

A photograph of several wind turbines standing in a body of water at sunset. The sky is a mix of blue and orange, with the sun low on the horizon. The turbines are silhouetted against the bright sky, and their reflections are visible in the calm water. An orange diagonal shape covers the bottom-left corner of the image, containing the text.

OMAN POWER, WATER & SUSTAINABILITY

SPECIAL REPORT

thebusiness|year

THE BUSINESS YEAR: POWER, WATER & SUSTAINABILITY SPECIAL REPORT

Although Oman's power and water sector has great growth potential, during the period we conducted our research, demand has drastically fallen, opening up opportunities to replace conventional power with renewables through new technologies and further cementing the utilities sector as a front-runner in embracing innovation. Moreover, the utilities sector leads the way in PPPs, privatizations, foreign joint-ventures, and deployment of new technologies to drive down costs and increase customer experiences.

During our interviews, we learned how technological applications are impacting the power industry both at strategic and operational levels. Following the consolidation under NAMA Holding, the gradual sell-off of players across the power chain to international strategic partners is justified by one underlying goal: efficiency. This ambitious privatization program has so far seen the sale of up to 49% of shares in Oman Electricity Transmission Company and the sale of up to 70% of the shares in Muscat Electricity Distribution Company, Majan Electricity Company, Mazoon Electricity Company, and Dhofar Power Company. Future purchasers will be evaluated on their ability to implement high-tech, disruptive processes and IoT-based solutions that optimize cost-structures will raise productivity. In the words of NAMA Group CEO, this is deemed essential to improve customer experience and cut losses.

Progress toward sustainability proceeds at

two speeds. While Be'ah and the waste management sector is still focused on local coverage, technological solutions providers such as Glasspoint are ready to scale their innovations on a global level with different applicability. Further good signs come from the hydrogen industry; what was once speculation is turning into concrete projects and a reliable energy alternative.

While this edition goes to print, ACWA Power has just announced it had secured USD275 million from six lenders to complete the finance for the USD400-million, 500-MW Ibri II solar project, which will be funded on a 70:30, debt-to-equity basis. The announcement aligns with the government's vision of renewable energy as an enabler economic diversification and long-term economic sustainability. We have also asked banks their opinion on sustainable finance, receiving extremely positive feedback. "International investors are allocating a big portion of their investment criteria into sustainable and green financing" told us Standard Chartered - Oman CEO, Hussain Al Yafai. On the matter, former HSBC Oman CEO, Andrew Long, stated "while instruments such as green bonds may not offer financial advantage today, soon they will."

As Oman continues deals with extraordinary pressures on the oil market and as a result of the pressures brought by COVID-19, this special report on the power, water, and sustainability environment is a crucial snapshot as a sector on the verge of unprecedented relevance. ✖

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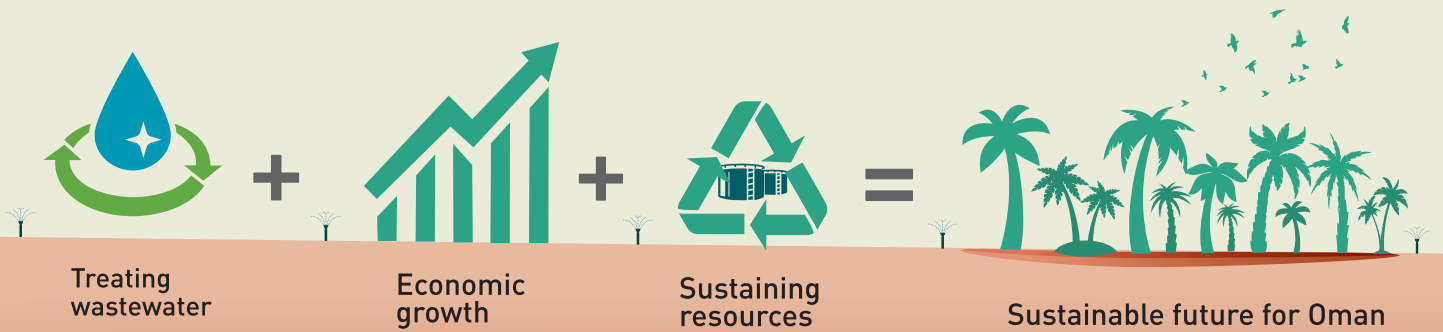


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Reusing wastewater. Balancing the demand and supply of water in Oman.

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balanced GROWTH



Mohammed bin Salim bin Said al Toobi
MINISTER OF ENVIRONMENT
AND CLIMATE AFFAIRS

“The Sultanate seeks to achieve balance in development in all regions, including rural and urban areas, and optimal exploitation and sustainability of natural resources.”

What is the key to strike a balance between a top-down and bottom-up approach to reach the highest standards of environmental sustainability in rural locations in Oman?

