Bloomenergy®

Solid Oxide: Ready for Primetime

Adam Bacon, Bloom Energy

BLOOM ENERGY AT A GLANCE

BE
LISTED
NYSE

MISSION

To make clean, reliable energy affordable for everyone in the world.

Global Footprint

Our corporate, manufacturing, and R&D offices serve as a strategic global anchors to help organizations around the world reduce carbon emissions, enhance resiliency, and chart a path toward a net-zero carbon future.

$972mm 2021 Revenue	**30% CAGR** Over last decade	**$8.5bn** Backlog	**12%** Annual Learning Rate (Cost Down)
~700 MW Installed Base	**>364** Issued Patents	**>$1.5bn** Cumulative R&D	**48% → 65%** Efficiency Since 1st Generation

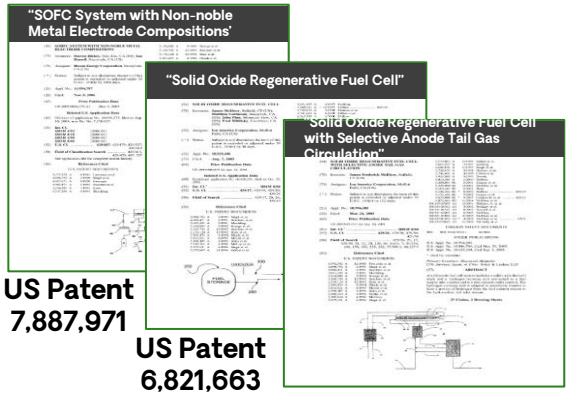
Scale and Experience:

Our solid oxide platform was built for hydrogen

Solid oxide was first designed to enable hydrogen production and use on Mars

First units made hydrogen 15 years ago

19 hydrogen patents



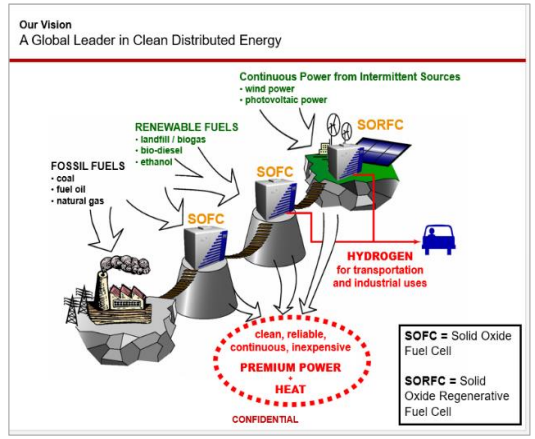
US Patent 7,887,971

US Patent 6,821,663

US Patent 6,924,053

Long term strategy has always focused on hydrogen...

...when the economics made sense



EFFICIENT HYDROGEN PRODUCTION

Same core platform | Same supply chain | Same manufacturing process | Same monitoring infrastructure

Same partners | 20-40% higher efficiency than low temp electrolyzers | Heat integration

