

BETTER TRANSFORMERS SAVE BILLIONS IN WASTED ELECTRICITY

SEPTEMBER 3, 2014

[FORBES INDIA](#)

Better Transformers Save Billions In Wasted Electricity

[+ Comment Now](#) [+ Follow Comments](#)

The excerpt below comes from Forbes/Wolfe Emerging Technology Report's recent full-length interview with Fumihide "Humi" Esaka, CEO of the power conversion innovator [Transphorm](#) (Full disclosure: My venture firm Lux Capital is an equity investor in Transphorm). Humi highlights the staggering amount of energy that the United States loses each year due to inefficient power conversion, and how the Transphorm team is working to make this a thing of the past.

Give us some quick background about Transphorm.

If you're using a laptop, feel the temperature of the conversion "brick" that you're using. Undoubtedly, you will notice that it's warm. This heat is wasted electricity due to inefficient power conversion. Transphorm was founded in 2007 to address the urgent need for increasing the efficiency of converting

CREDIT S

How we helped
Tony Fernandes get
AirAsia off the gro

power from one form to another. Power conversion is ubiquitous.

transphorm

What we realized from the beginning is that this problem is massive. More than 10% of all the electricity that is generated in the world is lost in power conversion. This amount of electricity is equal to the amount generated by hydroelectricity, power generation, solar, wind and all other renewables combined! That's how much power we lose in the power conversion process. More than 300 terawatt hours of electricity is wasted in America alone. This is enough to power the Western United States! Transphorm addresses this problem by offering the only gallium nitride-based power conversion solution, enabling converters to be 40% smaller and offering best-in-class efficiency.

How much money is wasted in the United States alone?

Forty billion dollars of electricity is wasted annually each year in the United States. This heat represents the waste in the electrical conversion process. Yes, this figure is just in the United States, but our technology will have an enormous impact worldwide. If you

INDIA
is leading the
way in **SOLAR**

will have an enormous impact worldwide. If you imagine the rapid rise of economies like India and China: these economies are consuming more energy at an increasing rate. If you're not efficient in these countries, the only way they can satisfy their needs is to generate more. The only way you can quickly generate more power is by using polluting technologies like coal. So, if people can actually put in an energy efficient solution, not only will it help the first world like the U.S., Europe and Japan, but it will significantly impact the developing economies of China and India.



Why is power conversion necessary?

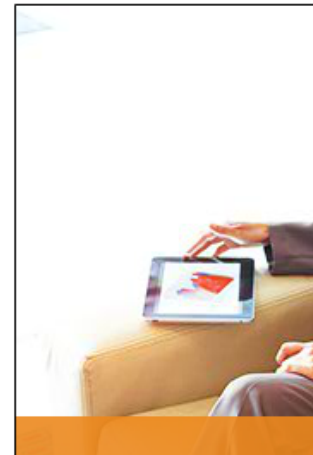
The electrical form that the power is delivered in is different from the form that it is going to be used. Crude oil is used to make gasoline or jet fuel and needs to be converted in order to be efficiently used by the end product. Electricity works the same way. Power conversion is like paying a tax. Each time you “do the transaction” you pay a tax. You pay for electricity supplied, not for electricity used, so people are effectively paying a 10% tax every time they convert electricity using current methods.

How does your solution differ from competitors in the industry?

Currently the standard is to use silicon for power conversion. Our solution uses gallium nitride, which many didn't think was even possible until we came along. Our solution allows for customers' inverters to be both smaller and more efficient. Not only is our device smaller, but also it allows for the entire inverter system to be 40% more lightweight and compact, along with higher efficiency. By using GaN, we can reduce the cost of the system compared to the cost of current silicon-based systems.

Is your solution commercially ready?

Yes. Transphorm is the only company that has a qualified, reliable gallium nitride based power conversion product in the market. It's very easy to just have a demonstration of something, but to take something from demonstration to actually making it scalable and economically viable is where the rubber meets the road and Transphorm has done that. We are the catalyst that has caused the gallium nitride industry to emerge today rather than 10 years from now.



Do you have proprietary knowledge or technology that has enabled you to move forward with this where others can't?

Certainly. One of the cornerstones of our success is our team's long history in the field, which has now led to more than 1,100 patents and patent applications that we have access to as part of our portfolio, and numerous more trade secrets that have allowed us to do what others have simply not been able to do. In every part of the value chain, from making our materials to delivering the final product, we have intellectual property in knowing how that is absolutely critical to achieving the success that we have had today.

In April, Furukawa Electric, the Japanese conglomerate that owns Fujitsu, decided that it would stop the development of its gallium nitride product because it realized it was getting behind even though it had the knowledge. Furukawa approached us and gave us exclusive license for those technologies. As a result, we believe we have more knowledge and technology than anybody else in the power conversion world.

CREDIT

How we helped
Tony Fernandes

Who are your target customers?

AirAsia off the gr

Our target customers are the people and companies that make inverter systems and power supply adapters.

Eventually, any company that works with electricity will be our customer. Right now, the sectors that can most benefit from our technology are industrial and automotive. Power supplies for things like servers, communication switches, data centers, etc. All these are very, very important segments where the cost of electricity is a substantial part of doing business.

How do you see Transphorm developing as a company in the near future?

We believe that 2014 is the start of gallium nitride powered conversion and we believe 2015 will be a breakout year for us as our foundry with Fujitsu will be starting up. We believe that we're going to change the whole world. We've had the privilege of seeing a revolution like this one with LED lighting. A lot of our team worked on the LED revolution and we've helped create a significant part of it, so we understand breakout, we understand the hockey stick, and we understand what it takes. We are very realistic about this matter, but at the same time we're super optimistic about it because we can see the same buzz and the same feel of what happened prior to the breakout of the LED. We can sense the same thing happening here.

team worked on the LED revolution and we've helped create a significant part of it, so we understand breakout, we understand the hockey stick, and we understand what it takes. We are very realistic about this matter, but at the same time we're super optimistic about it because we can see the same buzz and the same feel of what happened prior to the breakout of the LED. We can sense the same thing happening here.

Is there anything else you want to add?

We are incredibly excited by the future. We can't name all of our new customers, but we just announced a partnership with Tata Power Solar, who is excited to have our technology to introduce India's most efficient solar inverter. We have a chance to empower our customers with a much better product that will change the world.