For TUM German-Japanese Energy Symposium 2011

Corporate Information

ENAX, INC.

February, 2011

Ver. 203

ENAX

01

Company Profile

ENAX

02 ■Corporate philosophy

"We, Enax, focuses on the the safe and high quality Li-ion batteries which is loved and admired by our stakeholders, and contribute to construction of the society with mobility and convenience."

President & CEO Kazunori Ozawa, Ph.D.

ENAX

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■ Our Business Vision & Focus

◆ Business Vision

Development, production and sales of Lithium ion rechargeable battery pack / Sales of production machine / Development and sales of applied products of Lithium ion battery.

◆ Our Focus

Enax is focusing on the develop Li-ion batteries with following features differentiated from other players in the world.

-. High energy density

(high energy per unit mass)

best portability for mobile electronics

-. High power

(high power-to-mass ratio)

good for industry usage

-. Large size

Pouch format (Our Laminated Sheet Battery = LSB)

having wide variety of shapes and sizes efficiently fitting the devices they power.

ENAX

04 ■ Company Policy & Key words

◆ Company Policy

All of us aim to make ENAX a company loved in its quality and safety by customers.
We develop products that we can make our customers be impressed and provide them.
We have hope in our future and make an effort to improve our management system constantly.

◆ Key words

Key words to be addressed are ;

-. Safety

best conformance with safety standards
thanks to our unique Pouch format

-. Price

reasonable in terms of CBO (cost of ownership)
low Energy/ Consumer-price

-. Materials

superiority in following point of view.

- environmentally friendly
- increasing stability and cycle durability
- lower self-discharge rate
- improvement of high temperature performance

ENAX

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■Company Profile

- Company Name : ENAX,INC.
- President, CEO : Kazunori OZAWA,PH.D.
- Incorporation : 15 April 1996
- Capital Amount : 3,007 Million Yen (in September 2010)
- Sales : 1962 Million Yen (as of FY ending March 2009),
  802 Million Yen (as of FY ending March 2010)
  1500 Million Yen (forecast at ending March 2011)
- Employees : 75 (in September 2010)
- <Global Network>
  - ■ In Japan ・ Head Quarter : 8F Otowa KS Bldg.,2-11-19 Otowa Bunkyo-ku Tokyo
    ・ LSB Laboratory : Yonezawa, YAMAGATA
    ・ Machine Factory : Hachinohe, AOMORI
    ・ Power Battery Technical Center : Asaka, SAITAMA
    ・ New LSB Factory : Tokoname, Aichi (From March 2011)
  - ■Affiliate companies (Overseas) :
    ・ Enax (Anqiu) New Energy Co.,Ltd.(China)
    ・ Shuang Yi Li(TianJin)New Energy Co., Ltd.(China)
    ・ Enax Europe GmbH (Germany)
  - ■Overseas Office
    ・ Enax USA (USA)
- Main Bank : Mitsui-Sumitomo Bank, Tokyo-Mitsubishi Bank, Shonai Bank
- Major Client :

ITOCHU Corporation (Japan)	NEC Group (Japan)
National Maritime Research Institute (Japan)	JGI, Inc. (Japan)
Nissan Motor Co., Ltd. (Japan)	Hino Motors Co., Ltd. (Japan)
Mitsui & Co., Ltd. (Japan)	Degussa AG (Germany)

ENAX

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■Global network (in Japan)

<Tokyo Head office>

8F Otowa KS Bldg.,2-11-19 Otowa Bunkyo-ku,
Tokyo 112-0013

<Yonezawa Laboratory>

2474-1 Kubota, Kubota-cho Yonezawa-shi,
Yamagata 992-0003

<Hachinohe Factory>

2-9-15 Kikyono Kogyodanchi Hachinohe-shi,
Aomori 039-2246

<Sendai Office>

302-3-15-3 Izume Chuou Izumi-ku Sendai-shi,
Miyagi 981-3133

<New LSB Factory>
Tokoname, Aichi
From March 2011

<Saitama Technical Center>

3-19-13 Higashibenzai Asaka-shi,
Saitama 351-0022

ENAX

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■Global Network : Overseas Affiliate Companies & Office

Name	Enax (Anqiu) New Energy Co.,Ltd （安丘）	Shuang Yi Li(Tianjin)New Energy Co.,Ltd（双一力）		Enax Europe GmbH
Address	Anqiu Shandong China	Tianjin China		Munster ,Germany
Capital	US$2,500,000.00	Yuan 40,800,000		€ 25,000
Owner's interest	100.00%	5.51%		80.00%
Another Stock Holder	–	Dai-ichi Kogyo Seiyaku Co.,Ltd	Tianjin Yiqing	Jan-Steffen Lang
Voting right	–	50.00%	44.49%	20.00%
Established	Mar 2004	Mar 2005		Aug 2007
Commencement of Operation	Jun 2005	Oct 2005		Aug 2007
Activities	Li-ion Battery electrode manufacturing	Li-ion Battery manufacturing,assembly,packing		Business activities in Europe

