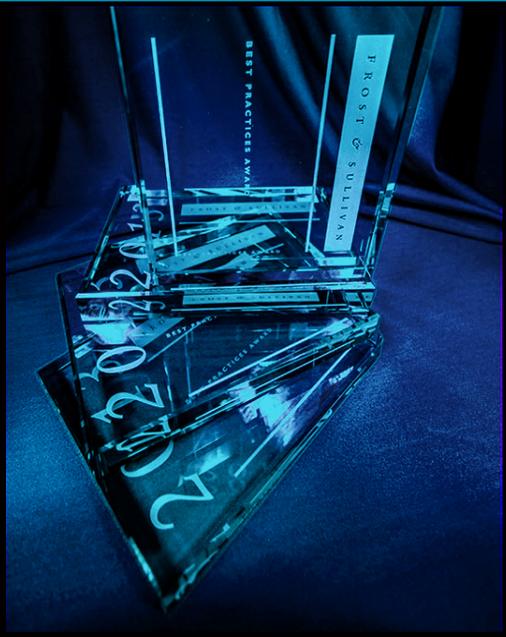


FROST & SULLIVAN

gogoro®

2016 European Electric Scooter
Technology Innovation Award



FROST & SULLIVAN

BEST
2016 PRACTICES
AWARD

EUROPEAN ELECTRIC SCOOTER
TECHNOLOGY INNOVATION AWARD

2016
BEST PRACTICES
AWARDS

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Background and Company Performance

Industry Challenges

In Europe, the electric scooter (eScooter) market is anticipated to grow at a CAGR of 30% between 2015 and 2025. An eScooter targets to solve the challenge regarding urban commute of an end user. Increasing traffic congestion woes, coupled with environmental concerns, is the key driver for the adoption of eScooters. These concerns are driving policy makers and end users to increase their preference for electric scooters. Germany, France, and Amsterdam are among the biggest markets in Europe for the adoption of eScooters. Early adopters currently drive the sales of the eScooters in Europe, and the segment that is equivalent to 125 CC is the most popular. For instance, in France alone, the 125 CC equivalent eScooter market segment grew by 52% in 2015 over 2014, or about 449 units sold in 2015 (per Frost & Sullivan independent analysis).

Frost & Sullivan notes that the key challenges that eScooters are aiming to overcome include cost, range anxiety, and the recharging time for batteries. The cost of vehicles is primarily driven by the battery costs, which alone account for up to 30% to 40% of the vehicle costs - depending on the battery technology. Forerunners of lithium-ion battery technology report to Frost & Sullivan that they anticipate the price of batteries to reduce to half by 2020. The second challenge is range anxiety, which is primarily due to the lack of abundant electric charging stations. However, as the policy makers increase their support for electric vehicles, this challenge is expected to reduce over time. Finally, recharging time is perhaps seen the biggest challenges for eScooters, as these are used for short distance commute. Currently, the recharging time averages 1 hour and 40 minutes for eScooters to reach 80% of the battery charge. eScooters have 100 Km range; hence the ratio of commute time to recharge time is 1. This is quite slow compared to gasoline-powered vehicles, which take around 2 – 5 minutes to fill the tank. Stakeholders addressing this challenge are proposing solutions - including carrying portable battery packs that can be removed and carried to charge comfortably at the destination. However, the hassle of carrying the battery before charging remains a clear pain point for the end users.

Frost & Sullivan applauds how Gogoro - a smart eScooter manufacturer - uses battery swapping technology and a disruptive business model to address today's key market challenges, including the goal of making urban commute both affordable and convenient for end users.

Technology Attributes and Future Business Value

Gogoro, founded in 2011 by Horace Luke (CEO) and Matt Taylor (CTO), is based out of Taipei (Taiwan). The company started with the vision of transforming mega cities into smart cities by providing cleaner and smarter energy to the people. The Gogoro Smartscooters and Gogoro Energy Network are designed to create an ecosystem with better connectivity, easy access to energy, and an enjoyable urban lifestyle. Gogoro has

announced that it plans to start its operations in Europe in 2016, with Amsterdam being the first market. Gogoro Smartscooters compete with traditional 125CC scooters and eScooters.

