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Green and Pink Hydrogen Solutions

The Fuel Dilema

- Limited fossil fuel resources.
- Environmental pollution.
- Economic damage.
- Geopolitical conflict.

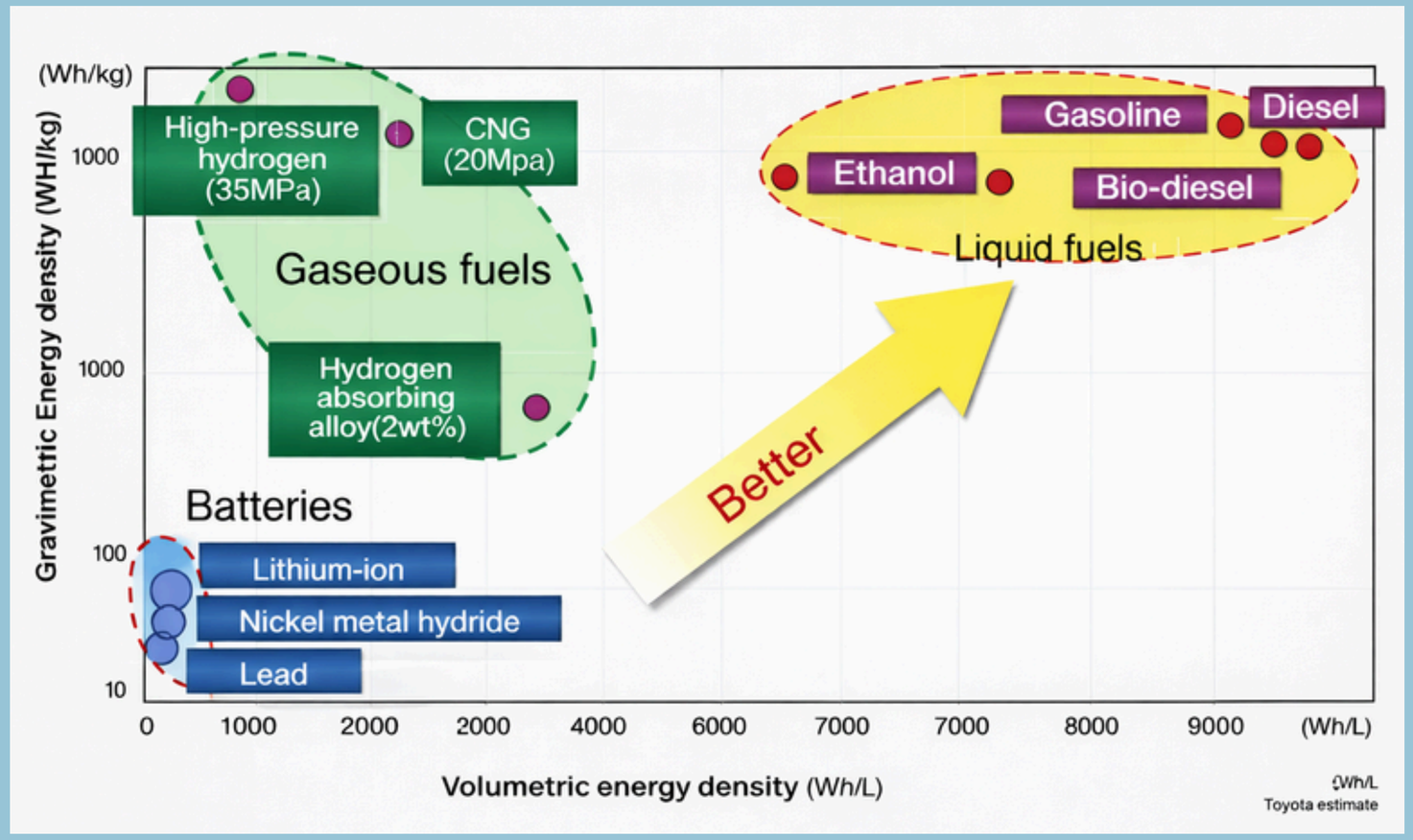
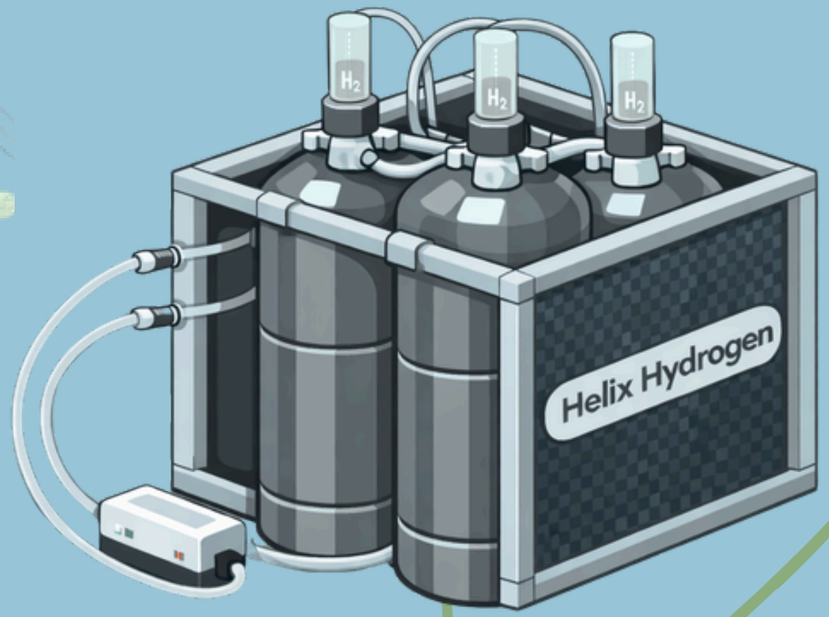


