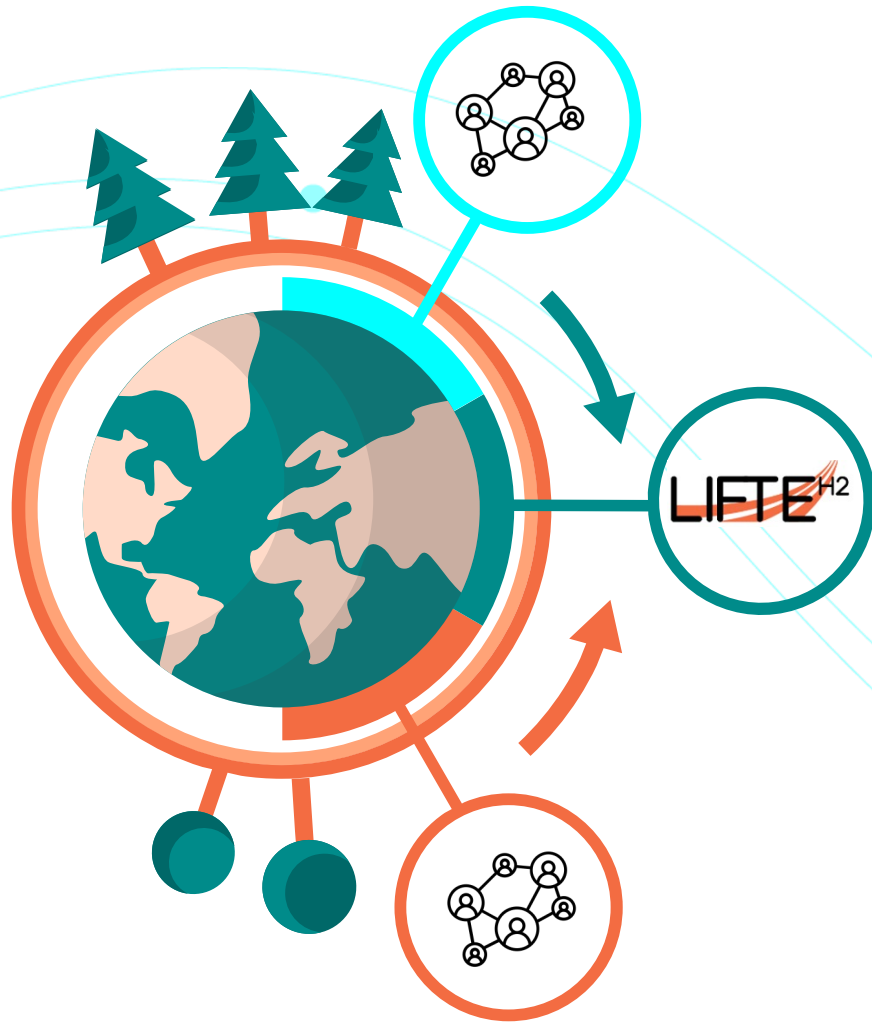
- With regional campaigns creating market pull, re-invest in the supply chain to enable next step in campaign

PROFITABLE HYDROGEN PROJECTS

Regional Campaigns

- Design projects to make the next easier/cheaper/faster (campaign mindset)
- Create market pull for supply chain to invest in region





LIFTE H2 is a hydrogen infrastructure development company, focused on creating **partnerships** with **technology developers** who share our values and want to **co-create** to deliver **turn-key** cost effective, safe, and reliable, hydrogen operations to H2 consumers.



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