

# NRG Expert Energy Storage Report

## Edition 1, 2011

### Market Intelligence

Energy storage has started to garner interest as a means to integrate more intermittent renewable capacity into the grid. Storage has more uses such as meeting peak demand and delaying investment in generation capacity as a whole, which makes it attractive for utilities.

Although while most interest in storage has focussed on grid-scale applications, there is also a large market for smaller, scale distributed storage. This includes storage at the consumer-side which could meet demand when the upstream part of the grid is offline. To illustrate the point, in 2010 grid-scale storage projects only accounted for just under a third of all storage deals.

The most commercial energy storage technologies are pumped hydro and compressed air energy storage (CAES), even though only two CAES facilities are in operation. Other storage technologies include flywheels and batteries which are also more viable for smaller scale storage projects and are less restrictive in terms of the suitable locations for projects. This includes batteries in electric vehicles, which can potentially be used to store excess off peak electricity and discharge the electricity at peak times. As the costs of some of these alternative storage options have fallen, they are starting to attract more interest. However, high costs and a lack of subsidies are limiting the development of the sector.

Electric vehicles and charging devices are receiving more subsidies, especially in China where automotive manufacturers are producing cheaper models than their European and US counterparts. The market for electric vehicles is expected to be the largest in China based on government targets and growth of the battery industry. Strong forecast growth in demand for batteries for the telecommunications and other sectors provides a solid core business for Chinese battery manufacturers involved in the manufacturer of batteries for electric vehicles.

It is expected that e-bikes and micro-hybrids will dominate the market in the short-term and electric vehicles and plug-in hybrids in the longer-term. Firstly, as larger numbers of scooters and small vehicles are on the road in China and India – another potential market for electric vehicles. Secondly, micro-hybrids (vehicles with an internal combustion engine and battery capacity for regenerative braking and start-stop functions) are the lowest hanging fruit for achieving fuel efficiency and CO<sub>2</sub> emission standards for vehicles.

## Highlights

Batteries for electric vehicles and plug-in hybrids are too expensive and the infrastructure is not in place for large-scale charging of vehicles. The development of smart grids would make these vehicles more attractive.

The development of the storage sector is largely reliant on rising oil prices, in the case of electric vehicles, and gas prices, in the case of grid storage and distributed capacity. Both of which are likely in the mid-term.

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# Table of Contents

Energy Storage .....	1
1. The Grid.....	14
Power Demand .....	14
Base load.....	15
Peak load.....	15
Intermediate load.....	15
Renewables .....	16
Renewable Portfolio Standards.....	17
Renewable Issues and the grid .....	19
Intermittency and variability.....	19
Capacity factor.....	19
Loss of Load Probability (LOLP) .....	20
Capacity credit.....	20
Spinning reserve.....	21
2. Renewables.....	22
Integration costs.....	24
Balancing supply and demand.....	25
Import/export electricity .....	28
Demand response .....	28
Back up.....	29
Storage .....	29
3. Rationale for storage .....	30
Value Chain .....	34
4. Current state of storage.....	43
Investment .....	45
Development.....	47
Economics .....	49
5. Storage Technologies .....	56
Mechanical Storage .....	56
Pumped storage .....	56
Compressed Air Energy Storage (CAES) .....	64
Flywheel .....	73
Electrochemical storage .....	75
Batteries.....	76
Lead-acid batteries .....	80
Advanced lead-acid batteries .....	81
Lithium ion (Li-ion) batteries .....	81
Nickel cadmium (NiCd) batteries.....	85
Nickel-metal hydride (NMH) batteries .....	86
Sodium sulphur (NaS) batteries .....	86

Sodium Nickel Chloride (NaNiCl) batteries .....	87
Flow batteries .....	88
Capacitor.....	90
Electric double-layer capacitor system.....	90
Electromagnetic storage .....	93
Superconducting Magnetic Energy Storage (SMES) .....	93
Fuel cells .....	95
Hydrogen Fuel Cell.....	96
Electric vehicles .....	102
Start-stop market.....	146
Thermal storage.....	164
Concentrating Solar Power .....	165
Parabolic Trough .....	165
Parabolic Dish Systems .....	166
Central Receiver Systems - Solar Tower .....	167
Solar Chimney Power Plants.....	167
Types of storage.....	169
Sensible heat storage.....	169
Concrete .....	169
Molten salt .....	170
Latent heat storage/phase change materials .....	171
Inorganic PCMs .....	172
Organic PCMs .....	173
Development of TES for CSP.....	174
Indirect system .....	174
Single-tank Thermocline.....	174
Direct molten-salt heat transfer fluid.....	175
Hot/Cold storage.....	175
6. Countries .....	177
North America.....	177
Canada .....	177
Mexico .....	180
USA .....	180
South America .....	198
Chile .....	198
El Salvador .....	198
Europe .....	198
Bosnia.....	199
Czech Republic .....	199
Denmark .....	200
France .....	200
Germany.....	200