The Sultanate pays great attention to the environment and its protection from the adverse effects of pollution in order to preserve its components and sources. The Sultanate provides a unique example in the preservation and protection of the environment, as it has a prominent place at the regional and international levels for its distinguished achievements in conservation of environment and wildlife placing it among the ranks of developed countries. The deterioration of environmental, social, and economic conditions in rural areas leads to high rates of migration to urban areas, especially in middle-income and least developed countries. The quality of life in the countryside has declined in most Arab countries for various reasons, the most important of which is the focus in development programs on solving the problems and needs of urban areas while neglecting the allocation of sufficient resources for the development of rural areas. The Sultanate seeks to achieve balance in development in all regions, including rural and urban areas, and optimal exploitation and sustainability of natural resources in rural areas by the competent authorities. The key to achieving balance in these aspects is through integrating social aspects and community opinion in rural areas in the development of these areas, taking their recommendations in decision-making, and realizing the relationship between society and its environment.

What are the main opportunities for the private sector to engage in addressing the challenges of desertification, land degradation, reduction in vegetation, drought, and loss of biodiversity?

Addressing these above issues is not limited to government agencies alone; the private sector also has a major and significant role in this aspect through the management and mitigation of degraded land use

The ministry's initiatives to monitor waste production and encourage companies to recycle and reuse processes will help Oman move in the right direction regarding waste management.

activities, restoration of degraded lands, and making use of ecosystem services, in particular Oman's wild plants and trees, using an approach based on the sustainable use of natural resources and the conservation of the ecosystem by: providing clear guidelines for environmental management and land rehabilitation, especially around oilfields and mining areas; introducing community-based management of grazing at open spaces and exploiting non-timber forest products (such as frankincense and honey); investing and making use of mesquite (*prosopis juliflora*) by using their wood as firewood and for charcoal production; establishing nurseries to propagate wild plants and trees and encouraging people to plant them; and the national initiative to plant 10 million wild trees of Oman. Finally, private sector sewage companies shall provide water for projects concerned with combating desertification and land degradation in regions and sites located near sewage plants.

What is your assessment on the country's path to divert waste by recycling and waste to energy projects?

Reducing waste production from different economic activities and increased population growth is one of the challenges facing many countries around the world, but the government always seeks to enhance the participation of the private sector in providing various services and advancing the development process in all sectors, including the waste sector. Since Oman Environmental Service Holding Company S.A.O.C (be'ah) has been granted the mandate for waste sector management and operation in the Sultanate, the company, in coordination with the ministry and other relevant entities, establishes many facilities for receiving, treatment and final disposal of non-hazardous solid waste and health care waste in all regions of the Sultanate. Also, there are many investment projects provided for the private sector to invest in, such as construction and demolition waste recycling projects, used tires recycling projects, waste into energy projects, production of biogas from waste, and other projects. The steps the ministry is taking to strengthen inspection and control of industrial and service establishments to urge them to reduce waste production and encourage them to recycling and reuse processes will enable the country to go on right direction regarding waste management in the next stage. ✖

BIO

Mohammed bin Salim bin Said al Toobi is the current Minister of Environment and Climate Affairs. He has 18 years of experience working with Petroleum Development Oman (PDO). He holds a degree in human resource management and is member of the Shura Council for Nizwa as well as the Environment Society of Oman (ESO).

power PLAY

With new technologies and opportunities in renewable energy on the horizon, Nama Group has put in place initiatives to further promote decentralization and electrification.

Omar Al Wahaibi
CEO,
NAMA GROUP



What stage is Oman currently at in terms of the power industry's privatization, and what will be the main implications of these efforts? As mandated by the government, Nama Holding has launched a partial privatization program, divided into five milestones, for Nama Group's electricity transmission, distribution, and supply companies by way of equity divestment to international strategic partners. We announced the sale of up to 49% of its shares in Oman Electricity Transmission Company (OETC) and the sale of up to 70% of its shares in its distribution and supply companies respectively: Muscat Electricity Distribution Company (MEDC), Majan Electricity Company, Mazoon Electricity Company, and Dhofar Power Company. For OETC and MEDC, this was done in October 2018. In December 2018, 23 companies expressed their interest to participate in OETC and MEDC privatizations, either individually or in consortia. As such, we appointed a consortium of advisors, led by Lazard Freres and London Economics, assisted by five other expert consulting firms, for this privatization program.

What does the increase in smart meter penetration mean for Oman's broader power sector, and what will be the major impact on the commercial, industrial, and government accounts?

Nama Group launched an automatic meter reading system (via the telecommunication network) for high-value and cost reflective tariff (CRT) customers to record their readings on an hourly basis. This technology improved reading quality and tracking consumption per hour, helping customers understand their consumption patterns, and enabled the implementation of the CRT. The project

has been implemented successfully to completion and enables the reading of 50% of electricity consumption in the country via automatic means and on an hourly basis. The number of customers in this category represent only 1% customer penetration.

How do you project the progress in energy storage solutions and efficiency of solar panels to impact the power sector in Oman, and what opportunities are there for the private sector to engage with?

The level of solar power density in Oman is considered among the highest in the world and can potentially meet the ever-growing demand for electricity in the country. Despite the abundance of solar energy, the storage mechanism is still not affordable. Nevertheless, if the storage technology evolved quickly on both the technical and economic fronts, and prices begin to fall, this will result in a radical shift in the overall power generation sector reducing dependency on conventional power plants. For this reason, a number of SMEs have shown great interest in the solar energy, as there are currently 15 qualified companies whose main business activity is rooftop solar panel installation. Tanweer's 11-site hybrid project includes storage system as a main component in the design, which was floated at the end of 2019, and we expect to reduce the electricity generation cost.