Visionary Innovation

Gogoro has two primary business activities, manufacturing the Smartscooter and developing an energy network, thereby becoming a key stakeholder in the creation of a green ecosystem — the end goal. Frost & Sullivan points out that there are two distinct needs the company properly addresses through their business — creating sustainable transportation and sustainable energy.

Gogoro has developed the world's first Smartscooters, which use lithium-ion battery packs. The battery packs are developed by Gogoro and are proprietary to the company. Gogoro eScooter battery packs eliminate the need for the user to charge the batteries; instead, a network of battery stations (GoStation) are used to swap the batteries with charged batteries when the user requires one. These charging stations are a part of the energy grid, which in turn help cities become efficient with respect to the utilization of energy. Frost and Sullivan recognizes the business opportunities that open up for the company in the long term due to their unique business model. For instance, partnerships with renewable energy companies would enable the Gogoro the power their GoStations using renewable energy source.

Product Impact

Gogoro is the first company to introduce the patented battery swapping technology for eScooters. Gogoro conceived a battery swap that is done in less than 15 seconds (6 seconds in case of no queue), compared to an average of 2 minutes end users spend at gas stations as they try to refill their traditional scooters. On the other hand, Frost & Sullivan research confirms that other competitors offering eScooters involve models that, on average, take around 1 hour and 40 minutes to recharge their batteries.

Gogoro is the first company to manufacture Smartscooters that are designed around mega cities. Gogoro's Smartscooters combine patented technology innovations such as electric throttle with Saferide™ redundancy, ride-by-wire reverse throttle, aeroframe aluminum monocoque chassis, storage, keyless start, and auto off activated via kickstand position sensor to enhance the user experience. The aluminum body of the vehicle enhances its power to weight ratio to 57.14 (W/kg) compared to competitors 21.05 (W/kg). Furthermore, by using the various sensors on the vehicle and its connectivity with the Gogoro Network, the company is able to provide smart features to the vehicle - including dynamic performance profiling, dynamic regenerative braking, headlight auto on/off/dim, and turn signal auto reset.

Gogoro Smartscooter and its battery also communicate to the end user's handheld device, such as a mobile phone, via Bluetooth technology. This enables the solution to nicely form a closed ecosystem between the user, vehicle, battery, and the GoStation. Through this, the user is alerted when the nearest GoStation approaches (depending on the mileage left in the vehicle). This way, the company is able to properly reduce range anxiety for its users.

Scalability

The battery pack costs are not accounted for in the Gogoro eScooter price; instead, the battery is offered on a subscription basis to end users. This enables the company to scale up its technology in its eScooters without passing on the costs to the user. For instance, the Smartscooters price in Taipei is \$3,000 to \$4,000, and the battery subscription costs between \$10/month to \$30/month depending on users' riding range, leveraging the pricing structure of telecom operators. With this model, for a price as low as \$3,000 the user is able to truly enjoy a technologically advanced scooter with unlimited range. This value proposition was the main reason that the company was able to outsell the market leader in Taiwan within the second month of launch.

Gogoro's cloud network enables the company to properly achieve scalability. Using the network of GoStations, its eScooters, the batteries, and the end-user movement, Gogoro analyzes the optimum location for new GoStations based on data collected from Gogoro Smartscooter traffic.

Application Diversity

When it comes to infrastructure, the application for GoStations goes beyond battery swapping. A network of GoStations is a part of the city energy grid — something critical to its success in the European eScooter market. GoStations, as a result, can be seen as nodes to utilize and improve the efficiency of energy usage in European cities. This is integral to creating smart cities in the future. For instance, during peak energy consumption, GoStations are used as a part of the city's energy grid. For example, as of 2016, Gogoro is working with municipal bodies in Amsterdam to fully tap the potential of Amsterdam GoStations before expansion in other European cities.

