



Giga Factory Business Plan

GIGA FACTORY

Ni/MH solution

www.mhgf.kr

 특허청 Patent : # 10-2023-0121922

 KEITI Eco Startup company (KEITI)

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01 IDEA

ITEM 1 : Treated MH granule can replace Cd

- Nickel Cadmium battery market increased (2022, CAGR2.8%)
- Treated MH can replace cadmium for battery
- Effect: ESG, Heavy metal contamination, Carbon Reduction

ITEM 2 : Industrial battery with MH granule

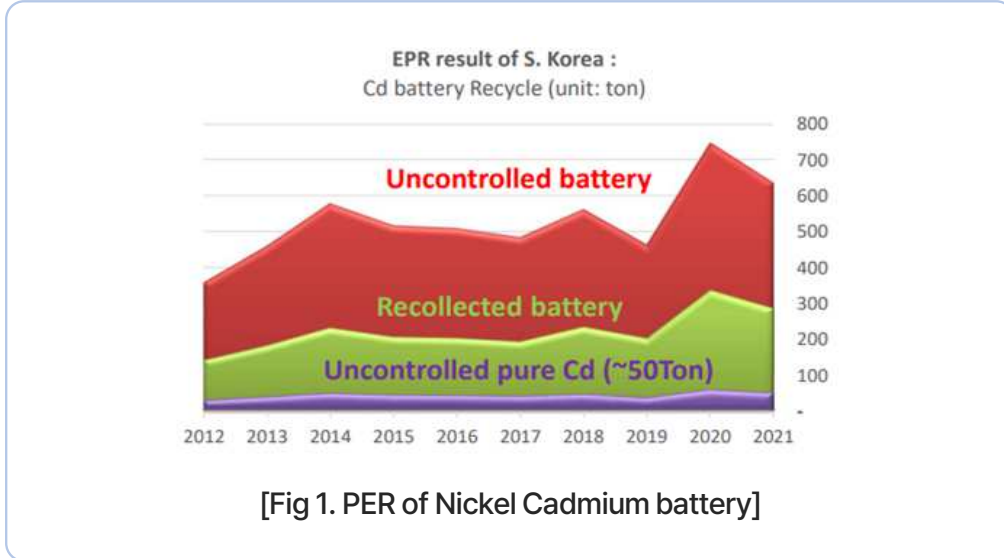
- Lithium Ion meet barrier at ESS market
- Ecofriendly massive energy storage system required (~2030)
- MWh of ESS need KWh of energy density per cell
- Over a decade, product performance and safety are proven

BUSINESS CASE

- **Problem**
Cadmium contamination (From production to the final waste)
Fluctuation of renewable energy need reliable massive energy storage system
- **Solution and effect**
Reduce wasted cadmium and replace, at once
Expand renewable energy and stable grid by eco friendly battery

02 Problem

Cadmium contamination



- Notorious Cadmium disease (Itai Itai , 1912 @ Japan)
- Fig 1 means 50 tons of cadmium is out of control in 2021
- “Nickel Cadmium” can be replaced by “Nickel Metal Hydride”
 - Ni/MH Consumer type: Japan developed in 1990
 - Ni/MH Industrial type: South Korea developed in 2000

Risk of ESS battery

□ 재생에너지 백업설비 구성을 위해 최대 약 45조원* 투자 필요

* 기타 저장장치 소요비용은 BESS를 기준으로 전망, 기술개발 등에 따라 변동 가능
 ※ 美 재생에너지국립연구소(NREL)의 BESS 비용 Low & High 시나리오 적용

< 재생에너지 백업설비 소요비용 전망(안) >

구분	유연성 자원	저장장치 필요량
단주기	기타 저장장치	3.66GW
장주기 ¹⁾	기타 저장장치	20.85GW ²⁾
	양수	1.75GW

[Fig2. 10th Electricity basic plan]

- LIB for ESS meet unsolved safety issue (32 case since 2017)
- In 2023, Government change battery strategy for ESS system (Fig2)
- Cause: Battery made of thick electrode are required for ESS, But, thin electrode of LIB make safety issue.**

