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# BEST PRACTICES

AWARDS

FROST & SULLIVAN

2020 BEST PRACTICES AWARD



**2020 GLOBAL WIRELESS CHARGING  
TECHNOLOGY INNOVATION AWARD**

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## Background and Company Performance

### *Industry Challenges*

As the dramatic pace of innovation has transformed consumer behaviors, a game-changing paradigm shift is imminent in the wireless charging market. In particular, advancements in next generation consumer electronic devices, coupled with the proliferation of "connected" devices and the need for new ways to power these devices have led to a dramatic opportunity for the next generation of wireless power charging solutions. The wireless charging segment has an array of technological solutions to the problem but all participants face stiff headwinds as products incorporating their technologies typically have long development cycles. Thus, they must anticipate changes in the marketplace and have insight into the direction of technological innovation and evolution of customer demands.

To compete successfully, market participants must demonstrate the advantages of their products and technologies over established alternatives and other emerging methods of power delivery. In order to succeed in today's environment, it will be critical to improve the cost performance, efficiency and ease of integration of wireless charging solutions for electronic devices as the demands of the market continue to evolve.

Some of the more specific industry challenges include:

#### **Rigid Regulatory Environment**

The wireless charging technique gaining the most traction from a number of participants involves power transmission using radio frequency (RF) energy, which is subject to strict regulation by the Federal Communications Commission (FCC) in the United States and by comparable regulatory agencies worldwide. Thus, companies in the power delivery segment must secure the necessary country-specific regulatory approvals for their charging technologies. For instance, several regulatory agencies worldwide, including the Federal Communications Commission (FCC), Industry Canada, and the Council of the European Union have set specific absorption rate limits on the allowable amount of energy that humans can absorb when exposed to radio frequency fields produced by wireless devices. There are also numerous coexistence rules which can vary based on region. The ability to obtain regulatory approval for devices using these technologies is time consuming and costly, and there can be no assurance that required regulatory approvals will be granted.

#### **Evolving Charging Requirements**

Until recently, the wireless charging techniques have been limited to inductive charging methods which require a charging pad or prepared surface designed for the device to sit on to charge. Exact placement is critical for these solutions as the charging coil on the receiver device must properly align with the charging coil on the pad. This orientation constraint is one of the main consumer complaints for coil-based wireless charging. The increased adoption of smart devices requires charging multiple devices simultaneously. Although there have been advancements in the wireless charging space, the charging of various devices in a limited area remains challenging. Current solutions have been challenged to achieve simultaneous multiple device charging. Thus, the development of a

wireless power transmission solution capable of charging numerous electronic devices across a specific area is a clear market differentiator.

### **Costs of Product Development and Intellectual Property Protection**

The costs associated with technology development and implementation in the wireless charging market is exceedingly high as integration into CE and IoT devices requires chip level solutions to meet the footprint, cost, security, reliability and configuration challenges posed by the product manufacturers. Thus, new product development for wireless charging solutions often requires considerable costs in advance of potential returns for such products. For example, rechargeable devices that utilize new receiver technologies, electronic devices generally need to be outfitted with enhanced hardware to enable the devices to be rechargeable with a new system. In cases where the existing technology is not already built into the device, customers may be required to upgrade the existing battery in the device. These additional expenses create challenges for industry participants. Moreover, it can be costly to protect intellectual property and proprietary technologies against third party challenges.

### *Technology Leverage and Business Impact of Energous*

#### **Enabling Wireless Charging the Way Wi-Fi Enables Wireless Data**

Frost & Sullivan recognizes Energous for introducing innovative WattUp Near Field contact based and Mid Field 'at a distance' charging technologies that support a broad and expanding range of customer applications. Founded in 2012 in San Jose, California, Energous has built a reputation as an innovator and pioneer in next-generation wireless charging. As a leader in wireless charging, Energous is the developer of an innovative, scalable wireless charging technology that is designed for a wide variety of industries including consumer electronics (CE), medical, automotive and industrial. The company supports a complete power delivery ecosystem with regulatory-approved wireless charging technologies that ensure high performance and interoperability across receivers and transmitters. Moreover, Energous has a particularly robust patent portfolio, with 218 patents issued to date, and over 110 patents pending.