Customer Acquisition

Frost & Sullivan feels that Gogoro's unique business model clearly allows it the flexibility to expand and cater to a wide range of customers. Features such as the digital dashboard display, exterior styling, head and tail lights, and vehicle sounds are customizable using the user's smartphone. This enables the company to make the scooter personal and distinct, with the various combinations amounting to 3.9 million. Through this, the company is able to make the Smartscooters a true lifestyle product, which unlike its competitors, extends to more than a simple tool for commuting. In addition, each Gogoro scooter is equipped with

80 sensors that monitor various user riding styles and help users get the most out of both their vehicle and the ride itself. Gogoro analyses these data points to enhance vehicle performance and suit the user, thereby offering the best comfort and convenience - while being diverse with respect to its offerings.

Technology Licensing

Frost and Sullivan anticipates technology licensing could be one of Gogoro's revenue streams. Frost and Sullivan recognizes the potential for licensing the Gogoro battery packs to other electric scooter manufacturers and companies, and as a result, Gogoro is on the forefront of creating standardized, superior battery packs. By creating value for the companies capitalizing on the GoStation network, this also enhances Gogoro's value proposition to customers.

Gogoro is creating its own ecosystem of Smartscooters, battery packs, and charging networks. This ecosystem is expanding the eScooter market as a whole, and the company is able to provide an impressive proposition to users that outperforms both traditional scooters and competing eScooters. As such, the battery pack licensing will be integral to Gogoro's business model as other companies leverage its technology to grow their sales.

Conclusion

Frost & Sullivan applauds how Gogoro is disrupting the European electric scooter market with compelling products that enhance the user experience, while improving the overall ecosystem of cities. The combination of eScooters and energy grids enables the company to contribute to the creation of sustainable transportation and sustainable energy, while also becoming a front runner for a unique platform targeting electric and connected scooters. Adding more value to its product and service offerings not only benefits the company, but also benefits those that partner with Gogoro. The business model of battery swapping and providing batteries as a service is certainly unique to the company.

With its strong overall performance, Gogoro has earned the 2016 Frost & Sullivan Technology Innovation Award.

Significance of Technology Innovation

Ultimately, growth in any organization depends upon finding new ways to excite the market, and upon maintaining a long-term commitment to innovation. At its core, technology innovation or any other type of innovation can only be sustained with leadership in three key areas: understanding demand, nurturing the brand, and differentiating from the competition.



Understanding Technology Innovation

Technology innovation begins with a spark of creativity that is systematically pursued, developed, and commercialized. This spark can result from a successful partnership, a productive in-house innovation group, or the mind of a single individual. Regardless of the source, the success of any new technology is ultimately determined by its innovativeness and its impact on the business as a whole.

Key Benchmarking Criteria

For the Technology Innovation Award, Frost & Sullivan analysts independently evaluated two key factors—Technology Attributes and Future Business Value—according to the criteria identified below.

Technology Attributes

- Criterion 1: Industry Impact
- Criterion 2: Product Impact
- Criterion 3: Scalability
- Criterion 4: Visionary Innovation
- Criterion 5: Application Diversity

