

December 5, 2022

**Shin Han, Ph.D.**

Founder & CEO

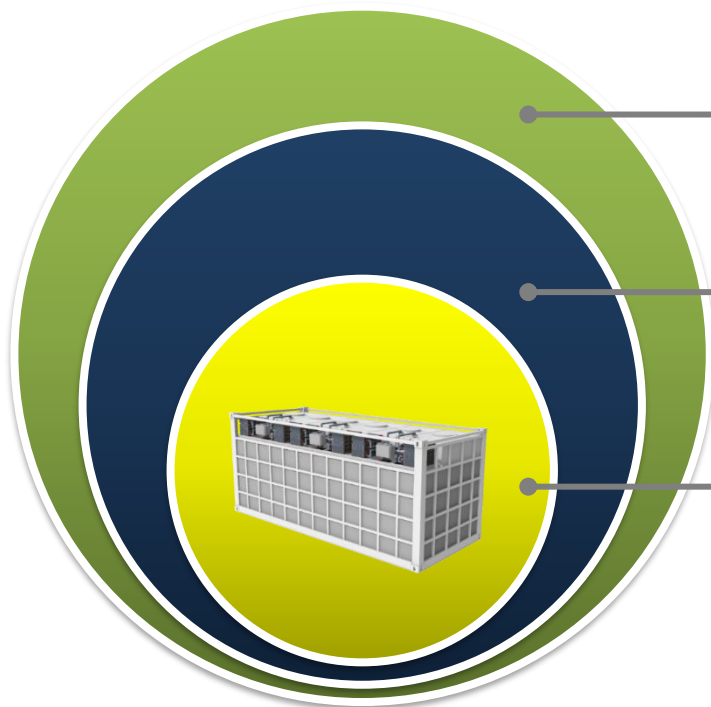
**H2, Inc.** | *The advanced  
energy storage company*





# BIG PICTURE

# Big Picture



Energy Storage

Long-duration, utility-scale

Vanadium Redox Flow Battery



Replace FOSSIL FUEL power plant  
utilizing curtailed renewable energy



# COMPANY

# H2 at a glance



2013 Korea's 1<sup>st</sup> commercial deployment of VRFB

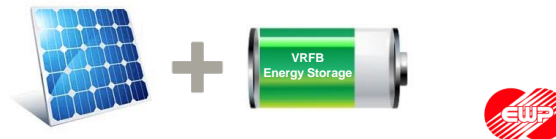


2018 Strategic partnership with QCELLS



fully funded by  


2017 Successful development of 1MWh VRFB



2021 World 1<sup>st</sup> PV+VRFB for commercial ops.

**2.2 MWh**  
megawatt/hour

2018 Commercial deployment of 2.2MWh VRFB

**20 MWh** in California

2021 U.S. largest flow battery project

## H2 at a glance



6

Countries for VRFB deployments

14

Commercial VRFB projects

31

MWh, accumulated global track records

**No. 1 in Korea and a global leader in advanced flow battery**

# H2 at a glance



## Strategic Investors



U.S. No.1 solar company

## Financial Investors



DAOL INVESTMENT



infobank



envisioning  
partners

SKS  
Sole Key Solution  
Private Equity Co., Ltd.



