

# TECHNICAL REVIEW

النشرة التقنية - الشرق الأوسط

MIDDLE EAST

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## HARNESSING NATURE

RENEWABLE INNOVATION AND THE POWER OF OPPORTUNITY

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Overcoming the region's  
thirst for fresh water

### Clearing the air

The changing technology  
behind air filtration solutions

## INSIDE

Industrial Gases  
Generator Sets  
Construction Solutions  
Middle East Electricity  
Trucks

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32 Years



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## EDITOR'S NOTE

WHILE THE STRESSES facing much of the world's economic system have caused concern to many business leaders, the success of the World Future Energy Summit in Abu Dhabi highlighted that the market for renewables remains strong and full of potential. Innovation within this field is continuing apace, and the low global oil price and rising costs associated with fossil fuel recovery are working in this burgeoning industry's favour. Whether the aftermath of the COP21 agreement has both economic and ecological benefits remains to be seen, but as our renewable energy analysis (p14) points out, there are opportunities to take advantage of. Elsewhere in this issue of *Technical Review*, we look at the industrial gases market (p22), we consider developments in materials handling (p24) and look ahead to Middle East Electricity in Dubai in March (p38).

At *Technical Review* we always welcome readers' comments to [trme@alaincharles.com](mailto:trme@alaincharles.com)

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## MIDDLE EAST

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## Briefly

### Etihad Rail signs supply chain deal

ETIHAD RAIL, THE developer and operator of the UAE's national railway network, has signed an MoU with supply chain management firm CEVA Logistics for the latter to supply a cost-effective and reliable mode of transport to complement the former's services.

Jerome Lorrain, EVP – Balkans, Africa, Middle East and Africa for CEVA Logistics, noted, "Etihad Rail will provide us with a much more reliable and environment-friendly alternative to traditional modes of transport. Moreover, once the GCC rail connection is operational, it will significantly enhance the scope of our business."

Once completed, the Etihad Rail network will span approximately 1,200 km across the UAE, providing both passenger and freight services. The network will also form part of the GCC Railway Network, which will link the UAE to Saudi Arabia via Ghweifat in the west and Oman through Al Ain in the east.

Etihad Rail CEO Faris Saif Al Mazrouei commented, "We look forward to working closely with CEVA Logistics and play our role in the greater diversification of the UAE economy."

### Final design for KhalifaSat

UAE ENGINEERS ARE preparing to manufacture the flight model of KhalifaSat, which has been scheduled for launch in 2018, after the Mohammed bin Rashid Space Centre (MBRSC) announced the final design completion of the KhalifaSat Engineering Model, as well as the software and systems within the satellite.

H.E. Yousuf Hamad Al Shaibani, director general of MBRSC, said, "The completion of the final design of the engineering model is a major milestone, not only in developing this satellite; it is an achievement for the entire satellite manufacturing sector in the UAE."

"The success of Emirati engineers in leading and executing this project is a testament to the skills they gained from two previous projects; especially since KhalifaSat is the first practical step in manufacturing an Emirati satellite built by Emirati expertise in Space Technology Laboratories in Dubai."

## 'Growth inevitable' in region's aviation sector

RISING PASSENGER NUMBERS and the growing fleet of airlines throughout the Middle East is leading to billions of dollars worth of investment in the airport industry, according to the organisers of the region's largest aviation B2B trade event.

Globally, US\$441bn worth of investments are currently being made on more than 2,500 airport projects, according to the Centre for Asia Pacific Aviation (CAPA), with developments in the Middle East – where US\$32.7bn worth of airport investments underway or planned in the UAE alone – pushing global investments.

Daniyal Qureshi, director of the Airport Show and GALF, said, "The Middle East aviation sector is among the highest growth markets in the world. With airlines across the world expecting more than 3.7bn passengers in 2016, and the Middle East taking a high share of this, airport expansion is imperative. This expansion also brings in a plethora of opportunities for product and service providers in the aviation industry and allied sectors."

Angela Gittens, director general of the Airports Council International (ACI), the global body for airports, remarked, "Airports are capital intensive businesses highly dependent on economies of scale. Even in a downturn, airports have to invest to provide capacity for the future."

"The future is going to be challenging for airports, but the aviation sector is definitely going to grow. There will be winners and losers, but growth is inevitable."

Along with major investments in Dubai's two large airports – Al Maktoum International Airport and Dubai International Airport – the UAE is leading the way with major projects at Ajman International Airport and Abu Dhabi International Airport, while Sharjah International Airport, home to the low-cost



Doha's Hamad International Airport opened in 2014, replacing Doha International Airport as Qatar's main aviation hub. (Photo: gnoparus/shutterstock.com)

carrier Air Arabia, will continue to review its expansion every five years until 2030.

King Abdulaziz International Airport, which services Jeddah, Saudi Arabia, has begun a three-stage development with a budget of more than US\$1.5bn. Completion of the third phase in 2035 will enable the airport to cater for 85mn passengers annually.

Oman has earmarked US\$6.1bn over the next five years for aviation projects, with major terminal developments at Muscat and Salalah international airports planned. Upon completion, Muscat International Airport will be capable of handling more than 12mn passengers annually.

Bahrain is also undertaking a US\$1bn expansion of Bahrain International Airport in Manama, which will raise its capacity to 13.5mn passengers annually.

The 16th edition of Airport Show will take place at Dubai International Convention and Exhibition Centre from 9-11 May 2016.

## Jordan solar PV plant to supply 200MW to Kingdom's grid

ABU DHABI'S RENEWABLE energy company Masdar has signed an agreement to develop a utility-scale 200MW photovoltaic (PV) solar plant in Jordan.

Masdar, who along with its partners recently inaugurated the 117MW Tafila wind farm in Jordan, formalised the deal with Jordan's Ministry of Energy and Mineral Resources during the World Future Energy Summit in Abu Dhabi in January 2016.

Jordan Minister of Energy and Mineral Resources, HE Dr Ibrahim Saif, described the project as "an investment in Jordan's future energy security".

"It reflects the vision of His Majesty King Abdullah II to reduce the Kingdom's reliance on imported energy and limit our carbon footprint," he said.

"We believe the project will stimulate the investment climate for similar renewable energy projects in Jordan and will strengthen our status as a new and important destination for renewable energy investments in the region."

Jordan's 2010 renewable energy law called for 15 per cent of the country's electricity to come from renewable sources by 2020. Currently, Jordan imports close to 96 per cent of its energy needs at a cost equivalent to 20 per cent of its GDP.