Future Business Value

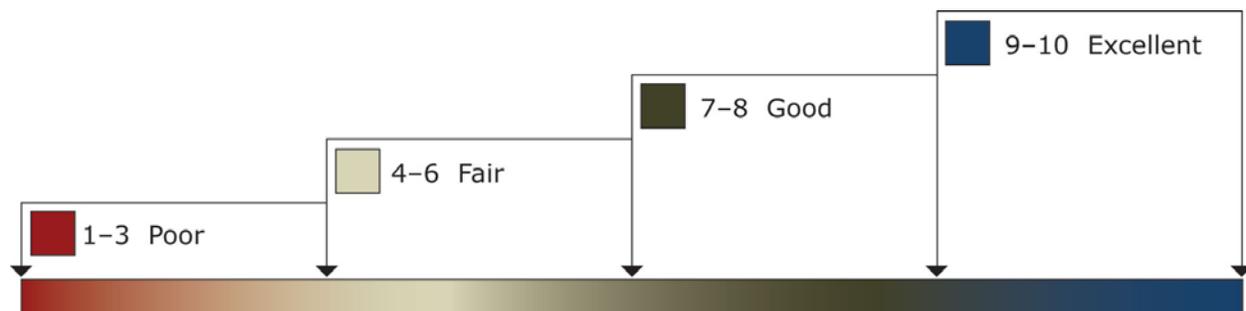
- Criterion 1: Financial Performance
- Criterion 2: Customer Acquisition
- Criterion 3: Technology Licensing
- Criterion 4: Brand Loyalty
- Criterion 5: Human Capital

Best Practice Award Analysis for Gogoro

Decision Support Scorecard

To support its evaluation of best practices across multiple business performance categories, Frost & Sullivan employs a customized Decision Support Scorecard. This tool allows our research and consulting teams to objectively analyze performance, according to the key benchmarking criteria listed in the previous section, and to assign ratings on that basis. The tool follows a 10-point scale that allows for nuances in performance evaluation; ratings guidelines are illustrated below.

RATINGS GUIDELINES



The Decision Support Scorecard is organized by Technology Attributes and Future Business Value (i.e., the overarching categories for all 10 benchmarking criteria; the definitions for each criteria are provided beneath the scorecard). The research team confirms the veracity of this weighted scorecard through sensitivity analysis, which confirms that small changes to the ratings for a specific criterion do not lead to a significant change in the overall relative rankings of the companies.

The results of this analysis are shown below. To remain unbiased and to protect the interests of all organizations reviewed, we have chosen to refer to the other key players as Competitor 2 and Competitor 3.

<i>Measurement of 1–10 (1 = poor; 10 = excellent)</i>			
Technology Innovation	Technology Attributes	Future Business Value	Average Rating
Gogoro	9.1	9.5	9.3
Competitor 2	8.7	8.1	8.4
Competitor 3	8.6	8.0	8.3

Technology Attributes

Criterion 1: Industry Impact

Requirement: Technology enables the pursuit of groundbreaking new ideas, contributing to the betterment of the entire industry

Criterion 2: Product Impact

Requirement: Specific technology helps enhance features and functionality of the entire product line for the company

Criterion 3: Scalability

Requirement: Technology is scalable, enabling new generations of products over time, with increasing levels of quality and functionality

Criterion 4: Visionary Innovation

Requirement: Specific new technology represents true innovation based on a deep understanding of future needs and applications

Criterion 5: Application Diversity

Requirement: New technology serves multiple products, multiple applications, and multiple user environments

Future Business Value

Criterion 1: Financial Performance

Requirement: High potential for strong financial performance in terms of revenues, operating margins and other relevant financial metrics

Criterion 2: Customer Acquisition

Requirement: Specific technology enables acquisition of new customers, even as it enhances value to current customers

Criterion 3: Technology Licensing

Requirement: New technology displays great potential to be licensed across many sectors and applications, thereby driving incremental revenue streams

Criterion 4: Brand Loyalty

Requirement: New technology enhances the company’s brand, creating and/or nurturing brand loyalty