Since 2013, the company has secured financing of approximately \$180 million (including \$25M from Dialog Semiconductor) which has enabled Energous to accelerate its path to commercialization and develop a wireless technology that meets regulatory certification requirements in many markets worldwide – and counting. Energous common stock is quoted on the NASDAQ under the symbol "WATT."

#### **Strategic Partnerships Drive Growth Opportunities**

In 2016, Energous entered a strategic partnership with Dialog Semiconductor to manufacture and distribute Energous' WattUp wireless charging technology. Energous WattUp chipsets are manufactured, shipped, and supported by Dialog. The companies collaborate on go to market strategies and have established a mutually beneficial revenue sharing relationship based on the commercialization of licensed products. Frost & Sullivan believes this alliance provides Energous with substantial growth opportunities and speed to market advantages based on Dialog's ability to penetrate a variety of vertical markets with large volumes sales.

Leveraging the relationship with Dialog, Energous has aggressively pursued an ecosystem strategy, engaging in a range of tactical partnerships with value chain partners in order to drive the adoption of their charging at a distance technology. For example, in February 2019, Energous announced a collaboration with Vivo Global, a leading Chinese technology company, to explore integrating Energous's WattUp wireless charging 2.0 technology into smartphone designs that charge wirelessly over-the-air. Vivo Global is looking to minimize smartphone battery anxiety issues. In August 2019 Energous customer Delight (in collaboration with SK Telesys of Korea) launched the Oasis-RC Personal Sound Amplification Product (PSAP) on Amazon, marking the world's first RF-charged consumer device on the market. Moreover, in October 2019, Energous entered into a partnership with ZPower, the world's only developer of silver-zinc microbattery technology, to develop next-generation rechargeable wireless power solutions to be used in a wide variety of small electronic devices, including wearables. Also in October 2019, NewSound, a hearing instruments company, worked with Energous to launch the WattUp-enabled Primo W next-generation hearing aid, which alleviates the frustration users experience with legacy devices that require the frequent need to replace extremely small batteries in the device.

Frost & Sullivan believes Energous's wireless charging solutions have clear advantages over older charging methods such as coil-based charging, wall plug-in charging, inductive charging, magnetic resonance charging, and charging stations. Evolving technologies and consumer demand has shifted the focus towards wire-free, or untethered, charging solutions. In this environment, Frost & Sullivan believes the WattUp technology provides compelling competitive advantages, particularly with respect to cost, size, scalability and portability, among other advantages. By capitalizing on a first mover advantages with their innovative technology, the company holds the potential to capture a larger share of this vibrant and dynamic market.

### **Providing Industry-leading Ecosystem and New Innovative Solutions**

At the heart of Energous' success is the WattUp® Wireless Charging Ecosystem, a revolutionary total systems solution that combines industry-leading hardware, software, antenna and chip technology components to enable wireless charging for a broad and growing range of applications. This solution offers many benefits over coil and other contact-based wireless charging solutions. For instance, it provides improved interoperability and a footprint that enables WattUp to integrate with products of various form factors, including devices without flat surfaces or with curved edges. Moreover, the company's WattUp technology allows foreign object detection, eliminating any thermal issues with metal and other materials, while also ensuring 90-degree angle support and full orientation freedom. Energous' WattUp receiver technology enables at-contact and over-the-air wireless charging at distances up to 15 feet while allowing users to scale it to fit a broad range of sized electronics, including small electronics, such as an in-the-ear hearing aid, wearables, medical sensors, hearables, smart glasses, earbuds and much more.

The company's WattUp transmitter technology, which is currently unmatched by competitors, can scale from contact to charging distances of 15 feet and greater depending on the application, all under a compatible umbrella which provides CE and IoT product

manufactures with a long-term wireless charging road map for future generations of products. The complete solution, integration flexibility and long term road map coupled with the Dialog partnership enables Energous clients to both future-proof their product offerings while benefiting from a proven and reliable supply chain.