Jordan is aiming to generate 15 per cent of its electricity needs from renewable sources, such as solar PV, by 2020. (Photo: Martin D. Vonka)

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# ON THE WEB

A round-up of the leading developments and innovations recently featured on *Technical Review Middle East's* online portal. To read more or to stay up to date with the latest industry news, visit [www.technicalreview.me](http://www.technicalreview.me)

## Gulf Air restructures aircraft orders worth US\$7.6bn

BAHRAIN'S NATIONAL CARRIER, Gulf Air, announced restructured orders of 45 aircraft with Boeing and Airbus in deals worth a total of US\$7.6bn.



*The orders have been agreed on after extensive negotiations with both aircraft manufacturers to revise Gulf Air's previous orders with Boeing and Airbus.*

The orders consist of 16 Boeing 787-9 Dreamliners, 17 Airbus A321neo and 12 Airbus A320neo aircraft, and the deliveries are to commence from Q2 2018.

The restructured orders are expected to simplify Gulf Air's future wide-body fleet to Boeing 787-9 Dreamliners and ensure its future narrow-body fleet will largely focus on the A320neo Family aircraft. [www.technicalreview.me/logistics](http://www.technicalreview.me/logistics)

## TE Connectivity opens first cable assembly facility in Morocco

TE CONNECTIVITY HAS opened its first assembly plant in Morocco's Tangier Free Trade Zone, marking its presence in Morocco's automotive sector.

The facility will specialise in the assembly of new cables, while additionally focusing on the production of automotive applications. The range of products will cater to the needs of automotive sector customers throughout Europe, the Middle East and Africa.

[www.technicalreview.me/manufacturing](http://www.technicalreview.me/manufacturing)

## Daimler Trucks set for return to Iran

DAIMLER TRUCKS HAS signed letters of intent with its local Iranian cooperation partners Iran Khodro Diesel (a subsidiary of Iran Khodro Industrial Group) and the Mammot Group.



*All partners are considering a joint venture for the local production of Mercedes-Benz commercial vehicles. (Photo: Daimler)*

The areas of cooperation include a JV for the local production of Mercedes-Benz trucks and powertrain components in addition to the establishment of a sales company for Mercedes-Benz trucks and components. Daimler also plans to return as a shareholder in the former engine JV Iranian Diesel Engine Manufacturing Co. [www.technicalreview.me/logistics](http://www.technicalreview.me/logistics)

## Rehabilitation for Jordanian power station

ACWA POWER HAS signed a 25-year PPA with National Electric Power Company for the 485MW Hussein CCGT IPP. The plant will be located in Zarqa Industrial Area and will replace Jordan's first thermal power station – the Hussein Thermal Power Station, which has been operating since 1975 and has recently been decommissioned.

The project, with a total investment cost of approximately US\$460mn, will use GE Energy's 9E turbines and run on natural gas as the primary fuel, and light diesel oil as the secondary fuel. [www.technicalreview.me/power-a-water](http://www.technicalreview.me/power-a-water)

## Egypt and Kuwait set for Saudi Arabia power project loan



*The electricity linkage project will lead to the exchange of about 3,000MW of power between Egypt and Saudi Arabia. (Photo: Ekaterina Rainbow)*

EGYPT HAS ANNOUNCED that Kuwait has agreed to loan the North African country approximately US\$100mn to fund the electricity linkage project between Egypt and Saudi Arabia.

Kuwait Fund for Arab Economic Development (KFAED) will transfer the loan after all the arrangements between the Egyptian and Kuwaiti parties have been finalised.

The Kuwaiti Cabinet approved a Presidential Decree regarding the loan agreement between Egypt and KFAED. The agreement was originally signed in Cairo back in November 2015 aiming to fund electricity linkage between the two countries.

[www.technicalreview.me/power-a-water](http://www.technicalreview.me/power-a-water)

## 'Multiple challenges ahead' for the coating industry

THE UAE AND Saudi Arabia can provide big opportunities for the coatings industry, according to the managing director of chemical R&D firm Anichem FZCO.

Dr. Thazyasseril Vijayan said, "The non-oil economy has performed far better than expected. After the UAE, Saudi Arabia still holds many opportunities for our business to grow, despite budgetary cuts in the nation."

Vijayan warned that in 2016 the coatings industry should avoid being aggressive and should settle for low to moderate risk.

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22-24	<b>PetroEnvironment</b>	DAMMAM	www.petroenvironment.com

## MARCH

1-3	<b>Middle East Electricity</b>	DUBAI	www.middleeastelectricity.com
1-3	<b>Solar Middle East</b>	DUBAI	www.solarmiddleeast.ae
7-10	<b>The Big 5 Saudi</b>	JEDDAH	www.thebig5saudi.com
8-9	<b>Middle East Rail</b>	DUBAI	www.terrapinn.com
14-16	<b>International Conference on Energy Research and Development</b>	KUWAIT	www.ashrae.org
27-28	<b>Moving "Safety" into the Boardroom</b>	DUBAI	www.hse-forum.com

## APRIL

13-17	<b>Iran Plast</b>	TEHRAN	www.iranplast.ir
19-21	<b>WEPower</b>	DAMMAM	www.wepower-sa.com
25-27	<b>USETEC</b>	KARLSRUHE	www.usetec.com

*Readers should verify dates and location with sponsoring organisations as this information is sometimes subject to change.*

## Renewable energy partnerships to promote opportunities for women in MENA region

OPPORTUNITIES FOR MENA-based women working in the renewable energy sector received a boost with four strategic partnerships announced during Abu Dhabi Sustainability Week (ADSW).

Women in Sustainability, Environment and Renewable Energy (WiSER) will form partnerships with the Moroccan Agency for Solar Energy (MASEN), Renewable Energy Policy Network for the 21st Century (REN21), General Electric (GE), and the Masdar Institute of Science and Technology's Young Future Energy Leaders programme (YFEL). The announcements were made at WiSER's first all-day conference to coincide with ADSW. MASEN and WiSER will jointly establish an internship programme for women to gain hands-on experience at the Moroccan solar agency. This arrangement will also see the development of a renewable energy conference on the sidelines of COP22 to address the role of women in post-COP21 implementation and broader renewable energy challenges.

"Affording women the ability to gain hands-on professional experience is one of the most effective ways of ensuring their

influence is felt in key sustainable industries," said Nadia Taobane, MASEN's project development director. "That is why this internship arrangement between WiSER and MASEN is so important and will be the start of a long and fruitful relationship as we move towards a joint-conference on women's role in sustainability at COP22."