ENAX

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■Company History

- **1996** ENAX Inc. founded.
  Founding capital: 40 million yen.
- **1997** Consulting program for LIB manufacturing project of LG Chemical conducted. Developed relevant Production equipment, manufactured and sold exclusively.
- **1998** LIB battery pack for Note-PC commercialized.
- **1999** "ENAX research laboratories Inc." founded in Yonezawa.
  First third party share allotment, capital 75 million yen.
- **2000** Commercialization of EV using our large scale LIB's as a power source initiated.
  Second third party share allotment, capital 487 million yen.
  Acquisition of ENAX research laboratories Inc.
  Complete LIB production line system supply to UTI (Taiwan).
  Hachinohe Factory built.
  Production of LIB mounted EV cars initiated.
- **2001** "Development of large capacity PBS's" adopted by creation and technology research & development project of Ministry of Economy, Trade and Industry.
- **2002** Large capacity PBS's adopted by JAMSETC as rechargeable batteries system for Underwater investigation vessel "Urashima".
- **2003** LIB Batteries and control system for "EV Global"(USA) E-motorcycles developed and OEMed to Takara(Japan).
- **2004** Large capacity PBS's adopted for rechargeable batteries of "Robots" . Hitachi Ltd., Sohgo Security Services Co., Ltd., Mitsubishi Heavy Industries, etc. as customers.
  Actual Driving Test of "Fukui Tramcar " using a LIB system jointly developed with Fukui University conducted.
  Award-wining Excellence Prize for "Tokyo Venture Technology Awards" for development of supecific LIB for vehicles as an alternative to lead secondary batteries.
- **2005** Battery for engine starters of bush cutters for Komatsu Zenoah (Japan) produced and sold.
  JV Plant for production and assembly of batteries for electric automobiles built by ENAX, Daiichi Kogyo Siyaku Co., Ltd., and Tianjin Yiqing Group.
  JV Plant for manufacturing of electrodes in Anqiu City, Shandong Province in China initiated under joint management by ENAX and Degussa, AG.
  Electrode materials developed jointly with Degussa AG.
  Batteries for HEV developed jointly with Continental AG.
- **2006** Comprehensive Business Alliance among Murata MFG Co., Ltd., ENAX, and Daiken Chemical Co., Ltd., concluded a for the development, design, manufacture and sales of Li-ion batteries.
- **2007** Developed and supplied LIB packs for Gazzel (Holland) assisted E-byke
- **2008** Share allotment by TEMIC Automotive Electric Motors GmbH and Sumitomo Corporation, capital 1,007 million yen.
- **2010** Share allotment by The Innovation Network Corporation of Japan (INCJ)and Jafco, capital 3,007 million yen.

ENAX

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■Member of the Board of Director (as of December 2010)

- **President and CEO: Kazunori Ozawa (Born in 1945)**
  - 1966: Graduated from Engineering department of Tokyo University
  - 1966: Joined Sony Corporation
  - 1988: Division head of Magnetic Electronic Device Division of the Electronic Components Division at Sony Corporation
  - 1990: Division manager (project leader) of Lithium battery development Division at Sony Corporation
  - 1996: Founded this company, assumed position of President

In his days at Sony, Kazunori Ozawa succeeded in the development and mass production of world first new technologies in the fields of single crystal ferrites for VTR heads, vapor deposition tape for digital VTRs, and LIB's. In 1992, he succeeded in mass production of LIB's while under employment as division manager of the LIB development Division. He is familiar with all LIB technology from materials and manufacturing through to mass production and at the same time maintains a wide network in the industry.

- **Director: Masaki Saikusa (Born in 1955)**
  - 1980: Joined Nissho Iwai Corporation
  - 2000: Joined ITX Corporation
  - 2005: Joined Espec Corporation
  - 2008: Joined Hosokawa Micron Corporation
  - 2010: Assumed as director and COO in this company
- **Director: Haruyasu Asakura(Born in 1961)**
  - 1984:Joined Mitsubishi Corporation
  - 1999:Joined Apax Partners
  - 2001:Joined The Carlyle Group
  - 2009:Inovation Network Corporation of Japan
  - 2010:Assumed as outside director in this company
- **Director : Koichiro Taniyama(Born in 1969)**
  - 1992:Joined Industrial Bank of Japan(IBJ)
  - 2001:Joined The Carlyle Group
  - 2009:Inovation Network Corporation of Japan
  - 2010:Assumed as outside director in this company
- **Director : Toshiyuki Ohashi(Born in 1974)**
  - 1999:Joined Deloitte Tohmatsu Consulting Co.,Ltd.
  - 2000 Joined Goldman Sachs Japan Co.,Ltd.
  - 2009:Inovation Network Corporation of Japan
  - 2010:Assumed as outside director in this company