BEHIGH INVESTMENT



**\$42 million**, total fund raised

- (2021) \$13 million raised
- (2022) \$17 million raised

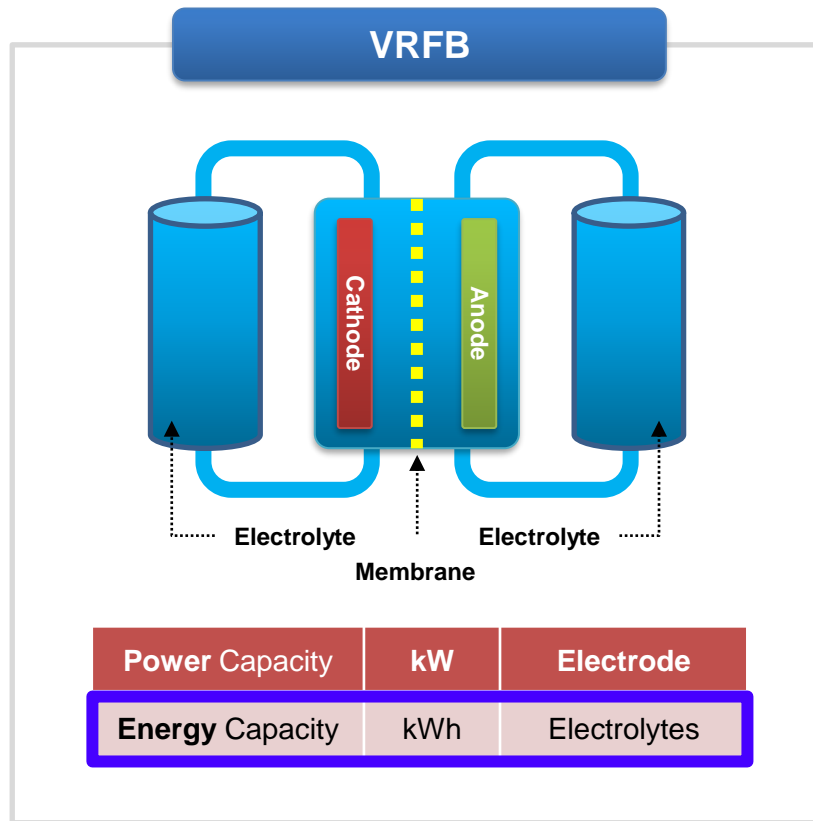
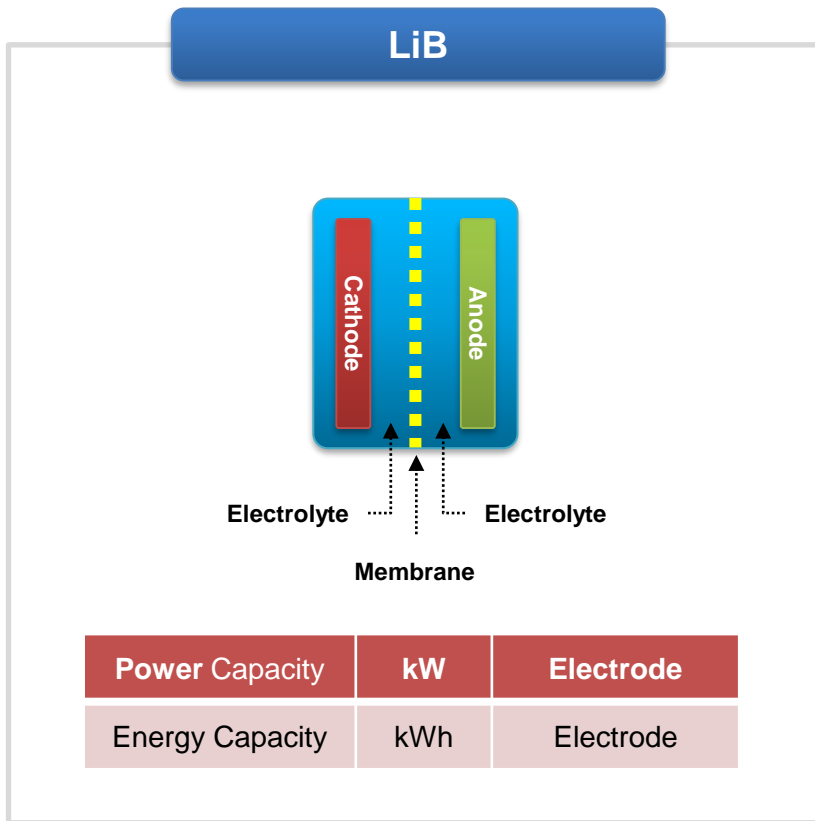