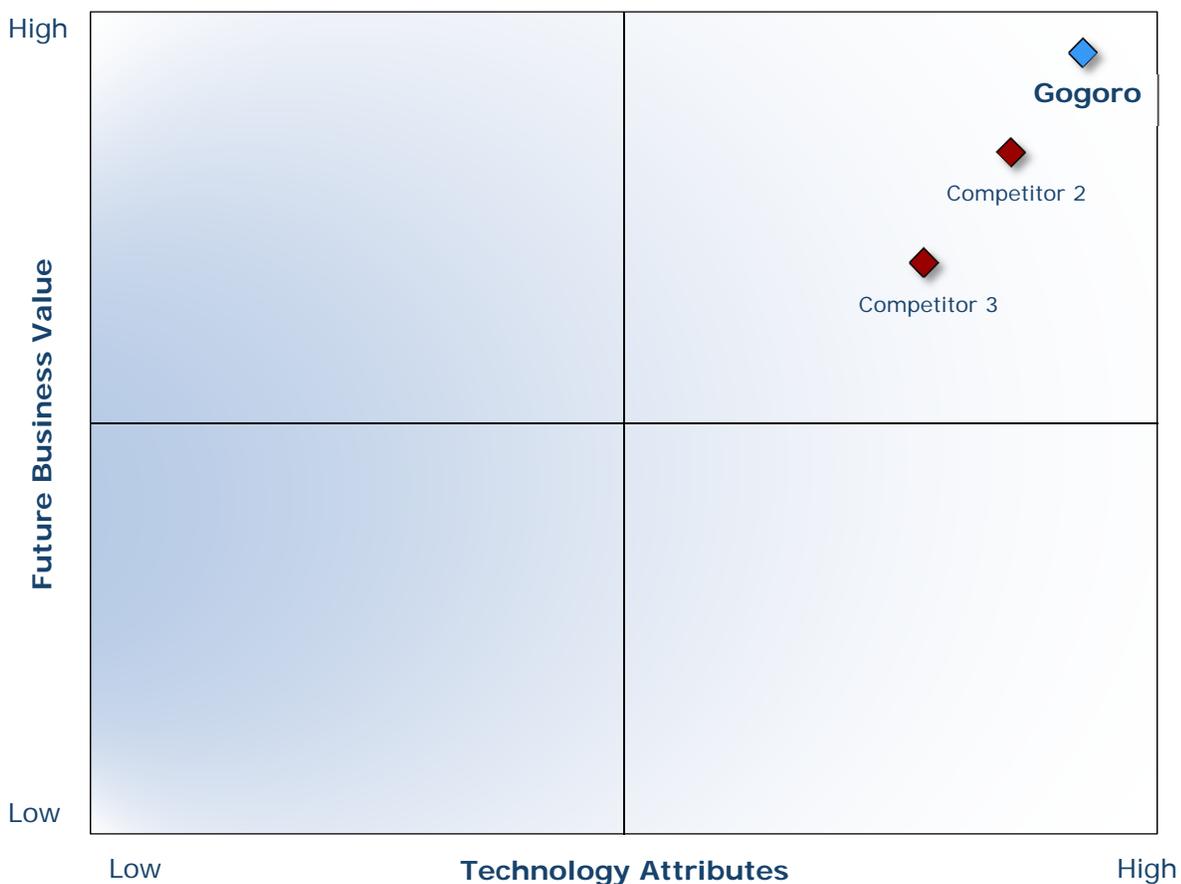
Criterion 5: Human Capital

Requirement: Customer impact is enhanced through the leverage of specific technology, translating into positive impact on employee morale and retention

Decision Support Matrix

Once all companies have been evaluated according to the Decision Support Scorecard, analysts can then position the candidates on the matrix shown below, enabling them to visualize which companies are truly breakthrough and which ones are not yet operating at best-in-class levels.

DECISION SUPPORT MATRIX FOR TECHNOLOGY INNOVATION AWARD



The Intersection between 360-Degree Research and Best Practices Awards

Research Methodology

Frost & Sullivan’s 360-degree research methodology represents the analytical rigor of our 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, leading to 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.



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

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

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

About Frost & Sullivan

Frost & Sullivan, the Growth Partnership Company, enables clients to 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 almost 50 years of experience in partnering with Global 1000 companies, emerging businesses and the investment community from 31 offices on six continents. To join our Growth Partnership, please visit <http://www.frost.com>.