- **Auditor: Takehiko Taya (Born in 1943)**
  - 1966: Joined Tokai Bank Ltd.
  - 1996:Joined Yuzawaya Co.,Ltd.
  - 2006:Corporate Auditor of Enax,Inc.
- **Auditor: Minoru Maeda (Born in 1933)**
  - 1992: Employed as Director at Asahi Beer
  - 2002: Assumed as auditor in this company
- **Auditor: Takeshi Oyama (Born in 1959)**
  - 1982:Joined Mitsui Bank Ltd.
  - 1987:Qualified as CPA and Joined Deloitte Touche Tohmatsu LLC.
  - 1997:Set up Oyama CPA office
  - 1999:Director of Enax,Inc.
  - 2007:Corporate Auditor of Enax,Inc.
- **Auditor: Masahiko Okumi (Born in 1983)**
  - 2007: Joined Mckinsey & Company,Inc Japan
  - 2009: Joined Innovation Network Corporation of Japan
  - 2010: Assumed as outside Auditor

ENAX Main Business Field

I. Laminated Sheet Battery (LSB)

II. Power Battery

III. Li-ion rechargeable battery production Equipment, Materials and/or Consulting service

■ I. Laminated Sheet Battery

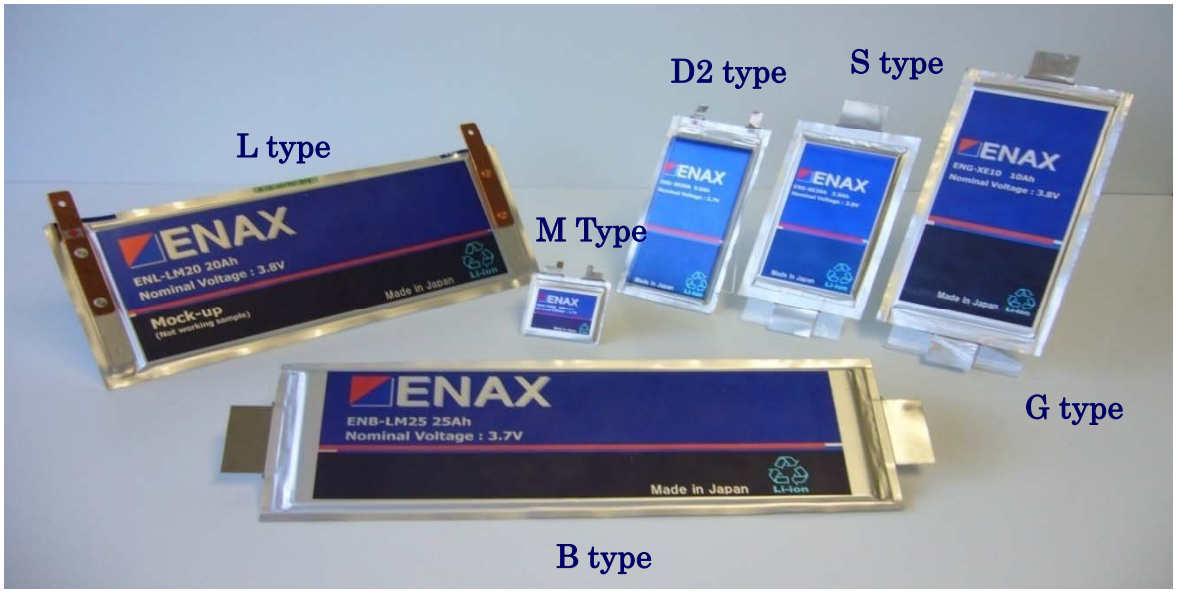
■Laminated Sheet Battery(LSB)

- Development and manufacturing of Lithium Ion Batteries for automotives and other power unit and relating business.
  By spending first 10 years for developing core technologies, we established good reputation as a high performance LIB company and partnership with major companies.
- LSB is expected to be used in automotive (EV and HEV), e-bike, construction machine, power tool as a high performance power source.

【Feature of technology・ Domination】

① High safety
② Five kinds of electrode materials recipes are developed for different applications.
③ Laminate type can be less weighted and small sized
④ Quick full re-discharging longer cycle life
⑤ Quick charging

■I. ENAX LSB Cell Line-up (currently available)



	Type	Part No.	Capacity	Dimension *(mm)L×W×H*	Weight	Specific characteristics
High energy Type	S type	ENS-XE36	3.6Ah	86 × 160 × 5.5mm	0.105kg	High Capacity
	D2 type	D2-50EC-L	5.0Ah	78 × 165 × 6.1mm	0.118kg	
	G type	ENG-XE10	10Ah	99 × 225 × 6.4mm	0.260kg	
	L type	ENL-LM20	20Ah	325 × 156 × 7.5mm	0.570kg	
	B type	ENB-LM25	25Ah	342 × 118 × 7.5mm	0.570kg	
High Power Type	S type	ENS-XP20	2.0Ah	86 × 160 × 5.0mm	0.109kg	Low - temperature characteristics High Power
	M type	ENM-XP08	0.8Ah	50 × 55 × 6.0mm	0.027kg	

Remark : Rate Capability 3C(maximum 5C 10~30sec) *Power type 20C

■ II. Power Battery : Currently available

■Power Battery (PB)

Power Battery is a battery pack of 18650 type Li-ion rechargeable cells.
We develop, manufacture, and distribute Power Battery, which applies to laptop computers, digital cameras, or specific uses such as submarines and robots.