Lithuania .....	200
Luxembourg.....	200
Netherlands .....	200
Norway .....	201
Romania .....	201
Slovakia .....	201
Slovenia.....	201
Sweden.....	201
Switzerland.....	201
United Kingdom .....	201
CIS .....	202
Georgia.....	202
Russia.....	202
Ukraine .....	202
Asia Pacific .....	202
Australia.....	202
China .....	202
India.....	205
Japan.....	205
South Korea.....	206
Vietnam .....	207
Africa.....	207
South Africa .....	207
7. Companies .....	208
Batteries, fuel cells, hydrogen storage and ultracapacitors .....	208
A123 Systems .....	208
Advanced Battery Technologies (China).....	210
Technology: Rechargeable polymer lithium-ion (PLI) batteries .....	210
AES Energy Storage .....	210
Technology: Lithium-ion batteries .....	210
Altair Nano.....	212
Technology: Advanced lithium-ion (nano-structured lithium titanate) batteries .....	212
American Superconductor.....	212
Aquion .....	213
Axion Power International .....	214
Boston Power .....	214
BYD – Build Your Dreams (China) .....	215
C&D Technologies.....	219
China BAK Battery (China).....	219
China Ritar Power (China) .....	220
DuPont.....	220
ENAX (Japan).....	220

Ener1 .....	220
EnerSys .....	222
Enervault .....	222
Evonik .....	222
Exide Technologies .....	223
GE.....	224
GS Yuasa (Japan) .....	225
Hitachi (Japan) .....	226
High Power International (China) .....	226
Johnson Controls.....	226
LG Chem (Korea) .....	227
Maxwell Technologies .....	227
McPhy Energy .....	231
Nanosys.....	231
NEC Corporation (Japan) .....	231
New Energy Systems (China) .....	231
NGK Insulators (Japan) .....	232
Panasonic (Japan).....	234
Samsung .....	234
Sanyo .....	234
Seeo .....	235
Sumitomo .....	235
Sony (Japan) .....	235
Prudent Energy VRB Power Systems .....	235
Tesla.....	236
Toyota (Japan) .....	236
Ultralife Corporation.....	237
Valence Technologies .....	238
VBB Energy .....	238
XP Extreme Power (XP) .....	239
Taken from XP Extreme Power's website .....	240
Yinghe Technology.....	241
Compressed Air Energy Storage (CAES).....	241
Dresser-Rand .....	241
Energy Storage and Power .....	241
E.ON.....	245
General Compression .....	245
SustainX .....	246
Flywheel.....	246
Active Power.....	246
Beacon Power .....	247
Boeing .....	248

Power Thru .....	249
Multiple Technologies .....	249
ABB .....	249
8. Barriers .....	251
9. Sources .....	252

## Tables

Table 1-1: Three main types of electricity demand.....	16
Table 1-2: Typical capacity factors for different generating technologies.....	19
Table 2-1: Variability factors for intermittent renewable energy sources.....	22
Table 2-2: Summary of US wind integration cost studies.....	24
Table 3-1: Dedicated renewable applications of energy storage and their whole-grid counterpart.....	32
Table 3-2: Comparison of specifications of typical energy storage systems.....	32
Table 3-3: EPRI definitions of ten energy storage applications.....	34
Table 3-4: General Energy Storage Application Requirements.....	36
Table 3-5: Representative benefit PVs (present values) of selected energy storage benefits.....	37
Table 3-6: Traditional Major Grid Applications of Energy Storage.....	40
Table 4-1: Energy storage technologies by development status.....	48
Table 4-2: R&D Timelines for Emerging Energy Storage Options.....	48
Table 4-3: Latest prices for energy storage in Great Britain and Germany.....	50
Table 4-4: Energy storage technologies.....	50
Table 4-5: Energy storage characteristics by application.....	51
Table 4-6: Projected incremental energy delivery cost at 7% discount rate in USD 90 million facilities (ignoring energy cost) for 2015 technology.....	54
Table 4-7: Comparison of bulk storage systems.....	54
Table 5-1: Typical values for various pumped-storage plants.....	58
Table 5-2: Status of selected pumped storage projects at the end of 2010.....	61
Table 5-3: CAES plants in operation or planned.....	66
Table 5-4: Comparison of CAES systems.....	67
Table 5-5: Comparison of batteries.....	78
Table 5-6: Comparison of different battery energy storage systems.....	78
Table 5-7: Selected battery energy storage plants in use.....	79
Table 5-8: Lithium-ion battery characteristics by chemistry.....	84
Table 5-9: Comparison of the applications of SMES systems.....	94
Table 5-10: Fuel cell types.....	96
Table 5-11: Comparison of net storage capacities of large scale storage technologies.....	101
Table 5-12: International support for fuel cells.....	102
Table 5-13: Regulations on fuel economy and CO <sub>2</sub> emissions in the US and EU.....	102
Table 5-14: Key differences between PHEVs and BEVs.....	104
Table 5-15: Specifications of several plug-in vehicles sold or expected to be sold in 2011.....	106
Table 5-16: Plug-in Vehicle Tracker.....	112
Table 5-17: Manufacturers of BEV/PHEVs and partnering battery manufacturers.....	141
Table 5-18: Incentives for electric and plug-in hybrid electric vehicles and low emission vehicles....	151
Table 5-19: US state incentives for electric vehicle.....	155
Table 5-20: Summary Table: Key Data and Figures for Hybrid, Plug-in Hybrid and Battery Electric Vehicles.....	161
Table 5-21: Comparison of the main CSP technologies.....	168



