ABB Recognized as the

2021

Company of the Year

GCC Electrification of Desalination Plants Industry

Excellence in Best Practices

FROST & SULLIVAN

Best Practices Criteria for World-Class Performance

Frost & Sullivan applies a rigorous analytical process to evaluate multiple nominees for each award category before determining the final award recipient. The process involves a detailed evaluation of best practices criteria across two dimensions for each nominated company. ABB excels in many of the criteria in the electrification of desalination plants space.

Driving the Need for Enhanced Energy-efficiency and Improved Process Optimization

The Gulf Cooperation Council (GCC) has a long history of employing seawater desalination (commencing with the GCC's first modern desalination plant in Kuwait in 1960[1]) as the most viable water production method owing to the region's climatic conditions (i.e., arid and semi-arid zones with limited freshwater supply) and geographic location (i.e., abundant coastlines). The escalating freshwater demand, driven by the ongoing urbanization and economic diversification in the water-scarce and water-stressed GCC countries, further increases the region's reliance on desalination plants. The GCC's desalination market has grown to account for approximately 40% of the global market.[2] Moreover, the Kingdom of Saudi Arabia (KSA) is the world's largest desalinated water producer, generating nearly one-fifth of the global capacity to fulfill 60% of its domestic water demand.[3]

Despite the pivotal contribution of desalination plants towards strengthening the GCC's water security, there are several challenges associated with this water treatment process. Firstly, desalination is a highly

[1] *Desalination in the GCC- The History, the Present & the Future* (General Secretariat of the Cooperation Council for the Arab States of the Gulf (GCC), 2014). Accessed from: https://www.gccsg.org/enus/CognitiveSources/DigitalLibrary/Lists/DigitalLibrary/Water%20and%20Electricity/1414489603.pdf

[2] https://www.zawya.com/mena/en/business/story/GCC_countries_have_the_highest_global_water_desalination_capacity_of_81_SEWA_chief-WAM20190310173147547/

[3] *Water in Saudi Arabia: Desalination, Wastewater, and Privatization* (US- Saudi Business Council, January 2021). Accessed from: https://ussaudi.org/water-in-saudi-arabia-desalination-wastewater-and-privatization/

energy-intensive process, with energy consumption comprising 20% to 50% of overall operational costs (depending upon the type of desalination technology used). Secondly, enhancing the operational effectiveness and overall productivity of desalination plants is paramount to ensuring the optimal utilization of water resources and maximizing cost savings. This need to improve the desalination process's energy efficiency and operational effectiveness drives the industry's digitalization, prompting significant business model changes. The industry has witnessed the formation of numerous public-private partnerships and the introduction of several new entrants, resulting in increased competition for established market players. To that end, companies offering solutions that improve the water-energy nexus by enhancing energy efficiency, augmenting productivity, improving asset performance, and reducing operational costs of desalination plants are likely to register robust growth in the coming years.

Setting New Benchmarks with Industry-leading Solutions in Landmark Projects

Switzerland-based ABB is a leading global technology company with more than 130 years of experience in offering industry-leading solutions across its electrification, process automation, motion, and robotics and discrete automation portfolios. With a long history, the company is present in over 100 countries with a workforce of 105,000+ employees. The company entered the GCC market with an agreement to deliver gas turbines to Saudi Arabian Oil Company in 1951. ABB secured its earliest desalination projects in the region in 1997 and 1998 for building gas-fired power and desalination plants in Bahrain and the United Arab Emirates (UAE), respectively. Over the years, the company has established a firm foothold and a significant installed base in the GCC with seven manufacturing locations and a team of 2000+ expert engineers. ABB maintains a direct presence in all six GCC countries and supports the complete business cycle, including manufacturing, project management and engineering, sales, and after-sales service.

> *"ABB's comprehensive portfolio of industry-leading products, expert services, and advanced digital solutions drive impressive outcomes for customers in the desalination sector, such as 20% to 30% savings on energy bills, 30% to 40% reduction in O&M costs, and 10% enhancement in asset life."*
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> ***- Nideshna Varatharajan, Senior Consultant***

ABB's desalination sector portfolio comprises complete solutions encompassing electrical systems, control and instrumentation systems, drives, motors, and mechanical packages designed to reduce energy consumption, enhance efficiency, and decrease operational and maintenance (O&M) costs. The company strives to address the sector's energy efficiency and asset optimization needs through the constant development and deployment of highly efficient products such as motors, transformers, variable speed drives (VSDs), and soft starters. In addition to these differentiated products, the company's long-standing expertise in water services helps it deliver customized solutions. ABB's industry experts work closely and continually with engineering, procurement, and construction (EPC) companies to design efficient, safe, and reliable desalination projects. The company also offers accurate energy audit services for desalination plants and supports customers with necessary process modifications to reduce their overall energy footprint.

