

TECHNICAL REVIEW

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MIDDLE EAST

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How Morocco is transforming its energy sector

Digging deep

Middle East mining is poised for growth

BACKUP GIANTS

DEMAND FOR POWER RENTALS IS SURGING IN THE REGION

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EDITOR'S NOTE

THE MIDDLE EAST is home to some of the world's biggest oil-based economies, yet the region has taken impressive steps towards a more sustainable future. Our special report on Morocco (p36) highlights how it will soon be the clean energy leader of the MENA region — by 2020, nearly half of Morocco's power will come from renewable sources. As the region's biggest economy, Saudi Arabia, is diversifying, it has set its sights on mining. More in our special report on the Middle East's mining sector (p42). Elsewhere in the region, mega projects — such as Dubai's Expo 2020, the US\$500-billion Neom city in Saudi Arabia and Sharjah's US\$6.5-billion Aljada development — are all being designed for a decarbonised future. With the boom in infrastructure and building projects comes an increased demand for power rentals. Our annual gensets review (p22) takes a look at developments in this booming sector.

Comments? Questions? Ideas? Get in touch: trme@alaincharles.com

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TECHNICAL REVIEW MIDDLE EAST

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Briefly

Abu Dhabi's new law aims to cut private housing construction costs

ATTEMPTING TO REDUCE construction costs for landowners, the department of urban planning and municipalities (DPM) issued new legislation regulating the construction of private villas in Abu Dhabi.

The new legalisation regulations are aligned with the Abu Dhabi Government Accelerators Programme, Ghadan 21 (Tomorrow 21), to review infrastructure policies and reduce building costs.

In response to feedback from landowners requesting more flexible spatial requirements, the DPM has revised its building legislation to reduce the minimum size of bedrooms, kitchens, dining areas and majlis seating areas.

The new legislation was drafted following a series of workshops with specialised DPM teams, including engineers from Abu Dhabi, Al Ain and Al Dhafra municipalities, as well as other relevant authorities.

UAE's manufacturing sector adds US\$33.2bn to GDP in 2018

THE MANUFACTURING SECTOR'S contribution to the UAE's non-oil GDP grew 2.5 per cent to US\$33.2bn in real prices last year from US\$32.5bn in 2017, according to the data revealed by the Federal Competitiveness and Statistics Authority.

As reported by the Emirates News Agency (WAM), the sector has maintained its steady growth over the past five years, with its gross output growing 5 per cent in 2017 as compared to 2016, during which manufacturing industries hit a growth rate of 4.8 per cent.

Economic expansion is primarily driven by the non-oil sectors, including manufacturing, construction, trans shipment, and financial service industries, the report said.

Abu Dhabi has embarked on an ambitious growth and diversification programme, Economic Vision 2030, to boost non-oil sector growth. The emirate has announced a three-year, US\$13.6bn stimulus package to jumpstart non-oil activity in the capital emirate.

EWEC and ACWA sign US\$890mn deal for reverse osmosis desalination project

EMIRATES WATER ELECTRICITY Company (EWEC) and ACWA Power have finalised a US\$890mn deal for the world's largest reverse osmosis desalination project.

EWEC, a public sector entity coordinating planning, purchasing and supply of water and electricity across the UAE, signed the water purchase agreement, with ACWA Power, a Saudi Arabia-based developer, investor and operator of power generation and desalinated water plants.

The deal will enable the development of desalination facility in Taweelah, UAE, with a capacity of over 900,000 m³ per day – sufficient to meet the demand of water for more than 350,000 households. Approximately 45 km north of Abu Dhabi, the project will use reverse osmosis technology to desalinate seawater and will be one of the largest, most cost- and energy-efficient plants in the world, according to a statement.

The new Taweelah reverse osmosis desalination plant sets new benchmarks for its size, efficiency and cost of water produced.

Supplying 909,200 m³/day, it will be 44 per cent larger than the world's current largest reverse osmosis plant of 624,000 m³/day.

A major driver for the adoption of reverse osmosis instead of thermal desalination is the



Othman Al Ali, CEO of EWEC.

Photo Credit : EWEC

higher energy efficiency it offers.

The plant is expected to set efficiency benchmarks with record low energy consumption of less than 3kWh per cubic metre.

Around 50MW of solar power generated at the plant's site will further boost its green credentials.

"The choice of reverse osmosis seawater desalination technology will play a critical part in significantly reducing water production costs, contributing to our goals to build a more sustainable and efficient water and energy sector in the UAE," said Othman Al Ali, CEO of EWEC.

The plant is scheduled to commence full commercial operations in Q4 2022.

Dubai opens phases 3 and 4 of roads leading to Expo 2020

DUBAI ROADS AND Transport Authority (RTA) has opened phases 3 and 4 of the roads leading to Expo 2020 site, aiming to ensure a smooth traffic flow that serves visitors and future projects in the area.

The two phases, costing US\$353mn, included the construction of bridges and roads extending 5km and 17 km.

Mattar Al Tayer, director-general and chairman of the board of executive directors of RTA, said, "The improvement of roads leading to Expo is one of the biggest roads projects currently undertaken by RTA to meet the needs of hosting Expo 2020 in Dubai. Due to the immense nature of the project, it had been divided into six phases to ensure the delivery of all works on the prescribed timeline, well before the opening of Expo."

Works completed included constructing intersections of Sheikh Zayed bin Hamdan Al Nahyan Street with both Expo and Al Yalayas Streets, building two flyovers on Sheikh Zayed bin Hamdan Al Nahyan Street at Dubai Investment Park, and widening Sheikh Zayed bin Hamdan Al Nahyan Street from two to five lanes in each direction.



The two phases, costing US\$353mn, included the construction of bridges and roads.

Photo Credit : RTA

Under phases 1 and 2 of the project, the roundabout at the intersection of Sheikh Mohammed bin Zayed Road with Expo Road had been converted into a flyover. The total length of roads constructed under these two phases amounted to 43 km.

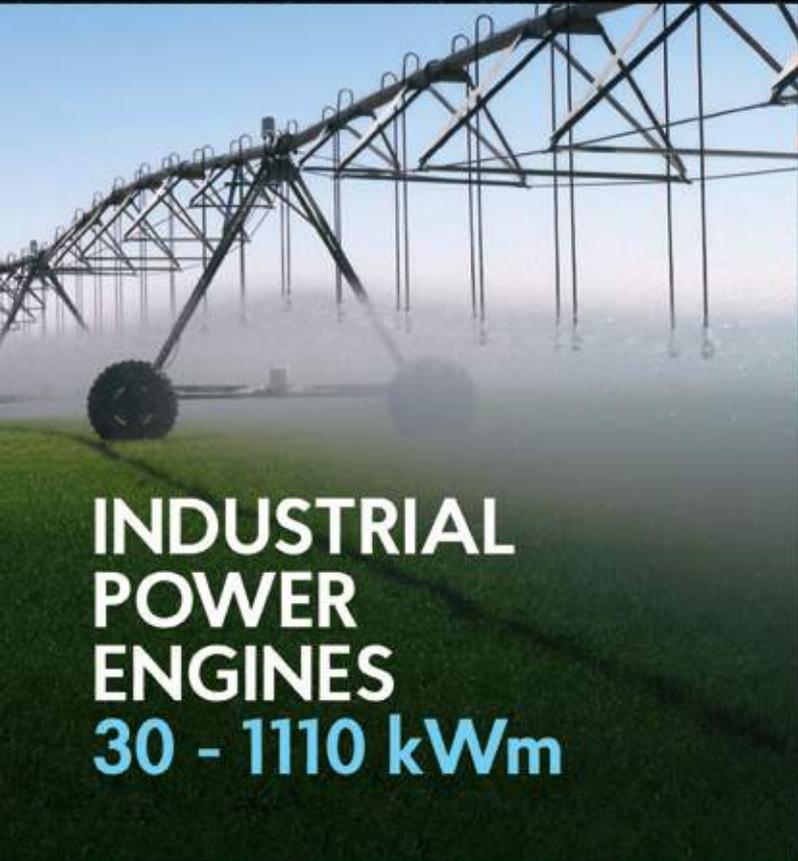
Phases 5 and 6 of the project cover improvements of Expo Road as well as the intersection of Emirates Road and Expo Road. Under these two phases, bridges to be constructed will span four km in length, and roads will extend 11 km in total.

The RTA masterplan is designed to serve the needs of hosting Expo 2020 and ensuring safe and smooth mobility for visitors.

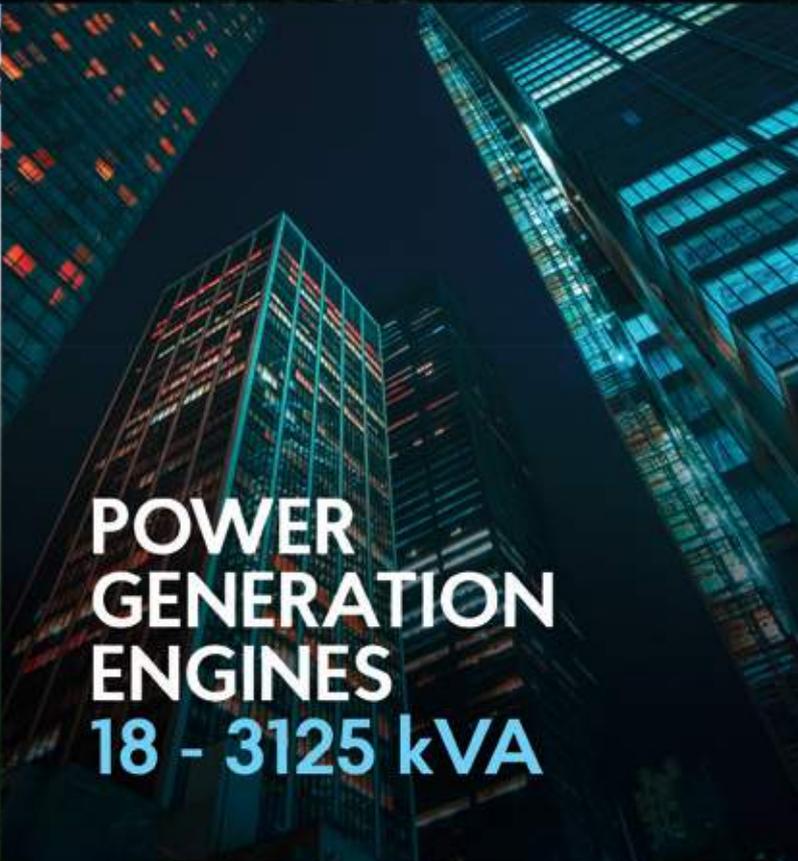


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Briefly

Energy transition accelerating across countries worldwide

THE WORLD ENERGY Council, in partnership with Oliver Wyman, has unveiled the latest progress for 130 countries on developing policies for energy security, equity and environmental sustainability.

Launched during the 24th World Energy Congress in Abu Dhabi, the UAE, the World Energy Trilemma Report and Index provide a ranking of countries' energy performance using global and national data. New this year is the analysis of historic trends. There has been a general trend of improving energy policy performance. Since 2000 nearly 120 countries have been improving their overall Trilemma scores over the 20-year period while nine countries have seen their overall performance decline.

Switzerland, Sweden and Denmark are the top three rated countries across all three Trilemma dimensions in 2019. The rate of improvement in overall Trilemma performance also appears to be increasing – half of the countries have consistently improved overall scores since 2015.

WWST to supply solar power for brick manufacturers in Morocco

WORLDWATER & SOLAR TECHNOLOGIES (WWST) has signed contracts with three brick manufacturers in Morocco to deliver solar power for their operations.

Revenues from the projects will exceed US\$4mn for the Princeton-based company, according to Quentin T Kelly, chair and CEO of WWST.

Morocco has few hydrocarbon resources of its own and imports most of its energy requirements, mainly from countries in the Middle East, Kelly said.

The three manufacturers are brick factories located in Rabat and Zaio, in northern Morocco near the Mediterranean coast.

These projects are expected to generate more than 7,000MW hours of clean energy annually, which is equivalent to the emissions from 2,750 tonnes of coal burned, 11,500 barrels of oil consumed, or the carbon sequestered by 6,000 acres of forests in one year.

Saudi Arabia leads GCC construction sector with 5,000 projects worth US\$1.6tn: Report

SAUDI ARABIA CURRENTLY holds great potential for the construction sector within the GCC, with 5,000-plus capital projects worth more than US\$1.6tn in the pre-execution stage, according to a cost and project management consultancy.

The report by Linesight cited long-term positive factors such as economic diversification, social reform, especially in Saudi Arabia, and general demographic demand, combined with renewed government ambition, as the main drivers.

Linesight, which has a GCC pipeline worth more than US\$10bn, noted that activity in the construction sector throughout the GCC countries, will begin to recover steadily from the beginning of 2020, after a challenging period of subdued performance over recent months.

That includes more than 150 development projects worth US\$3.27bn, for the Tabuk region, in the north-west of Saudi Arabia, which were announced by Saudi Arabia's King Salman bin Abdulaziz, in November last year.

King Salman launched more than 600 projects in Qassim worth US\$4.36bn and around another 200 new projects in Hail valued at US\$1.14bn.

The centrepiece of the Kingdom's Vision 2030 initiative is the US\$500bn Neom megacity project, situated along 468km of Saudi Arabia's Red Sea coast close to Egypt and Jordan. The first phase of Neom, is due for completion in 2025.

"Saudi Arabia is also actively seeking to improve its rail, airport, port and other transport-related



Photo Credit: Adobe Stock

The centrepiece of Vision 2030 initiative is Neom project.

infrastructure, as well as increase residential supply, healthcare, leisure and tourism facilities. Without doubt, the kingdom remains the most active construction market in the region, signalling exciting times ahead," noted Damien Gallogly, regional director for the Middle East at Linesight.

The project developments in Linesight's own GCC pipeline are worth in excess of US\$10bn, with average annual revenue growth of over six per cent. Some of the more prominent developments in Saudi Arabia include the US\$4bn Thakher City mixed-use project in Makkah and the Al Faisaliah district redevelopment project in Riyadh, which involves upgrading the Al Khozama, retail, hospitality and commercial complex.

Turkey's Efeler geothermal plant gets US\$350mn financing

THREE MAJOR DEVELOPMENT banks are helping Turkey diversify its energy mix with an investment adding close to 100MW in capacity to Efeler, the country's largest geothermal power plant.

The Asian Infrastructure Investment Bank (AIIB), the European Bank for Reconstruction and Development (EBRD) and the Black Sea Trade and Development Bank (BSTDB) are contributing to a financial package worth US\$350mn for three new units at the plant.

Efeler is located in western Turkey, in the region of the Büyük Menderes Graben basin, the area in Turkey with the greatest potential for geothermal energy.

Gürmat Elektrik, a renewable energy subsidiary of Gürış Holding, is using the finance for the expansion at Efeler that will tap into locally available geothermal resources.

Of the three new units, EFE-6 with 22.6MW capacity and EFE-7 with 25MW are already operational. Construction of EFE-8 with a capacity of 50MW is underway.



Photo Credit: BSTDB

The financing is part of the effort to help Turkey develop local renewable energy sources.

When fully completed next year, the plant's eight units are expected to have a total installed capacity of 260MW.

Under the financing package, Gürmat Elektrik will receive US\$100mn loan from the AIIB, a US\$60mn loan from the EBRD and US\$ 20mn loan from the BSTDB.

Additionally, Turkey's commercial lender Isbank is providing a US\$90mn loan, and the Industrial Development Bank of Turkey and ICBC Turkey are also extending loans of US\$50mn and US\$30mn.

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ON THE WEB

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DEWA and Huawei set up AI lab for digital services

DUBAI ELECTRICITY AND Water Authority (DEWA) and Huawei have launched a laboratory to develop and implement AI digital services for the Middle East. The announcement in regard to the lab was made at a strategic summit between DEWA and Huawei. The summit saw the commencement of a training and development programme for DEWA staff in different areas of disruptive technologies.

www.technicalreviewmiddleeast.com/business-a-management



Photo Credit : DEWA

The strategic summit aimed to increase cooperation between DEWA and Huawei.

Lekela funds first wind project in Egypt

LEKELA, A RENEWABLE power generation company that delivers utility-scale projects across Africa, has reached a financial close on the 250MW West Bakr project in Egypt.

The company said construction will commence soon and once the project is fully operational in 2021, it will produce more than 1,000GWh per year and power more than 350,000 homes. West Bakr is located 30 km north-west of Ras Ghareb, Siemens Gamesa Renewable Energy will install 96 of its SG 2.6-114 turbines through a turnkey EPC contract and provide 15-year long-term maintenance services. West Bakr Wind is joining Lekela's portfolio of wind projects across Senegal, Ghana, and South Africa. In total, there are now more than 1,000MW in operation or construction.

www.technicalreviewmiddleeast.com/power-a-water

Borusan EnBW Enerji wind farms expansion to boost Turkey capacity

BORUSAN ENBW ENERJI, a joint venture between German firm EnBW and Turkish company Borusan, is set to add 210MW of output from wind energy in Turkey with the signing of turbine supply contracts. The JV has signed turbine supply contracts with GE and Vestas for the construction of the Saros onshore wind farm and the expansion of the Kiyiköy onshore wind farm. After completion of both projects by the end of 2020, the installed capacity of onshore wind power will increase to 646MW. The Saros onshore wind farm with an output of 138 MW and an annual production of 530 GW hours is one of the biggest wind farm projects in Turkey.

www.technicalreviewmiddleeast.com/power-a-water

Oman awards US\$24mn contract for Khazaen Economic City

KHAZAEN ECONOMIC CITY, the master developer of the largest public-private-partnership in Oman, has awarded the first construction package to Galfar Engineering & Contracting for US\$24mn. Galfar is expected to begin construction in October of this year, and will be responsible for developing 10 km of asphalt roads, 15 km of stormwater channels, and a 22 km potable water network.

www.technicalreviewmiddleeast.com/construction



Photo Credit : Khazaen

Khazaen is strategically located in Barka, between Muscat and Sohar.