The WiSER-REN21 partnership agreement aims to develop of a women's pillar as part of the International Renewable Energy Conference (IREC) Latin America, which will take place in 2017. This partnership will also focus on the role of women in the post-COP21 sustainability landscape.

Christine Lins, executive secretary of REN21, said, "Helping to grow this network of opportunity through partnership arrangements, such as between REN21 and WiSER, can only strengthen the tools available to women to be an equal voice in this rapidly growing field post-COP21."

The Masdar Institute's initiative with WiSER initiative will provide a number of full scholarships to aspiring female sustainability leaders to enrol in Masdar Institute's graduate-level sustainability programmes. Additionally, several seats in the YFEL programme will be made available through competitive fellowships to women from around the world. Masdar will also play a role in the GE-WiSER partnership. It is a leadership training programme in renewable energy, located at the GE Ecomagination Center in Masdar City. Experts from GE and Masdar will be on hand to train women in various aspects of the renewable energy industry.

The GE partnership has two goals, according to Deb Frodl, global executive director of GE, Ecomagination. These are "encouraging women's participation in the renewable energy industry and promoting their entrepreneurial skills".



*The strategic partnerships were announced during Abu Dhabi Sustainability Week (ADSW) in January 2016.*



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# Providing power to projects

In 2015, French genset manufacturer SDMO hosted a series of sales meetings with representatives from the regions in which the company sells its products. Export director Patrick Le Guen discusses the aims of those meetings and the company's future plans.



*SDMO manufactures its products at world-class facilities in Brest, France.*

**W**HILE DIFFICULTIES IN the global market have caused many problems for the manufacturing industry, in France, SDMO has been bucking the trend. Work at its busy manufacturing plants, complete with a bustling workforce and huge warehousing facilities, continues apace as the company continues to diversify its range and take advantage of its heavy investment in R&D and training facilities at its headquarters in the French city of Brest.

In the Middle East, the company's presence has been strengthened in recent times by the introduction of a new sales office and the expansion of its storage facility in Dubai. Supported by a second

sales office in Egypt, the company is helping industry professionals across the region who are looking for efficient and effective power solutions.

**“It's impossible to be successful on a long-term basis if you do not deliver a good service to the customer.”**

Along with its diverse range of genset products, the company's strength lies in its distribution networks, which have helped it become the third largest manufacturer of generator sets worldwide.

Despite its sales successes in markets throughout both Africa and the Middle East, and its ability to manufacture its products at world-class facilities in Brest, export director Le Guen keenly points out that “business is done out in the field, not in Brest”.

“For the time being, we have quite good numbers in the Middle East, in spite of the issues with the global oil price,” he remarks. “The market is really very different in Africa and in the Middle East.

“The market in the Middle East is driven by projects, because there are large projects in countries such as Saudi Arabia, Kuwait, Qatar and the UAE. Your figures can be really impacted depending on how successful you are at supplying large projects. In Africa it is very different as there are fewer large projects, with the main market there concentrated on the 10-1,000 kVA range.”

### Distribution support

By inviting a group of distributors from across the Middle East to see first hand the company's operations in Brest, SDMO was able to educate its customers and enhance its service to countries throughout the region. The meeting, which took place last year, was part of a series of regionally-focused meetings that brought together local distributors of the company's premium products.

“I think we have a good distribution base and we are present in countries throughout Europe, the Middle East, Africa and Latin America,” says Le Guen. “Our challenge now is to make our distributors better and this means convincing them to put service first, because it is really important. It's impossible to be successful on a long-term basis if you do not deliver a good service to the customer – especially as SDMO is a premium brand.”

Le Guen says that the company strongly encourages all of its distributors to be perfectly trained in its products – a service it offers at its facilities in Brest or locally on the ground.

“For training we have people in Brest dedicated to service, but for each area we have a service manager. It is their responsibility to visit all our distributors, train them, check they have the spare parts, set the new warranty claims and provide information about the products.”

### Market focus

With the oil price affecting various industries throughout the Middle East and Africa, Le Guen says that there are certain markets the company plans to target more aggressively in order to maintain its strong standing within the genset industry.



*The X1400C, which SDMO promoted on its stand at last year's Middle East Electricity.*

“Currently, the market for oil and gas is not so great, but of course it still exists and is a target for us,” he notes. “For the time being, however, SDMO is not so strong in that market as it is in perhaps the construction or energy markets, but we have received some good orders over the past two years, and we want to take the benefit from that and establish a larger presence in the oil and gas sector.”

Designed with potentially hazardous industries in mind, the company has developed specific generator sets, which Le Guen describes as being “very special models for the oil and gas sector”.

“Each genset must be able to operate in what is classified as zone 2 under the ATEX directive, which covers potentially explosive locations, so the gensets in the range have been equipped with all type of features that protect them,” he notes.

As it has in recent years, SDMO will once again have a strong presence at Middle East Electricity in Dubai this March, where it will be located on stand S1F10. Last year the company's stand featured a range of power products, including rental and portable gensets. The main attraction was the a 1400 generator set from its Power Products >700 kVA range, and a model more than capable of working in extreme conditions – perfect for usage in the arid Middle East. The machine is, according to SDMO, more cost-effective due to its lower consumption and the longer intervals required between maintenance. Along with its impressive load impact recovery, the generator set does not require any derating up to use at 40°C.

Portable and compact products have

helped SDMO grow its rental business throughout the Middle East. On the sidelines of the International Rental Exhibition in Amsterdam in 2014, the European Rental Association, which represents 4,300 European rental companies across the continent, presented SDMO with an award for its Rental Compact range, with the shock resistance qualities of the gensets leading to recommendations for construction sites in extremely difficult conditions. The quality of its products, says Le Guen, has really helped the company in the rental market, where it is trusted to supply well-maintained products.

“In the Middle East, rental is a big market for us, but it has been affected over the past two years,” Le Guen notes.

“The rental business is often up and down, but it is also a market that we want to be better in, because we have the products and we have the service.

“In Dubai we have hired new people and now we really have a strong base in terms of service,” he adds.

With a strong distribution base in place, the company has no plans to invest further in this network, but does plan to improve its distribution through training and ensuring the correct business segments are covered.