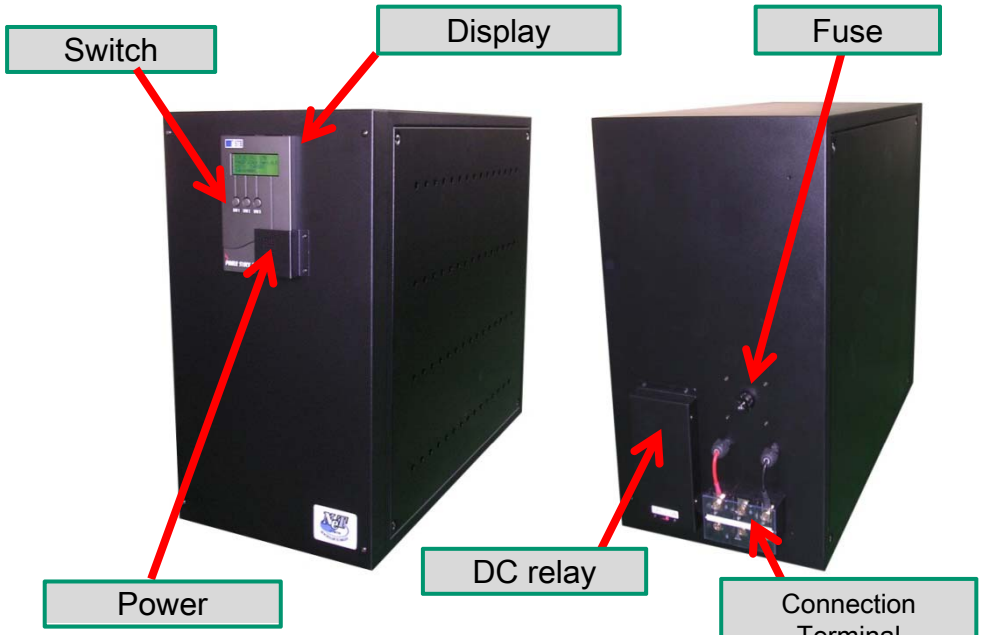
Power Battery HEVA

Power Battery

■ II. Power Battery : Large Capacity Storage System for Industrial use (New release)

• ENAX Power Stack Series (Tentative Name) Appearance

Ruck type



Standard type

ENAX

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■ II. Power Battery : Large Capacity Storage System for Industrial use (New release)

Applications

- Power storage system for communication, electric power, security instruments
- Power storage system for Alternative energy, renewable energy (S olar power, Wind power, Hydroelectric, Bio-mass etc.)
- Power storage system for back-up power
- Power source for any machinery that needs DC power
- Power storage for UPS （ small、middle、large size)

■ II. Power Battery : Large Capacity Storage System for Industrial use (New release)

• Product Line up

- 18650 types are initially launched to the market
- ENAX Large LSB based system with sub-mega Wh capacity version will come.

items		Voltage / Capacity						
		126V 48Ah	235V 24Ah	250V 24Ah	302V 24Ah	386V 24Ah	403V 24Ah	423V 24Ah
Input Voltage	Max. input voltage	DC126V	DC235V	DC250V	DC302V	DC386V	DC403V	DC423V
Output Voltage	Max. input voltage	DC126V	DC235V	DC250V	DC302V	DC386V	DC403V	DC423V
	Min. input voltage	DC99V	DC185V	DC198V	DC237V	DC303V	DC316V	DC334V
Cell installed (Change to LSB type)		Li-ion 18650	Li-ion 18650	Li-ion 18650	Li-ion 18650	Li-ion 18650	Li-ion 18650	Li-ion 18650
No. of cells installed		600Cell	560Cell	600Cell	720Cell	920Cell	960Cell	1,010Cell
Cell configurations		20P30S	10P56S	10P60S	10P72S	10P92S	10P96S	10P101S
Nominal power capacity		5.3kWh	4.9Kwh	5.3kWh	6.4kWh	8,1kWh	8.5kWh	8.9kWh

Any voltage is applicable on request. (24V ~ 423V)