DP World partners with China's CCC group to develop traders market

DP WORLD HAS announced a partnership with Zhejiang-based China Commodity Citygroup company (CCC) to develop the traders' market in Jebel Ali Freezone (JAFZA). DP World will hold a majority share in the 70/30 JV. The traders' market project will span approximately 800,000 sq m with Phase 1

development covering about 220,000 sq m. Phase 1 capex is estimated at US\$150mn, with construction expected to start in Q4 2019.

www.technicalreviewmiddleeast.com/logistics

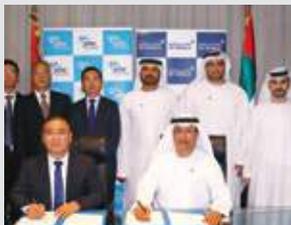


Photo Credit : DP World

Officials of DP World and CCC group at the signing event.

5G to drive effective adoption of emerging technologies

GLOBALDATA HAS REVEALED how 5G can influence the deployment of emerging technologies, such as the Internet of Things (IoT), autonomous vehicles, robotics and drones, and virtual reality (VR). GlobalData, a data and analytics company, has stated that 5G mobile technology's intrinsic capacity to connect the Internet's end systems with enhanced data flows and faster response times will unlock the full potential of emerging technologies. In the case of IoT, GlobalData stated that 5G could find its major use case in helping IoT applications to overcome 4G limitations in industries such as mining, where lower latency and reliability are critical for daily operations and safety. Swedish mining company Boliden, for example, collaborated with Ericsson to deploy 5G at its Aitik mine equipped with industrial automation sensors.

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7-10	Saudi Build	RIYADH	www.saudibuild-expo.com
9-10	HSE Forum Kuwait	KUWAIT	www.hse-forum.com
21-23	WETEX	DUBAI	www.wetex.ae
30-31	Kuwait Smart Grid Conference & Exhibition	KUWAIT	www.kuwaitelectric.com

NOVEMBER 2019

5-6	The Mining Show 2019	DUBAI	www.terrapinn.com/exhibition/miningshow
3-5	ELECTRICX	CAIRO	www.electricxegypt.com
19-20	HSE Forum Oman	MUSCAT	www.hse-forum.com
19-21	MEE Saudi	RIYADH	www.middleeastelectricitysaudi.com
25-28	Middle East Concrete	DUBAI	www.middleeastconcrete.com
25-28	The Big 5	DUBAI	www.thebig5.ae
25-28	HVACR Expo	DUBAI	www.hvacrexpodubai.com
25-28	Middle East Stone	DUBAI	www.middleeaststone.com

Event dates and locations are at the discretion of individual event organisers and are subject to change.

Dubai HSE Forum to tackle challenges, trends and new technologies

THE UAE HAS GROWN phenomenally as a major business centre, with a plethora of profitable industries. Economic growth has driven the need for a robust labour force capable of carrying out high-risk jobs across multiple industries.

Protecting the health and safety of this ever-increasing workforce is a priority for all. Despite a regulatory push for better safety measures at work with the support of all stakeholders, workplace accidents do occur.

In this context, the **Dubai Health, Safety & Environment Forum 2019** will present the latest innovations to help businesses deal with challenges related to occupational health and safety.

Taking place from 24-25 November, 2019 at Habtoor Grand Resort, Autograph Collection Dubai, the forum brings together industry experts from across the region.

At the two-day event, industry leaders sharing solutions to enable companies and organisations to run successful operations while maintaining the highest health, safety and environment (HSE) standards.

Researched and developed by the *Health, Safety and Security Review Middle East*, major topics to be discussed include



Industry experts speaking at Dubai HSE Forum 2018.

Photo Credit: Dubai HSE Forum

wellness and prevention management, enhancing HSE standards in UAE, ensuring safety without compromising on quality, protecting consumers while ensuring quality, developing policies and implementing technologies to control emissions, monitoring potentially hazardous environments with IoT, mitigating work-related risks using artificial intelligence (AI), impact of digital transformation on the workplace (and why it is an opportunity for HSE leaders), disaster management systems, emergency preparedness and readiness.

These topics are crucial for major sectors such as oil and gas, construction, utilities, logistics and transportation, manufacturing, and food and beverage.

The forum presents an opportunity for the attendees to gain deep insights on policy, strategies and technical expertise. The event will focus on:

- Networking with industry leaders, international speakers and decision-makers.
- Analysing the latest challenges and issues in the region.
- Interacting with globally renowned HSE professionals and experts sharing their experience and knowledge.
- Understanding the future of new technology to enhance HSE performance.
- Exploring new avenues to develop businesses.

Advisory panellists include Dr Rehab Al Ameri, director of National Accreditation System Emirates Authority for Standardisation and Metrology; Salman Dawood Abdulla, executive vice-president of HSSEQ, Emirates Global Aluminium; Professor Janvier Gasana, chair of department of Occupational Health, Kuwait University; Raed Marzooqi, head of HSE, Dubai Municipality; Nasser Al-Buhairi, head of Emergency Unit, Kuwait Oil Company.

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Continuous development

Inmesol offers a host of power solutions for the rental sector.

INMESOL IS CONSTANTLY adapting to the requirements of the market, particularly in the rental sector – an increasingly professional sector affected by demanding emission regulations.

Generator sets with Stage V engines

New Stage V gas emission regulations for engines and gen sets, have led to the development of engines that incorporate accessories occupying extra space that must be accommodated in the genset housing. To this end, Inmesol is working to adapt its canopies to the new engines and their accessories, to maintain optimal dimensions for easy transport, just like its predecessors.

The new 40 and 60 kVA pre-series and higher power prototypes developed so far, have turned out to be generators with lower noise emissions, lower heat emission, and very low levels of gas emissions.

50-60 HZ Dual sets

The sets from the rental sector are characterised by their versatility. One of the most demanded requirements is of 50-60HZ dual gensets, and different voltages, for sites such as harbours where vessels often demand different frequency and voltage systems.

Lighting towers: IT-06

The latest lighting tower development undertaken by Inmesol, the IT-06 model, has been created due to client demand for the rental sector. Compact, stable, lightweight and easy-to-install and use, the towers are fitted with LED spotlights and are connectable to any available power source. They can be used both indoors and outdoors, without worrying about gas or noise emissions. With optimised volume and measurements (their base adapted to the dimensions of a pallet) to facilitate the transport of several units, they are connectable as a series with more units for increasing lumens whenever necessary (up to 12 units).

Ultraquiet: 50 dB(A)

The rental sector is demanding ever quieter generator sets. Inmesol, since its inception, has constantly worked on the design and use of the latest technology in soundproofing materials in order to reduce to the maximum noise emissions that engines produce during their operation. The last special canopy designed for rental generator sets that house generators from 85 kVA to 130 kVA PRP has been commercially well-received. Thanks to its design, depending on the power of the generator inside, it has been possible to reduce noise emissions by 60-64 dB(A) down to 50 dB(A) @ 7m and 75 per cent load.



Photo Credit: Inmesol

Inmesol's ultra quiet generator for the rental sector.

Heavy rental range

The CT-1230 model container, specifically designed for the rental sector, was recently unveiled at trade fair Bauma. With an MTU engine and the latest control centre model developed by the brand DEIF, it is characterised by its great versatility as it is programmable for any type of application. This is a sturdy generator set, capable of generating up to 1230 kVA of LTP power in a container with a luxury finish.

Portable line

Portable generators designed especially for the rental sector, are robust, easily transportable, with a metal protection protecting the generator, as it is widely used in construction and public works and often moved around from one place to another.

For events in deserts, quarries, and mines and anywhere dusty conditions prevail, generator sets can be used without any risk to the set's components caused by dust. Hence, the set is equipped with different filters located in parts prone to deterioration: heavy duty filters in the engine, special filters in the alternator and suitable grilles in the air inlets allow the generators to work in a perfectly normal fashion.

Genset reserve genset (dual mutual stand-by)

In facilities where there is no mains supply, generator sets working in pairs are a suitable solution since they work as a backup to each other, that is to say one set acts as a main source of energy supply while the other remains on standby in case of emergency. ■

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The largest supply chains are electrical and machinery, petroleum and chemical products, transport equipment, financial and business services, and textiles/apparel.

The global network

Participating in global production networks brings several gains to manufacturers, says economist Moin Siddiqi

IN TODAY'S INTEGRATED marketplace or global village, trade and production are increasingly organised around global value chains (GVCs), where products and services from conception, design, R&D, marketing and distribution are dispersed across the globe and between lead firms, thanks to advances in information and transportation technologies and declining trade barriers.

Internationally, fragmented production process adds value along the supply chains to final goods – taking advantages of different factor costs and global division of labour.

Multinational corporations (MNCs) have optimised their sourcing strategies through geographic re-organisation and by separating various tasks. About four-fifths of world trade is linked to the networks of MNCs.

The largest supply chains are electrical and machinery, petroleum and chemical products, transport equipment, financial and business services, and textiles/apparel.

The rise of 'servicification' of manufacturing is noticeable. Transportation, logistics, warehousing, banking, insurance, business

processing services and ITC are supplied at every stage of the production phase. These services play a crucial role in merchandise trade by helping to move various components efficiently across national borders. The Organisation for Economic Cooperation and Development (OECD) and World Trade Organisation (WTO) 'Trade in Value Added' (TiVa) database revealed that the value generated by the services industry as intermediate inputs represented one-third of total value-added in manufactured goods.

Multinational corporations have optimised their sourcing strategies through geographic re-organisation and by separating various tasks.

Measures of participation

The literature on world trade integration measure GVC participation via two distinct concepts, both expressed as a percentage of a country's gross exports: the share of foreign value-added (FVA) in total exports that was imported from external suppliers – termed backward linkages and the share of a country's exports that are further re-exported as intermediates to third countries – termed forward linkages.

Combining both concepts provides an accurate measure of a country's participation in global supply chains.

GVC-related trade is defined as exports and imports that either embed FVA or are exports of domestic value-added, which are

‘Trade in Value Added’ database revealed that the value generated by the services industry as intermediate inputs represented one-third of total value-added in manufactured goods.



About four-fifths of world trade is linked to the networks of MNCs.

Photo Credit: Jeson/Audob Stock

absorbed in other countries' exports.

Countries can be positioned in GVCs depending on their specialisation, and their positions could change over time. 'Upstream' economies produce the raw materials or knowledge assets (e.g. research, design) at initial output stages, whilst 'downstream' economies assemble processed products, such as machinery, electronics components or specialise in customer and distribution services.

Over the past two decades, China has integrated into GVCs by specialising in final-product assembly lines, boosting its participation via a competitive supply chain of intermediate inputs and through improved export quality.

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For emerging economies, GVC offers a path to 'fast-track' industrialisation by joining existing production networks instead of building them from scratch

Spillovers from international activities

Empirical evidence suggests that GVC participation is positively related to domestic and foreign direct investment (FDI), productivity, skill acquisition and export growth. GVCs offer, to varying degrees, access to foreign markets, better management practices and technical know-how to local economy.

The International Monetary Fund (IMF) echoed: "Knowledge transfers from other producers in the value chain and, eventually, upgrading to higher value added segments of the production chain can support productivity and income growth".

For emerging economies, GVC offers a path to 'fast-track' industrialisation by joining existing production networks instead of building them from scratch.

“Knowledge transfers from other producers in the value chain and, eventually, upgrading to higher value added segments of the production chain can support productivity and economic growth.”

The International Monetary Fund

While firms in developed economies can source cheaper, better quality inputs through offshoring, joining a supply-chain removes the need to possess [all] necessary upstream or downstream capabilities along production stages. Thus, respective countries benefit from specialising in and exporting products for which they enjoy the lowest opportunity cost of supply.

Furthermore, firms through various GVC channels can achieve efficiency by relocating the least efficient parts of production to low-cost locations and induce technological transfers. Criscuolo, C. and Timmis, J., 2017 *The Relationship Between Global Value Chains and Productivity*, highlighted gains from specialisation in core tasks, access to imported inputs and knowledge spillovers as well as pro-competitive effects of foreign competition.

What determines GVC investment

Given the rising complexity and competition in global production networks, MNCs selectively choose locations based on certain

factors, notably infrastructure connectivity (vital for trade facilitation), economic size and development (upper-middle and high-income countries entice more GVC investment than lower-income countries), geographic proximity to final demand, efficient trade logistics, such as customs services, unit labour costs, skilled workforce, common language and exchange-rate stability.

Increased GVC participation also demands a business-friendly environment and a pool of suppliers/manufacturers that meet lead firms' requirements for quality and timeliness as well as intellectual property protection and strong legal institutions (contract enforcement). In particular, establishing faster import/export processes is vital to integrate the global supply networks that heavily rely on imports for assembling activities.

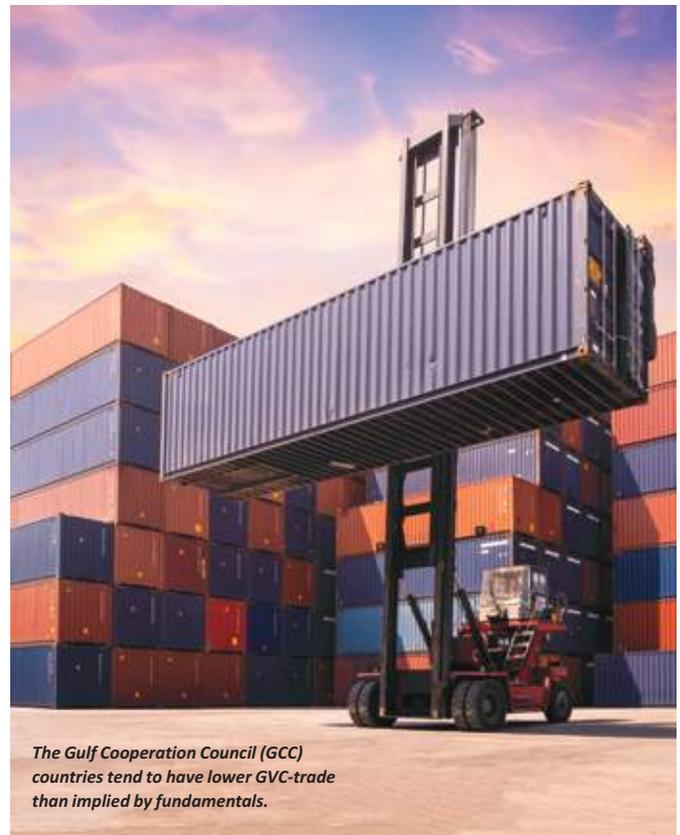
Greater openness to global trade is measured by import barriers, quotas and average tariffs. Trade liberalisation promotes new export sectors, with positive spill-over effects on economic growth and job creation.

Greater openness to international trade is measured by import barriers, quotas, average tariffs, and so on. Trade liberalisation promotes new export sectors, with positive spill-over effects on economic growth and job creation.

Policy barriers, such as lengthy customs procedures, undermine the competitiveness of time-sensitive and perishable products. High tariffs on the import of intermediates and non-tariff barriers, like quotas, licenses and local procurement rules, can also hamper the overall competitiveness of the value chain business.

Regional GVC participation

The Gulf Cooperation Council (GCC) countries tend to have lower GVC-trade than implied by fundamentals. Like major commodity exporters such as Russia, GCC exports dominated by fuels, lubricants



The Gulf Cooperation Council (GCC) countries tend to have lower GVC-trade than implied by fundamentals.

Photo Credit: Nuamfajlo/Adobe Stock

and basic chemicals, participate at earlier stages of GVCs and exhibit high forward linkages (i.e. exports of commodities from GCC-bloc are mostly inputs in other countries' production).

While a low participation at final stages of GVCs means a minor share of foreign value-added in Gulf exports. Thus, value-added and diversification of exports remain quite low compared with peer emerging economies.

However, Saudi Arabia and the UAE (especially) possess natural resources and world-class infrastructure to emulate the success of China and some Asian countries in GVC-trade. In manufacturing, 'just-in-time' orders need airfreight capacity, while automotive production necessitates port facilities.

Manufacturing and assembly-line operations are attracted by the presence of cluster industrial parks and special economic zones

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(SEZs), which permit 100 per cent foreign ownership and tax exemptions. There are over 20 SEZs in UAE and Saudi Arabia is building new economic cities to facilitate trade and FDI.

Eliminating the non-tariff bottlenecks to trade by streamlining and automating border procedures can increase the tradeable non-oil sector.

The region maintains a revealed comparative advantage (RCA) in primary commodities (see footnote). In 2016, the number of products with RCA ranged between 31 in Qatar and 172 in the UAE (IMF data). The sectoral distribution of exports also shows that Saudi Arabia has RCA in plastic and rubber exports, Bahrain, Oman and UAE in metals and minerals, and UAE (also) in stone and glass. But manufactured goods, machinery and transport equipment comprise small share of merchandise exports of GCC-countries due to lower GVC-trade.

