

Fronius USA – Inverting Sustainable Energy into 24 Hours of Sun

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The primary subject matter of this case concerns the changing landscape of consumer energy needs. It focuses the application of alternative technologies and fuel sources to work towards a sustainable energy source; a 24-Hour Sun. Secondary issues examined include collaborative efforts with other organization to move a mission forward. This case is designed to be taught in one to one and one-half hours. It has a difficulty level of three; junior level. It is expected to take about an hour of outside preparation by students. Case information was gathered from public information and personal interviews at Fronius USA Headquarters.

CASE SYNOPSIS

Fronius is a multinational company based in Pettenbach, Austria. They strive for a sustainable future through innovation, quality, and first-rate service. From humble beginnings in 1945, Fronius has grown to a large multinational corporation with three separate successful business units; Perfect Charging, Perfect Welding, and Solar Energy. Fronius believes in a future where 100% of the global energy requirements come from renewable energy sources; or the world of 24 hours of sun. As the world looks for alternative sources of energy, Fronius must balance the 24-hour sun initiative while maintaining its other core businesses.

BACKGROUND

When Fronius was founded by husband and wife Gunter and Friedl Fronius in 1945, charging car batteries was a major problem. Gunter Fronius was driven to find a solid solution to this issue. He built his first battery charger and opened a specialist repair workshop for radios and electrical engineering. With a small workshop and one additional employee, he laid the framework for a multinational company. By 1950, Mr. Fronius expanded to include welding transformers through the launch of Perfect Welding Business Unit. By the 1980s, the successful medium sized company was turned over to his children, Brigitte and Klaus. Under their leadership, Fronius saw tremendous internationalization and growth. In

the early 1990s, the company saw potential in the field of solar energy, and thus split into three distinct divisions: Perfect Welding, Solar Energy, and Perfect Charging.

In 1995, Fronius launched “Sunrise”, their first grid-connected solar inverter which generates power from solar energy and feeds it into the energy grid. By 2001, “Fronius IG” inverter offered flexibility to customers utilizing data communication and compatibility with industry-standard photovoltaic modules. Subsequently, Fronius expanded to the United States in 2002, locating in the Detroit area to be near the automotive industry. In 2012, they opened a state-of-the-art USA national headquarters in Portage, Indiana. Fronius has greatly contributed to the American market having offices across the country in Brighton MI, Chattanooga TN, Houston TX, Riverside CA, and San Francisco CA. Today, Fronius has subsidiaries in 28 countries and representatives in over 60 countries. Throughout their growth and expansion, Fronius has maintained their focus on creating a sustainable future through innovation, quality, and first-rate service.

FRONIUS BUSINESS UNITS

Since the beginning, Fronius has a strong passion for new technologies and rigorous research. They position themselves as the technology leader, finding, developing, and implementing innovative methods in each of their business units. Fronius seeks out new opportunities and works towards finding difficult solutions. They attribute this to their clear vision, inventive spirit, and ingrained passion for quality. This allows them to extend the limits of what is possible and set the trends that change the market.

A Strategic Business Unit (SBU) is an independently managed division of a large company. Each division will have its own vision, mission, and objectives. The planning of each of these divisions are done separately from other businesses of the company. More specifically, a SBU is a cluster of associated businesses. Typically, the separations often include divisions along the lines of businesses, products, or product/brand. Each of the divisions maintains autonomous planning and has its own set of competitors. Fronius is segmented in this way.

The first of the three business units is Perfect Charging which has been around since Fronius’ inception in 1945. Their range of products and services in this unit allows Fronius to deliver performance, efficiency, cost effectiveness and sustainability. The purpose of this range of products is to ensure maximum power availability for vehicles thereby lowering operating costs and a longer service life. The second business unit within Fronius is the Perfect Welding Business Unit. Operating since 1950, this unit has progressed the welding technology sector. One specific innovation, a process of thermal joining steel and aluminum was once considered unachievable. Fronius’ efforts to push the boundaries of possible has led to this innovation. The newest but equally important business unit is Solar Energy. Starting as a pioneer in the field, Fronius’ 24 hours of sun vision has substantially contributed to the energy revolution. To aid in their goal of a future with 100% of energy coming from renewable sources, Fronius covers a product spectrum that includes energy generation, storage, distribution and consumption of solar energy. More specifically, this includes inverters, storage units, meters, energy monitoring system along with integrative complete system solutions.