FIGURE 6.5 Volumetric and gravimetric energy densities of different energy storage mechanisms. SOURCE: Fushiki and Wimmer (2007).

Overview of Green and Pink Hydrogen

Renewables



Nuclear

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Commercially Available Electrolyzers are Inefficient

- Inefficient: typically under 85% efficient
- Inefficiencies are caused by:
  - Uneven current distribution - current leaking and shunt currents.
  - Limited surface area per volume.
  - Gas bubble accumulation.
  - More efficient electrolyzers come with high material cost.

$4k/KW Capacity with Comparable Conventional

Notable Competitors

Enapter
H-Tec Systems / Quest One
Cummins / Hydrogenics
Linde Engineering
FuelCell Energy – SureSource
H2Pro

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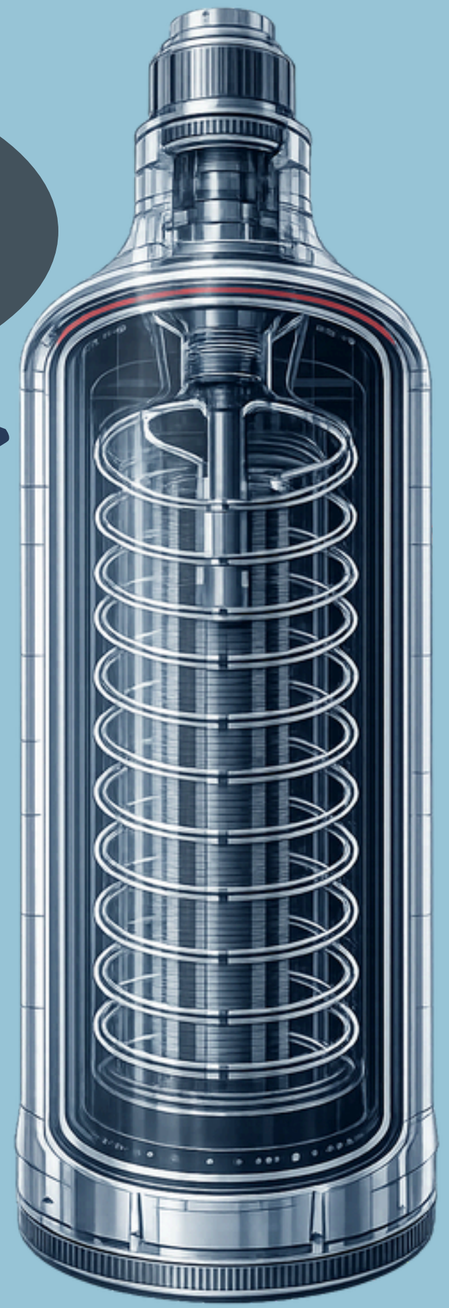
A New Electrode Geometry

