

Analysis of ESS Business - Flow Battery Tech. & Market

<https://marketpublishers.com/r/A512E64AE97EN.html>

Date: May 2013

Pages: 200

Price: US\$ 4,250.00 (Single User License)

ID: A512E64AE97EN

Abstracts

Flow Battery, the new solution for ESS market

An ESS (Energy Storage System) is a device that stores electric power energy that is delivered from the power plant, transmitted to the substation and distributed to the end consumer. Pumped storage power plant and UPS (Uninterruptible Power Supply) are typical energy storage systems which were widely used from the past. However the application market of ESS is much more diverse and can be classified into 19 areas. Among many ESS technologies, flow battery technology shows high potential and is expected to be applied in various application markets in the future.

This report contains broad range of topics related to flow battery, one of the most influential technology of ESS. The report looks into the history of flow battery and various redox couples and describes component parts of the battery.

In addition, the report includes patent trend analysis of flow battery by country, company and research institution. The trend of major flow battery research institution and companies of each country are covered in the report

The report mainly focuses on the market of the flow battery. About 85 flow batteries (small-scale batteries excluded) were installed in the world until 2012 which is above 343MWh in capacity. The installation market for flow battery is becoming more active in recent years. Flow batteries are mainly used for load leveling, renewable capacity firming, micro grid system, UPS and frequency regulation. The status of the global installation market of flow battery has been examined and analyzed by country, redox couple technology and by year and predictions on market share of flow battery were made with consideration to other ESS technologies. In 2012 the flow battery occupied

approximately 0.5% of the ESS market but is expected to increase to 25% by 2020.

Strength of the Report:

Covers all contents on flow battery history, technologies, component parts and trends of global research institutions and companies.

Provides trend of flow battery through patent analysis.

Provides information on global flow battery installation up to 2012.

Analyzes factors affecting the flow battery market and provides market prediction.

Contents

1. LARGE-SCALE ENERGY STORAGE TECHNOLOGY DEVELOPMENT STATUS

- 1.1 Concept of Large-Scale Energy Storage System
- 1.2 Technology Types and Characteristics of Large-Scale Energy System
 - 1.2.1. Pumped Storage
 - 1.2.2. Compressed Air
 - 1.2.3. Flywheel
 - 1.2.4. Lead Acid
 - 1.2.5. NaS Battery
 - 1.2.6. Lithium-Ion Battery
 - 1.2.7. Supercapacitor
 - 1.2.8. Redox Flow Battery
- 1.3. Large-Scale Energy Storage Technology Development Trend by Country
 - 1.3.1. Japan
 - 1.3.2. South Korea
 - 1.3.3. China
 - 1.3.4. US
 - 1.3.5. Europe

2. REDOX FLOW BATTERY TECHNOLOGY

- 2.1. Necessity for Redox Flow Battery Development
- 2.2. Understanding Redox Flow Battery
 - 2.2.1. Redox Flow Concept
 - 2.2.2. Redox Flow Battery Development History
- 2.3. Redox Flow Battery Technology
 - 2.3.1. Cell Structure
 - 2.3.1.1. Single Cell
 - 2.3.1.2. Battery Stack
 - 2.3.1.3. Battery System
 - 2.3.2. Electrode
 - 2.3.2.1. Carbon
 - 2.3.2.2. Metal
 - 2.3.3. Redox Couple
 - 2.3.3.1. Iron-Chromium (Fe-Cr)
 - 2.3.3.2. All Vanadium (V-V)
 - 2.3.3.3. Vanadium-Halide (V-Halide)

- 2.3.3.4. Bromine-Polysulfide (Br-polysulfide)
- 2.3.3.5. Soluble Lead-Acid (Pb-Acid)
- 2.3.3.6. Zinc-Nickel (Zn-Ni)
- 2.3.3.7. Zinc-Bromine (Zn-Br)
- 2.3.3.8. Zinc-Cerium (Zn-Ce)
- 2.3.3.9. Organic
- 2.3.3.10. Lithium
- 2.3.4. Bipolar Plate
 - 2.3.4.1. Metal
 - 2.3.4.2. Graphite
 - 2.3.4.3. Carbon Composite
- 2.3.5. Membrane
 - 2.3.5.1. Pore Filled Ion Exchange Membranes
 - 2.3.5.2. Perfluorinated Membranes
 - 2.3.5.3. Modified Perfluorinated Membranes
 - 2.3.5.4. Partially Fluorinated Membranes
 - 2.3.5.5. Non-fluorinated Membranes
- 2.3.6. Flow Distributor & Turbulence Promoter
- 2.3.7. Electrolyte Tank