24 HOURS OF SUN INITIATIVE

Like many companies, Fronius is search for a path to the perfect sustainable future. The longevity of the company rests on the ability to commit to sustainable practices. To attract customers, the products must not only be effective, but cost effective as well. Keeping this in mind, Fronius introduced the next generation of solar systems to the industry, the Fronius Smart Solution. This system satisfies the needs for both residential and commercial users. It provides a flexible design, shade mitigation, NEC compliance, high performance and state-of the-art monitoring. Additionally, the system was developed to keep the number of components low and installation easy to be more easily integrated with other companies.

To achieve the 24 hours of sun initiative, Fronius is utilizing three principles relating to the generation, storage, distribution, or consumption of renewable energy:

1. The Reliability of supply: does it ensure a long term and reliable operation
2. System Optimization: does it optimize performance along the lines of efficiency
3. Future Proofing: does it contribute to or accommodate future demands

With the application of the principles listed above, Fronius will take one step at a time to ensure a most cost-effective form of energy in the world, making 24 hours of sun a reality for every nation. Fronius knows that this is not to be achieved alone, but rather a collaborative effort with other passionate program initiatives around the globe. See Table 1 for an example of how these technologies work with one another.

**FIGURE 1
FRONIUS' VISION FOR THE FUTURE**



FRONIUS USA

Fronius expanded to United States in 2002 by opening a location in Brighton, Michigan which is strategically located near the automotive hub of Detroit. Since 2002, Fronius USA has expanded from six original employees to a team of more than 100 individuals in sales and service across the US. As a result of sustained growth in America, Fronius opened a state-of-the-art US headquarters in Portage, IN in 2012. Portage was selected due to its proximity to Chicago (40 miles) and affordability. In fact, the building that currently houses Fronius USA was paid for with cash. The location is ideal for many of the Austrian executives who enjoy the proximity of Chicago and the low operational costs in nearby Portage. Fronius USA CEO Wolfgang Niedrist has been with the company for 18 years and was one of the six original US employees. He maintains intimate approach to operations. He is responsible for the leadership and training of Fronius USA employees. As a native Austrian himself, he strives to integrate the primarily Austrian and American workforce. Additionally, he oversees the massive Fronius warehouse, a task that is typically handled at a lower level. His commitment to the company is a shared theme of many members of the organization. The company enjoys low turnover and high employee retention. In addition to Wolfgang, the rest of the original six US employees still maintain leadership positions. When an open position does arise, Fronius is very particular to ensure those onboarded meet their standards.

TABLE 1
FRONIUS' VISION FOR THE FUTURE DESCRIPTION

Technology	Description (Table adapted from Fronius.com)
1. Photovoltaic Power Plant	Converts part of the solar radiation into electrical energy using solar cells. Energy can be used, stored, or fed into the public grid.
2. Wind	A wind farm converts wind energy into electrical energy. Kinetic energy of the wind causes rotor blades on the turbine to rotate. Rotational energy is fed into a generator, converting the mechanical energy into electricity.
3. Hydroelectric Power Station	Mechanical energy of water drives a generator, which produces electrical energy using transformers. This can be done with running water on a continuous basis, or pumped storage to produce energy on demand.
4. Energy Independent Single-Family Home	The "Fronius house of the future" shows how photovoltaics can be used as the primary energy source to generate a fully autonomous electricity and heat supply for an energy-efficient single-family home. (rewrite)
5. Communal Storage Unit	Communal storage unit distributes renewable energy as electricity, heat, or fuel as needed.
6. Pumped Electrical Storage Station	Currently the only efficient way of storing large quantities of electricity for a long period of time. When there is a surplus energy, water is pumped out of the storage basin to a reservoir located at a higher level. When energy is needed, the water flows back into the lower basin, driving a turbine, and producing electricity.
7. Central electrolysis/ Methanisation plant	Electrolysis or methanisation plants produce hydrogen or, in a second step, methane with the help of surplus power using an electrolysis process. Both substances can be used for space heating, industrial processes or in power stations as needed.
8. Hydrogen Refueling Station	Hydrogen is an excellent alternative to conventional drive systems and doesn't produce any harmful emissions; the only waste product is pure water. Hydrogen, which is generated from renewable energy, ensures sustainable and convenient mobility without limitation.
9. Methane gas Powered Station	Methane plants can rapidly react to changes in power output in the public grid and supply the electricity needed. In peak load gas-fired power stations, temporarily stored methane that is produced from renewable energy is converted back into electricity.
10. Energy-independent mobile communication base stations	For areas with no grid connection, a PV system generates electricity, which is then stored temporarily in the form of hydrogen following an electrolysis process and made available at stations using fuel cells. This provides a reliable, sustainable and permanently available energy supply.
11. Green intralogistics	The term "Green logistics" is used to describe environmentally friendly and sustainable transport and logistics concepts. Fuel cell vehicles, which are powered by hydrogen, and battery-driven vehicles, which use power from renewable energy sources, represent an important area to start implementing comprehensive energy concepts.