# TECHNOLOGY



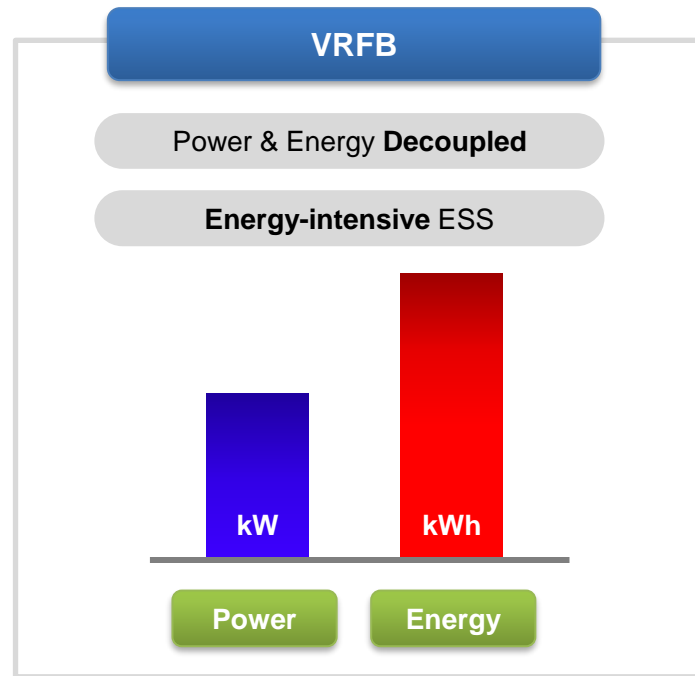
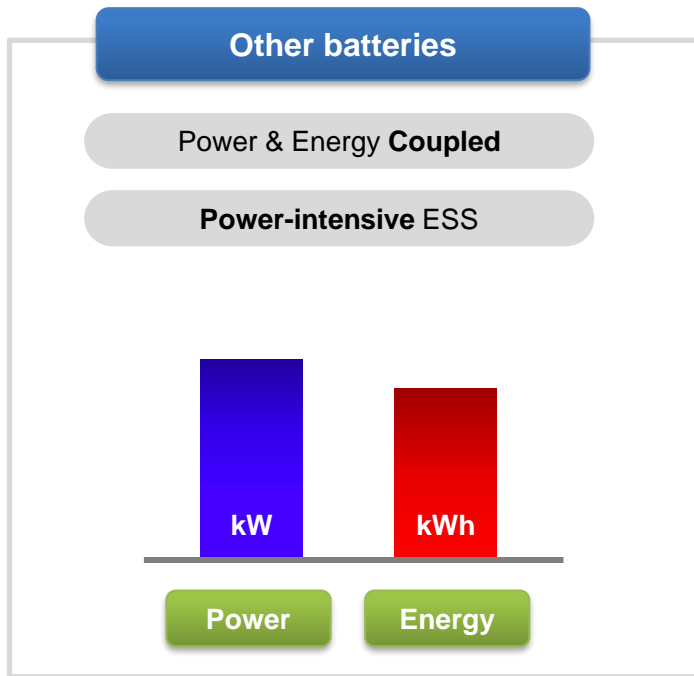
# VRFB Technology