Trade openness in Gulf region is high (tariffs are relatively low). Eliminating the non-tariff bottlenecks to trade by streamlining and automating border procedures can increase the tradable non-oil sector.

‘Moving up’ to high-tech manufacturing requires skills and industrial upgrading – hence the importance of training institutes and establishing testing laboratories. Developing new varieties of products is a vital element of successful strategies in many GVCs.

Finally, the IMF noted that “higher levels of [backward]

GVC Participation and Position by Sector, 2013

Sub-Sectors	Share in World Exports		GVC Participation Index 1		Position Index 2	
	Value-added concept	Gross concept	Backward linkage	Forward linkage	Downstream Index	Upstream Index
Manufacturing						
Electrical and Machinery	37.7	46.7	32.0	15.0	2.8	2.4
Petroleum and Chemical Products	15.0	15.3	33.0	25.0	2.6	3.1
Transport Equipment	5.2	8.1	37.0	10.0	3.0	2.0
Metal Products	5.1	4.3	29.0	35.0	2.9	3.6
Textiles and Wearing Apparel	3.8	4.5	27.0	11.0	2.8	2.1
Food and Beverages	1.1	1.4	23.0	9.0	2.6	1.8
Wood and Paper	0.9	0.7	26.0	30.0	2.5	3.0
Other Manufacturing	0.4	0.6	28.0	7.0	2.8	1.8
Services						
Financial and Business Services	20.7	5.7	8.0	91.0	1.7	2.4
Transport	3.0	1.6	19.0	38.0	2.2	2.6
Wholesale Trade	1.7	0.6	10.0	88.0	1.8	2.3
Retail Trade	0.6	0.2	12.0	76.0	1.9	2.2
Post and Telecommunications	0.3	0.1	14.0	63.0	1.9	2.4
Hotels and Restaurants	0.2	0.1	13.0	23.0	2.1	1.6

1. Backward linkages refer to foreign value-added in gross exports. Forward linkages refer to parts of domestic value-added exports that are further re-exported. Both expressed as share of gross exports.

2. Downstream index refers to number of production stages embodied in a good produced within a sector. The bigger the indicator, the complex the production process of final product is. Upstream index refers to number of additional steps to final consumer. Services industry has higher forward linkages reflecting that they are intermediate inputs for export destinations. Whereas, large manufacturing sectors tend to have higher foreign inputs (backward linkages).

Source: IMF Working Paper 2019 "Global Value Chains - What are the Benefits and Why Do Countries Participate?"

integration to GVCs, characterised by greater shares of imported foreign value added and used in the production of exports, can bring more regional trade into the GCC. Smaller GCC economies can become integrated into the supply chains of larger ones, e.g. those of Saudi Arabia and the UAE.”

In sum, an open/global integrated GCC region would reduce exposure to volatile hydrocarbon revenues and make their economies more productive. There is a scope for investing in knowledge-based industries, including innovation, R&D, for example in biotechnology, automotives (electric cars) and metal processing. ■



Developing new varieties of products is a vital element of successful strategies in many GVCs.

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Photo Credit: Doosan

The construction sector remains a driver for the genset market.

All-time **reliable power**

As the Middle East pumps capital into marquee projects, the genset market is ready to take off with its promise of continual electricity supply. Abhishek Paul reports.

Rising oil prices and a wide range of economic diversification efforts in the region are pushing the potential of the genset market.

AFTER BEING WITNESS to challenging situations in the last few years, the Middle East genset market is cautiously picking up, on the back of a number of infrastructure development projects and a renewed focus on the industrial sector.

Rising oil prices and a wide range of economic diversification efforts in the region are pushing the potential of the genset market. Underscoring this, a Research and Markets report has forecast the diesel genset market in the Middle East to cross US\$1.54bn by 2026.

Economic diversification in the GCC is focused on expanding industries such as automotive, mining, construction and manufacturing, which all need an extensive deployment of gensets as a standby source

of power at consumption centres for uninterrupted production.

Of all industries, the construction sector remains a crucial driver for genset market. A report by Ventures Onsite said construction contractor awards across the GCC building, infrastructure, and energy markets is expected to increase to US\$140.5bn in 2019, compared to US\$125bn in 2018. The total GCC construction project value across all three sectors is estimated to be currently worth US\$3.6tn. As a result, proliferating infrastructural development and industrialisation across the Middle East economies are expected to boost the demand for backup power sources such as gensets. Major players in the genset sector include Doosan Bobcat, FG Wilson, Inmesol, Perkins, Teksan and JCB Power.

Regional markets and opportunities

Reflecting on the current market climate in the Middle East, Hazem Elnaqeeb, district manager portable power, Middle East for Doosan Bobcat, said, "Saudi Arabia and the UAE are definitely the biggest two markets in the ME region. Saudi Arabia has the biggest domestic market while the UAE has the third largest domestic market and the first export market in the region exporting generators to many ME countries such as Iraq, Yemen and Saudi Arabia, in addition to



Photo Credit: Inmesol

Portable generator

The UAE diesel generator market is projected to grow at a CAGR of 3.4 per cent during 2019-25.

several African countries."

Saudi Arabia's diesel gensets market is forecast to surpass US\$500mn by 2023, according to data from Research and Markets.

The factors stimulating this anticipated growth are an increasing number of infrastructure projects, a growing demand for electricity and government-initiated schemes, which have resulted in an

increasing demand for diesel gensets across the country.

Coming to the UAE, marquee public and private infrastructure construction projects, backed by the UAE Vision 2021, Surface Transport Master Plan and global events such as Dubai Expo 2020, are expected to drive demand for diesel gensets. Certain vital sectors such as oil and gas, hospitality, and manufacturing would heavily contribute towards the surging demand for diesel gensets in the country.

According to the *UAE Diesel Genset Market 2019-2025* report by Research and Markets, the UAE diesel generator market is projected to grow at a CAGR of 3.4 per cent during 2019-25.

With Dubai Expo 2020 approaching, the expansion of metros and airports, along with the construction of new hotels and large residential complexes is likely to push the product demand. Additionally, upcoming projects such as Microsoft data centres, Abu Dhabi Metro, Warner brothers World and Dubai Eye - Bluewaters Island Development, along with Smart Dubai 2021

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Vision would increase genset use. The growth of the UAE diesel genset market is primarily driven from cities such as Dubai and Abu Dhabi.

A 6Wresearch report forecasts that the UAE diesel genset market will touch US\$309.9mn by 2022. In the UAE, diesel gensets with rating 5kVA-75kVA accounted for a majority of the market volume share due to ease of availability, low cost and wide usage across several verticals. 5kVA-75kVA rating genset market is expected to maintain its market dominance throughout the forecast period. The utilisation of these gensets in telecom sector in the unreliable and off-grid areas is expected to drive the market by 2022.

According to Elnaqeeb, the entire range of 15-2500kVA is much in demand in the industrial and business sectors; with the 15-100kVA range commanding highest volume sales and the 1000-2500KVA range having the biggest sales value. The smaller range covers all business sectors starting from individual housing to telecommunication business, oil and gas servicing projects. Whereas the bigger range supports power supply to small communities, factories and industrial complexes, shopping malls, quarry and aggregate business whether as a prime or standby power supplier.

Lately, the spotlight for the genset sector has been trained on Turkey, which has many genset manufacturing companies. In the last few years, the Turkish genset market shrank owing to challenging market conditions. However, it is expected to recover, taking advantage of Turkey's strategic position as an import-export hub.

With several infrastructural projects taking off, the Turkish genset market is forecasted to reach US\$352mn in 2021 and dominated by diesel gensets, according to Frost & Sullivan report. In terms of revenue, it's the 375kVA and above range of gensets that have the biggest piece of sales, though

Diesel gensets are undergoing a series of technological improvements, from advanced monitoring equipment to hi-tech control systems.

the lowest in terms of volume. Highest sales volumes are commanded by the below 375kVA output range of gensets.

With a series of large-scale construction projects launched in Kuwait, demand for diesel gensets is likely to rise. As the price of diesel in Kuwait is significantly low as compared to the global average, it provides an opportunity for faster adoption of diesel fuel for power generation.

Power generation: Diesel, gas or solar?

Technavio analysts forecast the diesel gensets market (2018-2022) in the GCC to grow at a CAGR of nearly 6 per cent during the forecast period, according to their latest market research report.

The incorporation of remote monitoring systems in gensets is one of the major trends being witnessed in the diesel gensets market in the GCC 2018-2022. Diesel gensets are undergoing a series of technological improvements, from advanced monitoring equipment to hi-tech control systems. Manufacturers are adopting these features into diesel gensets to differentiate them from their previous product portfolio.

According to Technavio analysts, one of the vital factors contributing to the growth of the diesel gensets market in the GCC is the low operational costs.

Commenting on the growth prospects of gas and diesel gensets, Hazem Elnaqeeb said, "Diesel generators are still dominating the power business in the Middle East and Africa region, there is a good potential for

gas generators being a cleaner source of energy compared with diesel. The potential is high with the gas producing countries such as Qatar, Iran, Saudi Arabia and recently Egypt."

It seems fuel efficiency is one of the major advantages of diesel gensets. When compared with petrol-powered gensets, diesel gensets use less fuel because the former uses a compression ignite engine. According to a senior analyst at Technavio, "Fuel and air are introduced into the engine separately. Only the air is compressed, which allows the engine to run more efficiently, using lesser fuel. Petrol engines mix fuel and air together in a carburettor before compression, thus reducing fuel efficiency."

There is a great future for the solar energy in the region, but the power generation cost is still high and the power capacity is rather limited, Elnaqeeb said. He added, "We expect this to dramatically change in the next decade."

Taking a rental route

In response to growing expenditures and budget constraints, customers are switching to rent equipment over a capital purchase. When it comes to small-scale projects, increasingly many organisations prefer to rent or lease a genset, which helps them keep tighter control over their finances. The Middle East Power Rental Market of diesel and gas gensets is projected to grow at a CAGR of 3.3 per cent during 2019-2025, according to ResearchAndMarkets.com.

After the 2015 oil crash, many countries in the Middle East region have started focusing on diversifying the economy towards non-oil sectors and have heavily invested in infrastructure, construction and manufacturing sectors. Such developments would cause a surge in demand for diesel gensets, thereby impacting the growth of the power rental market in the Middle East region positively, the report said.

As the report concludes, government initiatives such as Saudi Vision 2030, UAE Vision 2021, Bahrain Vision 2030 and Turkey Vision 2023 would lead to growth in demand for power rentals in the Middle East. ■

Diesel Gensets Market in the GCC 2018-2022



Source: Technavio

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Plug-in game changer

Technical Review Middle East catches up with Medhat Al Shafey, engineering products division manager, TAMGO, FG Wilson dealer in the Kingdom of Saudi Arabia and Naveen D'Souza, vice-president, FG Wilson (Engineering) FZE, FG Wilson dealer in UAE and the Gulf region



Photo Credit: FG Wilson

Investor confidence always increases when oil prices rise, and this has a positive effect on the market for gensets.

Technical Review Middle East (TRME): As oil prices rise to US\$56 recently, what are the upcoming changes do you predict for the genset market?

Medhat Al Shafey (MAS): Yes, the recent oil price increase will have a positive impact on the market in Saudi Arabia, and this is going to reflect on the growth and recovery for the genset market. But product costs are always going to be important and genset brands will need to look towards lower cost manufacturing countries to stay competitive. Gensets made in China now account for about a third of the Middle East market and below 375 kVA that rises to more than half of the market. Some of this is Chinese brands but much of it is accounted for by established global brands like FG Wilson, manufacturing in China. We know that for some customers who may have previously bought gensets made in Europe or the USA, there can be an image challenge with made-in-China products, maybe to do with quality or how a product will be supported. With FG Wilson, our China-made products are built in modern, world-class factories, at the same standard, to the same design, with the same components and supported with the same global parts infrastructure as any of our other European or USA-made products. We make a big effort to show this to our customers. And, of course many other industries work the same way: look at the phone in your pocket or the computer on your desk. Most likely these were made in China.

Naveen D'Souza (NDS): Yes, we're seeing positive signs in the Gulf region. As oil prices have increased, we've noticed brisk activity in the oil and gas and construction sectors. Investor confidence always increases when oil prices rise, and this has a positive effect on the market for gensets.

TRME: Factors leading to the rise in power rental market in the Middle East? How has the growth been in the GCC, especially in UAE and Saudi Arabia?

NDS: In the UAE, the rental sector is certainly seeing growth, as customers opt for equipment rental instead of a capital purchase. It makes a lot of sense when customers have budget constraints or are thinking about liquidity. Renting or leasing a machine means it becomes an operating expense, not a capital asset. This helps customers keep tighter control over their finances. Other benefits of renting are that customers don't need to employ people to maintain the genset: it's all looked after by the rental operator. And if a unit fails, the rental operator is contractually obliged to repair or replace it immediately. With a dedicated rental product range, backed up by effective aftermarket support and ready spare parts, FG Wilson is a preferred brand with several Middle Eastern rental operators.

MAS: I agree with Naveen. Another reason why renting machines is becoming more popular is because construction projects are more often broken up into smaller, shorter phases which encourages

customers to focus on shorter time horizons and not think about investing in machinery for an entire long-term project. For these shorter project timescales, renting can be a very good solution.

TRME: Which is the biggest genset market in the region? Recent reports suggest Saudi Arabia, the UAE and Qatar are leading the way. What are the countries, you think, follow the list?

NDS: The last few years have been challenging for many in the industry but there is now renewed vigour and investment across the region. We would see the top three markets as Turkey, UAE and Saudi Arabia. Together they account for well over half of the entire genset market in the Middle East.

Interest in solar power generation has increased tremendously in the region but for the foreseeable future, this will co-exist alongside gensets.

TRME: Between gas and diesel gensets, which has a better growth prospect and why? With solar generation being tapped in a big way today especially in Saudi Arabia, the UAE and Egypt, do you think it may affect the genset industry?

NDS: I think diesel gensets have better growth prospects in the immediate future. Although gas gensets have been in use for many years, lack of proper distribution and local storage constraints are hindering growth. But there is now much emphasis on clean energy in the region which could drive growth for gas gensets. There are efforts to provide local storage solutions, with uninterrupted supply of gas and this will help to grow the gas market.

Interest in solar power generation has increased tremendously in the region but for the foreseeable future, this will co-exist alongside gensets. Even though the size of solar panels is reducing, you still need a very large surface area to install a solar plant compared to the space occupied by a genset. We see a lot of people who ask



Medhat Al Shafey

Photo Credit: FG Wilson



Naveen D'Souza

Photo Credit: FG Wilson

about solar power generation but what they really need to meet their needs is a genset.

MAS: Yes solar power generation will definitely play a growing role in Saudi Arabia and across the Middle East, but for now and the foreseeable future, we're going to see power generation solutions combining diesel and solar, especially in the telecoms sector.

TRME: What is the role of hybrid gensets in the present context?

MAS: All telecom companies in Saudi Arabia are interested in hybrid gensets. They prefer a complete solution from one source, so it's one call for service and support for the entire system. At TAMGO, we're working closely with our customers to provide them a complete solution.

NDS: Yes, we see this strongly too. There are a few variants of hybrid gensets in the market. However, the only successful hybrid options are for solar with back-up from a diesel genset and battery. These are mostly used by telecoms operators to provide power to the GSM towers. As the batteries get more efficient and smaller, hybrid gensets with battery back-up might play a bigger role in the coming years.

TRME: What are the preferred ranges that are most popular in the region and the industries that are catered to?

NDS: FG Wilson manufactures gensets from 6.8-2,500 kVA. These are used across the various industry segments. Most of our 6.8 – 30 kVA range are installed by telecoms operators and our 30-700 kVA range is used widely to provide prime power at construction sites, offices, small industries and events. Our larger range of 750-2500 kVA gensets are used in power plants (as a main source of power), large industries and emergency standby in buildings and other installations, where continuity of power is important, for example, hospitals, banks, data centres and high-rise buildings.

TRME: Upcoming trends in the genset market for the Middle East region. How is North Africa region looking in terms of genset market?

NDS: Customers are certainly becoming more price conscious. We think in terms of lifetime value. So while we focus heavily on cutting down the costs, we do not compromise on quality, reliability and support. It's always possible to find something which is cheaper up-front, but always important to think of ownership experience and costs over a product's lifetime.

North Africa is experiencing strong growth mainly driven by infrastructure development, oil and gas and structural reforms and these will drive demand for gensets.

MAS: Yes, we're seeing promising developments in Egypt with new infrastructure projects and the new capital city which is now under construction. ■



Smoke, oil vapour and engine exhaust fumes should not enter the genset room.

Photo Credit: Teksan

A guide to designing genset rooms

Generator specialists Teksan offers advice to optimise the performance of gensets

WHATEVER THE TYPE of building – be it a hospital, home, data centre, military facility or factory – reliable power is essential for smooth operations. When it is time to invest in a genset, the design of the space where it is to be positioned and operated is absolutely crucial for hassle-free operations.

Space allocation issues do arise with large power gensets. We recommend the design of generator rooms be considered right from the beginning in the building design process and their design should be carried out in consultation with experts, to ensure smooth operations.