How do you expect IoT and the advent of Industry 4.0 to innovate the utilities market in Oman and the region, and what will be the major regulatory challenges with the technological disruption?

Studies show that new emerging technologies will significantly affect the cur-

"The level of solar power density in Oman is considered among the highest in the world and can potentially meet the ever-growing demand for electricity in the country."

rent electricity market environment, structure, and requirements. These trends are most notably electrification, decentralization, and digitalization. As for electrification, emerging technology themes such as power-to-mobility have a substantial power requirement and will might require capacity upgrades. With regard to decentralization, the increasing feasibility of decentralized energy solution will be prompted by the falling costs of energy storage systems and renewable energy system, coupled with flexible demand management models that reduce peak loads. Finally, digital networks including digital grids, smart meters, smart cities, sensors, and control systems will have a broader impact on the technological revolution.

What are Nama Group's strategic priorities for 2020 with regards to water and wastewater restructuring?

We continue to work closely with the Public Authority for Water to restructure the water sector, spearheading the execution of the 20-month long detailed design and implementation phase, which was initiated in April 2018 and is moving forward as planned. ✖

INTERVIEW



BIO

Abdullah Al Rawahi was appointed CEO of Al Kamil Power in 2017. He holds a master's degree in industrial engineering and bachelor's degree in mechanical engineering from Sultan Qaboos University. Al Rawahi has been associated with power plant operations and management in various power plants for over 22 years.

Abdullah Al Rawahi
CEO,
AL KAMIL POWER

What have been the main highlights over the last two years, and what is your strategy for 2020 and the pillars supporting this strategy?

As a power company, our business model is straightforward, because we have a power purchase agreement (PPA) with OPWP. Al Kamil started in 2002, signed the PPA up to the end of 2017, and negotiated an extension up to the end of 2021 with OPWP. Starting from 2022, OPWP will launch a new way of tendering for another PPA. First, it did stage one in which it set a benchmark equal to the new player. If these companies accept that, they do not need to bring a new player.

How do you see the future of electricity market in Oman?

In general, OPWP is stopping most new thermal plants and is instead looking to expand its

involvement in renewables. The main target is to reduce gas consumption and boost efficiency. In September 2019, gas consumption was reduced by 9.4% YoY, though there was an increase in generation. This means Oman is pushing for the use of gas more for industry and reduce it in power plants. Oman is heading toward a spot or wholesale market, where generators and investors are exposed to more risks.

How advanced is Oman regarding smart grid solutions?

With the advent of renewables, smart grids are necessary because you need to quickly adjust to changes and keep the provision of power constant. Previously, there were only plants operated by fuel gas, which was easy to manually switch on and off; however, now with the mix of energy sources, it is complicated and has to be managed by AI. This means adopting fast calculations and responses, big data, and so forth. ✕

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Saleh Al Rumhi
CEO,
RURAL AREA ELECTRICITY
COMPANY (TANWEER)

“Wind potential is strong in southern Oman, and solar potential is strong in the north.”

BIO

Saleh Al Rumhi has held several senior management positions in his career over the past 20 years. He is currently CEO of Tanweer. He served as non-executive director deputy chairman to the board of directors at Oman Power and Water Procurement Company and Electricity Holding Company (Nama Group). His previous executive positions include the general manager policies and strategies in the Public Authority for Electricity, senior manager privatization and restructuring, privatization manager at Electricity Holding Company. Before that, he held a number of positions at Petroleum Development Oman. He holds an MBA from University of Hull, UK, and a BNG in electrical & electronic engineering from Sultan Qaboos University.

renewable energy ON THE HORIZON

Tanweer's target is to achieve 20% of its capacity from renewable energies by 2025, along with Oman-wide water and electricity security.

What were the main highlights of 2019 and your expectations for 2020 in this regard?

We have looked at recent developments in renewable energy, whether solar, wind, or other options, and at the ease of disposal of diesel, subsidies, and environmental factors, to determine if they are feasible. Oman's National Vision also has the goal of 30% renewables by 2030, so Tanweer is a contributor to the country's wider vision. In 2019, one of our achievements was to take over a 50-MW wind project. That was commissioned, handed over to us, and is in the operational stage contributing to the grid in southern Oman. We are also in an advanced stage with respect to other renewable energy procurement activities. We have identified 11 sites where we have done expressions of interest and the pre-qualification stage. Hopefully in 2020, we will finalize the procurement cycle for these 11 renewable energy sites and then award these projects. Besides these activities, Tanweer is also involved in efficiency improvements and competencies development as we look to the renewable energy horizon.

What will be Tanweer's main procurement activities in 2020 in each of its licensed areas?

For Phase I of our hybrid renewable projects for the 11 sites, we have already passed the pre-qualification stage. We are now onto the technical bidding stage. This is why we have only qualified 15 out of the 60-plus consortiums that expressed an interest. We are at the stage where the consortiums have to submit their technical proposals for maximizing renewable energy resources and improving efficiency. The 15 consortiums are a mix of local and international portfolios of companies. It is encouraging to see this mix of different types of commercial arrangements. We are not sure if all of them will continue through the tendering stage or if some will drop out because there are elements of these 11 sites that are extremely challenging. We are working on Phase II of

our renewable hybrid program, and it will come once we have identified a few more sites. However, we want to go through the learning cycle of this first phase before we move on to other projects.