## Overview



# VRFB Technology

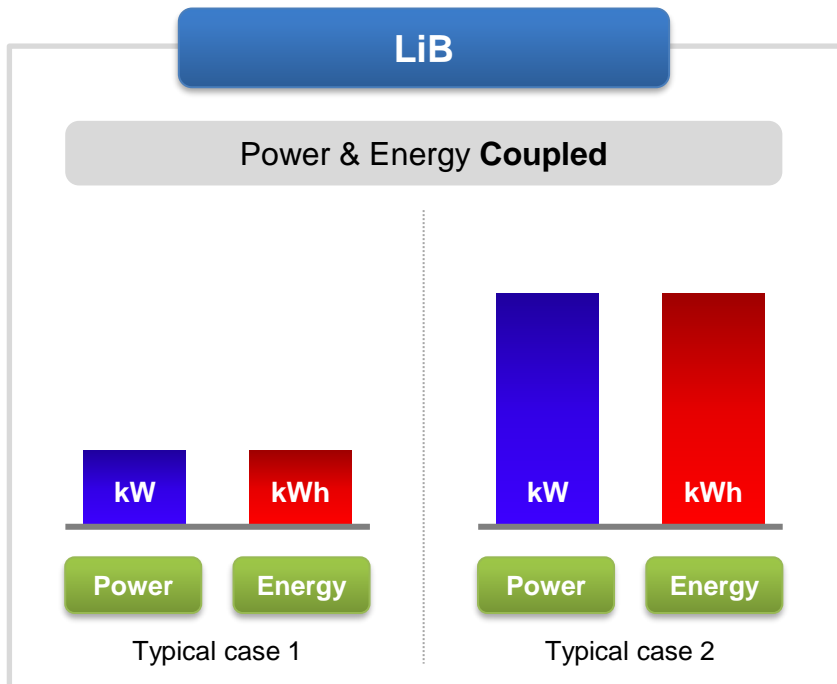
## Power & Energy Scalability



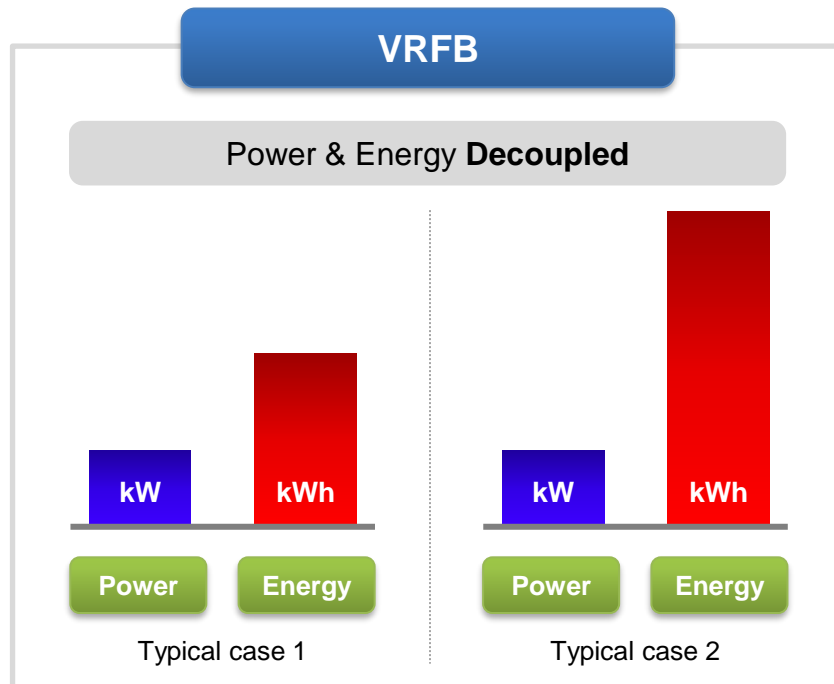
Unlike other batteries with coupled power and energy, VRFB has decoupled power and energy scalability ideal for long-duration energy storage requiring large amount of energy capacity