Some examples of ABB's market-leading solutions for the electrification of the desalination sector include:

- State-of-the-art power distribution solutions used to distribute electricity safely and effectively ensuring a constant, reliable availability of power. Digital switchgear which has low energy losses, lesser footprint and smart capability enables 30% energy savings, 15% reduction in space & weight and 40% reduction in operating cost.
- ABB's pioneering ultra-low harmonic (ULH) drives reduce harmonic content by 97% (compared to conventional drives), exceeding the requirements set by low harmonic standards. ULH drives mitigate the losses in the mains supply, improve the mains quality, and alleviate the risk of equipment disturbance.
- ABB's innovative high-speed bus transfer solutions improve the reliability and efficiency of desalination plants by eliminating the losses associated with critical load disturbances.

ABB is at the forefront of facilitating the ongoing digitalization revolution in the GCC's desalination market. The company's targeted digital solutions support process optimization and O&M cost reduction by gathering and analyzing data from desalination plant components to generate actionable insights and facilitate predictive maintenance capabilities. For instance, the ABB AbilityTM Condition Monitoring tool which enables full visibility and complete transparency on critical operational parameters for assets such as circuit breakers, contactors, relays, drives, motors, pumps, and mounted bearings. The solution collects the data from the built-in smart sensors and meters in the assets and stored in premise or on the cloud and is further accessed and analyzed to track the equipment's status and condition. Moreover, ABB enables seamless communication and interoperability between all the intelligent electrical equipment in a desalination plant via the International Electrotechnical Commission 61850 standards, ensuring completely integrated operations. Furthermore, ABB Ability™ employs a monitoring portal to offer a unified, real-time view of the individual desalination plant assets' operational parameters. Additionally, detailed dashboards provide easy and ready access to this collected data and the corresponding insights, empowering designated staff to conduct predictive maintenance activities. This capability enables plant operators to reduce equipment downtime, extend asset lifetime, lower costs, improve plant safety, and increase process profitability.

ABB's comprehensive portfolio of industry-leading products, expert services, and advanced digital solutions drive impressive customer outcomes in the desalination sector, such as 20% to 30% savings on energy bills, 30% to 40% reduction in O&M costs, and 10% enhancement in asset life. Moreover, ABB's success in operating costs reduction of desalination plants (which constitute 70% to 80% of the total cost of ownership) delivers exceptional price/performance value across all products and services. As a result, customers consistently choose ABB to support the electrification needs of prominent and challenging desalination projects in the GCC.

Use Case I: The world's largest desalination plant in Taweelah, Abu Dhabi, UAE, will use ABB's technology.[4] This $500-million project will set new benchmarks in the desalination sector for its size,

[4] https://new.abb.com/news/detail/75946/abb-technology-to-power-worlds-largest-seawater-desalination-project#:~:text=ABB%20technology%20is%20being%20used,demands%20of%20over%20350%2C000%20households.

energy efficiency, and overall cost with the lowest energy consumption per cubic meter of water produced. Expected to become fully operational in the fourth quarter of 2022, the plant will process over 900,000 cubic meters of seawater daily to serve 350,000 households. SEPCOIII, the EPC contractor, is scheduled to use 30 panels of ABB's medium-voltage switchgear and 250 panels of low-voltage switchgear equipped with digital capabilities. The company will also deliver a wide range of low and medium-voltage motors and VSDs to ensure optimized operations, reduce costs, and maximize energy savings.

Use Case II: Saline Water Conversion Corporation selected ABB's digitally enabled medium-voltage VSDs to reduce the energy consumption and lower the total cost of ownership for its desalination plant in Jubail, KSA.[5] With a daily output capacity of 400,000 cubic meters of processed water, the plant is one of the most prominent projects in the region. SEPCO Electric Power Construction Corporation, the project's EPC, is scheduled to install 56 units of the company's ABB Ability™ Condition Monitoring digital services equipped with ACS2000 medium-voltage VSDs.

Frost & Sullivan commends ABB's remarkable success in addressing the energy efficiency, operational optimization, and cost reduction needs of its GCC customers with its diverse portfolio of digitally-enabled and differentiated offerings in the desalination sector.