03 Solution and core technology | ITEM 1



[fig 3. Negative material treatment]

Briquetting

(Process for copper plated material)

Pressing make brittle product and decrease reactive surface area

Powder filling

(Process for MH granule/Positive material)

Easy to control and keep reactive surface area

Effect of MH granulation

- Large active surface area result high performance
- Eliminated hazardous copper plating process
- Circular process means effective material usage
- Similar to cathode shape means,,,
 - Worker can handle instantly
 - No need for facility investment

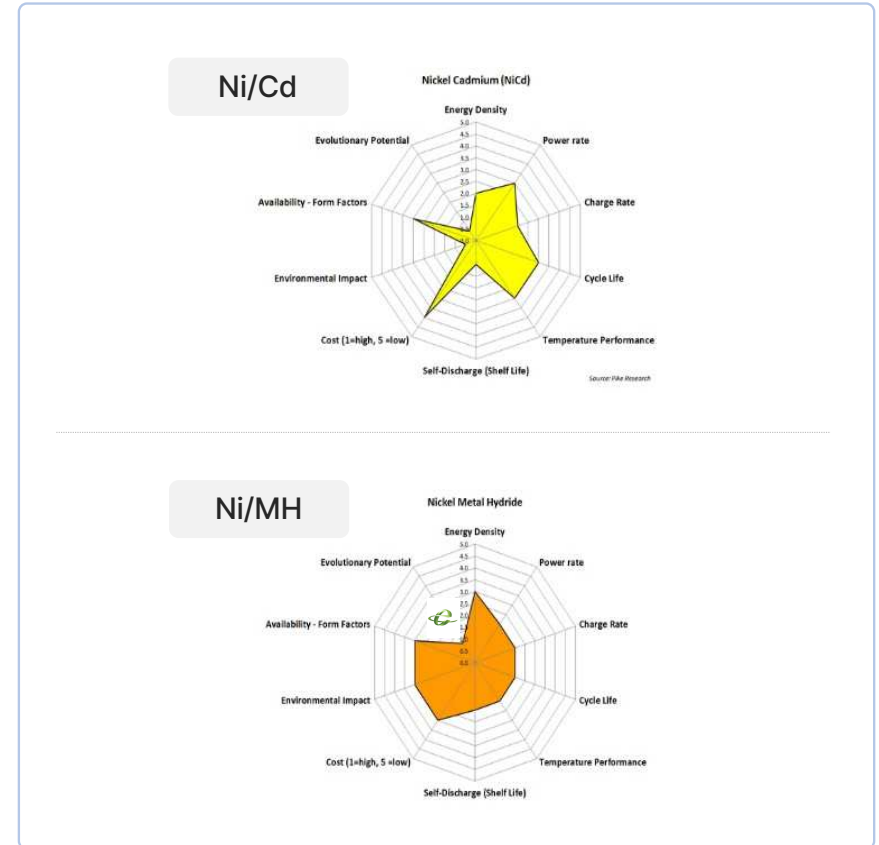
03 Solution and core technology | ITEM 2

- Over 1 meter of electrode can be produced and easy to handle
Several kWh of cell can be produced, instantly
[1,500Ah (1.8kWh) of battery are verified by government project]
- KWh level of battery is essential for MWh of ESS
- Registered Industrial standard (**KSC 8543, 8544**)
- No investment required for mass production system and supply chain
(Exactly same as Industrial nickel cadmium production infra)

When negative changed from Cadmium To Metal Hydride

- Radar Map improvement (Fig 4)
- Decrease heavy metal contamination
- Decrease budget for facility and it's operation cost
- Parallel production of eco friendly product

[Fig4. RADAR]



03 Solution and core technology | RESULT

Combination of M type pocket cathode and Giga Factory's negative
(Tested by R.S.P. : Surpass H type performance, KSC 8543)