# VRFB Technology

## VRFB vs. LiB : Power & Energy Scalability



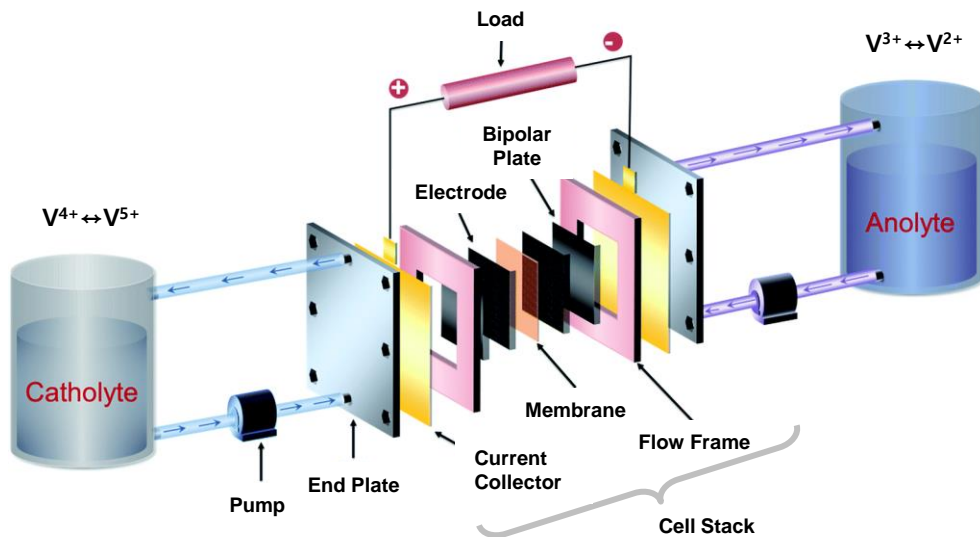
Good for **short-duration** application



Good for **long-duration** application

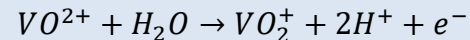
# VRFB Technology

## Chemistry and Structure

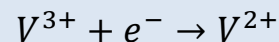


Charging

Cathode reaction

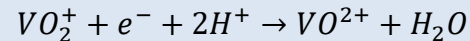