### **A Commitment to Technology Innovation**

Energous is expanding its technological leadership by focusing on innovation. In February 2019, the company announced a new WattUp Near Field fast charging transmitter and receiver solution that delivers 20 watts of power, particularly well-suited for tablets, drones, smartphones, and other high-power electronics. The technology is based on its Gallium nitride (GaN) Power Amplifier and DA4100 transmitter ASIC, which, when paired with its Gallium arsenide (GaAs) receiver, provides higher system efficiency compared to coil-based charging solutions. The company's small footprint receiver (Rx) architecture provides easy system integration and manufacturability. It also ensures high thermal performance and enables advanced foreign object detection, which is compatible with RFID, NFC, and other subsystem technologies.

Moreover, in September 2019, the company launched its WattUp hearable developer kits for manufacturers, enabling fast-charging higher power levels required by many smart hearables. Later in 2019 the company also launched its WattUp developer kits for Hearing aids/PSAPs, as well as a separate WattUp developer kit for smart glasses. The developer kits are designed to ease and accelerate the product development cycle for manufacturers.

### **Global Regulatory Approvals**

Importantly, Energous secured FCC certification in 2017 for its first generation WattUp Mid Field over-the-air wireless charging transmitter. The transmitter underwent tests to confirm that it met regulatory requirements. This announcement marked a milestone as it was the first wireless charging company to have received FCC approval on over-the-air charging under Part 18 rules. To-date, Energous' WattUp wireless technology has been approved to ship in more than 111 countries including the United States, European Union, Taiwan, India and many others.

### ***Conclusion***

Despite the regulatory and technical hurdles that prevent many competitors from progressing in this dynamic and challenging market, Energous is well-positioned to in the space as it has already captured market share in the power delivery space with its innovative WattUp technology and continues to maintain its leadership position in regulatory. By successfully anticipating the evolution of networks, devices and customer demands, Energous has achieved a clear first mover advantage in the wireless charging market through technology innovation and is well-positioned to capture growth opportunities in many markets. With its strong progress and commitment to innovation in wireless charging, Energous earns Frost & Sullivan's 2020 Global Technology Innovation Award in the Wireless Charging Market.



## Significance of Technology Innovation Leadership

Technology-rich companies with strong commercialization strategies benefit from the demand for high-quality, technologically innovative products that help shape the brand, resulting in a strong, differentiated market position.



## Understanding Technology Innovation Leadership

Technology innovation leadership recognizes companies that lead the development and successful introduction of high-tech solutions to customers' most pressing needs, altering the industry or business landscape in the process. These companies shape the future of technology and its uses. Ultimately, success is measured by the degree to which a technology is leveraged and the impact it has on growing the business.

## *Key Benchmarking Criteria*

For the Technology Innovation Leadership Award, Frost & Sullivan analysts independently evaluated 2 key factors—Technology Leverage and Business Impact—according to the criteria identified below.

### **Technology Leverage**

- Criterion 1: Commitment to Innovation
- Criterion 2: Commitment to Creativity
- Criterion 3: Technology Incubation
- Criterion 4: Commercialization Success
- Criterion 5: Application Diversity

### **Business Impact**

- Criterion 1: Financial Performance
- Criterion 2: Customer Acquisition
- Criterion 3: Operational Efficiency
- Criterion 4: Growth Potential
- Criterion 5: Human Capital



## Best Practices Recognition: 10 Steps to Researching, Identifying, and Recognizing Best Practices

Frost & Sullivan analysts follow a 10-step process to evaluate award candidates and assess their fit with select best practices criteria. The reputation and integrity of the awards are based on close adherence to this process.