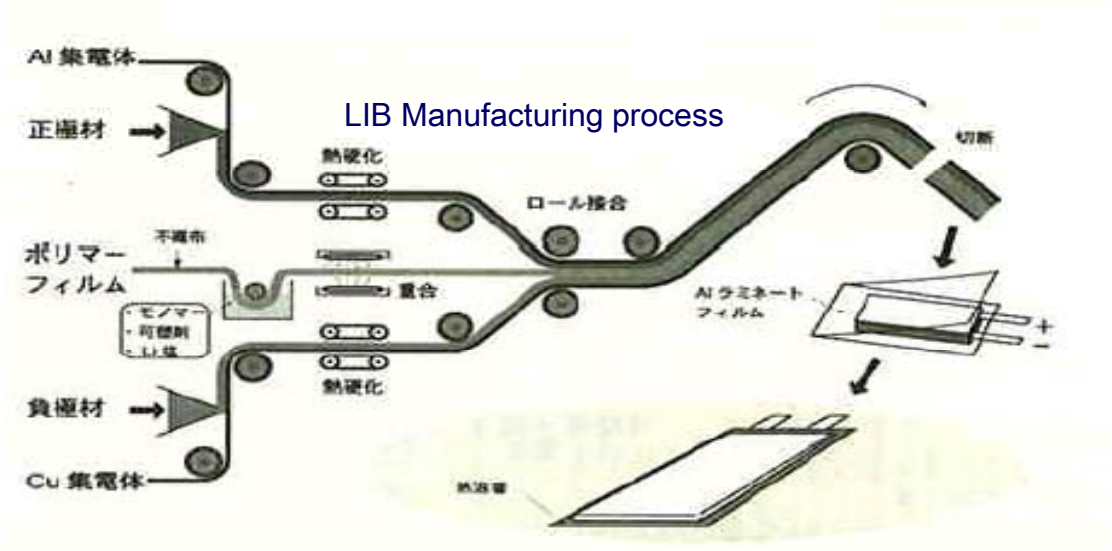
■ III. LIB Production Line Equipment/Materials sales Technical Consulting service

For companies that start business of Li-ion rechargeable batteries, we provide total consulting services : supplying equipment, giving technical recommendation for establishing factory, giving know-how of installation and efficient operation for production of Li-ion rechargeable batteries.

■III. Battery manufacturing process (total process)

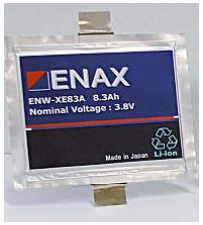
Former process:

①Raw material → ②Synthesis Mixture → ③Spreading → ④Drying → ⑤Pressing



Post-process : Cell Assembly

⑥Sliding → ⑦Assembly → ⑧Sealing → ⑩Inspection → ⑪Battery cell completion → ⑫Packaging → ⑬Battery pack → ⑭Module



■III. Major Equipment : Former Process

Powder Mixing

Slurry Mixing

Coating

Roll Press

■III. Major Equipment : Post Process (Cell Assembly)

Slitting

Cell Assembly

Sealing

Charging / Discharging

Applications

< Electric Vehicles >
I. Tram
II. Hybrid Electrical Vehicle (HEV)
III. Plug-in Hybrid Electrical Vehicle
IV. Electric Bus
V. Brush Cutter
VI. Battery-Assisted Bicycle
VII. Electric Bicycle
VIII. Motor Sports Car

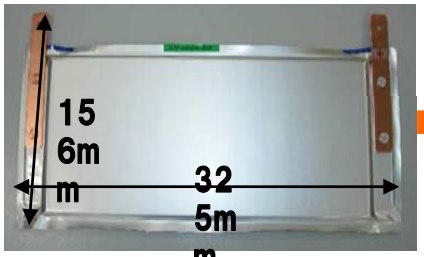
< Mobile Gear>
Quick-charge Batteries

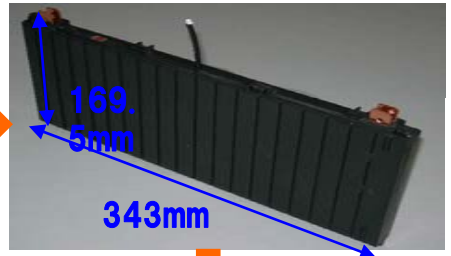
<Grid connection>
Grid Connection Facilitate Storage System

■I. Tram

Requirements:

- High acceleration for a few minutes
- High amount of energy to run fairly long distance
- Development of a special cathode material: $LiMn_2O_4$





Tram

Dimension	17.84m (L) × 2.75m (W) × 3.982m (H)
Weight	30.3t
Electric Motor	80kW DC motor × 4

Battery

Dimension	1.8m (L) × 1.5m (W) × 1m (H)
Total Weight	600kg
Total Voltage	615.6V (average)
Cell Conection	162Series 12Parallel
Charge rate	2C

Running Data

Running Distance	20Km
Maximum Speed	70Km / H

■II. Hybrid Electric Vehicle(HEV)

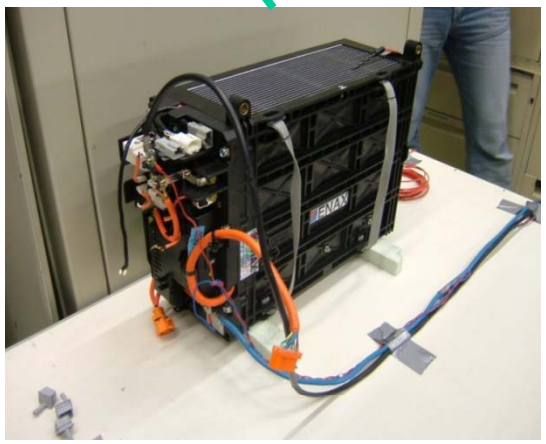
The following system has been selected:

Battery pack:

Nominal Operating Voltage: 144V
Cell connection: 40s3p

Cell:

Dimension: 76mm x 148mm x 5,2mm
Capacity: 2 Ah
Weight: 110g
Better performance compared with the NiMh battery because of the lower internal electric resistance



Cathode Materials:

Mixture of $LiNi_{1/3}Co_{1/3}Mn_{1/3}O_2$ and modified $LiMn_2O_4$

Anode Material:

Amprphous carbon

Separator:

SEPARION

■III. Plug-in Hybrid Electrical Vehicle

Requirements:

- High energy
- High power
- Lower increase of temperature during charging and discharging

Developed 20Ah cell makes a low connection resistance possible.

New Charging System

ENAX

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■IV. Electric Bus

Requirements:

- High power for a steep road
- High acceleration for a few minutes
- High amount of energy to run fairly long distance
- Development of a special cathode material: $LiMn_2O_4$

Bus

Weight	4.6t
Capacity	29people

Battery

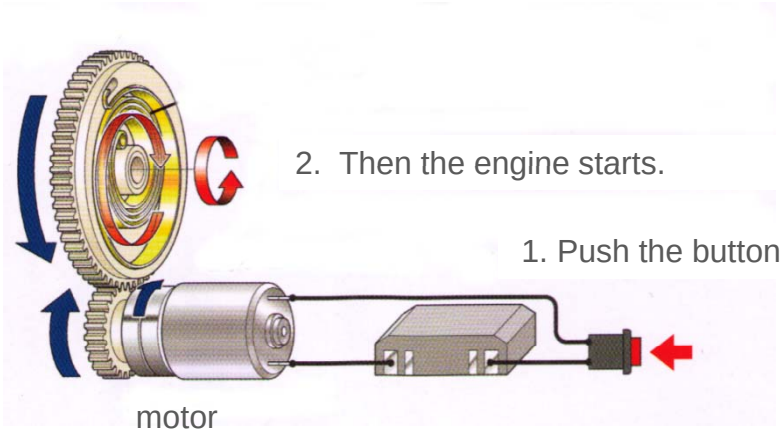
Cell Capacity	ENAX W-size 8.6Ah
Module	6modules
Total Weight	480kg (80kg/module)
Total Voltage	615.6V (average)
Cell conection	162Series 12Parallel (15S18P/module)
	BMS inside

Running Data

Running Distance	105Km
Maximum Speed	90Km / H

■V, Brush Cutter

This brush cutter with ENAX Li-ion battery starts its engine by pushing a button.



Battery pack

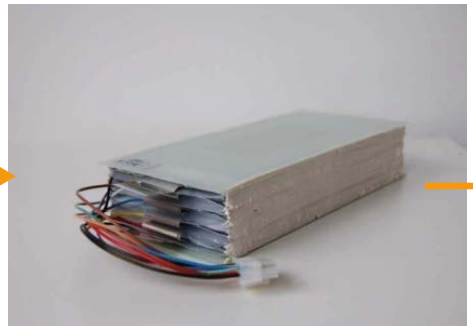
Voltage	7.6V （8.4V～5.0V）
Capacity	800mAh
Discharge Current	30A 12seconds

Battery pack for the brush cutter (left)

Cell for the battery pack (right)

■VI. Battery-Assisted Bicycle

This battery-assisted bicycle
has ENAX Li-ion battery pack
under its book rack on the back.

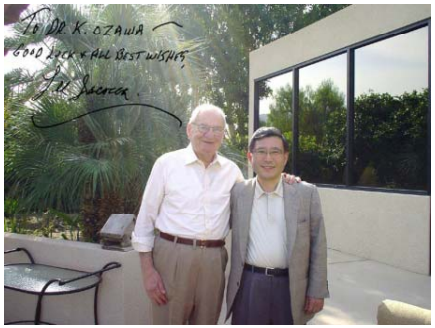


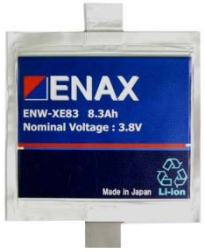
The battery pack :
Nominal Operating Voltage : 38V
Cell connection : 10S1P

Cell :
Capacity : 7Ah

■VII. Electric Bicycle

This electric bicycle “E-bike” is powered by ENAX Li-ion battery, and designed by Mr. Lee Iacocca.





LSB

Battery Pack

■VIII. Motor Sports Car

ENAX Li-ion battery is used as a starter battery of this motor sports car.