Anode reaction



Discharging

Cathode reaction



Anode reaction



No risk of fire

Aqueous Electrolytes

1

Large-scale  
energy capacity

2

No degradation  
over 20 years

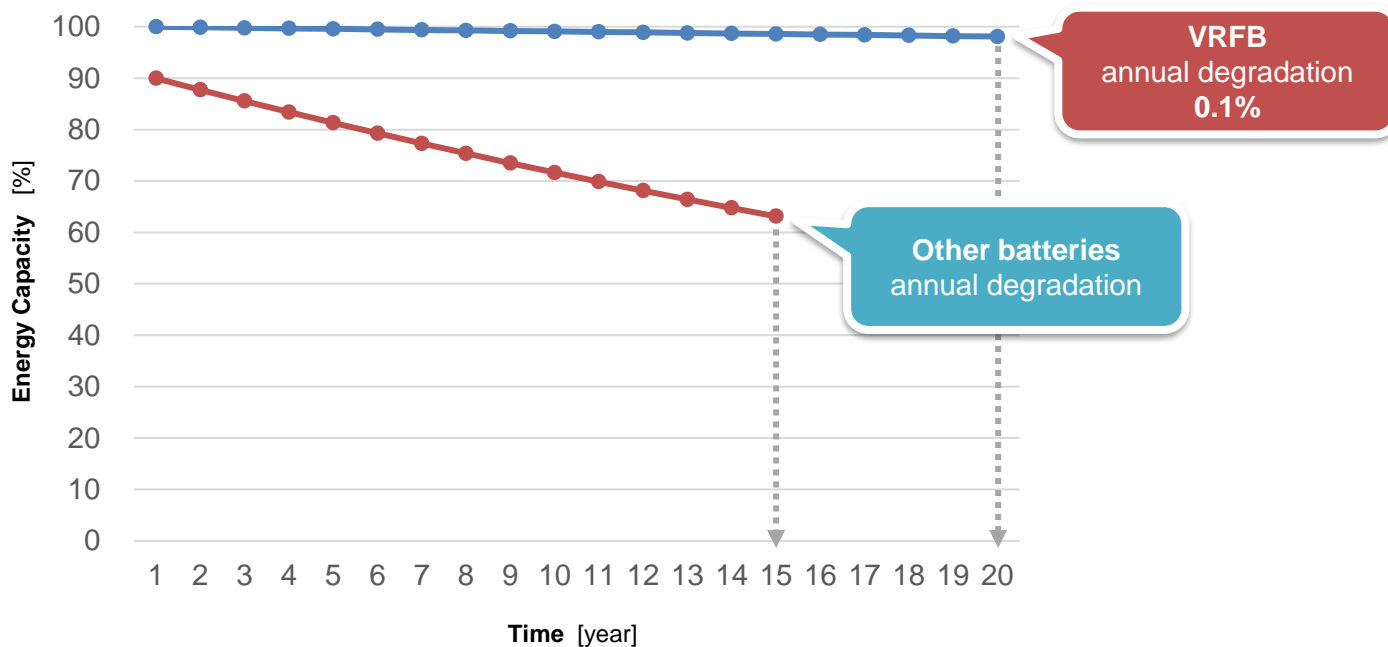
3

Competitive  
LCOE

4

# VRFB Technology

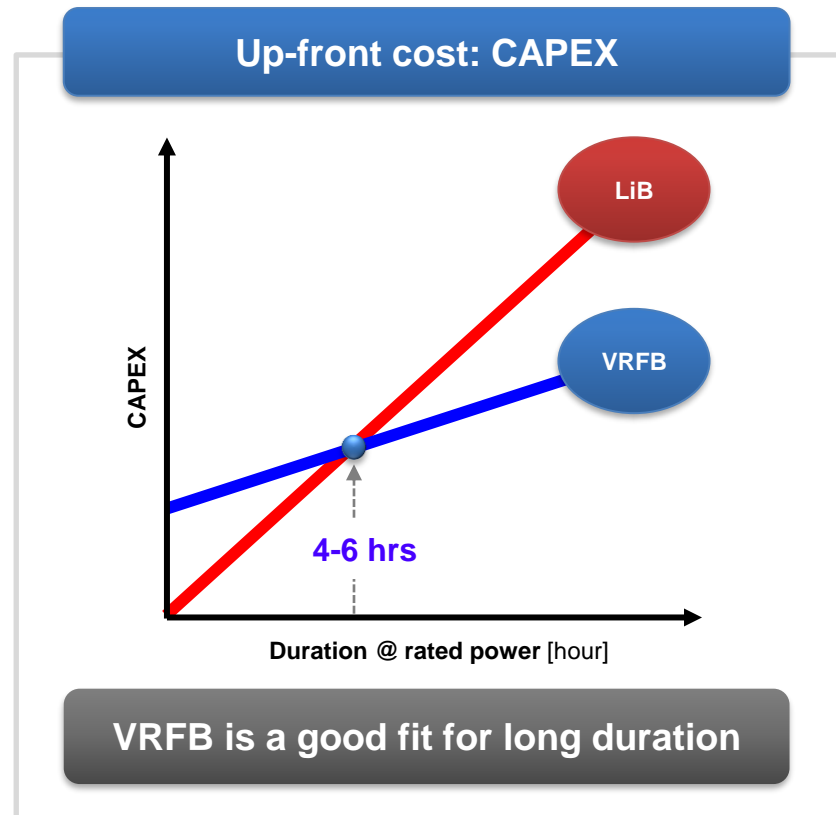
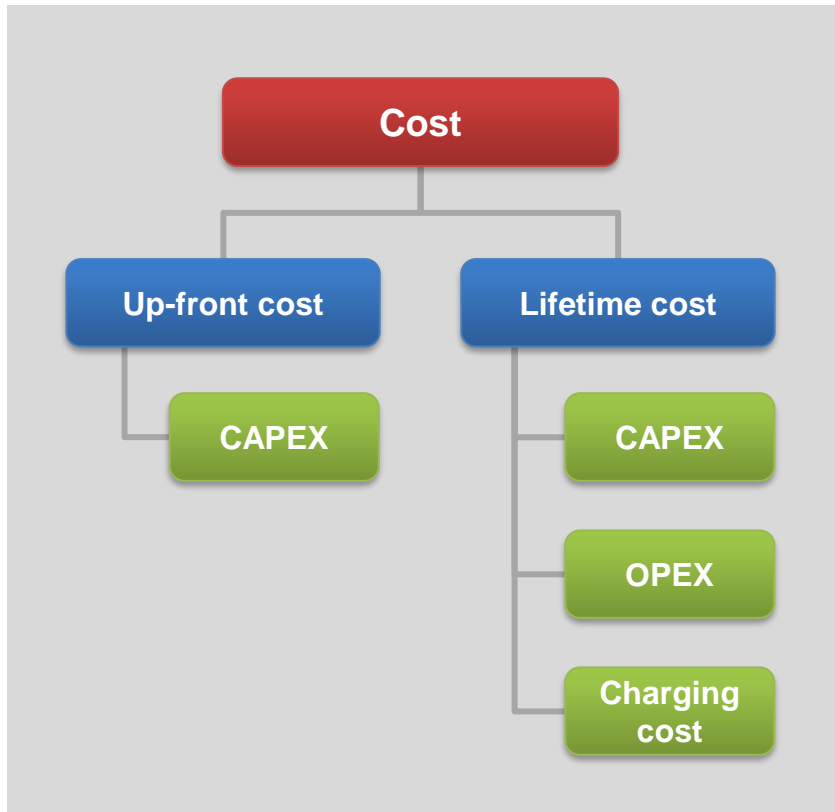
## Capacity Retention