“Sometimes we have distributors that are very good in the construction business, but it is possible they are not experts in the industry sector,” says Le Guen. “We really want to have better segmentation across our business and to be more present in all of them.” ■



*Throughout the Gulf, measures are being taken to encourage competitiveness and efficiency in the energy market, with many purchasers turning to solar power. (Photo: gyn9037)*

# A renewable future for the Middle East

The COP21 agreement in Paris signals a great opportunity for the development of renewable energy in the Middle East. Along with the Islamic Declaration on Climate Change, the region could finally move away from its dependence on fossil fuels. Vicente Lopez-Ibor Mayor presents his analysis.

**T**HE DRAMATIC FALL in oil prices has posed a rare challenge to the Middle East, culminating in a global oil price war and moving OPEC members to slash profits to retain market share. But at a time when OPEC's hegemony over the oil markets has been challenged, and will continue to be challenged as the world makes huge strides towards renewables as part of the latest COP21 agreement, let us not forget there is another abundant natural energy resource the Middle East possesses – the sun.

The abundance of sunlight (and therefore solar power) offers Middle Eastern energy producers an opportunity to achieve first-move advantage in a market that appears to be the longer-term future of energy. In light of instability in oil markets, the importance of alternative renewable energies, particularly solar, has become all the more pronounced. The drop in oil prices has precipitated an efficiency rush in energy production in all producer nations. In the US, oil producers are leaving no stone unturned in the hunt to become as efficient and sustainable as possible. In Europe, there is a renewed push for

renewable energy and some countries like the UK are also pursuing nuclear energy as a longer-term solution. In the Gulf, there are similar measures taking place to become more efficient in a more competitive energy market and, increasingly, they are turning to solar to achieve it.

## Domestic budgets

The Gulf states remain some of the biggest oil producers in the world, and make up the largest exporting members of OPEC, especially Saudi Arabia. While some of these countries can afford to swallow current oil prices for now, they will nonetheless find it difficult to maintain their domestic budgets – all OPEC countries chose to cut prices in order to hold onto market share, this means slashing profit.

Most of them are now facing domestic financial trouble. The other, more serious concern for these major oil producers is the increasing consumer demand in their own countries. In past decades, the region has been able to sustain luxury alongside completely inefficient energy policies through government subsidies.

But the entire energy outlook for the region is changing rapidly.

Rising populations, a growing middle class, industry diversification and increasing consumerism has turned a number of countries in the Gulf region into major energy consumers. In Saudi Arabia, oil accounts for more than 65 per cent of all electricity production, while in Kuwait it is 71 per cent. In Lebanon the figure stands at 94 per cent and in Yemen it is an astonishing 100 per cent. This represents an energy policy that is inefficient and, in the long run, unsustainable.

Saudi Arabia is the biggest petroleum consumer in the region, it is the world's second biggest consumer of total primary energy, 60 per cent of which is petroleum-based. But, most importantly, it paints a distressing future for the region's oil export industry. If consumer demand continues to grow, it will eventually result in downward pressure on oil exports and could start affecting subsidies. Without a robust and efficient energy balance in the region, it will inevitably lead to these producer nations becoming less profitable with a weaker export outlook.



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## The Islamic Declaration on Climate Change

In July 2015, the Islamic Declaration on Climate Change was issued by Muslim scholars from 20 countries and this has the potential to be a game changer for Middle East countries in relation to sustainable energy policy. The declaration acknowledges the role of humans in climate change, the risks faced by disadvantaged communities, the importance of acknowledging the conclusions of leading climate scientists and the need for a proactive approach.

The declaration may help give both moral and economic impetus to policy makers in Middle East and other countries in the Islamic world when it comes to creating regulations, legislation and setting targets in response to the issue of climate change among some of the world's biggest fossil fuel producing nations. As well as the compelling moral arguments for mitigating climate change, as outlined by the religious scholars, the economic argument is strong. Large swathes of the Islamic world are well placed to harness the benefits of solar power in particular, which is becoming increasingly more affordable for investors in both the public and private sectors.

As well as being a motivating factor for the more developed countries of the Middle East to make more progress with renewable energy, other parts of the Islamic world, such as Pakistan, have serious problems with energy supply, and the move to renewables may benefit them. A move towards clean, off-grid energy sources, such as solar and wind power, could offer a practical, effective and affordable alternative to fossil fuel-based energy.

Tesla CEO, Elon Musk, made some interesting observations on the possibility of developing countries making technological advances in solar storage capacity.

He said that off-grid communities in developing countries may "leapfrog" the need for a centralised energy grid infrastructure, similar to how mobile phones have helped communities in these countries leapfrog the need for landline telecommunications infrastructure.



*International leaders signed the COP21 agreement in Paris in December 2015.  
(Photo: Frederic Legrand - COMEO)*

## The long-term international dynamic

With competitors in the oil market like Russia, Iran and North American shale, this is a long-term dynamic that will undermine Middle East's global energy dominance. However, the possibilities associated with harnessing Middle Eastern solar energy could be a game-changer. Solar is becoming much cheaper to invest in, and now has an established and ever improving infrastructure. Substantial investment in solar will act as a shield for the region's more valued commodity; oil. Saudi Arabia alone, for example, could have made US\$43.8bn in additional oil revenue in 2013 were it not for its spiralling domestic consumption.

The recent COP21 agreement does offer this region a way out. While slashing fossil subsidies was not discussed, the landmark agreement is set to have a dramatic effect on the renewable energy industry, making it grow significantly in upcoming years.

A robust renewables portfolio in the region would act as a massive stimulus to the country's finances as it would remove the need for fossil subsidies. Earlier this year, Saudi Aramco, the state oil company, announced it would be making solar energy investments across the country in an attempt to diversify the country's energy supplies. It is also expected to conserve the country's oil resources primarily for export.

It has been a slow process, but is nonetheless an important one for the future of the solar energy sector. One of the biggest success variables for any solar energy project is not just investment, but location. The Middle East's solar industry is

one of the most economically sustainable and acts as the best conservator of the region's oil resources.

## Investment opportunities

It is also a very strong investment opportunity for those looking to invest in a sustainable, long-term energy sector with a ready market and significantly lower start-up costs than depleting energy exploration. What's more, the COP21 agreement is set to allocate a considerable amount of resources to renewable capacity building in developing countries, which will significantly raise investment opportunity in the solar industry of developing regions such as the GCC. But these new developments would also have another important advantage for the Middle East; a cleaner environment. The use of petroleum for electricity generation has made the Middle East's air quality one of the poorest in the world. Twenty nine of the world's most polluted cities are in the MENA region. Recent energy challenges could have very costly consequences for the region if left unaddressed, but they could also reap huge rewards if met with robust energy reforms and additional investment in alternative energies, especially solar.