Lotus motor sports car

Battery Pack :

Nominal Operating Voltage : 14.8V
Cell connection : 4S5P
Weight : ~2.5kg

Cell :

Dimension : 76mm×148mm×5.2mm
Capacity : 2Ah

Cell for the starter battery

NEDO Grid Connection Facilitate Storage System

New Energy / Electric Power Supply use Li-ion Electric Storage System

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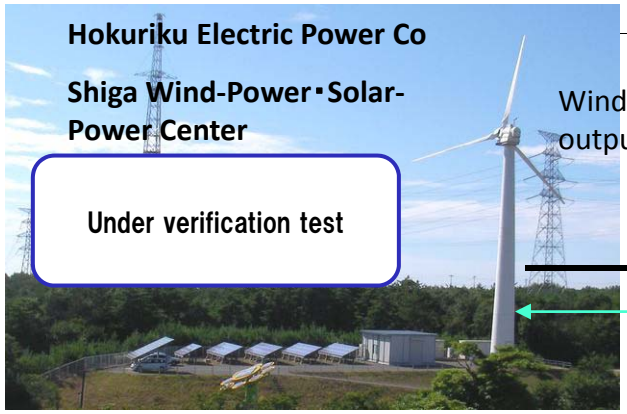

Wind power output 275kW

［Priod of verification test ：2006FY～2010FY］

Grid Connection 6.6kV

AC480V

Wind power generaion cotrol system

Convertor

DC-DC convertor

Charge/discharege system

Monitoring sysetem

FRT・DVS control

LFC control

Governor free control

CAN communication

Remote battery observation

Internet

Observation node

BMS

Safety control

SOC control etc.

CAN communication

DC320V

cell：84S8P=672cell

Li-ion Battery Pack 50kWh×（2 systems）

Cell balancer・Cell Voltage／Temperature observation functions

100kWh Electric Power Storage System & Convertor

ENAX

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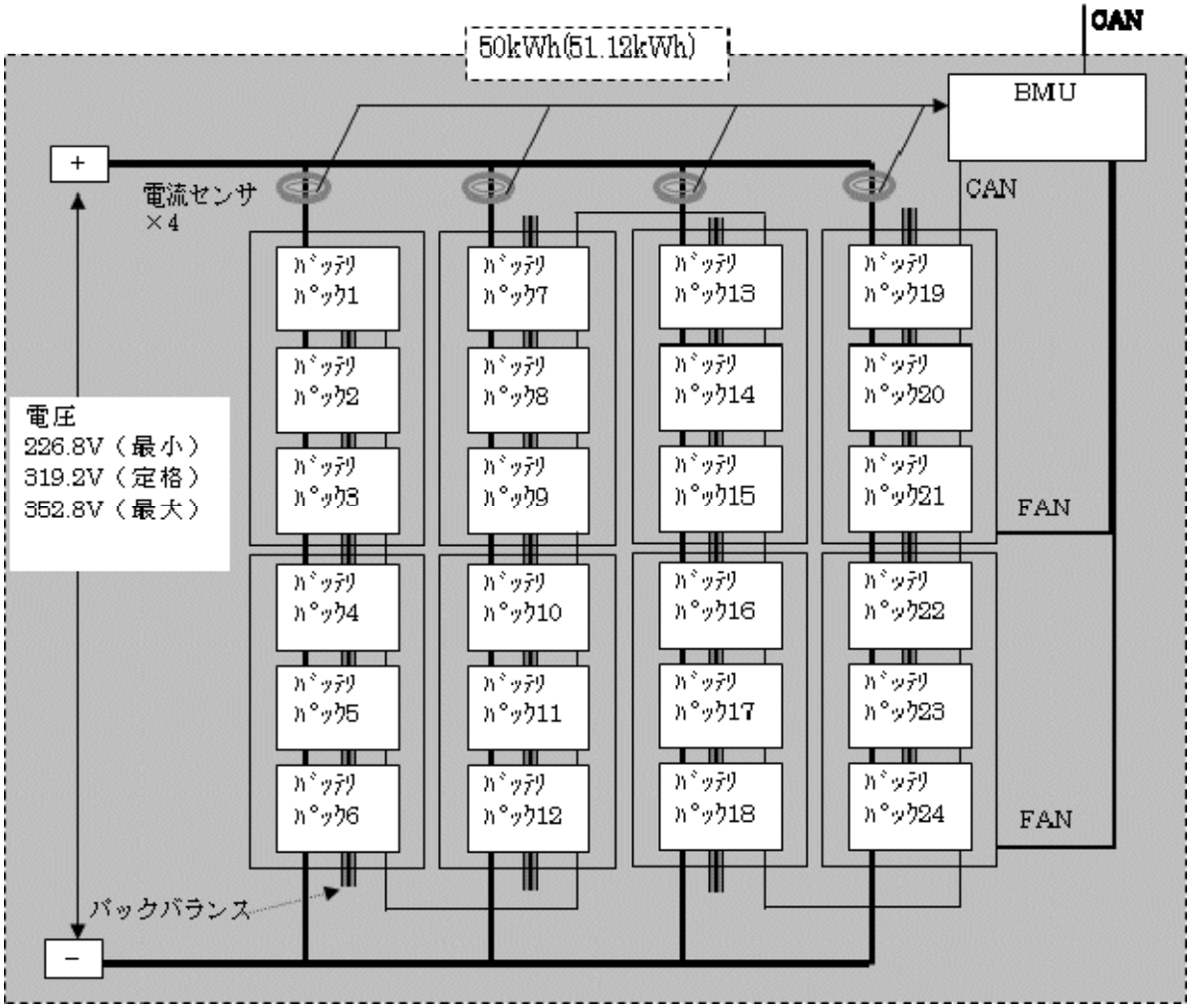
NEDO Grid Connection Facilitation Storage System
Battery Pack Configuration



