



Leveraging Novel Green Ammonia Synthesis for Totally Green Power

Shelli Zargary Marketing Strategy, GenCell Energy World Hydrogen Energy Summit 2021



KEEP RUNNING. NO MATTER WHAT.™



About GenCell







Develops innovative alkaline fuel cell technology





Reliable and cost-effective backup and primary power solutions



SAY NO TO DIESEL

Key Advantages of GenCell's Alkaline Fuel Cell Technology 🕿

- Regenerative **CO2 scrubber** technology
- Non-noble catalyst
- Ammonia cracking and catalyst technologies
- Highest electrochemical efficiencies among the known fuel cell types
- Highest resiliency- resistance to extreme weather conditions, high altitudes and humidity
- Can tolerate economical, industrial-grade hydrogen fuel
- Eliminates the logistics issues of hydrogen by using ammonia as a renewable energy carrier

ALKALINE FUEL CELLS FOR BROAD USES





GenCell's Core Product Portfolio

BACKUP POWER

GenCell BOX Long-Duration Backup Solution

- Instant power with extended run-time
- Designed for extreme climates



Fuel – Compressed Hydrogen



- 4 cylinders provide over 8 hrs of 5kW power
- 20 cylinders provider over 40 hours of 5kW power





GenCell IoT Remote Manager



 Remote management software – enables easy monitoring and analysis of hundreds and thousands of units
Option to manage hybrid energy architecture using GenCell "GEMS" software

SAY NO TO DIESEL



Storing Energy as Hydrogen is Challenging:

- Infrastructure and Supply Chain are expensive & inefficient
- Compressed hydrogen is still not dense enough for efficient transport
- Cryogenic hydrogen is costly and has leaks



GenCell's Core Product Portfolio

PRIMARY POWER



Remote Manager



 Remote management software – enables easy monitoring and analysis of hundreds and thousands of units
Option to manage hybrid energy architecture using GenCell "GEMS" software

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Key Advantage of Ammonia as a Hydrogen Carrier

Liquid ammonia has **high hydrogen density** at room temperature and pressure



Gencell A5 Overcomes Challenges Of Hydrogen Infrastructure With Liquid Ammonia

- The GenCell A5 off-grid power solution extracts hydrogen from liquid ammonia
- A single 12–15-ton tank of ammonia provides enough fuel for a year of 24/7 operation
- Ammonia makes energy solutions accessible to multiple regions and use cases in any grid conditions

A total cost of ownership of 30-50% less than diesel

GenCell A5 is cleaner and lower cost compared to other power solutions



A5 Off-Grid Power Solution



Let's have a look at the A5 - from vision to reality





SAY NO TO DIESEL

But What About the Ammonia Itself? Is it Clean?

Traditional NH3 Synthesis: Haber-Bosch Process



CO₂ emissions contribute to global warming



15%* of Solar (PV) Energy Produced is Not Stored. GenCell Plans to Store this Energy Chemically, as a Source for Green Ammonia Production, within a Market of \$70 Billion**



Green Ammonia for Completely Clean Power



Problem

Solution

Markets







• Ammonia synthesis involves pollution.

• Synthesis of green ammonia using GenCell knowhow and patents.

Image: NH3



• Green ammonia can be used for a wide range of applications from fertilizer manufacture to power generation

GENCELL SAY NO TO DIESEL

Green Fuel Production Complements Fuel Cell Technology for Total Green Lifecycle

Our next milestone:

Green ammonia will be produced and stored at the site where the power is needed. GenCell's A5 unit can then extract hydrogen on demand from this green ammonia to fuel the fuel cell, thus generating 100% zerocarbon footprint electricity on-site, independent of the grid.

Self-sustained circular economy green source of power to the site where the power is to be consumed, enabling electrification anywhere



Strategic Partnership Towards Green Ammonia Project





- TDK is a publicly traded company with a market cap of ~\$15b and 104,000 employees
- One of the world's top two largest manufacturers of lithium-ion batteries
- Joint technology cooperation established to focus on Total Green Energy
- Joint business development activity to distribute GenCell products in Japan under the TDK brand
- TDK shares GenCell's vision for a Total Green Solution



Dai Matsuoka Corporate Officer & General Manager TDK Tech/IP HQ

"This technology signifies an important step forward for TDK towards achieving the 2050 zero-carbon emission targets set by the Government of Japan. We are extremely pleased to reach this important milestone towards developing our green ammonia vision." Dai Matsuoka, CTO, TDK Corporation

GenCell Stores Renewable Energy as Green Ammonia

Green Ammonia Storage 1 TON NH₃ = 2.3 MWh







Electrochemical Cell

Patent app no 15/746,085

Green Ammonia Generation



GenCell Proprietary Technology: 1 Ton of Green Ammonia Stores over 2MWh of Electrical Energy

GENCELL

GENCELL'S VISION FOR CLEAN DISTRIBUTED ENERGY STORAGE



KEEP RUNNING. WITH FUEL CELL POWER SOLUTIONS. Thank You!

For more information: Shelli Zargary shelliz@gencellenergy.com