VRFB has annual degradation of 0.1% over 20 years with continuous 100% charge/discharge operations, which is the best capacity retention capability ever implemented by any battery technologies

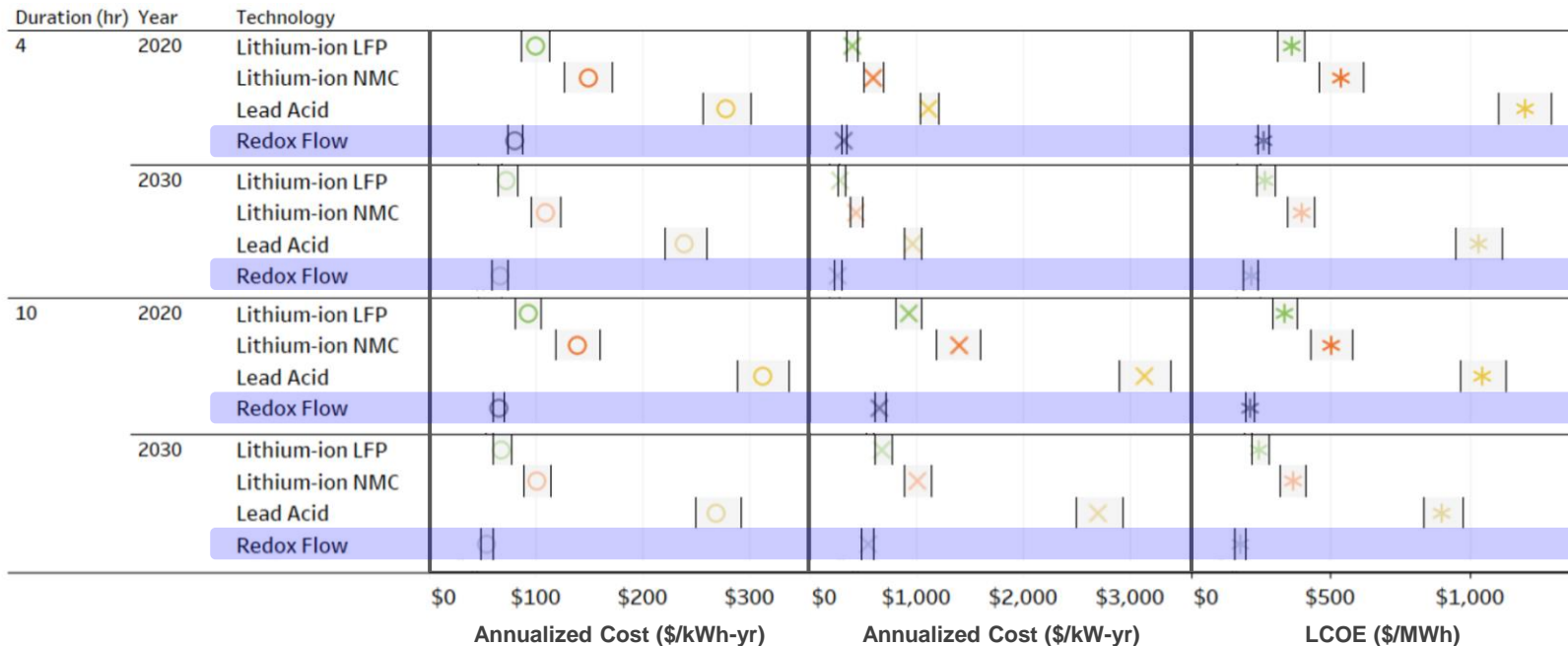
# VRFB Technology

## Cost Analysis



# VRFB Technology

## Lifetime Cost



(Source: DOE, 2020 Grid energy storage technology cost and performance assessment, December 2020)

Lifetime cost of VRFB is competitive now and in the future for long duration

# VRFB Technology

What happens after 20-year lifetime?