The 50-MW Dhofar Wind farm is an important milestone for the GCC region. What does it mean for Oman's energy mix, and what role will wind energy have in completing Oman-wide electricity coverage?

Wind potential is strong in southern Oman, and solar potential is strong in the north. Dhofar is the first of many wind projects in the pipeline. Having 50MW is insignificant in terms of the overall potential in that area. Any investment in wind technology would have to cope with the demand in that area. In the future, we expect there to be inter-connection between the north and south. If that happens, we will be able to add much more capacity than 50MW. It will definitely be a significant contributor to Oman's energy mix; however, the main driver will be the planning of these projects to cope with the growth in demand, as well as the inter-link between north and south Oman. The interlink project is progressing and will go all the way to Duqm in Phase I, which will be operational by 2023.

Will we witness any milestones in 2020 regarding these disruptive technologies?

Yes, automatic meter reading is one of them. That will be a game-changer. Instead of manual readings and issuing of bills, we are moving more toward automated meter readings and green bills. The water sector has stopped printing bills. We have to do that too, but in a way that is controlled and managed. We do not want to leap into disruptive technology that leads to immediate unemployment. For example, we have a number of meter readers, so changes such as introducing smart meters have to include re-skilling those people into other fields, such as analytics. ✖

INTERVIEW



Hussain Hassan Ali Abdul Hussain
CEO,
HAYA WATER

LOOKING *at the big picture*

Haya Water is looking at raising its standards and push forward restructuring that will eventually help it expand into the region GCC.

What were your key highlights of 2019, and how do they reflect your strategy for both the short and medium-term?

The key achievement of 2019 was we started commissioning the Al Amarat plant, which was delayed for a few years. We also finished two projects linked to Al Amarat that allowed to increase the number of connected people—from 116,000 to 126,000 in Muscat and from 34,000 to 39,000 in RG. We managed to install IVMS on all yellow tankers, which led to an increased number of trips to STP with the wastewater tankers from close to 250,000 to almost half a million. From a technology point of view, one of the key projects for us is converting sludge into energy, and we will spend more resources on that. Our focus is to move quickly, especially for the big project execution, hoping to get more funds in the coming years. There is a long way to go, especially in reverse osmosis, where connectivity is almost 4-6%. Within these short-term targets, our medium-term strategy is to expand internationally. This big picture thinking will allow us to solve our local issues and raise our standards, pushing forward a restructuring that will then help us expand into the GCC and other Arab countries.

What does the new PPP law mean for the utilities, and where do you see gaps within Oman's wastewater industry?

A new PPP and Privatization Law were implemented at the end of 2019, which shows how seriousness the government is about private partner involvement. On our side, we are looking to engage with a private player in the Misfaa STP project to help bring funds and develop it faster, better, and cheaper than Haya Water. We want to learn from them, as this will help our goals for international expansion.

How is this increased efficiency playing a role in the push to get SMEs into the ecosystem?

SMEs are key for Haya Water, and we started looking at them in 2013, before Riyaada was established in the market. We had a plan as part of our 2014 KPIs to develop and support SMEs, and we have already won two awards from Riyaada as a large company supporting SMEs. In

2019, we awarded contracts to 10 SMEs to do wet connections in Al Amarat, and they are doing an excellent job at a lower cost than main contractors. Slowly, small projects around OMR1-1.5 million can be given to SMEs. When water pipes are short and straight, it is easy; however, with wastewater, the pipes are longer in different directions, and it can be difficult for SMEs to take on such projects. We slowly gear them up for that. In 2019 and 2020, we carried out training programs for SMEs in three batches, 47 SMEs in 2020 alone. We instructed them on how to bid for projects, bookkeeping, and finance, and how to prevent the common mistakes made when bidding for our jobs.

What are your strategic priorities for 2020?

The market is extremely dynamic at the moment, and there are many forces. COVID-19 has driven oil prices to below USD30, and, as the budget was based on USD58, on a daily basis we lose USD28 million. Therefore, we have to borrow that money in order to meet the budget requirements, and we are all affected by the developments. The government has told us how much we will get this year; however, if it does not have money, we will have to reduce our budget. We need to work through those scenarios and risks, as 2020 has been a challenging year. ✖

“SMEs are key for Haya Water, and we started looking at them in 2013, before Riyaada was established in the market. We had a plan as part of our 2014 KPIs to develop and support SMEs, and we have already won two awards from Riyaada as a large company supporting SMEs.”

BIO

Hussain Hassan Ali Abdul Hussain became the CEO of Haya Water in 2012. He brings with him 24 years of experience in oil and gas projects, business operations, and commercial developments in Oman. He graduated from the University of Arizona and spent 14 years working for Petroleum Development Oman.



Ahmed Al Subhi
MANAGING DIRECTOR,
ACWA POWER OMAN



Antonio Olivas
MANAGING DIRECTOR,
AQUALIA - OMAN

BEST INTERNATIONAL PRACTICES

An increase in water and power demand in Oman is pushing the government and industry to reorganize the market and use technology to create greener ways to meet the increasing demand.