Solid Oxide: Superior Technology

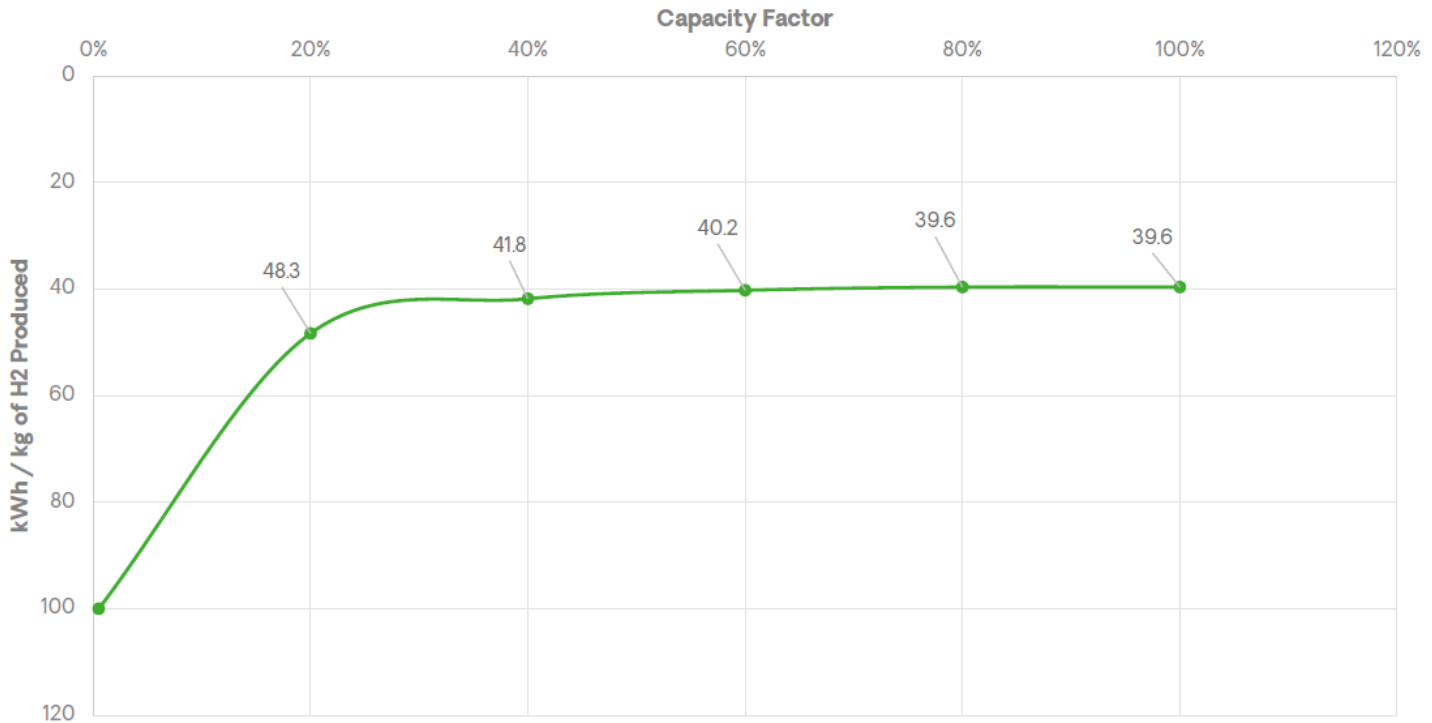
“Greatest potential for low-cost green hydrogen”

“Solid oxide electrolyzers hold the **greatest potential** to generate low-cost green hydrogen because of their **superior efficiency, rapidly declining costs,** and **scalability**. Achieving zero emissions in many sectors will depend upon making massive amounts of renewable hydrogen. Because **Bloom is the market leader** in solid oxide technology, I am very encouraged by [Bloom’s hydrogen market entry].”