## OPTION 1

Excellent economy

**OVERHAUL** VRFB H/W  
and **REUSE** the electrolyte for next 20 years

## OPTION 2

Good economy

**REUSE** the electrolyte in other VRFB

## OPTION 3

Moderate economy

**RECYCLE** the electrolyte  
and **RECOVER** vanadium out of it





# PRODUCTS

# Products

## Lineup



### **EnerFLOW<sup>®</sup> 430**



Dimension: 6.05×2.43×2.90m

**20ft container type**

**75kW / 385 kWh**

**Low Cost VRFB**

### **EnerFLOW<sup>®</sup> 330**



Dimension: 2.30×0.83×2.35m

**Cabinet type**

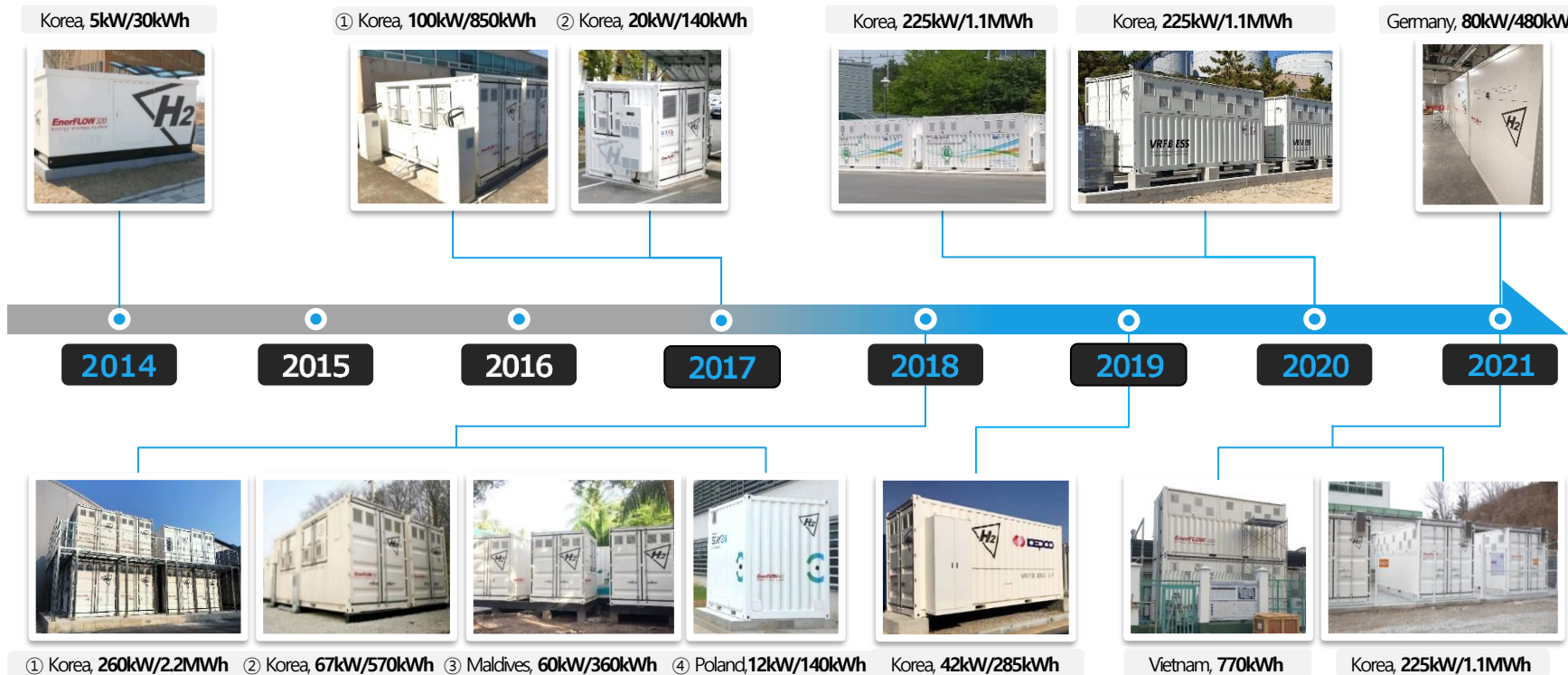
**10kW / 60 kWh**

**High Efficiency VRFB**

**Fully-packaged & modular VRFB energy storage by H2's proprietary technology**

# Deployments

## Overview



# Deployments



## Korea's largest VRFB energy storage by H2's turnkey build



**EnerFLOW<sup>®</sup> 420**

Capacity: 260kW / 2.2MWh

Customer: Mirae Paper, Korea

Location: Jeonju, Korea

Commission: July 2018

Economy: Saving \$20,000/month



# Deployments



## Korea's 1<sup>st</sup> Solar-plus-VRFB for commercial operation (2020)



**EnerFLOW<sup>®</sup> 430**

Capacity: 225kW / 1.1MWh  
Customer: EWP, Korea  
Location: Ulsan Power Plant  
Commission: November 2020



# U.S. LARGEST PROJECT

# U.S. Largest Project by H2



## U.S. Largest Flow Battery Project in California



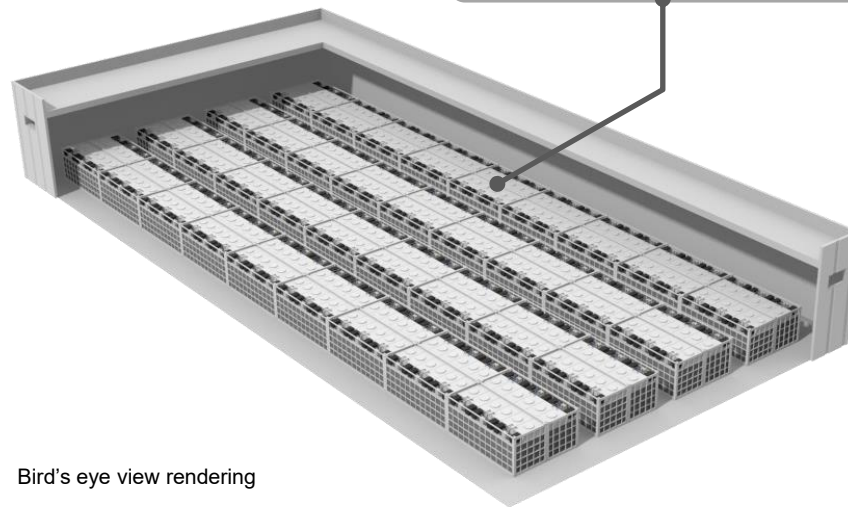
Capacity	20MWh / 5MW
Application	<p>Peaker plant (Resource adequacy)</p> <ul style="list-style-type: none"><li>Standalone energy storage operating on CAISO's dispatch order</li><li>Grid power will be used to charge energy storage</li></ul>
Site owner	<p><b>EWP Co. Ltd.</b></p> <p>One of five state-owned generation companies in Korea</p>
Location	Natural gas power plant in northern California
Schedule	<ul style="list-style-type: none"><li>(2021) Project kick-off</li><li>(2023) Commissioning for pilot operation</li><li>(2024) Commercial operation in CAISO grid</li></ul>

# U.S. Largest Project by H2



- 70 modules in total
- 71.5 kW / 286 kWh per module

All-new, 4<sup>th</sup> Gen VRFB



Bird's eye view rendering





# MANUFACTURING CAPABILITY

# 330MWh Manufacturing Plant in Korea



Drone view of construction site, October 7, 2022



**CLIMATE TECH COMPANY  
CHALLENGING NET ZERO  
WITH VRFB POWER PLANT**