Where does the power generation sector in Oman currently stand in terms of demand and supply?

AHMED AL SUBHI Although Oman's power and water sector has great growth potential, current demand has drastically fallen in response to the slowdown in the economy. This has given the government the opportunity to develop an ambitious plan to replace conventional power with renewables. By 2030, Oman needs to secure 30% of its installed capacity from renewables as part of the government's diversity mix. The government will make the necessary changes depending on the need to secure competitive rates or reduce risk. The Omani government has launched the spot market, which is a step toward the merchant market, highlighting a transition strategy that will eventually liberalize the industry and reduce the subsidy burden on the government.

What strategy did you adopt to enter Oman, and what was the driver behind this decision?

ANTONIO OLIVAS In 2018, Aqualia and

Majis Industrial Services entered in a strategic JV, Oman Sustainable Water Services (OSWS), to capture value across the entire water supply cycle, with each player owning 49% and 51% of the shares, respectively. As a global player with expertise in all aspects of the water supply cycle, we valued the deep local knowledge of the Majis team. The goal is to start from Sohar Port and expand organically in the Sultanate, tackling both industrial and residential sites. We are working to be one of the most customer-centric companies in Oman. To get there, we are committed to hiring exceptionally talented, bright, and driven people. Development is always linked to skills, and a young work force is the most powerful tool a country has. In this regard, our involvement with local talent is one of our main concerns.

What role will technology play in determining the path Oman will undertake in the medium-term in both power and water?

AAS The biggest impact of technology will be felt in replacing the combined cycle natural gas plants. Solar plants using con-

centrated solar power (CSP) is a proven technology and a positive solution moving forward. Their scalability depends on how fast the government pushes for implementation, since their price has drastically changed over the last 10 years, from being 10 times the cost of conventional power to less than 2% today. Recent technological shifts have also forced many utilities to consider highly efficient coal-fired power plants. Their environmentally friendly design has made this option valuable, as cost has become competitive with diversified energy solutions. Meanwhile, desalination is also driven by technology. Most GCC governments, and Oman in particular, have decided to use reverse osmosis because it is cheaper compared to multi-stage-flash distillation (MSF). As such, the key to win tenders is bringing new technologies and adopting innovative models to desalination processes. At times, it is about using organic fiber membrane, or even combining different technologies, especially at the early stage, to reduce the energy and environmental footprint.

AO The players in the Omani water industry are well-defined and fully engaged, but there will be considerable pressure around water access in the coming years, with a huge potential to bring efficient solutions in operations and management. Market fragmentation allows the government to explore options that let the government concentrate operations in a way that fixed costs are shared. At the same time, technology allows for those efficiencies to be created on different levels. The water management industry in Oman is under restructuring process, and there are many different public entities like the Oman Power and Water Procurement Company (OPWP), Diam, and Haya Water that are playing and will play an important role in the future of Oman's water sector. Efficiency improvement in the water distribution system will impact water production and treatment, so construction plans of new reverse osmosis plants and treatment plants could vary. There must be total alignment to work together to accomplish the targets. There are many desalination plants projects ongoing in Oman. It is a challenging and competitive market because it requires technical and financial capabilities from private companies to guarantee water supply for Oman's increasing population. This increase in water demand must be covered by new projects and improvement in the other areas of management including distribution, treatment, and reutilization. ✖

INTERVIEW

waste not WANT NOT

be'ah is committing the Sultanate to a sustainable future, one plastic bottle at a time.

Tariq Ali Al-Amri
CEO,
be'ah

Waste management can create many jobs opportunities

Biodiesel is investor niche

BIO

Tariq Ali Al-Amri became CEO of be'ah in 2011, bringing more than 26 years of experience spanning over many industries. He started his career as a project engineer working for Petroleum Development of Oman (PDO) and later joined a government pension fund as head of investment. He then moved to Oman LNG as head of strategic finance, where he was responsible for the economics of Qalhat LNG project. In 2004, he joined Omantel as head of finance before he was assigned the role of vice president responsible for the commercial, finance, HR, and corporate affairs. Al-Amri holds an MBA and BSc in electrical engineering, both from the US.

How has your strategy to expand and cover the whole country evolved over the last year, and what have been the major highlights?