And there are positive signs for the region. Saudi Arabia alone has announced a US\$109bn investment plan to generate a third of its electricity. Qatar has also made solar energy agreements with major renewable energy companies as part of its commitments to the Solar GCC Alliance.

How these measures materialise over the next decade or so remains to be seen, but there is room for optimism. What's more, the Middle East's unrivalled solar potential means that theoretically, it can become more than just a world leader in fossil fuel production, it can become a world leader in renewable energy production as well. ■

*Vicente Lopez-Ibor Mayor is chairman of Lightsource Renewables Ltd.*

**“The Islamic Declaration on Climate Change has the potential to be a game changer for Middle East countries in relation to sustainable energy policy.”**





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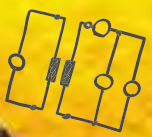


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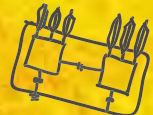


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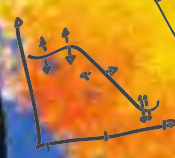
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*Most modern desalination facilities use reverse osmosis, in which water is pumped at high pressure through semipermeable membranes that remove salt and other minerals. (Photo: irabel8/Shutterstock)*



# COP21 offers tech boost to desalination projects

Since the Paris Climate Change Summit in December 2015, the MENA region is looking forward to adopting more environmentally-friendly drinking water technologies.

**B**UOYED BY A renewal in investor confidence in the region, a raft of desalination projects throughout the Middle East and North Africa (MENA) are now moving forward with several key projects nearing completion. With the exception of Libya, the turmoil that rocked North Africa in 2011 has, for the most part, faded. Countries like Morocco, Tunisia and Egypt are witnessing a boom in energy and water projects, some of which are groundbreaking in the sheer scale and deployment of new technologies.

Morocco's Agadir project, when completed, will be the largest capacity desalination plant in the region. Construction started in March 2015 and its initial 100,000 cu/m per day size has the potential to be doubled – a size, which if realised, will dwarf anything in existence so far in North Africa.

In Tunisia, a 150,000 cu/m desalination plant is planned for the country's coastal

and industrial centre Sfax. Further east, Egypt's two-step 'pervaporation' process that was unveiled recently is being lauded as an example of the growing importance of local technologies in providing drinking water solutions.

**At the summit, Saudi Arabia, the UAE, Qatar and Bahrain promised to develop their renewable energy sectors and diversify their economies.**

Researchers at Alexandria University describe it as a cost-effective desalination technology, which they claim can filter highly salty water in minutes. The technology is based on membranes containing locally-produced cellulose acetate powder. In combination with other components, this powder binds the salt particles as they pass through, making the technique useful for desalinating seawater.

Meanwhile, Oman's desalination capacity is about to get a massive boost with three new projects expected to get underway in 2016. The submission of qualifications (SoQ) for three independent water projects (IWPs), under the aegis of the Oman Power and Water Procurement Company (OPWP), was scheduled for 17 January 2016.

The projects will together add 240,000 cu/m per day of new domestic water capacity to the sultanate. They will be sited at Salalah, Sharqiyah and Duqm. The largest of the three, Salalah, will have a 100,000

cu/m per day capacity when it is fully online by 1 January 2019.

The Sharqiyah plant — a reverse osmosis based seawater desalination facility — will eventually have an 80,000 cu/m per day capacity. The first phase will have a capacity of 40,000 cu/m per day and is targeted for operation by 1 May 2019. The remaining capacity will be brought into commercial operation 12 months later. The third plant at Duqm will have a capacity of 60,000 cu/m per day.

Elsewhere in the GCC, research shows that there is similar optimism as to the viability of independent desalination projects. This is despite the effects of the oil price crash on national budgets in the region. Moves to procure a 204,570 cu/m per day desalination plant in Umm al Quwain have been started by the Federal Electricity and Water Authority, which serves the northern emirates of the UAE.

In Saudi Arabia, production at the Kingdom's 309,128 cu/m per day Ras Al-Khair reverse osmosis plant is now fully ramped up. The plant, which came online in 2014, is specially designed to treat the difficult waters of the Gulf. In October 2015, it received two technology awards at the Global Water Summit for its use of ground breaking technology.

In a report, the World Bank sent the clear message that water scarcity in the region has already become a challenge to development. This scarcity, says the bank, will only grow over time due to increasing population, expected economic growth, and the likely impacts of climate change on



According to World Bank, the water demand gap will 'quintuple' by 2050 to approximately 200 cubic km per year. (Photo: EugeneyDIYDen/Pixabay)

water availability and demand. The bank's analysis shows that the water demand gap will 'quintuple' by 2050, from today's 42 cubic km per year, to approximately 200 cubic km per year. It sees desalination continuing to play a critical role in MENA's future water supply portfolio. However, it also warned that desalination "is expensive and energy intensive".

For instance, Saudi Arabia burns around 1.5mn barrels of crude oil equivalent every day to produce water (through desalination) and generate electricity. Finding the means to reduce the cost of desalination by eliminating its reliance on fossil fuel and mitigating its environmental impacts are, therefore, crucial.

Since December's COP21 Paris Climate Change Summit, the MENA region is now under even greater pressure to adopt more

environmentally-friendly drinking water technologies. At the summit, Masdar – Abu Dhabi's renewable energy company – France and the International Desalination Association (IDA) officially launched The Global Clean Water Desalination Alliance to tackle the challenge.


The alliance's stated goal is to "seek solutions that will substantially reduce the projected increase in CO2 emissions from the desalination process, as global demand for drinking water continues to grow". Its published action plan could see a decrease in emissions from 50 metric tonnes CO2 up to as much as 270 metric tonnes CO2 per year by 2040. The focus is on improved energy efficiency of desalination processes; increased efforts on R&D and demonstration projects; better dissemination of innovative technologies; capacity building and analysis; and formulation of adequate policies and regulatory frameworks. The alliance says the initiative will ensure the sustainability of the entire desalination process is taken into account beyond the sole issue of energy sources.

