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TESLA

Tesla powerwall: battery for homes that challenges the power of large utilities.

Tesla Energy wants to revolutionize the market with their domestic batteries

The presentation to the public of the batteries for home and small businesses Tesla was a great media success. But, so are the batteries themselves? The whole project depends on the ability to accumulate photovoltaic energy to a higher level. And to meet that goal, Tesla needs to make a huge amount of batteries.

These energy storage batteries are part of Tesla's plan to expand its business into areas besides electric cars, as it has ambitions to change the way we consume and store energy in our houses. It's too early to say its efforts are a success but the early signs do seem to be encouraging.

After the spectacular launch of the new battery Powerwall, there have been some criticisms of the project. First, some experts have criticized the battery itself, stating that there is no remarkable innovation. And there who has said that this battery power is insufficient. But what is not disputed by anyone is the ability to Elon Musk to revolutionize the market and excite millions of potential customers. Mass marketing has come to the energy sector. And that is the truly revolutionary factor of this concept. And what can be more damaging to the large energy producers.

With Powerwall Tesla Motors continues to advance its vision of a new world starring

renewable energy. The company inspired by the visionary inventor Nicola Tesla is advancing to become a leader in the renewable sector. They did it with its luxury electric vehicle now hope to do so with the launch of a new battery that reaches 10 kilowatt hours, works with renewable energy, and will cost about \$ 3,500.

The new battery is not a great revolution from the point of view of innovation, as it is a version of the well-known lithium ion batteries, but from the business side, as is the largest attempt to popularize this system the residential market. In presenting the new product, the company chairman Elon Musk said that "we want to change the way the world uses energy".

The new battery goes to market under the trade name Powerwall, and will be produced by Tesla Energy. It is offered in two models, one designed for home and another for businesses. The basic battery will cost \$ 3,500 (3,125 euros). It is designed to be

powered by solar panels. It has a dimension of 130 centimeters high, 86 wide and 18 deep. That is, it can be installed in a garage without creating additional space. A model is 7 kWh for a price of \$ 3,000 and the other 10 kWh for \$ 3,500. The presentation explained that can be used to charge the Model S while sleeping. Through the website of the company, customers can now make the reservation product. They are assured that deliveries will begin this summer.

"The most obvious problem with solar energy is that the sun does not shine at night", said Elon Musk at the event, "so a system that allows storing that energy is needed". "But current batteries you are a mess, are really awful, and expensive", he said. The owner of Tesla estimated to transform the current energy infrastructure will be required 2,000 million Powerwalls as those designed for business. Musk says that this transition is not impossible, "have done similar things in the past".



Aerial image of Tesla Gigafactory. Gigafactory construction progress 03.03.2015, as seen from the air. The finished building is 40%.

But the truth is that this battery is far from a complete solution. The autonomy of these batteries is still very limited, about two hours with the home fully operational.

Closely Powerall

As the company presents, "Powerwall is a home battery that charges using electricity generated from solar panels, or when utility rates are low, and powers your home in the evening. It also fortifies your home against power outages by providing a backup electricity supply. Automated, compact and simple to install, Powerwall offers independence from the utility grid and the security of an emergency back-up".

The philosophy behind this project is based appears consistent and is one of the aspects that will probably end up being a big deal. "The average home uses more electricity in the morning and evening than during the day when solar energy is plentiful. Without a home battery, excess solar energy is often sold to the power company and purchased back in the evening. This mismatch adds demand on power plants and increases carbon emissions. Powerwall bridges this gap between renewable energy supply and demand by making your home's solar energy available to you when you need it".

Power companies often charge a higher price for electricity during peak evening hours than overnight when demand is low. "Powerwall can store electricity when rates are low and power your home when rates are high". Moreover, the company has achieved a system of simple, effective management and an attractive design to solve the problems of power outage. Powerwall automatically switches to battery

power in the event of an electric company outage, bringing peace of mind to those who live in areas prone to storms or unreliable utility grids.

Powerwall comes in 10 kWh weekly cycle and 7 kWh daily cycle models. Both are guaranteed for ten years and are sufficient to power most homes during peak evening hours. Multiple batteries may be installed together for homes with greater energy need, up to 90 kWh total for the 10 kWh battery and 63 kWh total for the 7 kWh battery.

Factories

The industry has the look on the new Tesla factory being built in the Nevada desert. A huge plant to manufacture lithium batteries inones which was originally designed to meet the demand of its electric vehicles. It will become operational in 2017 and 2020 to plain stress performance. The mega factory covers an area of around half a million square meters. With the demand for a new product as Powerall, this factory will probably not be enough and the company should build a plant more. And do it with the time required for the application does not see unserved.

