

# Rechargeable (Secondary) Batteries

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US Industry Study with Forecasts for 2020 & 2025

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## Rechargeable lithium batteries continue to post strongest growth

Due to cost advantages, lighter-weight, and ongoing improvements, lithium-ion (Li-Ion) batteries are increasingly finding use in high-drain applications such as consumer electronics and cordless electric power tools. Li-Ion batteries also stand to take off in hybrid and electric vehicle (H/EV) applications. Manufacturers are increasingly turning away from lower-value nickel metal in favor of Li-Ion, which offers greater power density. Li-Ion batteries are forecast to decrease in price in the near future, which will support demand. Li-Ion is also the most popular battery chemistry in energy storage systems (ESSs) and will continue to dominate battery chemistries utilized in this application going forward. Electronic cigarettes (e-cigarettes) are another niche market with the potential to offer significant future growth.

## Electric vehicle production to drive demand

Rechargeable battery demand will more than double in the H/EV market between 2015 and 2020, boosted by robust increases in electric vehicle production, growth in output and stocks of micro and mild hybrids equipped with start-stop systems, and a trend away from the usage of lower-value Ni-MH batteries toward more powerful, higher-cost, and lighter-weight Li-Ion batteries in full hybrids. Although the pace of increase will be much

slower than that for lithium-ion batteries, automotive lead-acid battery demand will climb as well, supported by the replacement product requirements of the large existing number of motor vehicles in use. Value gains will also be bolstered by the growing use of better-performing, expensive products like absorbent glass mat lead-acid batteries in micro and mild hybrids.

## US trade deficit to decline

Shipments of rechargeable batteries from US facilities are projected to outpace demand through 2020. This will be due to both robust gains in domestic lithium battery production, as exemplified by an anticipated ramping up of output at Tesla's Gigafactory in Nevada, and continued growth in shipments of lead-acid batteries. Although the US will remain a net importer of rechargeable batteries, its trade deficit will decline through 2020, and by 2025 the country is expected to post a modest trade surplus.

## Study coverage

This study analyzes the US rechargeable battery market. It presents historical demand data (2005, 2010, 2015) plus forecasts (2020, 2025) by product (lead-acid, rechargeable lithium, nickel-metal hydride, nickel-cadmium, other) and market (motor vehicle, portable device, motive power, backup power, other). The study also assesses key market environment factors, analyzes the industry structure and evaluates company market share.

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Smart & Other Mobile Phones

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Other Portable Devices

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#### Lithium-Ion

Lithium-ion batteries account for the vast majority of rechargeable lithium battery demand, comprising 85 percent of the market total in 2015. This share of consumption is expected to expand on the strength of the automotive market, which is projected to reach \$1.5 billion in sales, up from \$1.2 billion in 2015. The automotive market is shifting toward advanced technologies such as smartphones and tablets, which are replacing traditional desktop computers. This shift is expected to drive a considerable increase in demand for rechargeable batteries, which is expected to reach \$1.5 billion in 2020.

On the one hand, manufacturers of H/EV vehicles are increasingly replacing Ni-MH technology with lithium-ion based systems. For example, Honda replaced its Ni-MH systems with lithium-ion technology for 2012 and 2013 year CIVIC HYBRIDS; likewise, Toyota began offering lithium-ion batteries in most 2015 hybrid PRIUS models. While Ni-MH types offer lower production costs, lithium-ion batteries offer significant weight savings. Other companies offering lithium-ion based hybrids include Hyundai (SONATA HYBRID) and Chevrolet (MALIBU), the latter of which also used to feature Ni-MH batteries. Strong anticipated increases in domestic production of H/EV vehicles will also buoy demand, with shipment output climbing at a double-digit rate through 2020. Advances in battery technology, which increase the range of H/EV vehicles, will promote sales of these vehicles. Similarly, increasingly stringent EPA fuel economy standards will help fuel interest in lithium-ion batteries, which offer high energy density and a lighter weight than Ni-MH batteries. Gains will be restrained somewhat by the high cost of lithium-ion batteries.