Separate from this multilateral initiative, the UAE government has been investing heavily in cutting-edge technologies to improve the energy efficiency of the desalination process. This forms an integral part of Masdar's remit, which describes itself as a leading innovator on water desalination through the development of desalination technologies. ■

— By Nnamdi Anyadike

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*Air filtration technology acts to stop ultrafine particles which can deposit themselves in human lungs. (Photo: T.Dallas)*

# Clearing the air

Air filtration, the process of separating dispersed particles from a dispersing fluid by means of porous media, is a technology growing in use throughout the construction and power sectors throughout the Middle East. Mechanical engineer and air filtration consultant Dr. Iyad Al-Attar address some of the sector's core issues.

## Why is air filtration currently of importance to the region?

Air cleaning is now an important branch of social engineering, and the protection of the public – both in urban and rural areas – from harmful emissions is the subject of legislation in all civilised countries.

Increasing public concerns regarding indoor air quality in residential and commercial buildings has led to major developments of high-efficiency air filters.

Research revealed that exposure to ultrafine particles can impact our DNA, and respiratory and cardiovascular systems. Ultrafine particles can deposit themselves in human lungs, resulting in the inflammation and impairment of lung cells. Furthermore, inhaled ultrafine particles can be transported from the respiratory system to the blood circulation system and, eventually, to other organs.

Industrial air filtration has witnessed

substantial growth and the market is expected to reach US\$6.23bn by 2020. High Efficiency Particle Air (HEPA) filters accounted for more than 20 per cent of the overall market in 2013 and Europe, meanwhile, accounted for more than 25 per cent of the global industrial air filtration market in 2013.

Government emission regulations and norms are expected to drive the industrial air filtration market. Growing demand for products that provide enhanced efficiency and the lowest pressure drop possible are also key elements in the success of this growth process.

## When and why did air filtration experience its major advances?

The role and importance of the air filtration field is usually underestimated.

Over the past 60 years, filtration theories have been well developed, which is a testament to the application of high-speed computers following their emergence in the 1960s to the air filtration field. In 1969, the trip to the moon required massive clean rooms where computers managed the sophisticated flight planning. Such clean room standards were facilitated by the use of high-efficiency air filters, which have also integrated themselves in the electronic industry and became a standard for fabrication for delicate electronic chips such as microprocessors.

## Where are air filters used?

When the topic of air filters is addressed, HVAC applications hover in our minds as a sole venue for its usage. Clean air is required for HVAC systems in buildings, clean rooms,

pharmaceutical industries, all enclosed environments, and engine and gas turbine intakes. Air filtration is a preventative measure to used defend the heating/cooling coil and the subsequent HVAC systems from particle deposition, as well as protecting human occupants of indoor spaces.

Microorganism growth and dust cake formation stand as two common complaints in impeding the performance of HVAC on one hand, and degrading the indoor air quality on the other hand.

On the other hand, dust fouls the heat sinks found in personal computer power supplies, causing over-heating and failure. Submicron dust particles pose a major challenge to the micromachining industry since such dust will block the narrow area in their system causing malfunctions.

Air filters are also used in operating theatres to prevent post-operative infection and in providing sterile air for the preparation of pharmaceuticals.

## How effective is air filtration in providing clean air?

If executed professionally, air filtration is considered the most effective method of separating particles from the air stream. Human exposure to indoor particulate matter can be reduced through leakage-free air filters that are appropriately selected and installed, with desirable design features towards achieving energy efficiency, low-pressure drop and operational filter lifetime.

As far as the indoor air quality is concerned, it is important to remember that



*Air filtration consultant  
Dr. Iyad Al-Attar.*

while air filters can contribute to better indoor air quality, we can not blame it all on filtration products and techniques. Air filtration is not the main cause of poor indoor air quality and therefore it is not the only solution. It is also important to realise that some pollutants are emitted from within the indoor space where ventilation and internal filtration techniques may be employed to tackle such emission sources.

### What role can air filtration play in the operation of gas turbines?

Air conditioning is a key element in buildings in GCC countries and is typically one of the largest summer electrical loads. In countries where power usage is close to generation rate, gas turbine performance becomes critically important.

Advances in the field of material technology, such as new coatings, new cooling schemes and the growth of combined cycle power plants, also contribute to performance enhancement. In addition, improved compression ratio has substantially enhanced the thermal efficiency of the gas turbine.

Power plants operate gas turbines to

generate energy for our buildings for different purposes, such as air conditioning, which is regarded as the main user of power generated in the GCC states. Therefore, great advances in air filtration will prove invaluable to the gas turbine industry.

Furthermore, the past two decades have witnessed enormous growth in gas turbine technology. The advancements in design, fabrication, installation, operation and maintenance of gas turbines have played a paramount role in enhancing the power generation process, while minimising the impact on the environment. The inlet of a gas turbine has been designed to introduce large masses of clean air. Obviously, atmospheric air cannot be brought in without appropriate filtration.

The large amount of air required for gas turbine operation is conditioned through appropriate filtration stages prior to reaching the compressor section. It is estimated that 70-85 per cent of gas turbine performance losses are due to fouling compressor fouling.

Several contaminants can coat the compressor blades and cause erosive and/or corrosive damage to the turbine

components, thus causing a downgrade in the performance of the turbine.

Also, sticky contaminants can alter the blades' surface and mass contributing further to performance degradation. Contaminant deposition can change the airfoil shape, the incidence angle of the following airfoils in the compressor. It can also increase blade surface roughness and reduces throat area, resulting in reduced inlet mass flow, efficiency, pressure ratio and surge margin of the compressor, which would eventually leads to a lower power production at a fixed firing temperature.

The dilemma of increasing the number of filter stages and/or their efficiency come at the expense of increasing the pressure drop of the entire filter section. Operative decisions vary between reinforcing air filtration and compromising it to allow greater volume of, but less clean air, could expose the turbine components to higher contaminant concentrations, on the other hand. Therefore, compromised filtration places greater emphasis on compressor washing techniques often introduced in combination with filtration to recover performance losses. ■





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# Understanding industrial gases

Without these commodities most manufactures could not be produced. Many specialised suppliers are based here, but international links are the key to production success.

**O**UTPUT OF “INDUSTRIAL” gases such as nitrogen, oxygen and carbon dioxide is the under-covered activity of the chemical industry. But without this thriving international business, and the efforts of local suppliers like ADNOC, Linde, Al-Ruwais Industrial Gases and Jubail Gas Plant Company, many industries such as purification and smelting of ores, food and beverage processing and pharmaceuticals – and all those engineering activities based on the cutting and welding of metals – could not function.