- Patent-pending novel electrolyzer structure.
- Higher efficiency on bench-top models show 90%+.
- Nested helical wire electrodes.
- Earth-abundant and low-cost material components.
- Optimized surface area, gas release & current distribution.
- Scalable modular architecture.

Ushering in $1 - $3/kg green and pink hydrogen



$ Sub $2k/KW Capacity projected with Helix Hydrogen (~$900/KW or lower at scale)

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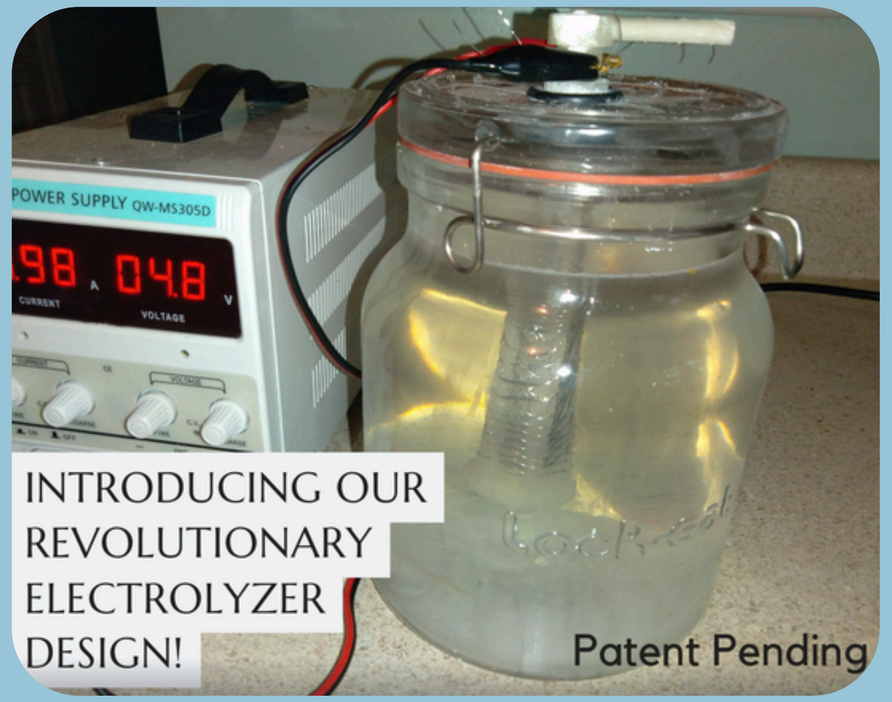
Our Early Prototypes