Dr. Jack Brouwer
Director of the National Fuel Cell Research Center, UC Irvine

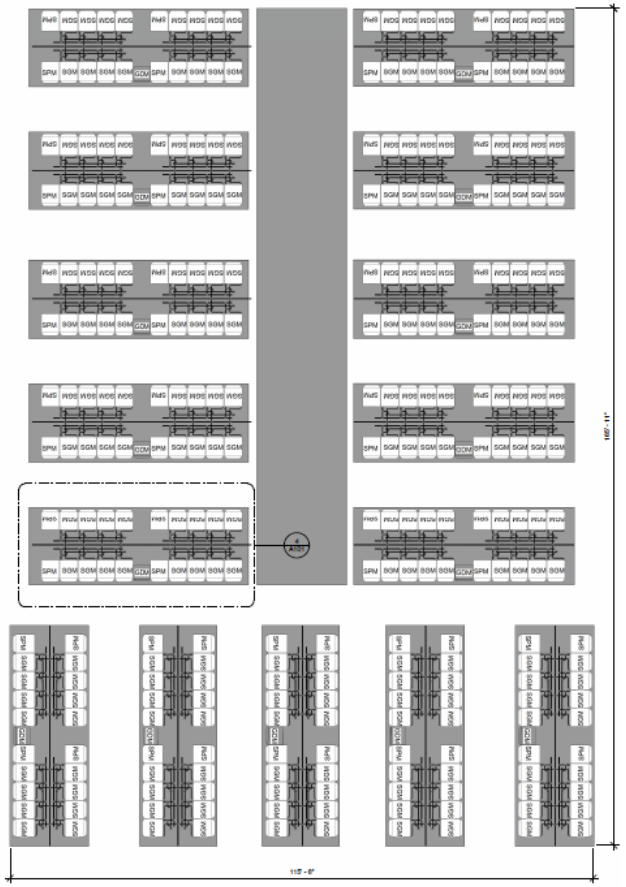
SOEC Efficiency

SOEC EFFICIENCY VS CAPACITY FACTOR



5% is base power required to keep SOEC in Hot Standby

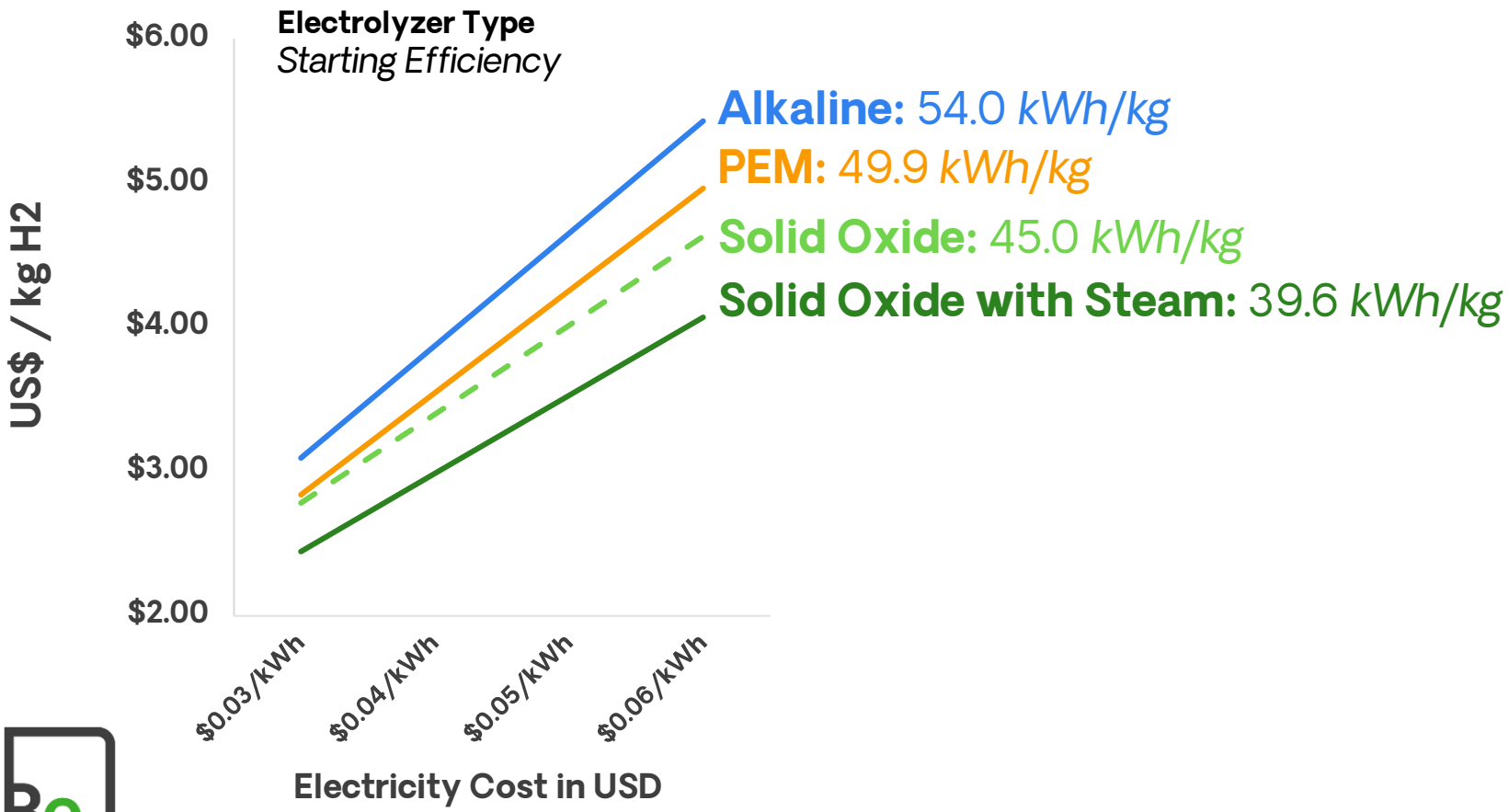
25MW Block Size



51 meters Long
36 meters wide

SOECs offer lowest-cost hydrogen

Levelized Cost of Hydrogen ($/kg)[1]



- **Highest efficiency**
- **Proven performance**
- **Manufacturing platform**
- **Modular approach**

1. Assumptions: Funded by project finance at 8% WACC, 98% capacity factor, 30-year plant lifetime, publicly released cost and technical values, includes impacts of replacement capex and degradation as appropriate.

Bloomenergy®

What Powers You

SOEC ATTRIBUTES

- Efficiency leader: with electricity as ~80% of H2 cost, lowest cost hydrogen
- Further efficiency benefit if paired with exothermic process, e.g., renewable fuels, refining processes, ammonia synthesis. . .
- Stack life: 5+ year life sans degradation in capacity or efficiency
- Supply Chain: in place to serve GW scale market; no precious metals
- Resiliency inherent in architecture– Electrolyzer availability > 99%
- Operating flexibility: full rates to 5% capacity in minutes, suited to renewables
- No need for external structures, no need for cooling and no need for de-oxygenation