We have come a long way since we embarked on our journey to provide sustainable waste management practices in the country. We have closed down over 300 traditional dumpsites across the Sultanate. Our strategy for developing municipal solid waste (MSW) involved setting up the required infrastructure of engineered landfills and transfer stations in all governorates and outsourcing 10 service contracts to cover the collection and disposal of municipal waste across the country. We have established 10 engineered landfills and 14 transfer stations so far and all are operational. For healthcare waste, we are using a network of three healthcare waste treatment facilities treating waste generated from all governmental and private hospitals and clinics. We are also handling industrial hazardous waste at our established facilities in North Al Batinah and in Duqm. These facilities are part of our integrated hazardous waste treatment facilities. The second phase of this project will witness the establishment of an incineration unit, a physical and chemical treatment unit, and a solidification unit. The completion of the integrated hazardous waste treatment facilities shall bring a sustainable solution for the treatment of industrial hazardous waste and provide the required support for our industrial sector. In reference to our strategic goal of reducing the amount of waste disposed at landfills, our diversion strategy paves the way for the initiatives and projects that are in the pipeline to achieve that goal. To highlight a few, we signed a memorandum of understanding with PDO for the development of a waste-to-steam project for the application of enhanced oil recovery. We are also cooperating and facilitating the operations of two lead acid battery recycling facilities. In addition, we have allocated 20 sites across the Sultanate to receive, handle, and recycle construction and demolition (C&D) waste. Similarly, there are investment opportunities to utilize end of life tires (ELT). Another major highlight is the new private-sector investment to establish a paper recycling plant at Sohar Industrial Estate. In addition, be'ah will supply around 30,000 tons per annum of tire-derived fuel, providing Oman Cement Company a fuel alternative to help reduce the consumption of valuable natural gas. Biogas projects are also key components of be'ah's diversion strategy. These projects combined will provide the Omani market with jobs and increase in-country value, offering various in-



vestment opportunities. They will also contribute to Oman's renewable energy target (renewable sources covering 30% of energy demands by 2030) and offset the environmental impact caused by increased waste generation.

What is the key to getting the banking sector involved in the process of developing a circular economy?

Financial institutions are key enablers to move to a circular economy, so we need to have different key factors in place. One is the government, by enabling and facilitating the proper legal framework. Then there are the financial instruments such as fees. There is also the extended producer responsibility scheme (EPR). These are mainly applied on other waste streams such as electronics, tires, and packaging materials. A nominal fee is to be charged on such products, then that EPR fee will go to a fund that will finance the activities related to the recycling and treatment of such waste streams. This framework will provide incentives for producers to change product designs and adopt innovative ways that are environmentally friendly and a great opportunity for financial institutions to foster innovation among SMEs by providing some incentives for these projects.

What technological upgrades are you expecting to have the greatest impact in meeting your targets?

There are a great deal of tried-and-tested technologies used in the waste management sector, with most focus being directed recently on enhancements to increase efficiency. Most importantly, what we are working on now is the control tower, which connects all our operations under one system by integrating different data sources such as sensors, CRMs, IVMS, and smart devices across various touch points and operational units. This system will enable us to monitor operations, capture and analyze data, and generate reports. The artificial intelligence to be applied on this wealth of information will help us streamline our current operations, making them more efficient. ✖



Firas A. H. Al Abduwani
FOUNDER & CEO,
HUSSAM TECHNOLOGIES
COMPANY

New technologies are pushing electricity providers to create solutions for increasing demand.

BIO

Firas A. H. Al-Abduwani, co-founder of Shams Global Solutions (SGS), has over 10 years of experience in building, developing and leading teams on visions with an emphasis on adding value and competitiveness to Oman. Al-Abduwani holds a PhD in petroleum engineering from Delft University of Technology, a master's in petroleum engineering from Heriot-Watt, a bachelor's in mechanical engineering from Imperial College, and is an alumnus of IMD and the National CEO Program. He chairs the SME committee of the Oman Chamber of Commerce (OCCI), is a board member of Oman American Business Center (OABC), a member of Oman Business Forum (OBF), and a member of Public Authority of Electricity and Water's (PAEW) Steering Committee of the Strategic Renewable Energy Program.

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What was the significance of 2019 for your business?

HTC established its energy department in 2016 as part of its growth and diversification strategy. 2019 saw this department achieve operational breakeven. A second 2019 achievement includes successfully reaching out and engaging with international and local solar developers to establish partnerships to address local market needs. This is significant, as a key missing aspect in our solar offering was the financial element allowing for plant leases over capital investment. Finally, 2019 was more about efficiency and utilization of manpower. We also introduced KPIs to monitor our employees' productivity. We looked at projects related to the fourth industrial revolution and started carrying out them as sub-contracts, which allows us to better understand the market and the technologies themselves.

What challenges prevent you from engaging with the B2C market?

B2C is a huge market with various hurdles. First, there is a fragmentation of technologies. However, Apple, Amazon, Google, and Zigbee Alliance have founded a consortium to standardize their different protocols. If this consortium develops a single standard of interoperability, this will help galvanize the market. Right now, there are some suppliers for home automation services but there are two different business models. Unifying the standards means the new model will start to erode the margins toward a service market, and we will see something in the middle, which is typically where we play in. The second issue with the B2C market is that the utility tariffs for water and electricity are extremely low, and the incentive for efficiency is low. The third issue is the electricity sockets and light switches. Usually, for home automation to work properly, you need to have a live, neutral cable going. However, in Oman, homes can only have a live, ground cable, not a neutral one. This blocks 95% of the home automation market, as homes need to be able to send their data to a command center. As such, we are trying to understand the safety and technical aspects of this divergence and see how we can address it.

Do you think tariffs will go up and there will be more awareness?