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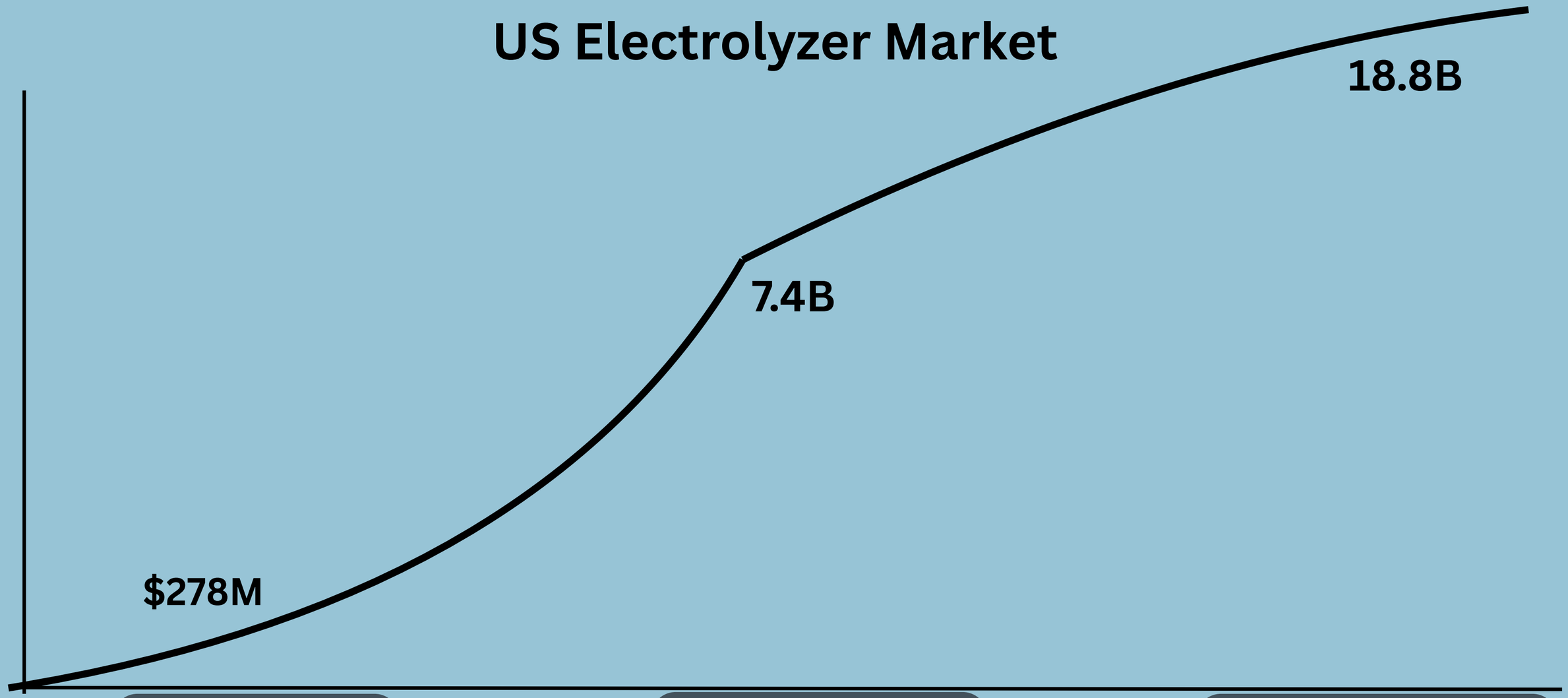
US Electrolyzer Market



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Company History

Patent Application Filed, Company Formation 2021

Start Smart SV SBDC

3d printed supports w nested helical electrode coils

SCCF S2V

DEIC SPARK RVA past participant

VIPC ICAP

Friends and Family Initial pre-seed funds

Multiple target markets researched, pivot back small-medium hydrogen deployers for beachhead market

Increased nesting capacity from 4 to 8+ concentric coils

Technological breakthrough, membranes applicable for gas separation - path to validate

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Core Founding Team

Daniel Warren, Founder

Ryan Degaraff, JMU COB Graduate
Networking and Business Growth Lead

Key External Business Advisor and IP Speacialist

Cindi Redding, JMU COB professor,
Business Growth Advisor

Reginald Ratliff, Vanguard/IP, LLP:
Patent attorney managing IP protection

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2026 and Beyond

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Thank you!