Genset room

The integrity of the genset and its equipment should be considered during the design phase. Its design should comply with the local fire protection regulations.

The generator room should be clean, dry,

well-lit, well-ventilated and not too hot; with a leak-proof floor. The floor and base of the room should be designed taking into account the static and dynamic weight of the genset.

Smoke, oil vapour and engine exhaust fumes should not enter the room. Insulating materials used in the room should be non-flammable or flame retardant.

Room layout

Door width and height should allow easy access for all equipment to be moved into the room. The equipment — such as fuel tank, silencer and so on — should be positioned close to the genset to prevent pressure losses.

The control panel should be positioned correctly for easy use, with sufficient space available for maintenance.

The room should have an emergency exit, kept free of any obstructions, such as cable

trays or fuel pipes, which can hinder building evacuations.

There should be three-phase/single-phase sockets, water lines and possibly air lines available in the room for ease of maintenance and operation.

If the daily fuel tank of the generator is of external type, the fuel piping should be fixed up to the genset and the connection from this fixed installation to the engine should be made with a flexible fuel hose, so that the engine vibration can not be transmitted to the installation. We recommend the fuel system to be installed via a duct through the ground.

Power and control cables should also be installed in a separate duct. Since the genset will oscillate on the horizontal axis in case of start, first step loading and emergency stop, it is recommended that the power cable should be connected by leaving a certain amount of clearance.

Ventilation

Proper ventilation improves the life-cycle of the genset and provides a comfortable environment for maintenance and operations personnel.

In the genset room, right after the start, an air circulation begins due to the radiator fan, fresh air enters from the vent located behind the alternator. That air passes over the engine and the alternator, cools the engine body to a certain degree, and the heated air is discharged into the atmosphere through the hot air outlet located in front of the radiator.

For efficient ventilation, the air inlet/outlet opening should be of suitable dimensions. Windows should be louvered to protect the air outlets, and fins should be sized so that air circulation is not affected. Otherwise, the recurring back-pressure can cause the genset to overheat.

A duct should be used between the radiator and the air discharge opening, with the connection insulated with canvas to prevent genset vibrations from being conducted to the building.

The engine crankcase ventilation should be connected to the front of the radiator via a hose, so that oil vapour can be discharged easily to the outside. Precautions should be taken so that rain water does not enter the crankcase ventilation line.

Automatic louver systems should be used in applications with gaseous fire-extinguishing systems.

Fuel system

The fuel tank and genset should be preferably positioned at the same level, and in compliance with fire codes. It should be installed in a concrete or metal bund and in a well ventilated space, taking care that the fuel piping is installed away from hot zones.

Black steel pipes should be used in fuel systems. Galvanized zinc or reactive metal pipes should not be used, in case impurities clog the fuel filter.

Warning labels must be assigned stating that no sparks, flames or smoking is allowed.

For cold weather places, heaters should be used for fuel systems and tanks and pipes insulated.

Filling of the fuel tank should be considered and designed during the room design process.

Exhaust system

The exhaust system (silencer and pipes) is installed to reduce engine noise and to direct toxic exhaust gases to appropriate areas, away from habitation, as they are a health and safety hazard. The exhaust system should consist of flexible compensator, silencer and pipes that absorb vibration and expansion. Exhaust pipe elbows and fittings should be designed to expansions due to temperature.

When designing the exhaust system, the main objective should be to avoid back-pressure. This can be done by ensuring that the pipe diameter is of the correct diameter and the pipe takes the shortest, straightest route.

A rain cap actuated via exhaust pressure should be used for vertical exhaust pipes.

The pipe and silencer should be insulated so that the exhaust temperature doesn't increase ambient temperature and affect the genset's performance.

Where space constraints won't allow the exhaust silencer to be suspended from the ceiling, an exhaust stand can be used. ■

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Smart solutions

Abdulmir Al Muscati, general manager, METCO, provides an overview of the company's IoT offerings

Tell us about some of your current major projects.

METCO is currently working on a few prestigious projects, involving different aspects of ICT, for distinguished regional organisations.

Some of these projects are:

- Passive and active infrastructure for data centres and company headquarters.
- Contact centre upgrades and unified communication network projects for various organisations across industries.
- AV equipment and resources for major oil companies.

Safety and security are concerns for all businesses in the digital world. What solutions does METCO offer to address these challenges?

METCO customises security solutions that assist organisations to move on to the next level of data security. Our experts ensure that network security is structured to protect IT investments from various threats facing many organisations today. We also provide 24-hour monitoring system that alerts our engineers of a threat on a network. Our team is focused on protecting the integrity and usability of our clients' networks and ultimately securing their organisation.

Please give us an overview of your Smart & Internet of Things (IoT) solutions.

METCO delivers a wide range of IoT solutions that fulfill the requirements of all

verticals, so life can be safer, easier and more comfortable. Our smart and IoT solutions include:

Smart power & cooling solutions for data centres: METCO provides a range of products for mission-critical environments, designed to minimise downtime, improve efficiency and reduce operating costs.

Smart telehealth systems: Telehealth has developed from a monitoring system of vital health data, into a smart tool where patients are aware of their lifestyle. Telehealth helps patients understand their physiology and lead healthier lives.

Connected Medical Devices: This solution offers medical device manufacturers a set of features for device remote control and monitoring, OTA updates, and data collection for delivering a timely healthcare service. It could be integrated with portable or stationary medical equipment, or used as tiny sensors in wearables.

Traffic and Signal Control System: Its intelligent management system offers unique features like real-time data captured from various sources and live dashboards with real-time infographic view to monitor junctions.

Room control and automation solutions: Our range of room control solutions help customers automate and control the systems with one central unit.



Abdulmir Al Muscati

Photo Credit: METCO

What are your strategies to offer the best customer experience?

We provide a spectrum of ICT solutions, including connectivity, operational support, and business applications, which all are scalable, secure, and cost-effective.

We are in the business of improving our clients' bottomline. Our alliances with leading technology providers help us deliver the tools necessary for a business to succeed.

METCO has a team of 500 employees across the region, who offer professional evaluation, integration, and troubleshooting services.

Our teams work closely with clients to clearly identify their ongoing requirements, KPIs, and targets. And all our policies, procedures and processes are compliant with industry best practices.

Our managed services include:

- 24/7 network monitoring
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- Dedicated customer service unit
- Field support
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- Back-up and patch management. ■

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Enabling the cloud

Any business transformation exercise begins by enumerating and detailing the cloud road map, explains Yasser Zeineldin, CEO, eHosting DataFort

MOVING A BUSINESS to a cloud platform or a multi-cloud platform requires preparation, thought, and a list of objectives, to remain focused and accountable. While the cloud is now a familiar buzzword, many businesses have adopted it as a tool, and not so much as a strategic exercise to help the organisation move to a much higher level of digital agility, flexibility, and revenue. Mapping the cloud journey before executing it is imperative, since it can be the backbone for a much larger organisational change covering end-user job roles, departments, and an end-to-end work culture.

Detail your business objectives

Businesses should start by taking a look at their regional markets and evaluating how many of their competitors have adopted the cloud as a business strategy. This will give them an idea of how far ahead or behind they are from the rest of the pack. Next it is important to make a complete and exhaustive list of what are the primary business objectives of moving to the cloud. It could be about making available selected business applications to a much larger number of employees based on a more economical cost of cloud-based software. If the business is expanding geographically, it may be about enabling end-users to go-live in a cheaper, more effective, more connected and more rapid fashion manner, by going all-cloud.

On the other hand, the cloud migration exercise may be based entirely on various IT objectives of reducing maintenance and upgrade costs, due to availability of cloud-based software.

Software available from a cloud platform is automatically upgraded and kept secure by the software vendor from whichever part of the world it is accessed. Data saved while using such a cloud platform can be accessed from whichever part of the world the end-user moves to next, while they work outside



Yasser Zeineldin,
CEO of eHosting DataFort.

Photo Credit: eHosting DataFort

office or work at home.

Migrating to the cloud offers longer term stability by allowing the business to replicate itself across many more cloud platforms, therefore making it disaster proof. But it can add more complexity in terms of service level agreements, security responsibilities and vulnerabilities, and country level data compliance requirements.

These need to be taken into consideration in the planning exercise.

Next, the business needs to evaluate whether the end-user experience of using the cloud software is superior to whatever it is using at present. The longer its end-user community has been using a particular

business application internally, the longer it will take for them to adapt to the new environment. This resistance to change needs to be planned for during the migration exercise, in terms of change management and mentoring.

Other than end-users, will customers also be impacted? If yes, then a change management evaluation needs to be made for them as well.

Customers are always looking for superior experience and innovative service offerings, and adoption of the cloud needs to be a step forward in this direction.

Relook at job roles

Adopting and migrating to the cloud empowers the overall organisation and its employees. By default, an IT department wields clout, as it has central control on the delivery and support of IT resources and business applications.

By migrating to the cloud, the control of the delivery of business applications has now moved outside the organisation. This outsourcing initiative, frees up more resources inside the IT department, allowing them to spend time looking at more strategic and longer-term initiatives.

This could be about how to use automation to remove manual and repetitive tasks from an employee's work time. It could be about how to use better analytical tools to enable higher levels of business insights for customer facing teams and senior management executives. It could be about how to manage larger volumes of data being generated through larger number of end-users now accessing cloud-based business applications. This would require building various data architectures and using various cloud-based analytical tools to enable business decision makers to get much better insights into customer behavior or in general organisational performance metrics. These responsibilities require new job roles and possibly new staff as well. ■

Adopting and migrating to the cloud empowers an organisation and its employees.

Path to sustainability

Global experts propose tech disruption for massive energy conservation at an industry event.



Live digitalised demo stations and working innovative solutions were displayed.

Photo Credit: Action Group

L EADING HVAC COMPANIES believe the adoption of new digitally driven technologies is vital to ensuring sustainability and a minimal environmental impact in the region where 80 per cent of energy is consumed by buildings, and almost a third of this is down to HVAC systems.

“The industry is ready to innovate and take up a role in assisting the region’s drive towards sustainability with energy savings and improved efficiency to deliver better buildings to live and work in,” said Hassan Younes, president of the American Society of Heating, Refrigeration and Air Conditioning (ASHRAE) Falcon Chapter.

Younes was the moderator of the one-day event – ‘Shaping the Future of the HVAC Industry’ – organised by four of the region’s biggest HVAC players who came together to tackle underlying gaps and address local market demands and pain points.

Global experts outlined how technological disruption can aid the region’s energy and water conservation drive. The event’s organisers were actuator and valve technology company Belimo, Danish water

and climate firm Grundfos, insulation experts Kingspan and water-bearing building systems and technology provider Reflex.

Colin Bridges, business development director at Belimo commented, “With fast growing urbanisation, finite natural resources and increasing global warming, it is clear that buildings are going to have to become smarter in every way. This will mean harvesting ‘real time’ data and its autonomous use by building management systems to continuously maintain efficiencies. This means doing things differently, not tomorrow, but today.”

“It is vital that we move the market towards the adoption of innovative and energy saving water solutions in HVAC. Digitalisation is opening new opportunities to optimise systems and integrate different components, allowing them to operate in better synergy,” said Ronak Monga, segment development manager for building services at Grundfos Gulf, Levant and Pakistan.

Live digitalised demo stations and working innovative solutions were displayed. HVAC experts at the event outlined how intelligent digitisation is

changing the face of the industry with integrated technology delivering optimal performance, enhanced energy efficiency, and reliability leading to lower power consumption, less noise and improved environmental comfort overall. Without action to address energy efficiency, energy demand for space cooling will more than triple by 2050 – consuming as much electricity as all of China and India today.

“To maximise operational efficiency, it is critical to consider all HVAC system components. System water, one of the most important components is usually underestimated. Water quality has an enormous influence on the efficiency of the HVAC systems. Modern control and measurement technology help us guarantee the maximum functionality, at minimal energy losses,” noted Moustapha Fahmy, regional sales director IMEA at Reflex.

“The HVAC industry, particularly the ductwork market, has traditionally been reluctant to change. It is time to embrace new types of materials that help save energy in buildings. This starts by honing of skills and training of HVAC contractors on the new technology, whilst updating specifications and introducing the best performing systems,” said Paul Barnard, head of HVAC for Kingspan Middle East.

The four partners say this first sustainability gathering should spur momentum for fast tracking innovation and collaboration to tackle crucial energy conservation challenges. ■

“It is vital that we move the market towards the adoption of innovative and energy saving water solutions in HVAC”

Ronak Monga, segment development manager for building services at Grundfos Gulf, Levant and Pakistan

BASEC plans collaborative Cable Quality seminar with Ducab

WHAT'S THE VALUE of quality to you?

This year, BASEC has launched a series of cable quality seminars designed for those who are involved in projects where cable installations are vital to the successful operation of their facilities.

Often the requirements of cable are overlooked or left until last, as typically electrical wiring is the last installation on a construction site.

Sadly, it often takes a tragedy before questions are raised about the impact of poor-quality building materials. As cables are commonly the cause of fire, BASEC is keen to raise awareness and promote good practices for those responsible in the specification of these products. Educating the construction industry plays a pivotal part in ensuring that any potential risks of fire to building inhabitants are minimised.

The sessions will focus on understanding the implications of poor-quality cables, the outcomes of fire testing and more – they are especially relevant to those working across the supply chain; from specifiers,



Photo Credit: BASEC

Electrical wiring is the last installation on a construction site.

consultants, architects, purchasing, to the main contractor, end users and installers.

The Cable Quality seminar in Dubai, organised in collaboration with Ducab, aims to give consultants and users an opportunity to learn from Ducab's experiences, while increasing awareness about independent cable testing and certification.

With safety now at the forefront of

everything we do, do not miss your opportunity to learn more about cable safety.

*The Dubai seminar takes place on **Wednesday 30 October, 2019.***

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BASEC is the preferred testing and certification partner to the worldwide cable industry. The mark of independently approved quality and safety is only awarded when cable products have been rigorously tested to meet the highest industry recognised standards. For more than 45 years BASEC has been a mark of reassurance for those manufacturing, specifying and installing cable. With comprehensive product testing approvals, stockist and control cable certification schemes designed to provide the purchasers of cables and contractors with the peace of mind that the cable they install is compliant, safe, fit for purpose and will provide years of reliable service.

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Safely testing recloser controls

ONLY CORRECTLY PARAMETERISED reclosers can safely protect overhead lines, says Stephan Geiger, head of product management and specialist in recloser test systems, OMICRON Electronics.

Reclosers are decentralised relay systems predominately used for overhead lines in distribution grids.

Incorrect parameterisation or a faulty device will not ensure a proper, selective switch-off, leading to grid outages in many cases.

Decentralised injection, example, via wind power and photovoltaic systems, is also a major challenge for distribution grids – and thus for the parameterisation of relay systems. Outages also affect performance indicators an energy supplier and can even lead to fines.

Most energy supply companies have a maintenance plan in which they test the recloser controller's functionality via secondary injection at a defined maintenance interval. However, several companies still do not run this test or only replace the affected recloser. This kind of run-to-failure strategy costs more compared with regular testing, which can often be performed while the recloser and grid remain in operation.

In the interest of outage performance

indicators, many energy companies use a sophisticated test programme for commissioning and maintenance. For example, the US NERC (North American Electric Reliability Corporation) has specified maintenance guidelines for protection systems. The 2016 edition, the PRC-005-6 standard also included reclosers in the programme.

Malfunctions can be caused by ambient conditions; sometimes the controller is subject to extreme temperature fluctuations, naturally leading to more rapid ageing of the components and increased errors, as opposed to protection relays, normally operated under a constant temperature.

The new ARCO 400 meets all the requirements for the timely testing of recloser controllers. It simulates the recloser with up to six voltages and performs a real, three-phase test directly onsite. This also includes simple trigger and restart tests as well as comprehensive and complex tests, which can also be direction-oriented. Even harmonics can be generated.

Testing several interconnected reclosers is an important requirement in modern energy distribution grids, as insufficient communication connections in automated distribution grids can adversely affect



Photo Credit: OMICRON Electronics

Stephan Geiger

their function. Several ARCO 400s can be GPS synchronised to inject transient signals in several recloser controllers simultaneously, enabling real load flows and error scenarios to be simulated and the correct functioning of centralised and decentralised automated systems to be tested in the lab and field.

Reports can be generated with the push of a button and then transmitted to an asset management system. This ensures that evidence of proper maintenance and settings of the recloser is available at all times.

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Morocco's Noor Ouarzazate Project 510MW is one of the world's largest concentrated solar power plants.



Picture credit: Masen

Stride to sustainability

Morocco is rapidly emerging as a clean energy leader in the MENA region, says Abhishek Paul

MOROCCO RANKS FIFTH in the world in the 2019 Climate Change Performance Index, and is the only country in the top 20 from Middle East and North Africa (MENA).

Ever since the Moroccan government began implementing its new energy strategy a decade ago, considering economic and environmental reasons, the renewable energy wheels of Morocco have been turning fast.

With 35 per cent of its energy requirements supplied by renewable sources as of 2018, the North African country is inching towards producing 42 per cent of its power from renewable sources by 2020, according to the Institute Research Solar Energy Et Energies Nouvelles (IRESEN).