Privatization is having an effect on demand, since Oman is extremely cyclical in terms of energy consumption, as winter and summer demand differ hugely. We have many plants that lie idle during certain times, while there are extremely specific peaks at other times; so, on the demand side, energy storage could be used to fix this. Distribution companies could install batteries in your house at their cost and when the demand and tariff cost are low, they start storing energy. Meanwhile, when demand and tariffs go up, energy could be pumped from the batteries, meaning there is no need for generators. What makes it challenging is that our tariffs are attractive for manufacturers, so solutions will have to wait until they mature. If you do not have a serious challenge, there is no motivation for innovation. If there were carbon credits, they would be another driver toward efficiency and smart solutions. If it remains as it is, it will be challenging.

What are your objectives and priorities for 2020, and what are the drivers behind them?

In telecoms, we purposely chose niche segments that we can excel in and that are typically passed over by the majority of solution providers. As such, we will keep on with our operational efficiency initiative and seek new markets to apply a strategy based on IoT and energy efficiency. The solar industry will grow exponentially in the commercial and industrial segment (where we operate in), and we will remain agile to capitalize on our position to continue leading the market share and value delivered to customers. Finally, we now have maturity and autonomy in telecom and energy, and moving forward we will seek more interaction between the two departments to leverage on markets. ✕

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FOCUS

Oman's hydrogen potential

A RARE POWER

OMAN'S FORAY INTO THE HYDROGEN ECONOMY WILL REAP BENEFITS FOR BOTH THE SULTANATE AND THE PLANET.

IN TERMS OF ABUNDANCE, HYDROGEN IS ONE OF THE MOST COMMONLY FOUND ELEMENTS IN THE UNIVERSE, though it rarely occurs naturally in a chemical form by itself on Earth. Instead, it is often found as a compound in substances (the most recognizable of which is H₂O or water). Thanks to our ability to dream big, we have discovered processes to harness hydrogen's incredible energy in multiple (though sometimes nefarious) ways. Since the 1970s, NASA has used hydrogen to propel its space shuttles into space. Hydrogen today is mostly commonly used to refine hydrocarbons, such as gasoline, natural gas, and propane. However, its role as a side character to other fuels is slowly changing. As we come to grips with inevitable climate change, hydrogen's ability to create energy while producing little to no pollution is increasingly of interest to the renewable energy sector. Thanks to Oman's geographical characteristics and developed oil and gas infrastructure, the country could find itself one of the world's largest exporters of the element in the coming years.

A study done by the Technical University of Munich and Hydrogen Rise AG, a German firm specializing in hydrogen fuel technology, found that Oman's natural resources of wind and sun have the potential to provide the huge amount of electricity necessary for hydrogen production. Furthermore, its large swaths of desert land are equally important for carrying out the industrial-sized production envisioned in the report. Thanks to its abundance in all three components, the price tag of its hydrogen would be a steal; researchers found that the cost to produce a kilo of hydrogen in the Sultanate would amount to USD3, an amount way below the global average. Though the studies results have yet to be fine-tuned, Oman has jump-started its start in the race to produce this clean energy on a large scale.

As such, Oman recently opened the Oman Hydrogen Center at the German University of Technology (GU Tech). The center, which was inaugurated by Minister of Technology and Communications Azza bint Sulaiman al-Isma'eeli in 2019, will seek to establish a "hydrogen economy" in Oman. In doing so, it will develop the technological and market capacity of Oman to become an exporter of hydrogen by bringing together specialists in research, technology, education, industry, and, of course, the economy. To this affect, an MoU was signed by Germany-based Hydrogen Rise Company and GU Tech owners Oman Education Services Establishment, founding a private company to sell the hydrogen both to the Omani market and abroad.

Along these same lines, Belgian-based DEME Concessions NV currently has proposed to build a solar- and wind-powered hydrogen production plant in Duqm. As a port town on the Arabian Sea with its own special economic zone (known as SEZAD), Duqm is well-disposed for the creation of hydrogen, thanks to its location. On top of its strong potential for wind and solar power, Duqm offers easy access to Oman's onshore and offshore sites, which could host renewable generation assets, the company said, as reported by PV Magaine. Currently feasibility studies are being carried out for the plant, with hopes to find investors by 2021. It is estimated that the plant's electrolyzer (the machine used to split water molecules into hydrogen and oxygen using an electrical current) will have a capacity between 250-500MW.

Omanis too are also playing roles in the promotion of the hydrogen economy. EJAAD, a state-supported Omani innovation platform, has announced its formulation of a national strategy for a hydrogen economy. In workshop that brought together over 40 stakeholders, EJAAD set the foundation for future policy and regulatory frameworks, as well as identifying strategic partnerships and business opportunities for the Omani market.

Besides creating a better future for the planet, Oman's hydrogen economy could also bring in a new source of revenue for the Sultanate, which heavily relies on hydrogen's close relations, hydrocarbon fuels, for its revenue. According to estimates, Oman's hydrogen could be worth USD20 billion by 2050. Hydrogen might just be the new "liquid" gold. ✖



Abdullah Al Badi
CEO,
NATIONAL ENERGY CENTER



Steven J. Moss
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OPTIMIZING ENERGY SOURCES

Renewable energy sources, along with IoT-based technology, is radically changing Oman's energy landscape.

How is today's technology impacting both the sector and your growth?