Success depends on the distribution arrangements made, usually at the outset of a production plant’s planning. There are many opportunities for small local companies to set up as suppliers equipped with just a small vehicle fleet able to handle the specialised containers needed. The Gulf region’s many industrial zones, set up to diversify the hydrocarbon-based economy, all provide a home to small manufacturers and packagers who use bottled or other forms of processing-gas supplies. The ability to make reliable “just-in-time” deliveries is what sets apart the best; barriers to entry are low. Nowhere more is this so than in hydrocarbon hubs like Ruwais and Jubail. Supplies are usually categorised either by end use(s): such as specialties, medicals, fuels, refrigerants and welding gases. Or by their method of production. Mostly produced in air separation plants are the three key liquefied elemental gases nitrogen, oxygen and argon, along with CO<sub>2</sub>, a safe and useful compound.

Produced from hydrocarbons are liquid hydrogen and helium, along with a range of handy other fuels such as liquefied petroleum and natural gases.

Other common industrial materials encountered include compounds such as anhydrous ammonia, hydrogen chloride and sulphur dioxide, all with a wide range of sophisticated further-processing applications



*Industrial gases help to keep the wheels of many industries turning. (Photo: Angelo Gilardelli)*

such as the manufacture of fertiliser-grade urea. Hydrocarbons frequently encountered include ethane, propane and butane. Welding (such as oxygen and acetylene) and “breathing” gases are typical of the very diverse ‘mixture’ end of the business. When supplied as a handy household fuel common bottled gas is usually supplied as a mixture because this burns more safely.

Other familiar products include inert gases, such as nitrogen and argon. These are widely used to keep potentially dangerous or damaging atmospheres below a critical concentration. With most industrial gases including inert ones a modern air separation unit or ASU is the key piece of production hardware based on an endlessly repeated refrigeration cycle.

The logistics of making economic local deliveries are fundamental to the success of the industrial gas industry wherever it operates. So much so that this end of the business is usually worked out before the local production technologies are decided on. Many of the saleable commodities are in their gas phase at ambient temperature and pressure, and are therefore delivered as compressed products in some kind of

refillable cylinder or tube trailer, which is topped up from a dedicated pipeline. Some can be liquefied by pressure alone; these are widely distributed as refrigerants.

Most of the gases used in the Gulf’s light-manufacturing premises are received in pressurised cylinders or liquid containers, or as bulk deliveries by tanker truck. For larger customers, a special gas production facility is often constructed by the supplier on site, connected by pipeline to the various offtake facilities. Large industrial gas companies often act as plant operators themselves, under the terms of operation and maintenance contracts that are individually negotiated. An example of one of these is detailed below.

These commodities rarely make headline news, yet in April 2015 US supplier Air Products (AP) and local infrastructure specialist ACWA Holding announced that Saudi Aramco had awarded a contract to build, own and operate “the world’s largest industrial gas complex”. Using AP’s proprietary technology and 75 per cent-owned by ACWA, this will supply 75,000 tpd of elemental oxygen (the greater part) and nitrogen – described as “critical gases” – to the brand new refinery and products terminal being built in Saudi Arabia’s new Jazan Economic City. This major development accords with the local analysis of the market for these commodities prepared by Nawaf Husein of National Commercial Bank in December 2014.

SABIC remains the main local supplier, the report said, and international partnerships such as the one outlined above are used to “leverage the necessary expertise” in this generally low-profile field. National Industrial Gases Co is majority owned by SABIC. Other producers operating locally include Union and Emirates Industrial Gases, and similar large suppliers often related to international operators such as Linde and Air Liquide are to be found throughout the region. ■

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# New 'movement' spurred by logistic sector growth

Multi-billion dollar investments in GCC-wide commercial and civil infrastructure projects are having a positive impact on the materials handling sector.

**Large scale industrial investments are likely to ramp up demand for intralogistics providers and suppliers of heavy lifting equipment.**

**A** **SPATE OF INVESTMENTS** in the UAE's industrial sector is injecting renewed impetus in the materials handling industry, as global logistics and warehouse suppliers turn their backs on sluggish domestic markets and look to the Middle East for growth.

The increasing complexity and evolving market dynamics in the regional logistics sector is fuelling demand for more technical innovations in materials handling equipment (MHE), ranging from pallets, forklifts, automated storage and picking solutions, labelling devices, warehouse trucks, telehandlers, tow tractors, cranes and packaging equipment.

The GCC's MHE market, which was valued at US\$3.8bn in 2014, will see revenues rise between US\$4.8bn to US\$5bn by 2020, a new study has revealed.

Saudi Arabia accounted for 46 per cent of materials handling equipment revenue in 2014, followed by the UAE with a 35 per cent share, while the other four member countries accounted for the remaining 19 per cent of revenue, according to Frost & Sullivan.

The Gulf region had awarded US\$86bn worth of infrastructure projects in 2014, 78 per cent over 2013, with the increased investments fuelling demand for providers of logistics, transportation, materials handling and supply chain solutions.

Abu Dhabi's Khalifa Port's Industrial Zone (KIZAD) and Dubai World Central, now Dubai South, have seen several multi-million dollar investments in various manufacturing, warehousing, and logistics operations in the first eight months of 2015.

Al Gharbia Pipe Company's US\$300mn manufacturing plant in KIZAD has added to the US\$322mn in investments in the UAE capital's industrial zone for the first half of the year, while in June 2015, global supply chain company Mohebi Logistics broke ground on its new US\$150mn 260,000 sqm facility at Dubai South.

Such large scale investments underline the positive sentiment currently pervading the regional industrial sector, and will ramp up demand for intralogistics providers and suppliers of heavy lifting equipment, pallets, racking, and picking and storage solutions.

"The Middle East's construction and major steel structural project market has recovered significantly from the global financial crisis, and we're seeing a marked increase in activity and orders from regional manufacturers," said Russell George, managing director at Bulmor at Materials Handling Middle East event in 2015.

German air cargo solutions company Unitechnik Systems is a supplier of automated warehouses and IT systems. Managing director Wolfgang Cieplik said at the event that Dubai would soon overtake major Asian centres as the world's largest air cargo and logistics hub. "With 2.4mn tonnes of cargo per year, Dubai International Airport is ranked sixth in the world for air cargo

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Industrial trucks such as forklifts are used to move materials and products.  
(Photo: Pashminu/Pixabay)

handled. With the new facilities at Al Maktoum International Airport, it's only a question of time before Dubai displaces Hong Kong from the leading position. This makes it an extremely exciting market for our products and services," he noted.