COLLABORATIVE EFFORTS TOWARD 24 HOURS OF SUN

Organizations utilizing Fronius products have received national recognition. For example, North Putnam Community Schools (Bainbridge, Indiana) was recognized by The Solar Energy Industries (SEIA) and the Smart Electric Power Alliance (SEPA) as the best photovoltaic project in the Midwest at the 2016 Photovoltaic Conference and Expo in Chicago. To win, the project demonstrated innovation, community involvement, and best practices that advance the industry – encompassing the Fronius concept of 24 Hours of Sun. North Putnam Community Schools is the first Indiana to run completely off zero “net energy”. The project will pay off it roughly 10 years due to the immense cost savings on the school’s energy bill. “This system is a great example on how solar can benefit the Midwest and is a lighthouse project for the whole region”, Tristan Kreager, Director of Solar Energy at Fronius USA, says.

New Ebenezer Baptist Church in Merrillville, Indiana also discovered the cost saving benefits of sustainable energy alternatives. In 2015, the church installed a system that saves them \$3,000 to \$4,000 per year in energy bills. Working with Jefferson Electric, LLC, the project was assisted through a grant from the Indiana Office of Energy Development to finance the project. Reverend Tom Brian hopes to encourage more churches to go solar and participates in the Climate Boot Camp, an event hosted by Hoosier Interfaith Power and Light.

Similar benefits are being realized by private home owners and businesses on a larger scale. Qwik Solar partnered with Fronius to bring a massive solar farm to life in Geneva, NY. This remote net metered project comprises 35 separate projects totaling over 1.5 MW of power. Employing New York state’s remote metering law and the NYSERDA NY-Sun Solar Electric Incentive Program, these projects are currently crediting energy into the accounts of 10 homeowners and 25 businesses. As a collective benefit, each of the systems is locally owned with the tax credits and cost savings staying in the local economy. This project is ongoing and expected to benefit additional private home and business owners.

Finally, Fronius is helping companies utilize more environmentally friendly means of procuring energy in their own backyards. SunWind Power is a Kentucky company that has witnessed the coal dependency has had on its state. Building toward a sustainable future of 24 hours of sun, Kentucky homes can move towards a greener and more efficient future. Jeremy Coxon, Installer with SunWind Power, values the flexible design and innovative features that simplified training and installation. A report released in October 2017 by the Union of Concerned Scientists (UCS) identified 2.6 gigawatts (GW) of coal capacity across six Midwest states that are considered uneconomic compared to cleaner alternatives. The report also found, nationally, that more than 20 percent of coal-fired generation is deemed uneconomical. Fronius is committed to ensuring a sustainable future.

TEACHING NOTE

Fronius USA – Inverting Sustainable Energy into 24 Hours of Sun

CASE DESCRIPTION

The primary subject matter of this case concerns the changing landscape of consumer energy needs. It focuses the application of alternative technologies and fuel sources to work towards a sustainable energy source. Secondary issues examined include collaborative efforts with other organization to move a mission forward. This case is designed to be taught in one to one and one-half hours. It has a difficulty level of three; junior level. It is expected to take about an hour of outside preparation by students.

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Discussion Questions:

1. How might a company, specifically Fronius, operate three distinct business units successfully?
2. What can Fronius do to make 24 Hours of Sun a reality?
3. Since the 24-Hours of Sun Initiative requires other strategic partners, how might Fronius further develop these relationships?
4. What opportunities does a company like Fronius have to make an impact on your campus?