Table 5-22: Sensible storage materials, solid and liquid, temperature, average heat capacity and media cost .....	170
Table 5-23: Selected low temperature inorganic salt hydrate PCMs, with melting points and average heat capacity .....	172
Table 5-24: Selected low temperature inorganic salt hydrate PCMs , with melting points .....	173
Table 5-25: Selected low temperature organic PCMs , with melting points .....	173
Table 6-1: New pumped storage plants or plants being refurbished in the US, 2008 to 2010 .....	180
Table 6-2: Estimated US supply of electric vehicles from 2011 to 2015 .....	190
Table 6-3: USABC Goals for Advanced Batteries for BEVs .....	195
Table 6-4: New pumped storage plants or plants being refurbished in China, 2008 to 2010.....	203
Table 7-1: Litarion Electrodes .....	223
Table 7-2: Lithium Energy Japan's manufacturing plants .....	225
Table 7-3: Current XP Extreme Power projects .....	240

## Figures

Figure 1-1: Base, Intermediate and Peak Load by time of day.....	16
Figure 1-2: Influence of wind power on power control margin at night .....	17
Figure 1-3: RPS policies and goals in the US states .....	18
Figure 1-4: Capacity factors by month for wind power for Denmark, Sweden, Germany and the Netherlands .....	20
Figure 2-1: Output of large PV plant over one day, with rapid variability due to clouds .....	23
Figure 2-2: Output from wind turbines during the day with storage capacity .....	23
Figure 2-3: Smoothing effect of wind power in Germany .....	26
Figure 2-4: Flexibility supply curve.....	27
Figure 2-5: Balancing demand and supply through the interconnected grid .....	28
Figure 2-6: Obstacles to energy storage and demand response.....	29
Figure 3-1: Example of electricity pricings during a 24 hour period in the US and electricity use .....	30
Figure 3-2: Operational Benefits Monetizing the Value of Energy Storage .....	35
Figure 4-1: Worldwide current installed capacity, MW .....	43
Figure 4-2: Storage technologies by capacity.....	43
Figure 4-3: Positioning of Energy Storage Technologies .....	44
Figure 4-4: Worldwide installed storage capacity for electrical energy at the end of 2010, MW .....	45
Figure 4-5: Grid-scale and all storage deals, 2006 to 2010.....	45
Figure 4-6: Energy Storage IPOs, 2006 to 2010.....	46
Figure 4-7: Venture investment in clean tech sector by quarter, Q4 2009 to Q1 2011 .....	47
Figure 5-1: Energy storage applications and technologies.....	56
Figure 5-2: Principle of pumped hydro storage systems .....	57
Figure 5-3: Diagram of a pumped storage configuration .....	57
Figure 5-4: Growth of adjustable speed pumped hydro.....	59
Figure 5-5: Underground pumped hydro.....	60
Figure 5-6: Cost breakdown of pumped hydro.....	61
Figure 5-7: Schematic of CAES plant with underground compressed air storage .....	65
Figure 5-8: Principle of the CAES system.....	65
Figure 5-9: CAES system in Huntorf, Germany .....	67
Figure 5-10: Salt structures and existing gas storage site in Europe .....	69
Figure 5-11: Overview of geological formations in continental US, showing potential CAES siting opportunities based on EPRI geologic studies .....	70
Figure 5-12: Energy Bag .....	71
Figure 5-13: Principle and structure of flywheel.....	74
Figure 5-14: Operational results of wind power with flywheel.....	74
Figure 5-15: Comparison of specifications of existing flywheel systems.....	75
Figure 5-16: Power density as a function of energy density for energy storage options .....	76
Figure 5-17: Idealised load and battery systems .....	77
Figure 5-18: Reaction Mechanism of Lead-based Cells.....	81
Figure 5-19: Specific energy and specific power of different battery types .....	82