Morocco's share of wind and solar energy was barely 2 per cent in 2009. But, by 2017, the clean energy share rose to more than 14 per cent. Building on that, the kingdom aims to produce more than 50 per cent of its energy requirements from clean energy by 2030. It has set bold objectives to expand its renewable energy capacity to 10,000MW by 2030, according to Mohammed Ghazali, secretary-general of the Ministry of Energy, Mines and Sustainable Development. The

additional capacity includes 4,500MW of solar energy, 4,200MW of wind energy, and 1,300MW of hydroelectric energy.

With the reduction in energy dependency from 98 per cent in 2008 to 93.9 per cent in 2017, Morocco is committed to energy transition, maintains Ghazali.

Meeting energy demand

As more than 90 per cent of Morocco's energy is linked to imported fossil fuel, its government has adopted multi-pronged strategies to strengthen their own energy security. One of these is pushing for energy diversification, focusing on solar, wind and hydro energy.

Morocco's minister of energy, mining, and sustainable development Aziz Rabbah said that the state will invest over US\$40bn in the energy sector by 2030, including in a liquefied natural gas project, reported the *Morocco World News*. The government will allocate US\$30bn of the total amount to renewable energy projects.

Morocco's demand for energy has been continuously growing over the last 10 years at an annual rate of 4 per cent, as per Rabbah.

Morocco's renewable energy targets for 2020 and 2030

Renewable energies	Installation target for 2020	Percent of capacity for 2020	Installation target for 2030	Percent of capacity for 2030
Wind	2000 MW	14 per cent	4200 MW	20 per cent
Solar	2000 MW	14 per cent	4560 MW	20 per cent
Hydro	2000 MW	14 per cent	3100 MW	12 per cent

Source: Moroccan Agency for Solar Energy (MASEN).

With increased economic development, the demand for electricity has more than doubled from 16TWh (terawatt-hour) in 2002 to 34TWh in 2014.

The industry sector is Morocco's highest consumer of electricity with 43.6 per cent, followed by the residential sector with 32.8 per cent and commercial, with agriculture sector (22.4 per cent), while the transport sector accounts only for 1.2 per cent of the electricity demand, revealed a research paper published by the *Journal of Engineering Science and Technology Review*.

According to Morocco's Ministry of Energy, Mines and Sustainable Development, future primary energy demand could reach 26 Mtoe (million tonnes of oil equivalent) in 2020 and 43 Mtoe in 2030.

Despite falling a spot on global renewable energy ranking (RECAI) in 2019, moving from 12th in the world to 13th, Morocco remains a leader in renewables, reported the *Morocco World News*.

Morocco's share of wind and solar energy was barely 2 per cent in 2009. But, by 2017 the clean energy share rose to more than 14 per cent.

Projects at glance

The country's prominent projects include Noor Ouarzazate Project 510MW, which is one of the world's largest concentrated solar power (CSP) project, and Noor PV1 Project 170MW. The three-phase Noor project has four parts. Noor CSP plants can store solar energy in the form of heated molten salt, allowing the plants to produce electricity in the night. Last year, Sener had completed Noor III 150MW plant. An additional 72MW photovoltaic system is planned to produce 582MW at peak when finished the entire project.

The Moroccan Agency for Solar Energy (MASEN) has been managing the solar complex project along with ACWA Power, as part of Morocco's Noor Solar Plan.

The projects that are underway include Wind Integrated Project (820MW), Midelt Wind Project (180MW) and Noor Midelt Solar Project (800 MW).

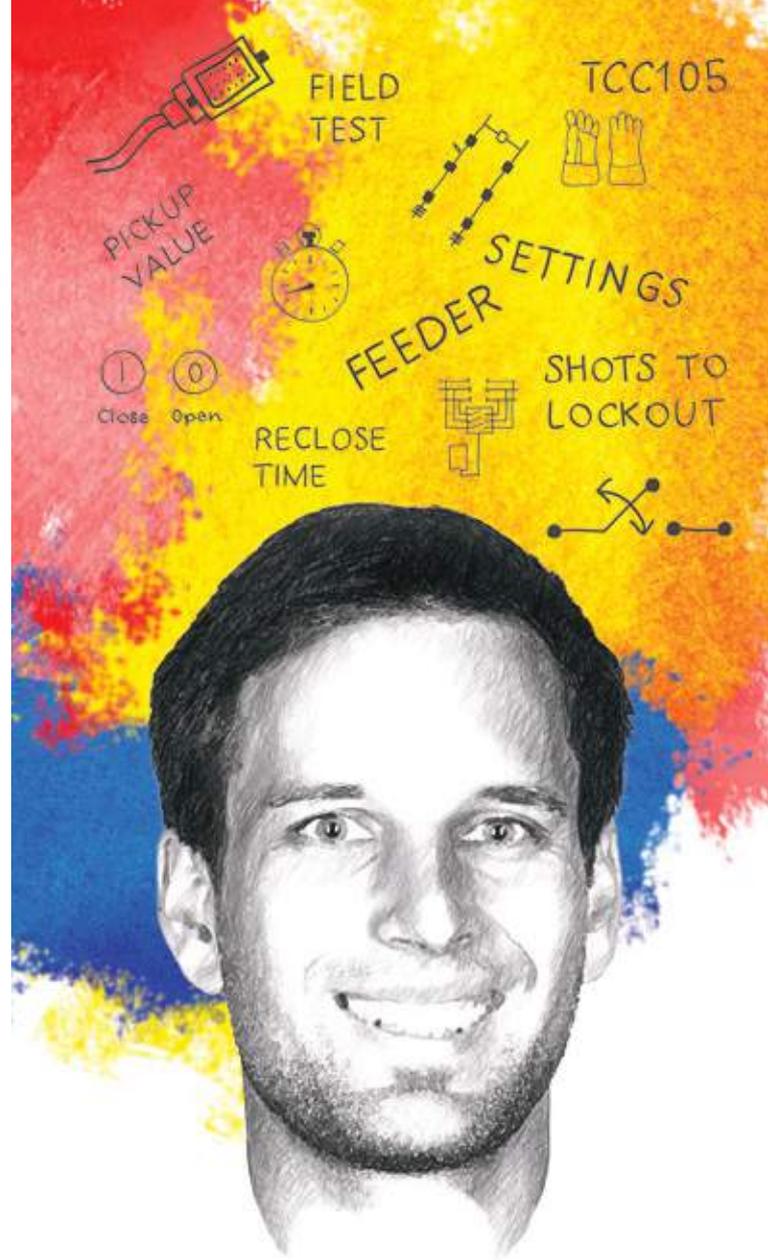
The government is planning to set up a wind blade factory in Tangier, with an annual production capacity of 700 blades, equivalent to 1,000MW, according to Mohammed Ghazali.

With 3,500 km of coastline and wind speeds up to 11.5 m/s at a height of 80 m, the total wind power potential in Morocco is estimated at about 25GW.

Efficiency drive

The Moroccan Agency for Energy Efficiency (AMEE) has revised its sustainability strategy with ambitious targets to improve energy efficiency by 20 per cent by 2030, and to develop action plans in the sectors of transportation, construction, industry, agriculture and public lighting.

Additionally, AMEE has set up R&D facilities such as Green Energy Park, Green and Smart Building Park, a solar cluster to animate and support the market development of different solar applications and training institutes in renewable energy and energy efficiency skills. ■



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Clean energy: The future of mobility

Beacon Energy Solutions and Technology installs customised solar car port solutions, with or without fitted EV charging stations in the UAE.

ELECTRICITY TO CHARGE an electric vehicle can be generated from the sun, and is the most effective way to fuel the growth of EVs and reduce carbon emissions.

Sandhya Prakash, founder and managing director of Beacon Energy, called on developers and owners to **Think, Act and Be Futuristic**. She said, "While designing customised solutions around renewable energy for parking and powering electric vehicles, one needs to consider parameters such as expected usage, time, speed of charging and energy consumption. At Beacon Energy, we propose multiple options to developers based on experiences from around the world. At the same time, we think through local needs, habits and behavior. We also need to be flexible to accommodate rapidly evolving technology."

According to Bloomberg's *EV New Outlook Report for 2019*, privately owned passenger EVs, shared EVs, commercial electric vehicles and e-buses displace a combined 13.7 million barrels per day (MMbd) of oil demand by 2040. Charging infrastructure remains a challenge in our forecast. There are already 630,000 public charging points installed globally, and utilities, oil and gas companies, automakers and pure-play operators are currently all active in this area. But much more will be needed to serve the growing EV fleet.

The excessive time, money and effort needed by traditional EV charging infrastructure is impractical and hinders mass adoption. Installation of grid-tied EV charging stations requires a timeline of 9 to 12 months, serious planning, invasive construction and extreme costs. Grid-dependent chargers leave EV drivers vulnerable during grid outages, resulting in grounded vehicles. Plugging into the grid also requires the use of fossil fuels, defeating the purpose of EVs.

The patented EV ARC™ (Electric Vehicle Autonomous Renewable Charger) is the



Photo Credit: Beacon Energy

world's only transportable but permanent EV charging infrastructure solution. Deployed in minutes without any disruptive, time-consuming and expensive construction or electrical work, the EV ARC™ will support the charger and service provider of your choice. EV ARC™ generates and stores all its own energy so there are no utility bills and vehicles can be charged day and night, during inclement weather and crucially, during blackouts.

Envision Solar CEO, Desmond Wheatley said, "A tremendous amount of research was conducted in the United States to develop the Solar CarPort. Envision's solar powered and rapidly deployable EV ARC™ product is a great fit for clients because of its ease of installation and as it provides a highly visible demonstration of your commitment to the environment."

The EV ARC™ will deliver true zero-emissions EV charging for visitors and employees, without environmental impact, the need for construction or a utility connection or resultant bill. As EVs become more widely adopted, the ability to add distributed, transportable, solar powered chargers without planning, construction or grid upgrades makes the EV ARC™ product the ideal solution for commercial real estate

companies managing growing EV charging demand. Beacon EST is the authorised distributor of EV ARC in the Middle East. ■

For Permanent Solar Car Port (customised) or Movable Solar Car Port (standardised), contact a Beacon consultant on bdm@consultbeacon.com or call +971 4 3883208, +971 50 5512481. www.beacon-energy.com

Here are six points to keep in mind for Solar Car Ports:

- If your building is not suitable for PV panels, this is a novel and aesthetically pleasing method of creating free energy for your business.
- Ground-mounted canopy constructions that stretch out over your car parking spaces.
- Customised Solar Car Port Designs can be fabricated.
- PV Solar panels are mounted on the roof.
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Human-centric lighting: a focus on wellbeing

Dishan Isaac, senior show manager, Light Middle East, on new-age lighting solutions that put people first

LIGHTING HAS BECOME a chief consideration in building design around the world. According to research firm Redseer, the Middle East is a “developing and high growth” market set to achieve sector expansion of 6-7 per cent until 2026; establishing the region as one of the world’s fastest-growing lighting solutions markets. The GCC is viewed as the regional driver with environmental commitments pushing demand for highly efficient and cost-effective solutions. Human-centric Lighting (HCL) is one such concept.

HCL is a hot topic for designers and scientists alike, as GCC governments pursue wellbeing goals such as Dubai Vision 2021 – a plan to make the emirate one of the world’s smartest and happiest cities.

Lighting has been shown to boost motivation, well-being and efficiency, and it has a significant influence on our ability to concentrate. HCL focuses on how lighting can affect a person’s mood.

One of the core aspects of lighting is timing. Our brain regulates the circadian rhythm of the body based on light signals from our environment, thereby controlling our energy levels, moods and sense of alertness. When our inner clock no longer functions synchronously with the time of the day, we often become agitated and our reactions slow down; we are less attentive and find it harder to concentrate.

Research shows that HCL supports the human circadian rhythm, improves concentration, aids healthy sleep patterns and enhances overall well-being. It is gaining huge traction as wellbeing is increasingly important to individuals, corporates and governments.

HCL products can now be made to order, customised in colours, temperatures and brightness. Through technologies such as the Internet of Things (IoT), lighting can be controlled in real-time. For example: employees in an office setting can control their own light levels and colour



HCL helps create healthier, more productive workspaces

Photo Credit: Light Middle East

temperatures using smartphone apps.

HCL can be used to create a stimulating ambience during the day using bluer frequencies and a relaxing one at night, using amber and red frequencies. While daylight is proven to be the best source of interior light for wellbeing and workplace productivity, HCL can deliver the same levels of light as the sun – boosting productivity at all hours of the day. It is applicable across

The changing nature of products is disrupting value chains and forcing companies to rethink nearly everything they do internally.

the board – in offices, homes, restaurants, factories, warehouses, schools and hospitals.

At this year’s Light Middle East, HCL is expected to open immense possibilities for the entire development supply chain – from design to final occupancy, taking the intelligent building concept to an entirely new level, while mimicking and potentially surpassing LED technology.

HCL is part of a ‘smart’ lighting revolution impacting design, construction and transforming intelligent building practices. Smart, connected products offer exponential opportunities for new functionality, far greater reliability, higher product utilisation, and capabilities that transcend traditional product boundaries.

The changing nature of products is disrupting value chains and forcing companies to rethink nearly everything they do internally. The lighting industry’s focus is now switching from hardware to smart software technologies that create healthier and more productive workplaces, as well as more relaxing home environments – all while reducing carbon emissions. ■



Advantage Sohar

With a consumer reach of more than 2.2bn, the port's Terminal 2D is open for leasing and promises attractive RoI

WITH SEVERAL DEVELOPMENTAL plans underway, including future projects, Sohar Port and Freezone continues to seek possibilities for growth and expansion. In line with this principle, the port is now looking forward to leasing out their Terminal 2D.

The sizable land area was initially developed in 2009 as a container terminal expansion, but has now been dedicated to businesses involved in the logistics and metal sectors. The waterfront location hosts an area of 100 hectares with easy access to the surrounding industrial clusters.

Commenting on the potential of Terminal 2D, Mark Geilenkirchen, CEO of Sohar Port and Freezone said, "Sohar is strategically positioned at the centre of global possibilities, and has a consumer reach of over 2.2 billion across Africa, Asia and the Middle East. Potential customers are generally based outside Oman, so we aim to support them in setting up at Sohar. Additionally, with our one-stop shop facility and the benefits we offer, investors will



Mark Geilenkirchen, CEO of Sohar Port and Freezone.

receive a favourable return on investment."

The One-Stop-Shop (OSS) service at Sohar Port and Freezone acts as a single-window for clients to obtain all necessary documentations and operate their businesses in a smooth manner. The OSS provides multiple crucial amenities

including company registration and licensing, plot work and labour permits and visas to deliver high-quality services.

"With several regional ports currently running out of space, Sohar still has the capacity to further expand and attract prospective investments. Clustering is an innovative form of business. Therefore, the close proximity to our petrochemical, logistics and food clusters will also support the creation of upstream and downstream opportunities for further business developments," Mark said.

"Moreover, as the Port and Freezone are both managed under a single entity, this allows for a seamless connection between the two, while also enhancing efficiency for feedstock imports and product exports," Geilenkirchen added.

Businesses can take advantage of the deep-water facilities and the accessibility of logistic services surrounding Sohar Port and Freezone. ■

For more information on Sohar Port and Freezone, visit soharportandfreezone.com



Photo Credit: Adobe Stock

Promising future

The GCC's mining sector presents opportunities for growth and throws up challenges. Abhishek Paul reports.

The GCC will continue to develop existing metallurgical industries such as aluminium and copper smelting.

THE GCC'S MINING industry is taking rapid strides to exploit the mineral resources of the region. Instead of riding on oil and gas revenues, the GCC countries have been focused on economic diversification – investing in non-oil sectors, such as mining, to boost their economies and jobs creation.

To realise this, the GCC countries are betting big on mineral deposits such as gold, silver, iron ore, copper and bauxite. Some of the mineral deposits left after desalinating seawater, such as magnesium, are being recycled as well.

"The GCC has huge untapped mineral deposits of all types, and with investment these could grow to be a substantial industry," says Nick Carter, president and CEO of American Arabian Development Company, in *The Economist Intelligence Unit's* report *The GCC in 2020: Resources for the future*.

Though the natural resources are available, the mining industry is not in a position to continue its business as usual, owing to constant disruption in the fourth industrial revolution and pressing concerns about sustainability practices.

"The mining industry is poised for greater growth than it's seen in a decade, but today's market realities are very different than those in the past," says Bart Cornelissen, partner and energy and resources leader, Deloitte Middle East and managing partner of monitor Deloitte, Middle East.

"Disruption and volatility has become the

new normal and the pace of change is challenging the industry's ability to adapt. In this new world order, mining companies will not attract talent, investment, or community support if they only focus on communicating the value that they currently bring to communities. Miners will need to go a step further and articulate what they stand for by developing differentiated business models designed to drive long-term value."

Challenges remain

Despite bold plans being charted out, such as Saudi Vision 2030, focusing on generating mining opportunities, it seems uncertainty over the sector's future climate is dampening investment spirits of all stakeholders. Some of the crucial challenges the industry is grappling with include human resources, health and safety, capital investment, sustainability, responsible use of water and energy and economies of scale.

According to Ines Scotland, CEO of Citadel Resources, a mining firm based in Australia, growth would be faster if governments were to build on new laws allowing foreign investment in mining by actively granting exploration and mining licences. "The major risks are around the ability to attract foreign investment," notes Scotland in *The Economist Intelligence Unit's* report. "Investment in exploration is risky, and you need companies that are prepared to take those risks and manage them with technical abilities."