Leveraging Local Market Expertise to Deliver Global Solutions

ABB's acknowledged market expertise, together with its global technology leadership and strategic regional presence, uniquely positions the company to support its GCC customers on their digital transformation journeys. A local footprint and an in-depth understanding of client mindsets are essential to prompt reluctant regional customers to adopt novel digital solutions. Differentiating itself from its peers, ABB operates a Digital Solution Center targeted towards its regional customers to help them digitally upgrade existing plants. Moreover, the company's digital solutions are modular and scalable from equipment to plant and network levels. This scalability allows customers to digitalize a small section of their desalination plants, evaluate the benefits of the technology, and then decide to expand across the entire project. Furthermore, the digitalization process does not warrant the need to strip down existing hardware but allows customers to start with small, simple, and inexpensive equipment upgrades. ABB has witnessed considerable success with this approach.

> *"ABB's vast and comprehensive service ecosystem allows the company to address all of its customers' needs (ranging from spare parts and technical support to remote cloud-based monitoring solutions), enabling it to deliver exceptional customer value consistently."*
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> ***- Sama Suwal, Best Practices Analyst***

ABB strives to deliver solutions that add value to customers' businesses by addressing specific pain points. The company collects customer feedback through numerous direct and digital channels to accurately capture changing customer needs and evolving market demands. Firstly, ABB's sales and technical promotions teams are in continual contact with industry consultants and contractors, drawing

[5] https://new.abb.com/news/detail/79773/abbs-medium-voltage-drives-to-ensure-efficient-and-reliable-pumping-in-major-desalination-plant-in-saudi-arabia

valuable feedback on emerging needs and market trends. Secondly, the company regularly gathers customer feedback through its extensive partner network. Moreover, ABB assesses customer satisfaction through its customer resolution process on its website and its annual net promoter score surveys.

ABB stands out due to its ability to draw from its extensive expertise across several industry verticals and broad water-related project experience to solve existing and emerging issues in the desalination sector. Moreover, ABB further differentiates itself due to its expansive global footprint, complemented by its external ABB Value Providers network, allowing it to engage with and serve customers irrespective of their physical locations. This capability is particularly pertinent to the GCC desalination market, which has a significantly scattered value chain with public utilities, EPC companies, and consultants often operating out of different geographies. At the same time, ABB leverages its robust regional presence to support its GCC customers with on-ground project management and engineering support during testing, commissioning, construction, and operation of plants. For instance, the company offers customers technical advice on dimensioning through to potential energy savings right from purchasing equipment such as medium & low voltage switchgear, UPS, VSDs, motors, and bearings. ABB then supports customers throughout the installation, commissioning, operation, and maintenance phases of the assets' lifecycle, even providing preventive maintenance programs tailored to a project's specific needs. Moreover, the company's engineers proactively contact customers to disseminate information about the most efficient replacement options, upgrades, and retrofit opportunities for registered equipment. ABB's vast and comprehensive service ecosystem allows the company to address all of its customers' needs (ranging from spare parts and technical support to remote cloud-based monitoring solutions), enabling it to deliver exceptional customer value consistently.

ABB utilized its digital capabilities to uphold outstanding customer value and ensure uninterrupted service during the COVID-19 pandemic. The company offered remote monitoring and assistance services to support the efficient maintenance of desalination plant assets. ABB introduced innovations such as intelligent virtual reality to enable engineers in remote locations to monitor and advise on-ground personnel regarding the project's O&M and fault rectification needs. Moreover, ABB mitigated project delays by digitalizing the factory acceptance test (FAT) for new equipment. This capability allowed customers to remotely view the FAT tests and confirm the equipment meets their required specifications before digital sign-off and shipment to the site. These measures ensure optimal customer satisfaction with the company's products and services. Furthermore, ABB maintained ongoing communications with its customers through digital means such as virtual events, webinars, and customer sessions in addition to conventional communication avenues. This approach reinforced the company's brand visibility, supporting the company's credibility in the GCC desalination space.

Frost & Sullivan believes ABB's commitment to delivering superior customer value under all circumstances, its focus on strengthening its technological excellence, and a vision to drive a sustainable future for the industry cements its leadership in the GCC market in the coming years.