RECOMMENDATION FOR TEACHING APPROACH

To start the discussion, it may be advantageous to ask students about their knowledge of alternative energy. Some students may be very knowledgeable and utilize these sources. Other students may only understand the concept, but not how its applied. The varying perspectives will likely get the discussion going with some students having a very passionate response. For that utilize alternative energy, they will likely discuss the long-term benefits of sustainability. They may focus on the ability to live off the grid and not be reliant on energy companies. In addition to the financial savings, the discussion can lead

towards areas that are remote and have less opportunities for energy. Similarly, developing countries with less infrastructure could be brought into the mix. For those that are less enthusiastic, the upfront cost and lack of convenience could be deterrents. For existing homes and businesses, the standard is to attach to the grid and flip on a switch. As the industry standard, it's sometimes hard to move away. Secondly, the large panels to obtain solar electricity may be unsightly to some. These are certainly not an exhaustive list of the pros and cons. The discussion around alternative energy could encompass an entire class period prior to discussing the case itself. It is suggested to start this discussion with a framework, then move into case specific discussion. To aid in this discussion, several discussion questions are included:

SUGGESTED ASSIGNMENT QUESTIONS WITH RESPONSES

1. How might a company, specifically Fronius, operate three distinct business units successfully?

A Strategic Business Unit (SBU) is an independently managed division of a large company. Each division will have its own vision, mission, and objectives. The planning of each of these divisions are done separately from other businesses of the company. More specifically, a SBU is a cluster of associated businesses. Typically, the separations often include divisions along the lines of businesses, products, or product/brand. Each of the divisions maintains autonomous planning and has its own set of competitors. Fronius is segmented in this way.

In order to successfully utilize the strategic business unit model, each autonomous unit should be self-sustaining. As with Fronius, the Perfect Charging, Perfect Welding, and Solar Energy units are all independent with their own set of customers, rivals, and markets. If any of these units began to falter, Fronius could operate the other two without interruption.

(The description of each unit from the case follows).

The first of the three business units is Perfect Charging which has been around since Fronius' inception in 1945. Their range of products and services in this unit allows Fronius to deliver performance, efficiency, cost effectiveness and sustainability. The purpose of this range of products is to ensure maximum power availability for vehicles thereby lowering operating costs and a longer service life. The second business unit within Fronius is the Perfect Welding Business Unit. Operating since 1950, this unit has progressed the welding technology sector. One specific innovation, a process of thermal joining steel and aluminum was once considered unachievable. Fronius' efforts to push the boundaries of possible has led to this innovation. The newest but equally important business unit is Solar Energy. Starting as a pioneer in the field, Fronius' 24 hours of sun vision has substantially contributed to the energy revolution. To aid in their goal of a future with 100% of energy coming from renewable sources, Fronius covers a product spectrum that includes energy generation, storage, distribution and consumption of solar energy. More specifically, this includes inverters, storage units, meters, energy monitoring system along with integrative complete system solutions.

2. What can Fronius do to make 24 Hours of Sun a reality?

To answer this question, students can refer to figure 1 and table 1 in the case. Figure one illustrates a picture of 11 different technologies working together towards 24 hours of sun. Similarly, table one provides a written description of each of these technologies. Though Fronius only active works on a few of these, they can continue their strategic partnership with other organizations.

**FIGURE 1
FRONIUS' VISION FOR THE FUTURE**



Each of the numbers corresponds with a different technology description below in table 1. Many of these technologies are likely implemented in the nearby area. For those students that are unfamiliar with this industry, it will provide an opportunity to learn more.

As a creative activity or discussion, the students could develop their own model for a sustainable system. Since the table includes nearly a dozen technologies, a large range of ideas could develop.

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3. Since the 24-Hours of Sun Initiative requires other strategic partners, how might Fronius further develop these relationships?

One way to start this discussion is to clarify what specifically Fronius does. In terms of sustainable energy, Fronius is the inverter. They do not make the panels that capture the energy. They make the inverter that convert the captured energy into useable energy. In that relationship, neither party can be effective alone. The case discusses several current relationships outlined below. The student can discuss how they can deepen these relationships – with additional technology/opportunities or develop new relationships. In either case, they will be making this technology more accessible for many consumers. The case outlines several projects that Fronius has completed, or that is ongoing. If the student is interested, he/she can look up additional projects that Fronius is part of.

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4. What opportunities does a company like Fronius have to make an impact on your campus?

To answer this question, students should have a basic understanding of opportunities available to them. On many campuses, there are specific green initiative programs that students can become involved with. If there are none, students can discuss an opportunity to implement them. On a larger scale, the students can focus on the external community. Background research into what currently exists can be a minor assignment on its own. Once the student has seen what has been started, and merges this to opportunities, he/she will be able to answer this question. The benefit from this question will be the brainstorming that comes along. Students may become active on campus or in their community when they realize the opportunity for impact.