Going by traditional metrics, things are

looking good for the world's top mining countries, according to PwC's Mine 2019 research report which mentioned that the world's 40 largest mining companies' revenue increased by eight per cent (US\$51bn) to US\$683bn in 2018. EBITDA of these companies was up four per cent (US\$7bn) to US\$165bn.

Dividends paid to shareholders recorded US\$43bn, which is an all-time high. Additionally, capital expenditure showed an increase by 12 per cent to US\$57bn for the first time in five years, albeit still below 2008 pre-boom levels.

However, issues such as trade wars, geopolitical crises and climate change continue to create industry volatility. This uncertainty was particularly evident at the end of December 2018, when commodity prices and emerging economy exchange rates decreased substantially, reveals the PwC report.

"And when investors and other stakeholders look at the future of the mining industry, it is clear they have concerns about the industry's perception on vital issues such as safety, the environment, technology and consumer engagement," states the report.

With mining companies investing in analytics and AI in a bid to leverage the data they generate to sharpen planning and decision-making across the mining value chain, it could improve safety, increase productivity, reduce costs, and enhance the employee experience, according to Deloitte Global's 11th annual mining report.

Experience the Progress.



Considering the tricky state of affairs, the report maintains leading mining companies need to prove they are keeping up with the pace of change. “As an industry, this means transforming their reputation as efficient ‘converters of dirt’ to prominent builders of both economic and societal capital. Prioritising green and customer-centric strategies, enabled by technology, will help earn the trust of stakeholders and enable miners to create sustainable value into the future,” says the PwC report.

Further, in order to drive sustainable shared social outcomes, mining organisations must go beyond seeing corporate social responsibility as a cost of compliance and listen more closely to their constituents to determine what stakeholders truly want and shift their operational processes in response, according to Deloitte’s mining report.

Rethinking mining strategy

Many mining companies are still holding on with their age-old strategies such as producing the highest volumes of ore at the lowest possible cost. This method has to change.

“Mining companies need to broaden their strategic outlooks. When done well, strategic planning cycles consider a range of issues in addition to producing at lowest cost, including the role of individual assets in the portfolio, the path to value creation, the balance between risk and return, and how the company is differentiating itself in the eyes of its stakeholders,” says Cornelissen, partner and energy and resources leader, Deloitte Middle East. “These key choices should ultimately drive a mining company’s investment allocation strategy, the partnerships it creates, and the kinds of capabilities it decides to build.”

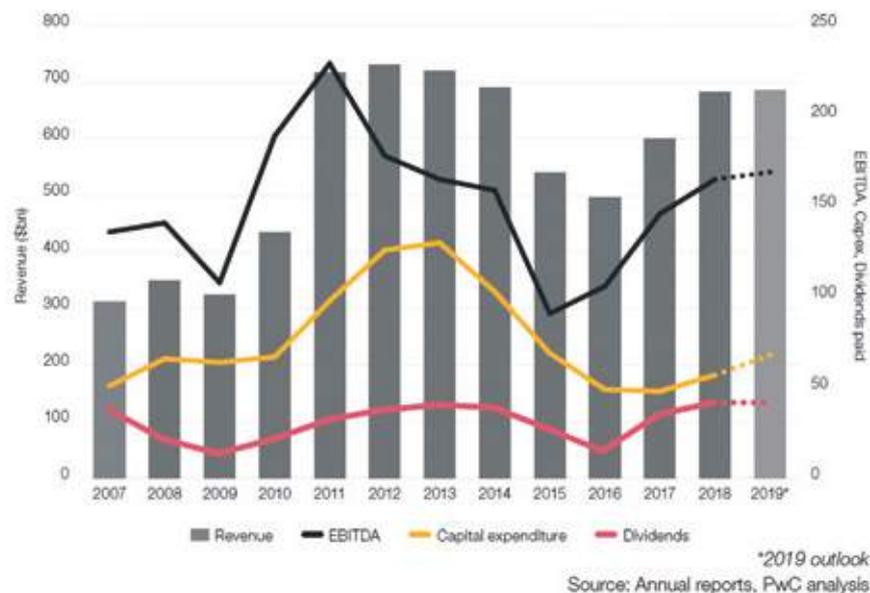
“Given these identified global trends and issues, also GCC governments and mining companies need to become increasingly more strategic about their investments, operational performance and social impact if they want to be able to play a significant role regionally and globally,” he added.

Creating opportunities and jobs

Like the hydrocarbons sector, the mining sector is vulnerable to shifts in international prices.

On the plus side, however, is the sector’s relative labour intensity compared to oil and gas extraction. “For every job created in mining, another seven are created indirectly,” confirms Scotland. Carter agrees that “Modern mining processes have the capability to provide very good long term

Figure 1: Top 40 mining companies performance trends (\$bn)



employment opportunities for the local population,” both in production and in management.

As digitisation and automation alters the very nature of work, and the mining industry faces a massive generational shift with enrollment in mining-related disciplines down, Deloitte’s mining report suggests mining companies will need to broaden their talent strategies. “They must consider not only the shifting nature of work, but how to attract a new variety of workers and tailor their workplaces accordingly,” says the report.

On the front of improving diversity and inclusion in the mining industry, and to attract new talent to help meet the industries’ digitisation, automation, and innovation goals, the report underpins that mining organisations will need to shift historical perceptions about the industry. “This will involve collaboration across organisations as they recruit from education institutions and other online platforms, a focus on exposing unconscious biases that influence hiring decisions and contribute to workplace inequality, and the implementation of more flexible workplace practices,” says the report.

Scotland notes that the legal framework for investing in mining is largely untested, which makes foreign firms cautious about committing resources. At least initially, most minerals will be exported in raw form. He notes that the availability of local management for mining firms is limited because the industry is new and most of the experienced staff are employed by

governments. “[Government experience] doesn’t necessarily lend itself very well to private sector operations, where capital and support might be limited and there are defined time constraints,” he says. “On the other hand, local management is important to navigate the political and cultural landscape.” It will take some years to build up local expertise and attract international experts to the GCC’s underdeveloped minerals sector, but the rewards are likely to be substantial.

For example, a “mineral railway” will be built in Saudi Arabia to link mineral mines to processing facilities. “Most minerals will be used for export and there is not a great deal of infrastructure allowing the processing of minerals within the region,” explains Carter. He adds that over time, new industries will undertake more mineral production locally, “similar to the development of the petrochemicals industry”.

Smelters will be developed first, he believes, followed by finishing mills and, later, manufacturing plants that use the finished materials. However, the GCC will continue to develop existing metallurgical industries such as aluminium and copper smelting. Additionally, it is investing in other mineral-based industries as part of diversification efforts.

As the industry shifts into a new stage of growth, miners must take an ever-expanding range of issues—from stakeholder engagement, to talent, geographic risk, and dwindling access to vital input commodities—into account when setting corporate strategy.

Sustainability

Given the rising constraints to supply water, mining companies can make business choices that optimise the use of energy and water management. "These changes are increasingly necessary if mining companies hope to maintain productivity, assuage community concerns, and manage their environmental risks in an energy- and water-constrained world," stresses Deloitte's mining report.

As customer demand for battery minerals rises, so too does the demand for transparent provenance. This is, the report says, exposing mining companies to increased scrutiny as socially conscious consumers question the origin of raw materials in products ranging from cell phones to electric vehicles. "As a result, downstream customers—such as automotive manufacturers and tech giants—are demanding ethically sourced minerals. This is driving the adoption of technologies such as blockchain to enhance the traceability of commodities," the report stated.



Photo Credit - Adobe Stock

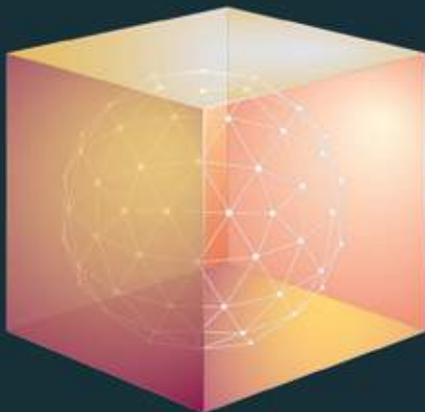
Mining companies can make business choices that optimise the use of energy and water management.

Mining sector in the digital era

Managing risk in the digital era is a different ball game altogether as traditional assurances around risk are no longer effective. "Boards, investors, and communities expect mining companies to have a forward-looking view on risk, moving from risk assurance to the anticipation of emerging risks. This will be enabled by analytics and a range of AI and cognitive tools that are now available to mining companies," the mining report said.

Additionally, the mining organisations need to determine how to interlink their supply chains from pit-to-port in order to gain the end-to-end visibility needed, enhance their asset utilisation, operational efficiency, and productivity. "After the challenges faced during the last down cycle, there is a sense of optimism for mining companies as commodity demand picks up. Before launching into the next wave of investment, miners must learn from the mistakes of the past and rebuild trust with stakeholders," the report concluded. ■

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Pinning hopes on structural change

Will trade tensions and decreasing commodity prices take the shine off Saudi Arabia's nascent mining sector?

SAUDI ARABIA HAS created an independent ministry of industry and minerals, separating it from the energy ministry. This major ministerial restructuring move comes when the kingdom is actively pursuing an economic overhaul programme – Saudi Vision 2030 – to ramp up its mining industry and wean its economy away from oil revenues.

Saudi Arabia aims to raise mining revenues to US\$64bn from US\$17bn by 2030, with the generation of 160,000 additional jobs, a Reuters report said, quoting former energy minister Khalid al-Falih (he was replaced by Abdulaziz bin Salman this September). Bandar Alkhorayef is the newly appointed minister of industry and mineral resources.

The world's largest oil exporter is looking to mine the vast untapped reserves of bauxite, phosphate, gold, copper and uranium through the Saudi Arabian Mining Company (Ma'aden) and attracting foreign investment into the sector.

Saudi Arabia topped the list of foreign direct investment (FDI) in the Gulf region with FDI inflows of US\$3.2bn when FDI across the world dropped by 13 per cent during 2018 to US\$1.3tn, according to the World Investment Report (WIR) 2019 compiled by the United Nations Conference on Trade and Development (UNCTAD).

However, the question is how much of this investment will be channeled into the mining sector.

According to the *Industrial Production Index* report by General Authority of Statistics, comparing the results of July 2019 with the same month in 2018, the production quantities decreased by 9.07 per cent in all industrial activities. "The main reason for this decreasing is that mining and quarrying activity decreased by 4.91 per cent," the report said.

Kingdom's mining arm

Ma'aden has recorded a net loss of



Photo Credit: Adobe Stock

US\$157mn (SR 590 million) in Q2 2019 compared to a profit of US\$167mn (SR 630 million) in Q2 2018. The loss is mainly attributed to decreasing commodity prices, which affected the year-on-year (YoY) profit by US\$128mn (SR 481 million), and one-time costs associated with the restructuring of its aluminium rolling business which amounted to US\$42.3mn (SR 159 million).

Commenting on the results, Ma'aden president and CEO, Darren Davis, said, "The second quarter of 2019 showed further weakness in our core commodities, phosphate and aluminium, with prices continuing downward trends seen since 2018, although gold prices remained strong. Aluminium prices remain under pressure as a result of continued uncertainty over the global trading environment, however the transaction to restructure our aluminium rolling business is proceeding as planned and will ensure the long-term sustainability of the business."

The company's profitability was affected by higher input costs, operating expenses including fixed costs, general and administrative costs, selling and marketing, and finance costs, caused by the full recognition of the operating costs of Ma'aden Wa'ad al Shamal Phosphate Company (MWSPC) and Ma'aden Rolling

Company (MRC) which commenced commercial operations in December 2018, according to the mining company.

Despite losses incurred in Q2 2019, revenue increased by 26 per cent, reaching US\$1.1bn (SR 4.3 billion) compared to US\$906mn (SR 3.4 billion) in Q2 2018. The increase in revenue resulted primarily from an increase in sales volume of ammonium phosphate fertiliser (APF) and aluminium Flat Rolled Products (FRP) as MWSPC and MRC reached full commercial operations.

On the business expansion front, Ma'aden has acquired Meridian, the Mauritius-based fertiliser distribution group, at an enterprise value of US\$140 mn.

Ma'aden's report of Q1 2019 mentioned that commodity fundamentals remain solid as outlook for global economy remains uncertain as well as phosphate, aluminium, alumina and copper all remain strong. But short term may see pressure on both copper and aluminium in particular if global economic weakness emerges. Gold may benefit from continued economic volatility, the report said.

At this juncture, with the creation of industry and minerals ministry, it is perceived that the kingdom is stepping up efforts to seek more private investment for fulfilling its 2030 Vision. ■

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MEE Saudi provides a platform for organisations to position themselves as thought leaders in the kingdom's dynamic power and electricity market.

Photo Credit: MEE Saudi

Power players in Riyadh

Middle East Electricity Saudi will bring together major players in the energy eco-system.

HISTORICALLY, THE MIDDLE East economies have been powered by oil, with the Kingdom of Saudi Arabia being one of the largest oil producers in the world. Oil and gas revenues have contributed to approximately 42 per cent of GDP and 90 per cent of export earnings in the Kingdom.

Weaning the power sector from fossil fuels to transition away from an oil-based economy and reduce the Kingdom's carbon footprint is a strategic objective of the Saudi Vision 2030 programme; a road map to achieving economic resilience through economic diversification.

Renewable energy is an important initiative under Saudi Vision 2030 and the King Salman Renewable Energy Initiative that aims to substantially increase the share of renewables in the total energy mix within the Kingdom to 27.3GW by 2024 and 58.7GW by 2030.

In line with Saudi Vision 2030, Middle East Electricity Saudi (MEE Saudi) attracts several international power players looking to invest in the country. It brings together a range of major stakeholders, from power manufacturers, suppliers, domestic wholesalers and distributors to thousands of visitors from across the Kingdom and neighbouring countries.

The exhibition provides a platform for organisations to position themselves as thought leaders in the kingdom's dynamic power and electricity market. MEE Saudi comprehensively showcases core segments of the power and energy industry, including: power generation, transmission and distribution, lighting, solar and energy storage and management.

In support of Vision 2030 which concentrates heavily on renewables, the 2019 edition of MEE Saudi has incorporated a new dedicated section to the show - Renewable Energy Arabia.

The Middle East Electricity Saudi Conference is the definitive platform bringing together senior stakeholders, policy makers, influencers and solution providers who are driving the energy eco-system regionally. The conference offers unparalleled opportunities to network with peers and to explore new products, technologies and services. ■

Middle East Electricity Saudi, 19 - 21 November 2019,

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For further information, see www.middleeastelectricitysaudi.com

Why Saudi Arabia

- More than 35 renewable energy parks to be developed by 2030
- 27.3GW capacity of renewable energy to be added by 2024
- 58.7GW capacity of renewable energy to be added by 2030
- Localisation requirement of the value chain to be increased to 40 per cent - 60 per cent in 2019
- By 2021, SEC plans to increase the capacity of generation total to 91,000MW and enhance transmission network lengths and reliability by adding 21,500 km
- Major projects such as, Al Qidiya, NEOM and The Red Sea will drive greater energy consumption in Saudi Arabia.



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AkzoNobel's water-tight solutions

Suitable for refurbishment and new build works, the Intercrete range from AkzoNobel includes impermeable, sulphate-resistant, cementitious coatings for structural waterproofing of below ground and water-retaining structures.

MODERN CONSTRUCTION TECHNIQUES enable structures to be built deep below ground level, posing a significant challenge to seal against water infiltration. Rising water tables have fuelled the demand for reliable tanking systems for underground structures, which may not have been designed to resist water ingress.

Effective waterproofing is essential to preserve a long service life.

Whether as part of the original design or as a remedial measure, the Intercrete range of structural waterproofing and tanking systems offers long-lasting, practical solutions to a range of typical problems. These thin-film cementitious coatings can help reduce the cost of post-construction underground structural waterproofing and, in most cases, the waterproofing will last for the life of the structure.

With water-based, non-hazardous formulations, Intercrete products can be safely applied in confined spaces and cure rapidly without releasing any strong odours or hazardous solvents. The range also includes mortars and coatings which are approved under Regulation 31(4)(a) for use in public drinking water supplies.

Ideal for demanding conditions

Intercrete cementitious coatings are designed to provide exceptional waterproofing protection. They resist both positive and negative water infiltration at pressures up to 10 bars and are perfect for application on to damp surfaces.

Intercrete products offer excellent chemical resistance and are ideal for sealing secondary containment facilities or bunds to mitigate leaks from storage tanks and silos into groundwater. They are also perfectly suited to the demands of deep level construction. When used in new construction, specialist linings can be applied without waiting for a full cure of the substrate concrete.



Intercrete cementitious coatings are designed to provide exceptional waterproofing protection.

Photo Credit: AkzoNobel

Waterproofing challenges

Intercrete systems are engineered to provide reliable waterproof protection for a wide range of commercial buildings and infrastructure.

Problem: Damp or leaking underground structures and piled walls may often be below the water table. They therefore require effective waterproofing to prevent damage to the fixtures and fittings.

Solution: Masonry, brick and concrete substrates can be effectively waterproofed by applying two 1mm coats of Intercrete 4841. It is suitable for internal and external use and can resist positive and negative pressure under 100m head in water-retaining and below ground structures. Where pointing requires reinstating, or a fair-faced, waterproof render is required, Intercrete 4820 can be used in thicknesses up to 6mm per layer.