Giga Factory suggest upgrade solution of cell performance

Meaning of KSC 8543 test result

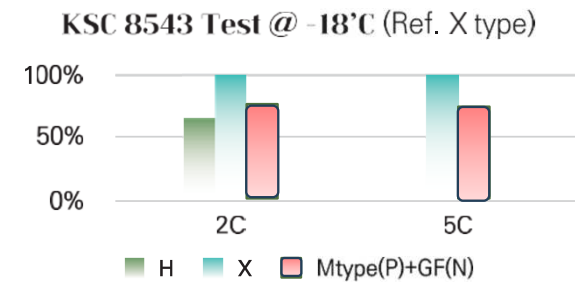
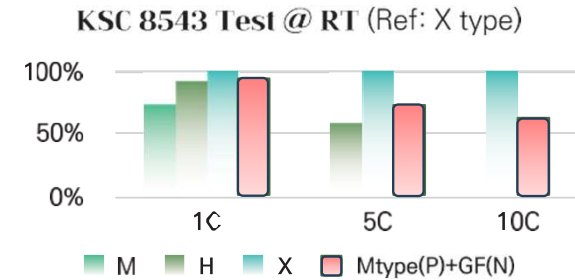
Big capacity with High performance and Safety

- Merit of pocket electrode system : Safety, Huge capacity (Kwh/cell)
- Easy process technology : Easy to handle and control
- Breakthrough of Industrial and ESS battery limitation

4. Results

Rate of constant current	Final voltage	Minimum discharge duration	Result time
10 I_t	0.8 V	H type : - X type : 2 min	1 min 15 s
			discharge duration
			Result time
5 I_t	0.8 V	X type : 3 min 30 s	2 min 31 s

Cell performance over H type
 (M grade pocket type Cathode + Giga Factory's Anode)



----- Tested by R.S.P -----

04 Value-up

1. Market

*ITEM	Market	**Amount (USD)	Remark	Note
1	Domestic	1M	2021's record	Industrial cell maker
	Oversea	210M	MH alloy 7K ton (\$30/Kg)	1.4B\$ (Fig5,6) 50%: Industrial
2	Domestic	390M (10year service life)	2,326GWh/M,30day = 77GWh/day	Korea Trading 0.5M\$/MWh (TSL MegaPack)
	Oversea	4,400M	2021's	Market&Market

* ITEM : 1. Material = replace Ni/Cd, 2. Battery = for ESS

** Global market is 9.4 B USD : 10% of M/S = about 1B USD





04 Value-up



2. Competitor

Other type of Battery

- Nickel Cadmium: Heavy Metal product, Replaceable by "Hydrogen storage granule"
- Lead Acid: Heavy Metal product, Widely used for ICE vehicle, industrial usage
- Lithium Ion: Increased in EV mobility but issued safety for ESS
- Next generation: Need verification over safety/performance/life/cost

ITEM's merit

- Sales record / history and satisfied KS requirement (Verified life cycle / Safety / Performance)
- Nickel cadmium maker can adjust Ni/MH product quantity by market situation
- Nickel cadmium maker need no facility investment for Ni/MH product

04 Value-up

3. Business plan

- Granule shaped negative material (Hydrogen storage alloy) is similar to cathode material (Nickel cadmium maker using now) make it easy to handle for Ni/Cd company
- Major company in S. Korea have record of purchase Ni/MH industrial battery (fig 7)
- Global green company's last problem is Green / Safe / Proven(15yr+) battery
- Related to Environmental risk, ESG, Renewable Energy, RE100 and more



04 Value-up

4. Lurching

- Supply for Nickel Cadmium maker
 - Short term: Domestic market
 - Long term: Oversea market
- 2.8% of Ni/Cd market growth rate per year (1.4B USD, 2022)
- Major applied area: Industrial battery, ESS
- ESS & Power Generation company
 - Mega+@ scale: Wind, Solar, GRID connected
 - Micro scale: Home ESS (EU, USA)



ITEM	Short term (Domestic)	Long term (Domestic/Oversea)	Remark
Material	5M	0.1B	ITEM 1
Battery	-	0.5B	ITEM 2

05 Team

Partner Companies

● A: Mass production facility



● B: Oversea sales
Material supply



● C: Pocket battery maker





Giga Factory Business Plan

THANK U



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