3. REDOX FLOW BATTERY APPLICATION EXAMPLES

- 3.1. Load Leveling
- 3.2. Power Quality Control Applications
- 3.3. Coupling with Renewable Energy Sources
- 3.4. Electric Vehicles

4. REDOX FLOW BATTERY RECENT TECHNOLOGY ISSUES AND DEVELOPMENT TRENDS

- 4.1. Low Cost
- 4.2. High Power Large Size Stack
- 4.3. High Energy Density

5. REDOX FLOW BATTERY PATENT TREND

- 5.1. Redox Flow Battery Patent Analysis Range and Standard
- 5.2. Patent Trend by Country
 - 5.2.1. Patent Trend by Year and Patent Share by Country

- 5.2.2. Patent Share by Country
- 5.2.3. Technology Development
- 5.3. Patent Trend by Technology Type
 - 5.3.1. Number of Patents of each Broad Category by Year
 - 5.3.2. Patent Share of each Medium Category and Number of Patents by Year
 - 5.3.3. Patent Status of each Medium Category by Country and Section
- 5.4. Patent Applicant Trend
 - 5.4.1. Redox Flow Battery Top Applicants
 - 5.4.2. Redox Flow Battery Top Applicants of each Broad Category
 - 5.4.3. Redox Flow Battery Top Applicants by Country
 - 5.4.4. Major Applicant (Sumitomo Electric) Patent Trend

6. TECHNOLOGY DEVELOPMENT AND BUSINESS TRENDS OF MAJOR RESEARCH INSTITUTIONS AND COMPANY

- 6.1. United States
 - 6.1.1. Pacific Northwest National Laboratory (PNNL)
 - 6.1.2. Sandia National Laboratories (SNL)
 - 6.1.3. ZBB Energy
- 6.2. Japan
 - 6.2.1. Sumitomo Electric Industries, Ltd.
 - 6.2.2. Kansai Electric Power Co., Inc.
 - 6.2.3. Ryukyu Electric Power Co., Ltd.
- 6.3. Europe
 - 6.3.1. Fraunhofer ICT (Institute for chemical technology) (Germany)
 - 6.3.2. Plurion Systems (England)
 - 6.3.3. ITI Energy (England)
 - 6.3.4. Cellstrom GmbH (Austria)
 - 6.3.5. Riso DTU (Denmark)
- 6.4. Australia
 - 6.4.1. V-Fuel Pty Ltd
 - 6.4.2. RedFlow
- 6.5. China
 - 6.5.1. Prudent Energy
 - 6.5.2. GEFC
 - 6.5.3. Dalian Institute of Chemical Physics (DICP)
- 6.6. Korea
 - 6.6.1. Korea Institute of Energy Research
 - 6.6.2. Samsung Advanced Institute of Technology

6.6.3. Honam Petrochemical Corp., etc.

7. FLOW BATTERY MARKET FORECAST

7.1. Flow Battery Installation by Maker (~2012)

7.1.1. Prudent

7.1.2. Sumitomo Electric Industries

7.1.3. ZBB

7.2 Worldwide Flow Battery Installation

7.3 ESS Market Status (USA)

7.4 Flow Battery Installation Case Study

7.5 Flow Battery Market Factor Analysis

7.5.1. Flow Battery Technology Position

7.5.2. Flow Battery Cost

7.5.3. Flow Battery Demonstrations and Applications

7.5.4. Flow Battery SWOT Analysis

7.6 Flow Battery Market Forecast (~2020)

I would like to order

Product name: Analysis of ESS Business - Flow Battery Tech. & Market

Product link: <https://marketpublishers.com/r/A512E64AE97EN.html>

Price: US\$ 4,250.00 (Single User License / Electronic Delivery)

If you want to order Corporate License or Hard Copy, please, contact our Customer Service:

info@marketpublishers.com

Payment

To pay by Credit Card (Visa, MasterCard, American Express, PayPal), please, click button on product page <https://marketpublishers.com/r/A512E64AE97EN.html>

To pay by Wire Transfer, please, fill in your contact details in the form below:

First name:
Last name:
Email:
Company:
Address:
City:
Zip code:
Country:
Tel:
Fax:
Your message:

****All fields are required**

Customer signature _____

Please, note that by ordering from marketpublishers.com you are agreeing to our Terms & Conditions at <https://marketpublishers.com/docs/terms.html>

To place an order via fax simply print this form, fill in the information below and fax the completed form to +44 20 7900 3970