Problem: Damp or freshly laid concrete floors require an effective treatment to eliminate osmotic blistering when impervious floor coatings and finishes are subsequently applied. Fast-track construction is also often a priority.

Solution: Intercrete 4851 can be applied to

damp surfaces to form a waterproof wearing course. Tested for water permeability under 10 bar pressure, it is spread to a minimum 2mm thickness and can be cured with sand for a slip resistant finish, or using Intercrete 4870 when a smooth finish is required. Subsequent coatings can be applied after just 48 hours, keeping downtime to an absolute minimum so that following trades can progress.

Structural waterproofing systems from Intercrete provide a long-term, cost-effective solution ■

Highlights

Intercrete structural waterproofing products have been specially engineered to cope with the extreme demands of below ground applications:

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The Dubai Declaration delivered by the summit every year is aligned with the long-term vision of establishing the emirate as the global capital of the green economy.

Decarbonising the future

Dubai's sustainability achievements, including a 19 per cent decrease in net carbon dioxide (CO₂) emissions, will be showcased at WGES 2019

Photo Credit: WGES

THE WORLD GREEN Economy Summit (WGES) is one of the largest and most anticipated forums on the green economy, bringing together thousands of decision makers from the public and private sectors from around the world.

Held in Dubai, the annual event serves as a strategic meeting point to establish dialogue, activate partnerships and exchange experiences.

Now in its sixth year, WGES invites policymakers, government officials, international business leaders and world-renowned experts

The annual event serves as a strategic meeting point to establish dialogue, activate partnerships and exchange experiences.

to discuss strategies that can advance sustainability and promote green investments.

WGES 2019 will be held in conjunction with the 21st edition of Water, Energy, Technology, and Environment Exhibition (WETEX), the fourth edition of Dubai Solar Show and the sixth edition of the Green Week.

The event is organised in Dubai, to support the ambitious emirate's efforts to become the global capital of green economy and sustainable development.

Dubai has received the Platinum Rating in the Leadership in Energy and Environmental Design (LEED) for Cities certification awarded by the US Green Building Council (USGBC), making it the first city in the Middle East and North Africa (MENA) region to receive this accolade.

The emirate has also achieved a remarkable reduction in net CO₂ emissions of 19 per cent by the end of 2018, ahead of the Carbon Abatement Strategy 2021 target to reduce the carbon emissions by 16 per cent by 2021.

"We work to achieve the vision of His Highness Sheikh Mohammed Bin Rashid Al Maktoum, Vice-President and Prime



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Minister of the UAE and Ruler of Dubai, to achieve sustainable developments in all aspects including UAE Vision 2021, UAE Centennial 2071, Dubai Plan 2021, and Dubai Clean Energy Strategy 2050 for Dubai to become a city with smallest carbon footprint in the world by 2050," said HE Saeed Mohammed Al Tayer, vice chairman of the Dubai Supreme Council of Energy, managing director and CEO of the Dubai Electricity and Water Authority (DEWA), and chairman of WGES.

"This remarkable decrease in net CO₂ emissions represents our latest efforts to move into a pioneering global model in green economy, covering all vital sectors in Dubai. We will highlight this achievement in the forthcoming summit to encourage all stakeholders and motivate them to intensify their collaboration to continue our successful progress towards sustainable growth in various sectors," Al Tayer added.

The Dubai Declaration delivered by the summit every year is aligned with the long-term vision of establishing the emirate as the global capital of the green economy.

At last year's summit, the Dubai Declaration 2018 included participants' recommendations to encourage green investments in smart cities, as well as green initiatives through empowering youth entrepreneurs who have the potential to generate innovative and sustainable solutions; and support global cooperation in sustainability through the World Green Economy Organisation.

Dubai has always been a pioneer in implementing solutions to enable it to have the lowest carbon footprint in the world by 2050. DEWA has sent a request for proposal (RFP) for consultants to study, develop and construct floating solar photovoltaic plants in the Arabian Gulf — an innovative initiative to use solar power that supports the objectives of the Dubai Clean Energy Strategy 2050 to diversify the emirate's energy mix, make it a global hub for clean energy and green economy, and provide 75 per cent of Dubai's total power output from clean energy by 2050.

The summit this year will be attended by important policymakers, government officials, international business leaders, and world-renowned experts to tackle strategies for global collaboration and drive dialogue and action amongst industry stakeholders.

The 2019 edition will focus on three crucial pillars: sustainable development, international cooperation towards a green economy and adoption of green innovative solutions across varied sectors.

More than 9,500 companies have joined UN Global Compact, the world's largest corporate sustainability initiative, voluntarily pledging to adopt sustainable and socially responsible policies, and to report on their implementation. This is up from 8,000 companies in 2018.

Additionally, 50 countries have agreed to present voluntary reviews of their progress towards the Sustainable Development Goals (SDGs) at the UN's High-Level Political Forum in July 2019, up from 47 countries in 2018.

Last year, WGES hosted the first WGEO preparatory conference attended by high-profile representatives from at least 60 countries.

As the figures show, sustainability is garnering more attention than any point in history. With the decline of natural resources and the rise in social responsibility, consumers are increasingly demanding ethically sourced and environmentally friendly goods.

As governments enforce energy and resource-efficiency policies, sustainable business practices will have a competitive advantage in the years to come, and with most consumers willing to pay more for sustainable products as several surveys have shown, a green economy is the only viable way forward.

The continued debate around the green economy will be crucial to determining what kind of actions governments, businesses, and communities should take to achieve the SDGs by 2030. WGES seeks

The 2019 edition of the summit will focus on international cooperation towards a green economy system and adoption of green innovative solutions across varied sectors.

to drive such dialogue amongst industry stakeholders, while showcasing innovative solutions. Led by a diverse line-up of high-profile speakers including former secretary-general of the United Nations Ban Ki-moon, WGES 2019 will take place at the Dubai International Convention and Exhibition Centre on 20-21 October 2019. Other prominent speakers are UAE's minister of state for food security Mariam bint Mohammed Saeed Hareb Almheiri and minister of climate change and environment Thani bin Ahmed Al Zeyoudi.

WGES is organised by the Dubai Electricity and Water Authority and World Green Economy Organisation and is held under the patronage of His Highness Sheikh Mohammed bin Rashid Al Maktoum, Vice-President Prime Minister of UAE and The Ruler of Dubai, in cooperation with Dubai Supreme Council of Energy and the United Nations Development Programme (UNDP). ■

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UAE pushes for green energy

WETEX 2019 is expected to attract more than 35,000 visitors, and 2,100 exhibitors from 53 countries



Photo Credit: WETEX

The event will focus on promoting environmental citizenship in achieving sustainable development.

DUBAI ELECTRICITY AND Water Authority (DEWA) will organise the 21st edition of Water, Energy, Technology, and Environment Exhibition (WETEX 2019) on 21- 23 October, 2019. This year, WETEX documents the UAE's push towards green energy under the theme 'At the forefront of sustainability'.

Taking place under the aegis of 'Green Week', the event will be held in line with the directives of His Highness Sheikh Mohammed bin Rashid Al Maktoum, Vice-President and Prime Minister of the UAE, and Ruler of Dubai, and under the patronage of His Highness Sheikh Hamdan bin Rashid Al Maktoum, deputy ruler of Dubai and minister of finance, and president of DEWA at the Dubai International Convention and Exhibition Centre.

It will focus on promoting environmental citizenship in achieving sustainable development, maintaining health, improving living standards, reducing poverty, securing new jobs, and protecting the environment by mitigating climate change and global warming, reducing acid rain and harmful waste.

Environmental citizenship will protect endangered species and water from pollution, contribute to food security, and increase crops.

According to the annual report of the International Renewable Energy Agency (IRENA) for 2018, the global renewable sector employed 11 million people in 2018, compared to 10.3 million in 2017.

Employment remains concentrated in China, Brazil, the USA, India and the European Union. As per the same IRENA report, Asian countries account for 60 per cent of employment in this sector.

"In accordance with the directives of HH Sheikh Mohammed bin Rashid Al Maktoum, we are working towards strengthening national efforts in the field of green energy. WETEX 2019 covers an estimated area of 78,413 sq m and will attract over 35,000 visitors, and 2,100 exhibitors from 53 countries, confirming Dubai's leading role in sustainability and green energy. It will be the largest edition since its inception 21 years ago, and will be held under the umbrella of the Green Week, in conjunction with the fourth Dubai Solar Show, and the

sixth World Green Economy Summit (WGES). It will feature leading international experts in the green economy, smart, innovative, and sustainable development fields," said Saeed Mohammed Al Tayer, managing director and CEO of DEWA.

"Dubai Electricity and Water Authority (DEWA) is keen to promote all forms of green energy as a clean alternative to conventional energy, in line with the 17 Sustainable Development Goals (SDGs) of the United Nations 2030 Agenda; and DEWA's vision to be a globally leading sustainable innovative corporation. Renewables such as solar, wind and water power are key to achieving sustainable economic, social and environmental development," added Al Tayer.

The fourth Dubai Solar Show, the region's largest solar energy exhibition, will be held in conjunction with WETEX 2019, covers an area of over 14,000 sq m and follows the success of the previous edition.

The Dubai Solar Show focuses on clean energy, a green economy, and environmental, social, and economic sustainability for the region. ■

5
sectors

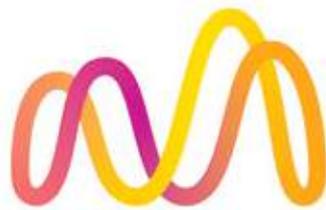
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New Wärtsilä 31DF engine makes entry to energy industry

WÄRTSILÄ HAS INTRODUCED ITS latest engine and power plant solution to the power generation markets.

Wärtsilä 31DF is a multi-fuel engine offering open-cycle efficiency, fuel choice flexibility, and dynamic operational features. The engine is specifically designed for two-stage turbo-charging and capable of delivering an output of 11MW, reducing fuel consumption and costs while minimising carbon emission levels.

Among the standout features of the Wärtsilä 31DF engine are its fast loading and unloading, and a quick start-up that facilitates easy integration of renewable energy sources.

The fuel flexibility of the engine aims to improve energy security and increases resilience against unpredictable interruptions to the fuel supply. Should a reliable supply of gas become available following installation of the Wärtsilä 31DF, the engine can be easily converted to pure-gas operation if required.

Thanks to the modularity of the engine design, it can be adapted to run on renewable fuels when they become available. The genset can be synchronised to the power grid within 30 seconds, and can reach full load within 120 seconds from the start-up command.

XCMG releases new Middle East series developed for the desert

CHINESE CONSTRUCTION machinery manufacturer XCMG has introduced a new Middle East series, including cranes, truck cranes, crawler cranes, tower cranes and aerial work platforms

The new products were presented at a release event in Muscat, Oman, attended by more than 200 customers and guests.

"The Middle East has always been a key market for XCMG internationally, and XCMG hopes to contribute to the Sino-Oman relationship through promoting China's leading manufacturing capabilities, technologies and standards," said Liu Quan, deputy general manager, XCMG. Muhammad, who purchased a 85-tonne truck crane at the event said, "The outstanding performance of XCMG's products has brought success to our business."

CAT rolls out D3 series skid steer and compact track loaders

CATERPILLAR RELEASED 16 new Cat D3 series skid steer loader (SSL) and compact track loader (CTL) models. The D3 series models support a line of new smart attachments. This advanced machine technology recognises certain attachments and tailors the controls and operator information to match the tool and the task.

Entering and exiting the new D3 series loaders equipped with an enclosed cab is now easier thanks to a wider opening cab door. Additionally, the distance between joystick pods has increased by 76 mm, offering extra space for the operator inside the cab.

The new Cat D3 series CTLs aims to deliver improved operating stability while handling heavy loads, grading or truck loading.

Changes to the undercarriage frame and torsion axles reduce machine pitching and rocking, while still offering a superior ride comfort.

All Cat D3 Series CTLs feature standard two-speed travel to improve performance at the jobsite. These machines are geared to deliver high torque digging performance as well as high top-end speed for travel.

The Cat 279D3 and 289D3 loaders boast a 13.6kph ground speed — a 20 per cent increase over their D series counterparts. They are built with two-speed transmission as standard, versus the previous single-speed, increasing travel speed by 9 per cent and aligning these models with the rest of the two-speed equipped CTL model range.



Photo Credit: CAT

The D3 Series models support a line of new smart attachments.

The advanced attachment technology allows the D3 Series Cat SSL and CTL models to automatically recognise smart attachments and convert machine controls to align with the operational and informational needs of that attachment.

Cat SSLs and CTLs offer advanced control features that include return-to-dig and work tool positioner that assists operators with repetitive tasks like grading, digging, and loading.

In conjunction with the D3 Series introduction, the previous XHP performance model identifier used with the 272 and 299 models has been replaced with the XE badge.

The 272D3 XE and 299D3 XE models represent the high performance and advanced technology available to customers in the Cat SSL and CTL line.

Paschal presents LOGO.3 formwork panels

PASCHAL HAS DEVELOPED the LOGO.3 formwork panels with integrated clamp mounting for optimised construction site logistics.

Along with "off-the-shelf" formwork systems, Paschal offers customer-specific adaptations, such as the clamp mounting for LOGO connecting pieces.

The formwork expert says the resulting improvement in the construction site logistics has been so convincing that the clamp mounting has been supplied as standard with all LOGO.3 large-size and midi panels since February 2019.

The number of clamp mountings attached adapts to the particular need for connecting pieces. For example, formwork panels with a formwork height of 270 cm have room for three wedge clamps, while four wedge clamps can be fastened to panels with a formwork height of 340 cm.

When moving and dismantling the formwork, the connecting pieces can be placed practically on the panel, and are therefore immediately



Photo Credit: Paschal

LOGO.3 formwork panels with integrated clamp mounting.

available for the next location. This process ensures shorter assembly and dismantling times.

Centrally-positioned on the middle cross profile, the clamp mountings ensure better accessibility from all sides, whatever direction panels are being formed or extended.

Formwork panels with clamp mountings can be stored and transported. The mountings, including "parked" clamps are flush — meaning that the formwork panels can be stacked.

Schneider expands Easy UPS 3M range

SCHNEIDER ELECTRIC HAS extended Easy UPS 3M from 60-200 kVA with the addition of 120, 160, and 200 kVA uninterruptible power supplies (UPSs).

Available in most countries, the Easy UPS 3M 120-200 kVA UPSs are easy to install, use and service. With an optimised footprint design and competitive product features, Easy UPS 3M protects critical equipment in a multitude of physical environments from damage due to power outages, surges, and spikes. This unit saves on capex investment while delivering up to 99 per cent efficiency in energy-saving ECO mode.

Customers benefit from the included start-up service to ensure the Easy UPS 3M is configured for better performance, reliability, and safety. This new offer is rugged, with a wide input voltage window and strong overload protection, all in a compact footprint.

It features an intuitive display interface for easy configuration and customers can monitor the UPS status remotely through Schneider Electric's EcoStruxure IT.

New expanded telehandler range from Bobcat

WITH THE INCLUSION of the latest high performance 8m TL43.80HF and 7m TL30.70 telehandlers, Bobcat has expanded its range to offer a choice of 13 rigid frame telehandler models for applications in construction, rental, recycling, waste and general industry, covering maximum lifting capacities between 2.6- 4.3mt with lifting heights from 6-18m.

The new TL43.80HF increases the lift capacity in the Bobcat range to 4.3mt, combining this with a maximum lift height of almost 8m. It provides a new solution for heavy lift-handling applications found in general industry, manufacturing, building materials, warehousing, quarrying and mining, as well as for farming work.

Another compact solution, the TL30.70 provides a maximum lift capacity of three tonne and a maximum lift height of nearly 7m, for a wide range of applications in construction, rental, recycling, waste and general industry. The compact width of 2.1m in the TL30.70 ensures it provides a cost effective format in the 7m class. The compactness



Photo Credit: Bobcat

and stability of the TL30.70 makes this machine a perfect tool for easy pick and go or for lifting materials to height on housing and commercial property developments.

The TL30.70 offers a compact and cost-effective alternative to larger 7m models, especially where working spaces are tight and increased manoeuvrability is required. In addition, performance is not compromised as the TL30.70 offers a maximum reach of 4m with a load of more than 1mt. At the maximum lift height, users can lift up to 2mt of weight, which is sufficient to place a pallet of heavy bricks in most conditions.

New Brady Inspection Timer sends maintenance alerts

BRADY CORPORATION HAS developed the Brady Inspection Timer that can help save lives by clearly showing on machines, equipment and tools when maintenance is needed.

The company's new product highlights when the next planned maintenance intervention is due. Versions are available that count down seven days, 30 days and 365 days. Each version is equipped with a dark green, light green, yellow and flashing red LED light that indicates the status of the newly inspected equipment. It can be applied directly to almost any machine, equipment or tool either with an adhesive, velcro, magnet, screw or zip ties. At the end of its predetermined inspection time interval, the tag can be reset until the one year plus tag



Photo Credit: Brady Corporation

battery is spent. A battery status indicator constantly shows how much power is left.

Machines, equipment and tools with the Inspection Timer are easy to spot and not likely to exceed their maintenance interval determined by laws, regulations or company policies.