Conclusion

The prominent Gulf Cooperation Council (GCC) desalination market drives the need for electrification solutions that enhance the energy-efficiency and optimize the productivity of the desalination plants. Switzerland-based global technology leader ABB leverages its diverse portfolio of digitally-enabled and differentiated offerings, strong regional presence, and extensive market expertise to address the specific needs of its GCC desalination customers. The company's ability to deliver impressive outcomes, such as 20% to 30% savings on the energy bill, 30% to 40% reduction in operational and maintenance (O&M) costs, and 10% enhancement in asset life enables it to secure prominent desalination projects in the region consistently. Moreover, ABB's commitment to delivering superior customer value under all circumstances, its focus on strengthening its technological excellence, and a vision to drive a sustainable future for the industry cement its leadership in the GCC desalination market. With its strong overall performance, ABB earns Frost & Sullivan's 2021 GCC Company of the Year Award in the electrification of desalination plants market.

What You Need to Know about the Company of the Year Recognition

Frost & Sullivan's Company of the Year Award is its top honor and recognizes the market participant that exemplifies visionary innovation, market-leading performance, and unmatched customer care.

Best Practices Award Analysis

For the Company of the Year Award, Frost & Sullivan analysts independently evaluated the criteria listed below.

Visionary Innovation & Performance

Addressing Unmet Needs: Customers' unmet or under-served needs are unearthed and addressed by a robust solution development process

Visionary Scenarios Through Mega Trends: Long-range, macro-level scenarios are incorporated into the innovation strategy through the use of Mega Trends, thereby enabling first-to-market solutions and new growth opportunities

Leadership Focus: Company focuses on building a leadership position in core markets and on creating stiff barriers to entry for new competitors

Best Practices Implementation: Best-in-class implementation is characterized by processes, tools, or activities that generate a consistent and repeatable level of success

Financial Performance: Strong overall business performance is achieved in terms of revenue, revenue growth, operating margin, and other key financial metrics

Customer Impact

Price/Performance Value: Products or services provide the best value for the price compared to similar market offerings

Customer Purchase Experience: Quality of the purchase experience assures customers that they are buying the optimal solution for addressing their unique needs and constraints

Customer Ownership Experience: Customers proudly own the company's product or service and have a positive experience throughout the life of the product or service

Customer Service Experience: Customer service is accessible, fast, stress-free, and high quality

Brand Equity: Customers perceive the brand positively and exhibit high brand loyalty

About Frost & Sullivan

Frost & Sullivan is the Growth Pipeline Company™. We power our clients to a future shaped by growth. Our Growth Pipeline as a Service™ provides the CEO and the CEO's growth team with a continuous and rigorous platform of growth opportunities, ensuring long-term success. To achieve positive outcomes, our team leverages over 60 years of experience, coaching organizations of all types and sizes across 6 continents with our proven best practices. To power your Growth Pipeline future, visit Frost & Sullivan at http://www.frost.com.

The Growth Pipeline Engine™

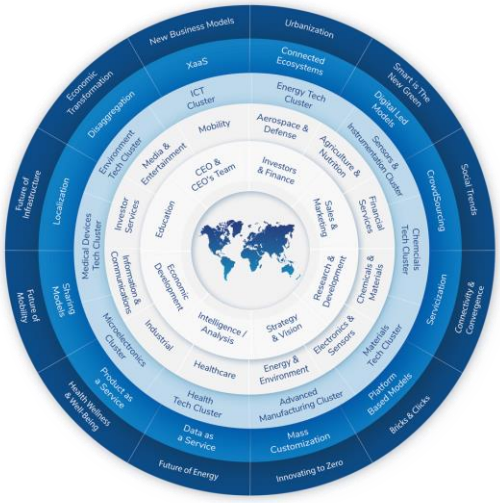
Frost & Sullivan's proprietary model to systematically create on-going growth opportunities and strategies for our clients is fuelled by the Innovation Generator™. Learn more.

Key Impacts:

- **Growth Pipeline:** *Continuous flow of Growth opportunities*
- **Growth Strategies:** *Proven Best Practices*
- **Innovation Culture:** *Optimized Customer Experience*
- **ROI & Margin:** *Implementation Excellence*
- **Transformational Growth:** *Industry Leadership*

The Innovation Generator™

Our six analytical perspectives are crucial in capturing the broadest range of innovative growth opportunities, most of which occur at the points of these perspectives.



Analytical Perspectives:

- Mega Trend (MT)
- Business Model (BM)
- Technology (TE)
- Industries (IN)
- Customer (CU)
- Geographies (GE)