Figure 5-20: Reaction Mechanism of Li-ion Cells .....	83
Figure 5-21: Future of the electric car and lithium ion battery markets .....	85
Figure 5-22: Nickel-Based Cells .....	86
Figure 5-23: Reaction Mechanism of Sodium-based Cells.....	88
Figure 5-24: ZBB Energy’s Zn/Br flow system .....	90
Figure 5-25: Principle of electric double-layer capacitor .....	91
Figure 5-26: Structures of capacitors .....	91
Figure 5-27: Principle of SMES.....	93
Figure 5-28: Structure of SMES system .....	94
Figure 5-29: Cost estimation of SMES as a function of stored energy.....	95
Figure 5-30: Fuel cell .....	96
Figure 5-31: Comparison of the Honda FXC Clarity with the BYD-E6 and Mitsubishi i-MiEV electric vehicles .....	98
Figure 5-32: Platinum prices, 1992 to 2011 .....	99
Figure 5-33: Location of hydrogen production facilities in Europe.....	101
Figure 5-34: Comparison of different electric power train configurations .....	103
Figure 5-35: Cost of EVs and PHEVs over Conventional Vehicles .....	105
Figure 5-36: Passenger LDV sales by technology type and scenario, million sales per year .....	107
Figure 5-37: Annual global BEV and PHEV sales in BLUE Map scenario, passenger LDV sales millions, 2010 to 2050 .....	107
Figure 5-38: Lithium-ion battery price forecast, USD per kWh .....	108
Figure 5-39: Development of alternative transportation options .....	110
Figure 5-40: Rollout of electric vehicle models .....	111
Figure 5-41: Electric vehicles and their expected launch date onto the US market .....	111
Figure 5-42: Government target and BEV/PHEV production/sales reported by Original Equipment Manufacturer .....	142
Figure 5-43: BEV/PHEV number of models offered and sales per model through 2020 .....	143
Figure 5-44: Illustrative cost/benefit to implement hybridisation technologies.....	145
Figure 5-45: Additional capital cost of hybrid electric vehicles compared to conventional gasoline and diesel vehicles, EUR .....	145
Figure 5-46: Global market estimates for sales of start-stop or micro-hybrid units, thousand units, 2010 to 2015 .....	147
Figure 5-47: XL Hybrid technology .....	147
Figure 5-48: Battery cost decline versus production.....	148
Figure 5-49: Projected cost of electric vehicle batteries in the US, USD, 2010 to 2030 .....	149
Figure 5-50: Global transportation trend, million barrels per day of oil equivalent (mbdoe), 1980 to 2030 .....	150
Figure 5-51: Aggregated national targets for BEV/PHEVs .....	151
Figure 5-52: Upfront Price Support for Low-Carbon Vehicles .....	159
Figure 5-53: Light-duty vehicle fuel economy .....	160
Figure 5-54: Public RD&D (Research, Development and Deployment) spending on BEV/PHEVs and vehicle efficiency in selected countries, 2010, USD million .....	160

Figure 5-55: Public spending on electric vehicle RD&D category for selected countries, USD million, 2008 to 2011 ..... 161

Figure 5-56: Parabolic trough ..... 166

Figure 5-57: Parabolic dish reflector ..... 166

Figure 5-58: Central receiver system ..... 167

Figure 5-59: CESA-1 Central tower test facility at Plataforma de Almeira, Spain ..... 168

Figure 5-60: Schematic for CSP plant with molten salt storage ..... 170

Figure 6-1: Active FERC Permits for Pumped Hydro Filings in the United States ..... 181

Figure 6-2: Energy Storage Demonstration Projects in the US ..... 183

Figure 6-3: Percentage of US stimulus grants for storage technologies under the Smart Grid Demonstration Programme ..... 184

Figure 6-4: Smart Grid Energy Storage Demonstrations in the US ..... 184

Figure 6-5: Locations of current and planned US Li-ion system grid demonstrations ..... 190

Figure 6-6: North American transportation battery market, millions units, financial years 2002 to 2014 ..... 192

Figure 6-7: Model year 2025 light-duty vehicle market share by technology type in three cases (percentage of total sales) in the US ..... 193

Figure 6-8: Impact of 20% investment tax credit on CAES ..... 197

Figure 6-9: Ideal road of increasing energy storage in the Western European Union towards 2050. 199

Figure 6-10: Electric vehicle chargers that will be deployed in Victoria, Australia ..... 202

Figure 6-11: Cities in China have announced BEV Pilot programmes ..... 204

Figure 7-1: American Superconductor's D-SMESTM ..... 213

Figure 7-2: Sodium ion batteries ..... 213

Figure 7-3: Average selling price per flywheel, USD thousand, 2005 to 2010 ..... 247

Figure 7-4: Beacon Power's fourth generation Smart Energy 25 flywheel ..... 248



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