It is believed that Tesla is ready to start mass production of batteries on a scale that is unprecedented. And that is already a revolution in the market of renewable energy and a great step forward to compete with conventional energy producers. But it is still not clear that the mass production of these batteries will lead to a reduction in costs. Another defect that is attributed to Powerwall is that it is more expensive than some of its competitors.

In any case, the market seems enamored with the proposals of Elon and each time

it launches one of his futuristic plans, company valuation is triggered. Powerall launch was accompanied by an increase of 20% in a month. The public has also received with enthusiasm this battery. In just one week after its release, it received 38,000 orders for eager buyers to participate in the "experience" of domestic powerwall.

The Powerpack, the industrial version has also started strongly, with 2,500 units launched. "A typical installation consists of ten units, so we have around 25,000 Powerpacks up," said Musk.

According to calculations by Bloomberg, Musk has a potential bill of \$ 712 million receivable only with confirmed orders. "These results are like a crazy release for me, but the level of demand is now amazing," considers the South African entrepreneur who is faced with a potential



Elon Musk, Tesla founder at the launch of the new battery.

problem; if it grows up with orders can not cope without an extension of the factory.

Another strategic partner is Fronius. Tesla and Fronius have partnered on a global level to offer Powerwall in combination with the Fronius Symo Hybrid inverter as a seamless solution for residential PV systems. For new PV installations, homeowners can use the Fronius inverter to operate both

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the PV and Powerwall, which reduces the overall system cost. For homeowners that already have solar PV, the Fronius inverter can be added to the system (AC coupled) or replace the existing inverter (DC coupled), and the Fronius solution will function with any type of solar energy system. This makes the Fronius plus Tesla solution a highly flexible solution across the globe.

Raising the Game

Tesla Motors has also encountered a problem with one of its key partners. SolarCity, the leading provider of solar US, and Tesla partner in this journey has decided not to install, for the moment, the Powerwall smaller capacity, the 7 kWh. This battery is designed for self-consumption of households.

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The provider of solar panels said that “no economic sense”. The causes are the incentives that the United States provides to holders of panels to sell their excess power to utilities. To households they find it more profitable to sell the excess energy that accumulate in a battery for own consumption.

SolarCity installing only 10 kWh model “for backup power.” Musk confirmed

this version: “At the moment, if someone wants to disconnect from the network with the battery, can finish coming out more expensive. This does not mean you should not buy the battery, because people want to disconnect from the network by principles or who simply want to be independent”.

For now, the profitability of these batteries depend on the energy policy and energy prices in each country. Independent analysts

have said that the system is already profitable for countries like Germany. According to consulting Catalytic “Tesla’s Powerwall \$350/kWh (DC) price is a huge step forward, which our calculations show already make sense for some homeowners in places like Germany, as long as installation costs are reasonably low, they own fairly large PV arrays, and are in the relatively sunny parts of the country”.

India can also be a good market for these batteries. According to analyst Ramez Naam, “ the power grid struggles to provide enough electricity to meet the daytime and early evening peak. India is now rolling out Time-of-Day pricing to residential customers and reports indicate that retail peak power prices are edging towards 20 cents / kwh in some cities. (Most commercial customers in India are already on Time-of-Day pricing.) For now, the solar + battery economics aren’t quite there for Indians that have access to the grid, though with outages there so frequent, high-income urbanites and commercial power users may find that the reliability value puts it over the top”.

Elon Musk may be a visionary like Steve Jobs, who reinvent the technology, or just an eccentric toymaker for the rich, as analyst Christopher Helman says in his devastating Forbes magazine article “Why Tesla’s Powerwall is just another toy for rich green people”. The short-term vision seems against him. But if it is really a visionary success will be medium to long term ◀◀

Specs

Technology
Wall mounted, rechargeable lithium ion battery with liquid thermal control.

Models
10 kWh \$3,500 For backup applications
7 kWh \$3,000 For daily cycle applications

Warranty
10 years

Efficiency
92% round-trip DC efficiency

Power
2.0 kW continuous, 3.3 kW peak

Voltage
350 – 450 volts

Current
5.8 amp nominal, 8.6 amp peak output

Compatibility
Single phase and three phase utility grid compatible.

Operating Temperature
-4°F to 110°F / -20°C to 43°C

Enclosure
Rated for indoor and outdoor installation.

Installation
Requires installation by a trained electrician.
DC-AC inverter not included.

Weight
220 lbs / 100 kg

Dimensions
51.2" x 33.9" x 7.1"
1300 mm x 860 mm x 180 mm

Certification
NRTL listed to UL standards



Electric vehicle and a battery installed in a home garage.