50kWh cubicle mount

3 Series Connection 6.39kWh

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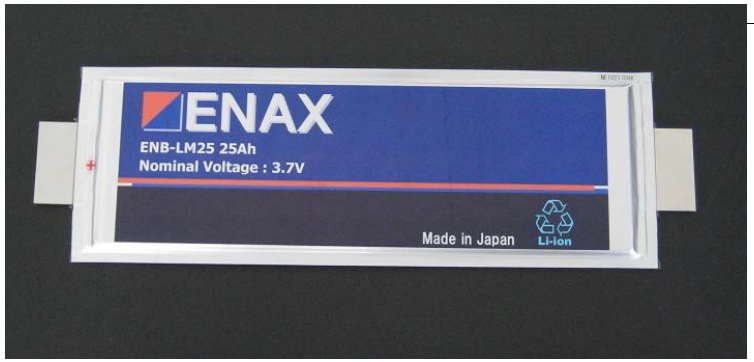
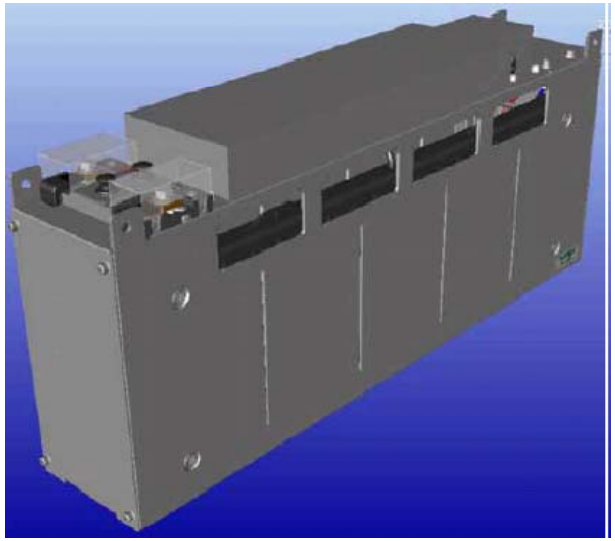
■New High Capacity Li-ion battery system



ENAX　B type cell（ENB-LM25）Outline

Capacity	２５Ａｈ
Voltage	３．７Ｖ
Dimension	342mm×118mm×7.5mm
Weight	0.570ｋｇ



Battery Pack Outline

Cell config.（8 cells）	4S2P	8S1P
Dimension	Ｗ８２×Ｄ４３２×Ｈ１９２	Ｗ８２×Ｄ４３２×Ｈ１９２
Weight	７ｋｇ	７ｋｇ
Capacity	７４０Ｗｈ	７４０Ｗｈ
Nominal Voltage	１４．８Ｖ	２９．６Ｖ
Maximum Voltage	４．２Ｖ×４＝１６．８Ｖ	４．２Ｖ×８＝３３．６Ｖ
Minimum Voltage	２．７Ｖ×４＝１０．８Ｖ	２．７Ｖ×８＝２１．６Ｖ
Specific Power Power-to-weight ratio	１００Ｗｈ/ｋｇ	１００Ｗｈ/ｋｇ
Functions	Cell voltage observation ： 2.1V～5.0V（observed by 10mV） Temp. observation : -10℃～80℃（observed by １℃） Balance Control Function by BMS ： Resistance discharge balance method	

Movement to the next stage

Our activities at New Facility
with Strategic Items.

■New LSB Factory (ENAX Chubu Lab & Plant)

Image Picture

As of beg. Feb. 2011

This new facility will commence its operations from April 2011 at Tokoname, Aichi Pref. Japan

Where new large capacity LSB sells (50 Ah cell and larger ones) will be produced as ENAX LSB Factory.

And
Major part of ENAX Advanced Technology Laboratory will be relocated from Yonezawa.

■Our Strategic item is planned in mass-production at chubu plant

【High Capacity 50Ah LSB Cell】 for industrial market

50Ah Cell

- New 50Ah LSB Cell is already completed in design.
- Started our sample supply to some automobile manufactures.

【Specifications】
- Capacity ; 50Ah
- Voltage ; 3.7V
- Dimensions ; 200×210×12mm
- Energy density ; 162Wh/kg

【Unique features】
- Law materials cost (due to large sized
- Assembly process and costs are almost same as smaller sized cell's
- Packaging costs to be similar to small cell's.

【Merit at volume production 】
- High yield rate
  Thanks to
  ① Thick film ceramic separator
  ② no-bent at seal portion