STEP	OBJECTIVE	KEY ACTIVITIES	OUTPUT
1 <b>Monitor, target, and screen</b>	Identify award recipient candidates from around the world	<ul style="list-style-type: none"> <li>• Conduct in-depth industry research</li> <li>• Identify emerging industries</li> <li>• Scan multiple regions</li> </ul>	Pipeline of candidates that potentially meet all best practices criteria
2 <b>Perform 360-degree research</b>	Perform comprehensive, 360-degree research on all candidates in the pipeline	<ul style="list-style-type: none"> <li>• Interview thought leaders and industry practitioners</li> <li>• Assess candidates' fit with best practices criteria</li> <li>• Rank all candidates</li> </ul>	Matrix positioning of all candidates' performance relative to one another
3 <b>Invite thought leadership in best practices</b>	Perform in-depth examination of all candidates	<ul style="list-style-type: none"> <li>• Confirm best practices criteria</li> <li>• Examine eligibility of all candidates</li> <li>• Identify any information gaps</li> </ul>	Detailed profiles of all ranked candidates
4 <b>Initiate research director review</b>	Conduct an unbiased evaluation of all candidate profiles	<ul style="list-style-type: none"> <li>• Brainstorm ranking options</li> <li>• Invite multiple perspectives on candidates' performance</li> <li>• Update candidate profiles</li> </ul>	Final prioritization of all eligible candidates and companion best practices positioning paper
5 <b>Assemble panel of industry experts</b>	Present findings to an expert panel of industry thought leaders	<ul style="list-style-type: none"> <li>• Share findings</li> <li>• Strengthen cases for candidate eligibility</li> <li>• Prioritize candidates</li> </ul>	Refined list of prioritized award candidates
6 <b>Conduct global industry review</b>	Build consensus on award candidates' eligibility	<ul style="list-style-type: none"> <li>• Hold global team meeting to review all candidates</li> <li>• Pressure-test fit with criteria</li> <li>• Confirm inclusion of all eligible candidates</li> </ul>	Final list of eligible award candidates, representing success stories worldwide
7 <b>Perform quality check</b>	Develop official award consideration materials	<ul style="list-style-type: none"> <li>• Perform final performance benchmarking activities</li> <li>• Write nominations</li> <li>• Perform quality review</li> </ul>	High-quality, accurate, and creative presentation of nominees' successes
8 <b>Reconnect with panel of industry experts</b>	Finalize the selection of the best practices award recipient	<ul style="list-style-type: none"> <li>• Review analysis with panel</li> <li>• Build consensus</li> <li>• Select recipient</li> </ul>	Decision on which company performs best against all best practices criteria
9 <b>Communicate recognition</b>	Inform award recipient of recognition	<ul style="list-style-type: none"> <li>• Announce award to the CEO</li> <li>• Inspire the organization for continued success</li> <li>• Celebrate the recipient's performance</li> </ul>	Announcement of award and plan for how recipient can use the award to enhance the brand
10 <b>Take strategic action</b>	Upon licensing, company is able to share award news with stakeholders and customers	<ul style="list-style-type: none"> <li>• Coordinate media outreach</li> <li>• Design a marketing plan</li> <li>• Assess award's role in strategic planning</li> </ul>	Widespread awareness of recipient's award status among investors, media personnel, and employees

## The Intersection between 360-Degree Research and Best Practices Awards

### Research Methodology

Frost & Sullivan's 360-degree research methodology represents the analytical rigor of the research process. It offers a 360-degree view of industry challenges, trends, and issues by integrating all 7 of Frost & Sullivan's research methodologies. Too often companies make important growth decisions based on a narrow understanding of their environment, resulting in errors of both omission and commission. Successful growth strategies are founded on a thorough understanding of market, technical, economic, financial, customer, best practices, and demographic analyses. The integration of these research disciplines into the 360-degree research methodology provides an evaluation platform for benchmarking industry players and for identifying those performing at best-in-class levels.



### About Frost & Sullivan

Frost & Sullivan, the Growth Partnership Company, helps clients accelerate growth and achieve best-in-class positions in growth, innovation, and leadership. The company's Growth Partnership Service provides the CEO and the CEO's growth team with disciplined research and best practice models to drive the generation, evaluation and implementation of powerful growth strategies. Frost & Sullivan leverages nearly 60 years of experience in partnering with Global 1000 companies, emerging businesses, and the investment community from 45 offices on 6 continents. To join Frost & Sullivan's Growth Partnership, visit <http://www.frost.com>.