Special thanks to DEIC, SVSBDC, SCCF, VIPC, Vangaurd IP, LLP, and JMU

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Appendix A

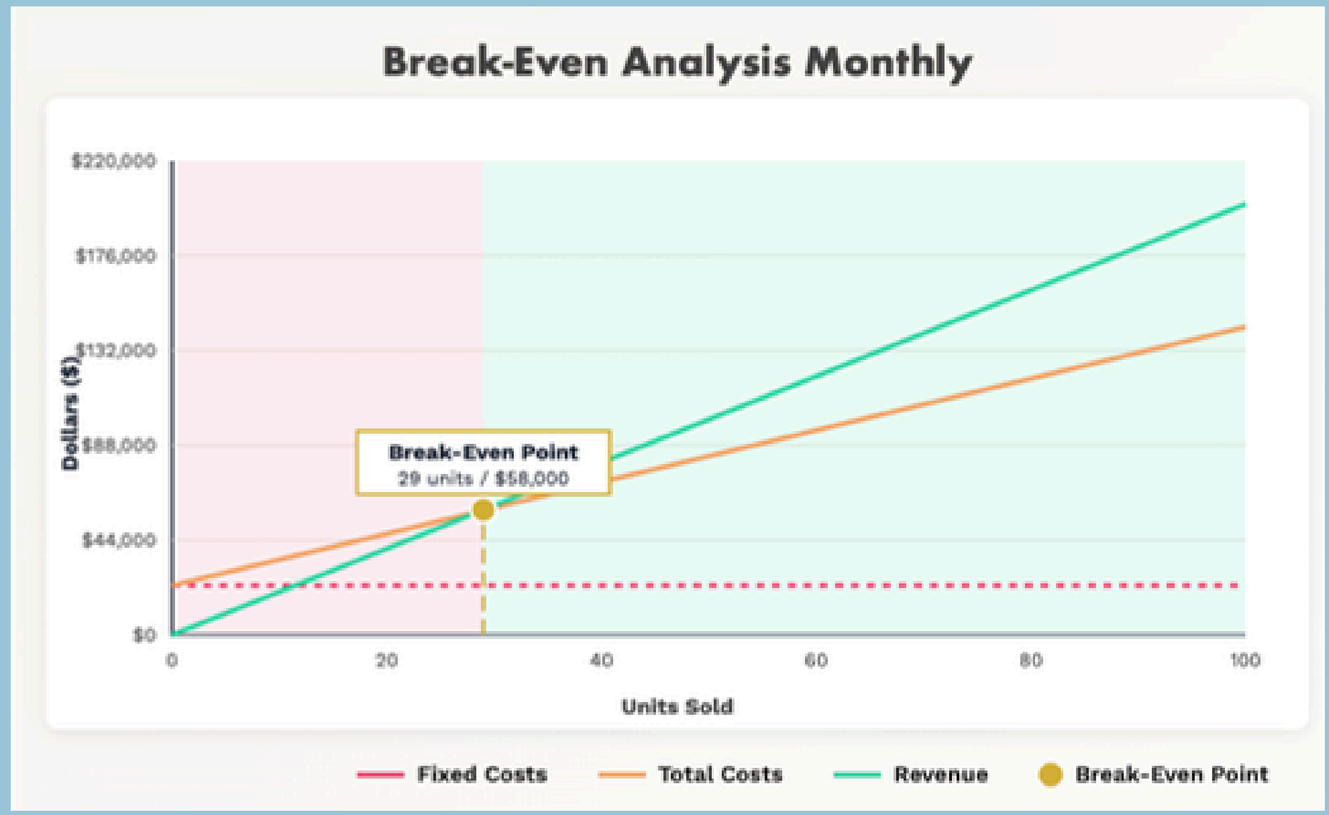
Go to Market Strategy and Break Even Analysis