ABDULLAH AL BADI: The IoT-enabled devices we are applying can capture many aspects, such as the backflow of water and leakages, from our premises or the customer's location. If there is no water in the lines, some of the meters can come back online with pressure, which is calculated later. As such, there are many advantages for both the public authority and for customers. As opposed to receiving a monthly bill processed manually, with potential inaccuracies, the whole system is run online. This means we provide data every 15 minutes for industrial customers and one hour for domestic customers, allowing clients to see their exact consumption. This will help the Public Authority of Water plan for expansion and determine the main factors for non-revenue water, which is extremely high due to leaks, commercial law, or technical issues. We are implementing the same system for electricity and other areas. One needs to put the right infrastructure in place and understand the behavior of the customer before identi-

fying the issues to understand the losses.

STEVEN J. MOSS: In more and more locations, solar steam injection for enhanced oil recovery (EOR) is proving to achieve the required cost-competitiveness with gas. Extracting oil in Oman is often more complex than other locations in the region, requiring an acute focus on cost competitiveness. It provides an excellent springboard for our technology to be applied elsewhere too. That leads to our last focus, namely the deployment of our next-generation technology that replaces our glass house with a film house structure constructed from advanced proven materials. This homegrown technology will lower capital and operating costs considerably and have the widest market applicability across a myriad of industrial heat applications across the world's sun belt. In Oman, that includes industrial zones and the exciting potential in the mining industry. This implies a national strategy looking at how our technology can be coupled with power generation solutions in industrial zones and an international strategy looking at how our technology can be applied to

the mining industry and other energy intensive industries. Expanding into the mining sector is a natural next step for GlassPoint. Many mining activities are in remote places with limited and expensive gas supplies and costly electricity, so using our technology for renewable combined heat and power is a win-win.

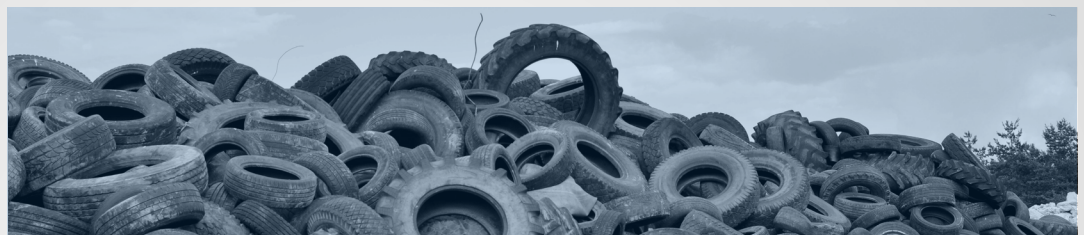
How long will it take until banks see the value of IoT without equity coming from funds?

AAB For banks, this is a new subject so it will be a challenge. They will accept it with either high interest rates or with many conditions. In our case, we evaluated excellent proposals from almost all the banks in the country when it comes to IoT, as it was an attractive model for most, and we received attractive proposals from local banks. Currently, one of our main projects with the public authority was financed up to 80% at an excellent interest rate. Regarding renewables, it is slightly difficult for banks to accept such models because they are long-term projects, and unless there is clear government involvement, there are conditions to be filled for local investors and developers to finance these projects.

What is the ideal relationship between hydrocarbons and renewables in the medium term?

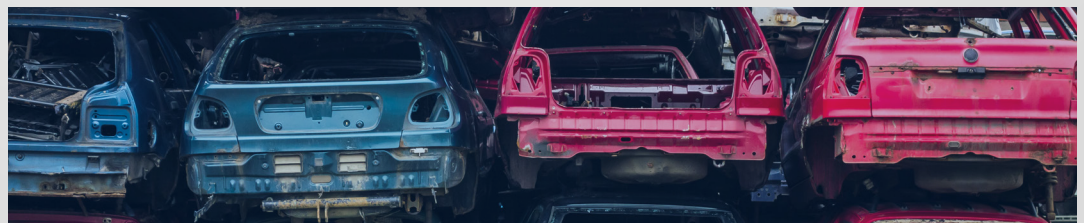
SJM Renewable energy is not a competitor to fossil fuels; rather, it is an enabler that allows countries like Oman to make the best decision about economic diversification at the right pace, without rushing. Extending oil generation over a number of years is a safer way of providing a solid revenue platform to the government, while using green technology is a sensible way to meeting one's renewable obligations in terms of CO2 emissions. In a way, renewables are a hedging tool that supports an economy based on energy confluence. At the same time, monetizing CO2 emissions is becoming a reality around the world. There are strong upward movements in European pricing, and bilateral agreements between European nations and Middle Eastern nations are coming to life. For a player like Glasspoint, it would mean bringing large additional revenues from those CO2 credits obtained via our technology to our customers and governments. Right now, we are aggressively working with our customers, partners, and relevant authorities to advance the environmental and economic benefit of this potential. ✖

GIVING YOUR VALUABLE ITEMS A SECOND CHANCE



We work on the commercialization and recycling of:

- Construction and Demolition Waste (C&D)
- End-of-Life Tires (ELT)
- Lead Acid Batteries (LAB)
- Green Waste
- Waste Electrical and Electronic Equipment (WEEE)
- End-of-Life Vehicles (ELV)



For more information, visit our website www.beah.om or contact our teams directly through (Psi@beah.om)