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## This study can help you:

- Determine your market & sales potential
- Learn more about industry competitors
- Assess new products & technologies
- Identify firms to merge with or acquire
- Complement your research & planning
- Gather data for presentations
- Confirm your own internal data
- Make better business decisions

TABLE V-1

### RECHARGEABLE BATTERY SUPPLY & DEMAND (million dollars)

Item	2005	2010	2015	2020	2025
Durable Goods Shipments (bil \$) \$ batteries/000\$ durables					
Rechargeable Battery Demand					
Lead-Acid					
Rechargeable Lithium					
Nickel-Metal Hydride					
Nickel-Cadmium					
Other					
+ exports					
- imports					
Rechargeable Battery Shipments					
price deflator (2009 = 100)					
Rechargeable Battery Shpts (mil 2009\$)					

Source: The Freedonia Group

TABLE VI-2

### MOTOR VEHICLE RECHARGEABLE BATTERY DEMAND (million dollars)

Item	2005	2010	2015	2020	2025
Motor Vehicles & Parts Shipments (bil \$) \$ batteries/000\$ shipments					
Motor Vehicle Battery Demand					
By Application:					
Conventional OEM					
Conventional Replacement					
Hybrid/Electric Vehicle					
By Chemistry:					
Lead-Acid					
Rechargeable Lithium					
Nickel-Metal Hydride					
% motor vehicles Rechargeable Battery Demand					

Source: The Freedonia Group

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## Related Studies

### World Battery Materials

Global demand for battery materials will rise 8.3 percent annually to \$46.8 billion in 2019. Chemicals will be the fastest growing materials, led by lithium and nickel used in Li-Ion and Ni-MH batteries. China will remain the fastest growing market. This study analyzes the \$31.4 billion world market for battery materials, with forecasts for 2019 and 2024 by product and application for six world regions and 16 major countries. Total demand is given for an additional six countries. The study also evaluates company market share and profiles industry participants.

#3350..... December 2015 ..... \$6200

### World Lithium

Global demand for lithium metal is projected to rise 8.9 percent per year through 2019 to 49,350 metric tons. Gains will be driven by torrid advances in lithium-ion (Li-Ion) batteries as world demand for hybrid and electric vehicles, energy storage systems, and high-drain portable electronics continues to grow. This study analyzes the 32,200 metric ton world lithium industry, with forecasts for 2019 and 2024 by product and market for six world regions and 19 major countries. The study also evaluates company market share and profiles industry players.

#3331..... September 2015 ..... \$6300

### World Batteries

Global battery demand is forecast to rise 7.8 percent per year to \$120 billion in 2019. China will remain the largest national market as well as one of the fastest growing. Secondary batteries will outpace primary types. Rechargeable lithium-ion batteries will be the fastest growing products. This study analyzes the \$83 billion world battery industry, with forecasts for 2019 and 2024 by type and market for six world regions and 16 countries. The study also reviews battery technology, evaluates company market share and profiles industry participants.

#3309..... July 2015 ..... \$6700

### Insulated Wire & Cable

US insulated wire and cable demand will rise 6.0 percent annually to \$27 billion in 2019. Building wire and cable will remain the largest product segment and will be by far the fastest growing, followed by magnet and power wire and cable. Construction will be the fastest growing market, surpassing electrical equipment to become the largest segment. This study analyzes the \$20.3 billion US insulated wire and cable industry, with forecasts for 2019 and 2024 by material, product, and market. The study also evaluates company market share and profiles industry players.

#3260..... May 2015 ..... \$5300

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## Freedonia's methods

- Establishing consistent economic & market forecasts
- Using input/output ratios, flow charts & other economic methods to quantify data
- Employing in-house analysts who meet stringent quality standards
- Interviewing key industry participants, experts & end users
- Researching a proprietary database that includes trade publications, government reports & corporate literature

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