Electrolyzer B2B sales: Small to Medium Hydrogen Distributors

Off-Gridders for Seasonal Backup Power

Off Grid Events, Commercial Building Backup Power, Heavy Industrial Processes,

Systems Integration, Install-maintenance-software-eduation



Break Even At $2K/KW Capacity

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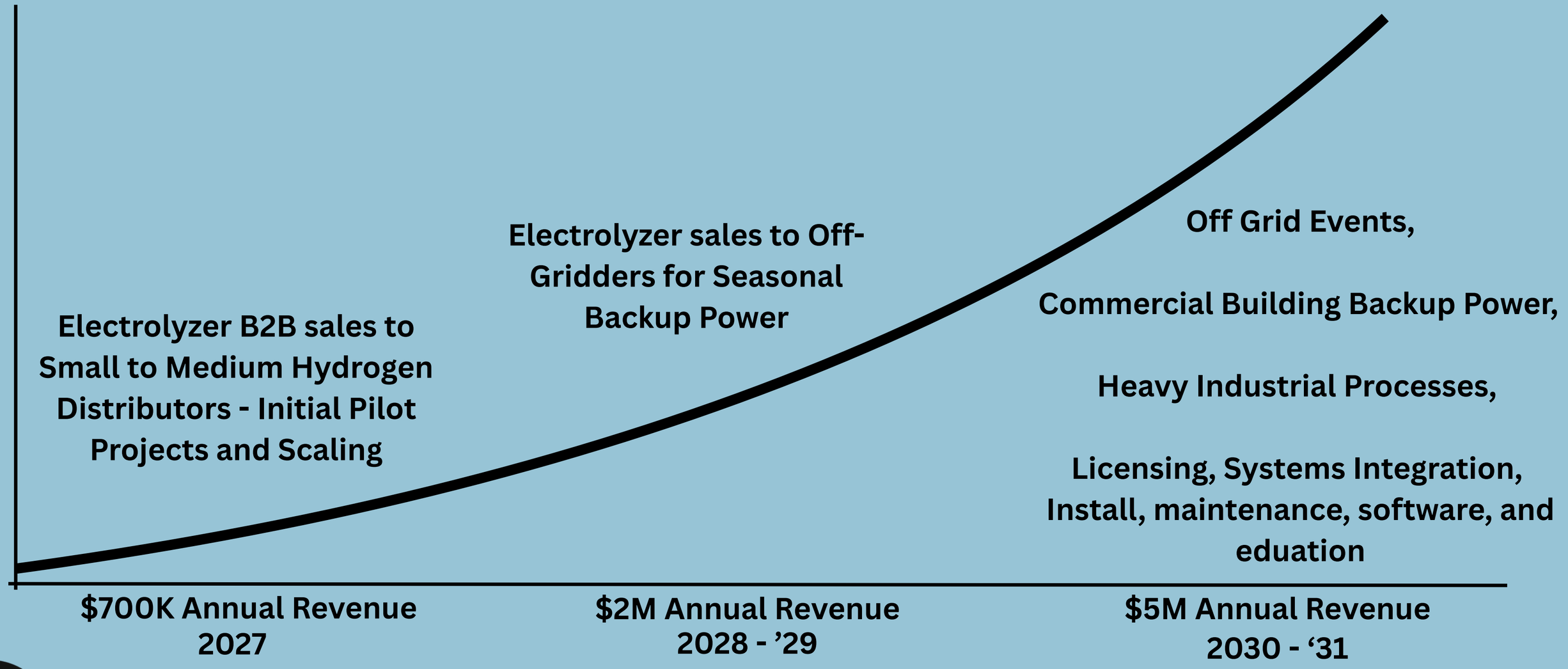
Appendix B

5 Year Market Strategy



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Appendix C
Tech Deep Dive

Apx 30-70% more surface area to volume ratio than plate-based Electrolyzer Cells - Varies depending on gap spacing and wire gauge used