SAB

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Gensets Buyers' Guide 2019

The Middle East's annual where-to-buy guide

Section One: International and regional suppliers of Gensets

Section Two: Contact details of Middle East agents & subsidiaries listed by country, page 68

ABZ Aggregate-Bau GmbH & Co. KG



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E-mail: rentals@aggreko.ae

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Fax: +971 4 8808007
Web: www.altaaqaglobal.com
E-mail: info@altaaqaglobal.com

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Ascot Industrial S.r.l.

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Web: www.ascotinternational.com
E-mail: sales@ascotinternational.it

Ascot is an Italian company providing diesel generating sets in the range 20-2000kVA; hybrid power plant (PV+diesel) 10 MW onwards for off or unstable grid application; hybrid diesel generator for telecom and defense application, range 1-20kW. More than 38,000 Power Solutions are installed worldwide. The Ascot mission is "ENERGY EVERYWHERE"

Baudouin



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E-mail: sales@coelmo.it

COELMO is one of the oldest European manufacturers of industrial and marine generators from 3kVA up to 4000kVA. Based in Italy, with a large stock of generating sets available to be shipped overnight to any destination in the world. Company profile, products and models are available online at www.coelmo.it

Agents:
United Arab Emirates - COELMO spa (DMCC branch)

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E-mail: sales@cressall.com

Cressall Resistors manufacture high power resistors, neutral earthing (NERS), portable load banks, bespoke HV and LV load banks, dummy loads and dynamic braking resistors as well as resistors for use in high voltage filters such as HVDC, SVC and MSC systems.

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Agents:

United Arab Emirates - Cummins Middle East FZE

Cummins Middle East FZE

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E-mail: cummins.middleeast@cummins.com

Cummins Inc., a Fortune 500 Company, designs, manufactures and services diesel and alternative fuel engines from 2.8 to 95 liters, diesel and alternative-fueled electrical generator sets from 2.5 to 3,750 kVA, as well as related components and technology. Cummins serves customers

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Deep Sea Electronics Ltd.



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E-mail: gaby.rhayem@doosan.com

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Agents:

Bahrain - Mohammed Jalal And Sons
Egypt - Triangle Heavy Equipment
Iraq - Vara Machinery
Jordan - Toolbox
Kuwait - Bahrah Trading Center
Saudi Arabia - Saudi Diesel Equipment
United Arab Emirates - Saudi Diesel Equipment
Yemen - Blue Triangle

Elcos S.r.l.

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Jordan - Horizons Engineering Contracting Est.
Lebanon - A.R. Jubaili & Co.
Pakistan - S.M. Jaffer & Co
Saudi Arabia - TAMGO
Turkey - FG Wilson Jenerator Sanayi Ve Ticaret AS
United Arab Emirates - FG Wilson (Engineering) FZE

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HIMOINSA

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HIMOINSA is a global corporation that designs, manufactures and distributes power generation equipment worldwide. The company adds incomparable application and engineering know-how, excellent design and service capabilities, delivering value beyond the equipment it produces.

The product range that the brand offers includes diesel and gas generator sets, control panels and paralleling systems for standby emergency power, prime power, peak power and distributed power. It also develops hybrid power gensets for the telecom sectors and manufactures lighting towers for the rental and construction markets.

Agents:

United Arab Emirates - HIMOINSA Middle East FZE

IREM S.p.A.

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IREM S.p.A specialises in design and manufacture of 1PH and 3PH electro-dynamic voltage regulators and line conditioners - in standard and customized versions - with power ratings from 1 to

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Iraq - Al-Ghodwa for Trading Agencies Co. Ltd. (JCB Power Products)
Jordan - Yazoure Group (JCB Power Products)
Kuwait - Riham General Trading and Contracting Co. WLL (JCB Power Products)
Libya - The White Alnoras (JCB Power Products)
Oman - MOS (JCB Power Products)
Saudi Arabia - WSCO (JCB Power Products)
Turkey - SIF (JCB Power Products)
United Arab Emirates - JCB GB Equipment Solutions

John Deere Power Systems

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John Deere Power systems develops, manufactures and markets diesel engines for a large variety of generator sets, compressors, industrial and agricultural applications. John Deere is one of the very few engine manufacturers that doesn't make gen-sets, this makes us unbiased partners with gen-set OEMs, offering them

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Agents:

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Lebanon - Ghaddar Machinery Co. SAL
Oman - General Engineering Services Est.
Saudi Arabia - Electrical Work & Maintenance
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Turkey - AKSA Servis Ve Yedek Parca AS (John Deere)
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Yemen - Abu Alrejal Trading Co.

Jubaili Bros

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Jubaili Bros has over 40 years of experience and is a leading provider of Power Solutions in the Middle East, Africa and Asia. Jubaili Bros serves its customers by offering high quality diesel generator sets, assembled at 3 manufacturing plants with 29 branches and service centers deployed in 9 countries that are dedicated to customer satisfaction.

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Gas Power Plant

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Demilec launches spray foam insulation products for Middle East market

DEMILEC, A SUBSIDIARY of Huntsman Corporation, has launched several spray foam insulation products for the Middle East market and opened its spray foam technical application and training centre in Dubai.

During the centre's opening, Demilec introduced several spray foam insulation products to the market, including Heatlok HFO Pro, Heatlok XT, Sealection 500 and Agribalance. The centre provides instruction in product capabilities and spray foam application techniques and features Graco reactor system.

"Having launched in Europe earlier this year, we are excited to take this next step in expanding our global footprint to better serve customers in the Middle East," said Demilec president Simon Baker. For more than 30 years, Demilec has been developing an energy-efficient line of open- and closed-cell spray foam insulation and coating products. Demilec serves customers in residential, commercial, industrial and agricultural construction.

Shanghai Electric exhibits smart energy technologies

SHANGHAI ELECTRIC SHOWCASED its latest technologies for smart energy solutions alongside its environmental protection equipment at the 24th World Energy Congress (WEC) in Abu Dhabi, UAE.

The group's concentrated solar power plant features leading heat storage tower and trough technologies to generate clean power while reducing emissions, and its nuclear power product utilises Generation II, III and IV technology to provide the comprehensive supply chain and significant equipment capacity in China. In addition, its power generation engineering and advanced desalination systems harness solar energy to improve energy efficiency and provide environmentally friendly, cost-effective integrated energy solutions. Shanghai Electric presented smart, connected platforms that harness the IoT and real-time data for more energy saving, safer operation and more streamlined management.

Omicron's ARCO 400: Smart recloser control testing

OMICRON HAS DEVELOPED a smart testing solution ARCO 400 for all recloser controls. It provides the fast way to perform simple manual trip and close checks.

Using Omicron's smart connect technology, Arco 400 is capable of detecting recloser specific test adapters. The device simulates the recloser and enables three-phase testing of the controller in lab and field environments. Arco 400 is equipped with accurate three-phase 12.5 A current amplifiers, six-phase voltage amplifiers (8 V or 150 V range), six binary inputs, and nine binary outputs.

The Arco Control software provides additional testing functionality through specific test tools, with the ability to control the Arco 400 wirelessly. The execution of predefined test plans allows for standardisation and time savings.

ARCO 400 provides the fastest and easiest way to perform simple trip/close checks.

Every smart controller adapter includes a chip through which



Arco 400

Photo Credit: OMICRON

Arco 400 automatically recognises the specific adapter and, once connected, configures itself for the test procedure. This allows immediate basic trip and close functionality checks via the controller's push buttons – without the use of any software.

Several Arco 400s can be time-synchronised to GPS and simultaneously test high-speed distribution automation schemes using RelaySimTest.

This allows for a complete testing of the scheme that includes logic in the controllers and communication channels. The wireless connection between Arco 400 and a

controlling laptop or tablet allows remote flexible operation of the test set.

The interface on ARCO 400, extension cable, and smart controller adapter leading to the test set are safe to touch.

This is possible due to a new connector concept where no blank pins are exposed on either side.

Automatic detection by the Arco Control software of a missing ground connection to the test set avoids potential dangers. Additionally, the software indicates when live currents and voltages are being output.

WEG unveils new M Mining series of slip-ring motors

MOTORS AND DRIVE technology manufacturer WEG has presented the new M (Mining) series of slip ring motors for use in the mining and cement industries.

Available in frame sizes IEC 355 to IEC 1000, the new M Mining slip ring motors cover the power range from 250kW to 10MW at 50Hz or 60Hz line frequency. These three-phase induction motors between 4 and 14 poles are designed for voltages up to 13.8kV. The M Mining series is intended for dusty environments in the iron ore or cement sectors. This makes the slip-ring motors a suitable choice for mills, crushers, blowers, exhaust fans, conveyors, centrifuges, and other applications in the mining and cement industries.

The M Mining motors are available with protection ratings from IP55 to IP66.

They are also protected by WEG paint systems that enable operation in abrasive and humid environments with atmospheric



M Mining slip-ring motor version with a brush lifting device

Photo Credit: WEG

sulphur dioxide.

The motor series is available in two versions: either with a brush lifting device, or with brushes in constant contact.

The lifting mechanism of the brush lifting device has been redesigned to make it even easier to maintain. Compared to the version with fixed brushes, the brush lifting system requires less maintenance. In addition, brush wear is reduced by fitted pressure springs. An integrated control system is available as an option for the brush lifting device.



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Over the last three decades, the UAE has become a major business centre with a diversified economy and a plethora of profitable industries. Economic growth has driven the need for a robust labour force capable of carrying out high-risk jobs across multiple industries. Protecting the health and safety of this ever increasing workforce is a top priority. Although the Government has taken several initiatives to promote safety at work with the support of all stakeholders, incidents do happen at workplaces. The Dubai Health, Safety & Environment Forum 2019 will present the latest innovations to help businesses deal with challenges related to occupational health and safety. Industry leaders will share solutions to enable companies and organisations to run successful operations while maintaining the highest HSE standards.



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الحكومة تسعى إلى خلق 6 آلاف فرصة عمل

الأوسط. كما بدأت شركة أكسيونا الإسبانية في دراسة تقنية الطباعة ثلاثية الأبعاد للخرسانة في عام 2013، وقد قامت بالفعل ببناء أول جسر خرساني مطبوع ثلاثي الأبعاد في العالم في مدريد بإسبانيا. كذلك عملت شركة أكسيونا في مشاريع البنية التحتية واسعة النطاق؛ مثل امتداد لخط مترو دبي عام 2020، وتأمل في جلب الطباعة ثلاثية الأبعاد إلى دول مجلس التعاون الخليجي هذا العام. وهذا يتماشى مع هدف دبي؛ لكل مبنى في الإمارة أن يكون 25 في المائة منه مطبوع ثلاثي الأبعاد بحلول عام 2025.

الطباعة ثلاثية الأبعاد، ستكون قادرين على تنفيذ مشاريع مستحيلة تقريبا باستخدام التقنية المناسبة، وسنقوم بعمليات بناء أسرع وأرخص من ذي قبل. وفي الوقت نفسه، قررنا الاستثمار في طباعة كبيرة جدا، بحيث يكون نطاق المشروعات التي يمكننا تنفيذها بأكبر حجم ممكن». وقد تم تسليم طباعة البناء «بي أو دي 2» ثلاثية الأبعاد في نهاية شهر مايو/أيار، وهي أول طباعة ثلاثية الأبعاد من نوعها في المملكة العربية السعودية. كما يوجد أيضا استيعاب قوي لتقنية الطباعة ثلاثية الأبعاد في قطاع البناء في الشرق

البناء في المملكة، وزيادة المدخلات المحلية بنسبة 70 في المائة. كما تسعى إلى توفير 6000 فرصة عمل، وزيادة إجمالي مساهمة الإنتاج المحلي إلى 80 مليار ريال سعودي (21,485 مليار دولار أمريكي). كذلك تسعى المبادرة إلى خفض تكاليف البناء بنسبة تتراوح بين 5 و20 في المائة، وتقليص وقت البناء إلى أقل من 90 يوما، وتحسين نوعية الوحدات السكنية وزيادة معدلات الرضا بالنسبة للمواطنين.

وفي نوفمبر/تشرين الثاني الماضي، أعلن البرنامج الوطني للإسكان والتنمية الصناعية واللوجستيات عن أول منزل في المملكة تم بناؤه باستخدام تقنية ثلاثية الأبعاد. ويقع المنزل على أرض وزارة الإسكان غرب مطار الملك خالد الدولي في الرياض، وتم بناؤه من قبل شركة سيبي الهولندية.

كما استثمرت شركة الإنشاءات العربية السعودية وشركة «إليت» للإنشاء والتعمير في أكبر طباعة إنشائية ثلاثية الأبعاد في العالم، وطباعة نوعية «بي أو دي 2»، من شركة «سي أو بي أو دي» ومقرها كوبنهاجن. كما قامت شركة «إليت» للإنشاء والتعمير بعملية الشراء استجابة لحاجة المملكة العربية السعودية لبناء 1,5 مليون منزل في السنوات العشر المقبلة.

وتحظى هذه الطباعة بإمكانية طباعة المباني التي يبلغ عرضها 12 مترا وطولها 27 مترا وارتفاعها 9 أمتار. ويمكن أن تنتج مباني من ثلاثة طوابق تزيد مساحتها عن 300 متر مربع لكل طابق دفعة واحدة. وتخطط شركة «إليت» للإنشاء والتعمير للاستفادة من هذه القدرات.

وقد صرح سعد الشاطري، المدير العام لشركة «إليت» للإنشاء والتعمير، في بيان صحفي قائلا: «سنجعل هذه التقنية الثورية متاحة في جميع أنحاء المملكة العربية السعودية، وسنكون قادرين على تنفيذ مشاريع مع أطقمنا الخاصة وعلى أساس الخرسانة القابلة للطباعة ثلاثية الأبعاد المصنوعة محليا».

وأضاف قائلا: «سيؤدي ذلك إلى خفض التكاليف بشكل كبير مقارنة بالطابعات المستوردة المؤقتة التي تستخدم مواد أجنبية. وباستخدام تقنية

شركة الصعاليات 2019

أكتوبر/تشرين الأول

21 - 23 ... معرض المياه والطاقة والتكنولوجيا والبيئة - ويتكس دبي

نوفمبر/تشرين الثاني

5 - 8 ... الطاقة الموزعة - أوروبا ريميني/إيطاليا

25 - 28 ... معرض بيج فايف دبي



المبادرة السعودية تزيد البناء بنسبة 70 في المائة

تقنيات جديدة للبناء في السعودية

المملكة العربية السعودية تقوم حالياً بنشر تقنيات بناء جديدة بسرعة من أجل تلبية الاحتياجات السكنية. فتقنيات البناء الحديثة تغير طريقة تنفيذ المشاريع في الشرق الأوسط بسرعة فائقة. إذ أن سرعة اتخاذ القرارات قد تكون أبطأ في هذه المنطقة أكثر من مناطق أخرى في العالم، في حين أن المشاريع الابتكارية القائمة على الوسائل التكنولوجية الحديثة في تقدم مستمر.

الطائف جنوب غرب البلاد، يضم 4775 وحدة سكنية. وهو مشروع من أكبر المشاريع العقارية في البلاد استخدمت فيه التقنية ثلاثية الأبعاد، حيث يتم بناء المنازل في غضون ساعات. إذ أن بناء العناصر الخرسانية يتم في المصانع أو في الموقع، مع إنجاز سريع ومراحل بناء أقل. كما أعيد استخدام القوالب وكان هناك انخفاض بنسبة 60 في المائة في الهدر.

وتسعى مبادرة تحفيز تقنية البناء في المملكة العربية السعودية إلى زيادة الطاقة الإنتاجية لمصانع

فخطة الإصلاح في رؤية المملكة 2030 تهدف إلى زيادة ملكية المنازل بين المواطنين، وزيادة مساهمة الشركات المحلية في قطاع البناء. كما تريد رؤية تحول رقمي في المجتمع السعودي. وتساعد مبادرة تحفيز تقنية البناء الحديثة، التي يشرف عليها برنامج الإسكان والبرنامج الوطني للتنمية الصناعية واللوجستيات، في الابتكار في قطاع الإسكان في المملكة، بالإضافة إلى تلبية متطلبات الرقمنة في رؤية 2030.

فهناك مشروع تم افتتاحه مؤخراً في مدينة

تقدم مجموعة من الأنظمة الجديدة، المطروحة في الأسواق، فوائد هامة وجليّة بالنسبة للمقاولين. وفي الاثني عشر شهرا الماضية، كان يتم استخدام الروبوتات والطباعة ثلاثية الأبعاد في مواقع بناء واسعة النطاق في جميع أرجاء المنطقة، كما هو الحال الآن بالنسبة للطائرات بدون طيار. وتعتبر الطباعة ثلاثية الأبعاد واحدة من التقنيات المستخدمة لتطوير قطاع البناء في المملكة، وفقا لما ذكرته وكالة الأنباء السعودية. ذلك أن الحكومة تسعى إلى خلق وظائف ومنازل مناسبة لمواطنيها.

المحتويات

القسم العربي

تحليلات

تقنيات جديدة للبناء في السعودية ٤



ملخص محتويات القسم الإنجليزي

التطورات: تطورات السوق.

تحليلات: الشبكة العالمية.

طاقة: التقرير السنوي للمولدات الكهربائية: طاقة موثوقة طوال الوقت.

الطاقة المتجددة: التحول إلى طاقة نظيفة.

التعدين: التقرير السنوي للتعدين.

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