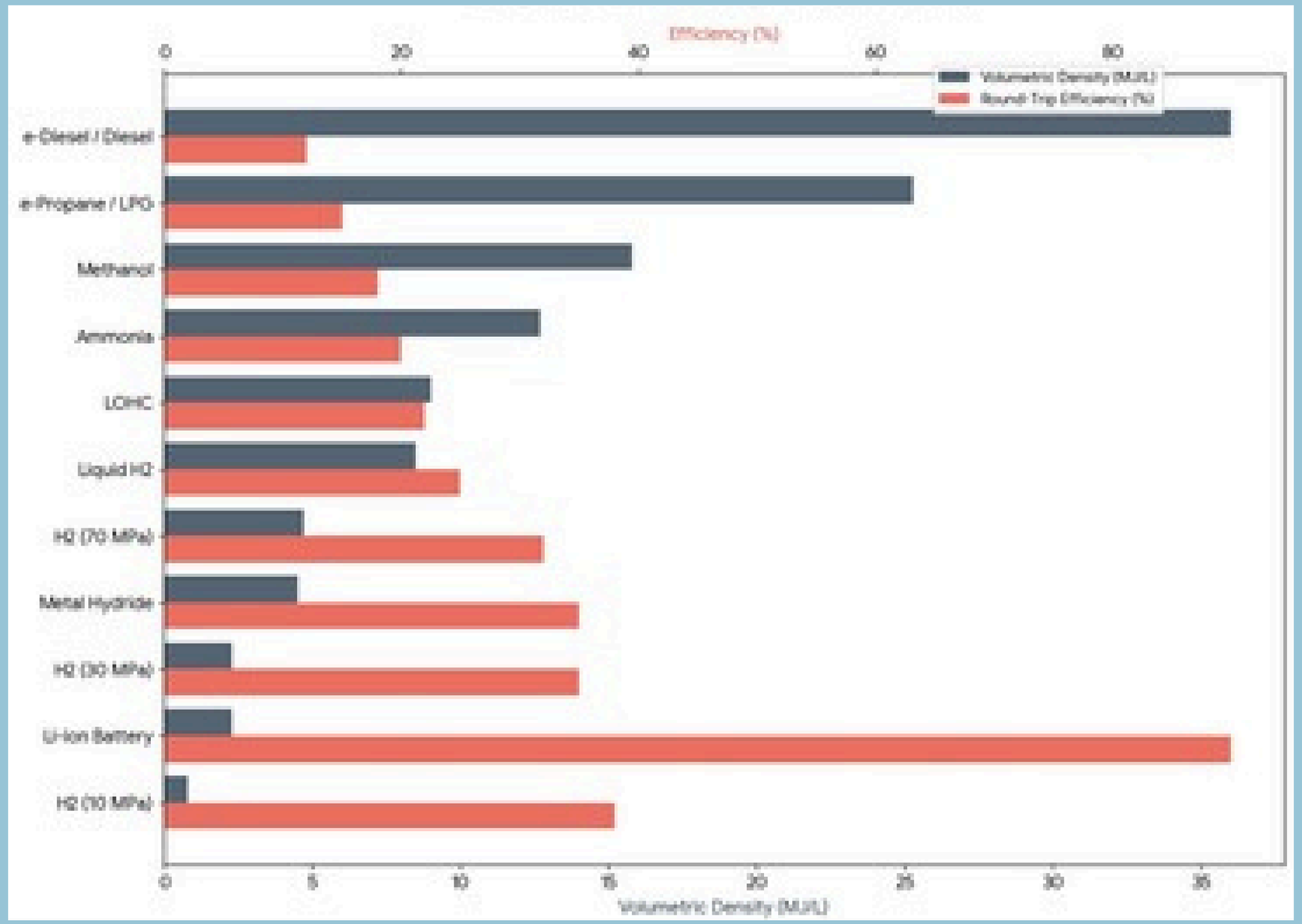
Upwards of 90% Efficient at Room Temperature with Alkaline Electrolysis (initial benchtop tests- needs third party verification)
Even Current Distribution, high current density,
Earth-abundant materials and easy assembly decrease Cap-Ex (~$2k/KW, targeting $900/KW at scale)
High Up-Time lowers maintenance cost
Durability lowers lifetime cost

Exploring Wastewater, Seawater, Stormwater sources for environmental stewardship
Business model based on reusable parts, recycling supply chains, and durrable hardware as fundamental design principles

It takes apx 2.5 Gallons of water to produce KG hydrogen
~44KWh at 90% efficiency,
Commercial average cited at 50 to 55KWh per KG

Appendix D

Why Hydrogen? The Energy Density Round-Trip Efficiency Trade-Off



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Appendix E Company Vision

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