According to industry reports, multi-billion dollar investments in GCC are having a positive impact on the materials handling sector.

However, growing challenges in the GCC logistics market is presenting remarkable scope for automation in the region's materials handling industry, new research has revealed. Another survey by Frost & Sullivan across the GCC indicated that there is strong intent to adopt automation in warehousing and transportation to improve operational efficiency and processes.

According to the survey of 200 respondents, forklifts are the most popular forms of mechanisation in the GCC logistics industry, with 37 per cent of respondents indicating they use this equipment, followed by coding and labelling devices (34 per cent of respondents) and warehouse trucks (26 per cent of respondents).

However, the overall opinion within the GCC logistics market is the level of penetration of automation is low, with over half of the survey respondents saying they do not use automated technology in their logistics operations because they are too expensive.

### Material handling equipment can be categorised into:

**Storage:** Storage equipment is used to hold or buffer materials during downtimes or times when they are not being transported. Racks, such as pallet racks, drive-through or drive-in racks, push-back racks and sliding racks, stacking frames, shelves, bins and drawers and mezzanines are a few examples.

**Engineered systems:** Covers a variety of units that work cohesively to enable storage and transportation. They are often automated. A good example of an engineered system is an automated storage and retrieval system (AS/RS), which is a large automated organisational structure involving racks, aisles and shelves accessible by a "shuttle" system of retrieval. Other types include conveyor systems, robotic delivery systems and automatic guided vehicles (AGV).

**Industrial trucks:** Refers to the different kinds of transportation items and vehicles used to move materials and products in materials handling. These transportation devices can include small hand-operated trucks, pallet-jacks and various kinds of forklifts.

**Bulk material handling:** Refers to the storing, transportation and control of materials in loose bulk form. These materials can include food, liquid, or minerals, among others. Generally, these pieces of equipment deal with the items in loose form, such as conveyor belts or elevators designed to move large quantities of material, or in packaged form, through the use of drums and hoppers. Examples include conveyor belts, stackers, reclaimers, bucket elevators, grain elevators, hoppers and silos, among others. ■






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## Briefly

### TVH named EMEA distributor for Lonking

TVH HAS BEEN announced as an official distributor of Lonking lift truck parts for the Europe, Middle East and Africa (EMEA) region.

Lonking will rely on TVH for the delivery of its parts throughout the region, and will offer its customers an after-market programme for its parts.

“The collaboration also results in a considerable expansion of our existing range of parts. In addition, we also broaden the one-stop shop experience we offer our customers,” said Johan Thermote, director of materials for TVH Parts.

The partnership also allows for TVH to stock Lonking lift truck parts and distribute them to the EMEA customers, while customers of TVH with a Lonking lift truck can now contact TVH for the fast delivery of parts.

Established in 1993, Lonking Holding Limited has grown into one of the largest machine manufacturers in China.

Today, the company consists of 19 wholly owned subsidiaries and four production bases that produce parts, lift trucks and earth-moving machinery.

### TCS adds five new Renault trucks to vehicle line-up

BAHRAIN-BASED TRANSCONTINENTAL Shipping Company (TSC) has followed through on the next stage of its development and expansion plans by adding five new Renault vehicles to its fleet.

The trucks, provided by Bin Hindi Heavy Vehicle Company, will be used to transport the company's merchandise throughout Bahrain.

TCS CEO Yousif Al Rayes said that the company was determined to add five more trucks to its line-up during 2016, which would be utilised on the transportation route between Bahrain and Qatar.

TCS recently made its first step towards GCC expansion by opening a branch in Qatar.

Al Rayes added that TCS represents a number of international shipping lines in Bahrain, with the company's latest partnership established with Toll Global Forwarding Company.

## Volvo set to restructure global truck division

*The entire Volvo Group will now comprise 10 business units, including Volvo CE and Volvo Penta. (Photo: Volvo Group)*



VOLVO GROUP HAS announced that it is reorganising its corporate structure to deliver clearer commercial accountability for each of its truck brands from 1 March 2016. Four separate business units, each with its own responsibility for profit and loss, will be created — Volvo Trucks, UD Trucks, Mack Trucks and Renault Trucks.

A Volvo Group executive board will also be created to reflect the new structure, and will have representation from each of its major business units.

It is the first major change for Volvo Group to be ushered in under new president and CEO Martin Lundstedt. Lundstedt said the new structure for Volvo Group would ultimately lead to a more dynamic business.

“This is an important change in how we conduct our truck business, with an expanded mandate for our sales organisations to control and develop

their businesses with an explicit responsibility for profitability and organic growth,” he added.

“We will gain a simpler organisation in which decisions are made more quickly and in closer cooperation with the customer, while each truck brand will be represented on the Group Executive Board with shared responsibility for optimising Volvo Group's overall truck business.”

Volvo said that it's entering a new phase, with a period of acquisitions, restructuring programmes and cost-saving measures now transitioning to a “more intense customer focus and a focus on organic growth and improved profitability”.

The entire Volvo Group will be comprised of 10 business units — Volvo Trucks, UD Trucks, Mack Trucks, Renault Trucks, Value Truck & JVs, Volvo Construction Equipment, Volvo Buses, Volvo Penta, Governmental Sales and Volvo Financial Services.

## Daimler Trucks reports third annual increase in global sales

**DESPITE CHALLENGING MARKET conditions, German truck-maker Daimler Trucks has witnessed an increase in sales over the past year.**

**Before final sales for 2015 have been presented, Daimler revealed that the company has sold more than the 495,700 vehicles sold worldwide in 2014 under its Mercedes-Benz, Fuso, Freightliner, Western Star, Thomas Built Buses and BharatBenz brands.**

**In October 2014, Daimler opened the first of six planned regional centres worldwide in Dubai.**

**While the truck markets in North America and Europe grew significantly, Daimler reported sales slumps in Brazil, Indonesia and Turkey.**

**According to Dr. Wolfgang Bernhard, member of the Daimler board of management, responsible for Daimler Trucks & Buses, 2015 saw the manufacturer increase unit sales for the third year in a row.**

**On the subject of future prospects for Daimler Trucks, Bernhard remarked that conditions in the truck market would remain challenging throughout 2016.**



*Daimler's truck brands include Mercedes-Benz, Fuso, Freightliner and Western Star. (Photo: Daimler)*

**“Nevertheless, our sights remain set on our next sales target of 700,000 trucks in 2020. To sit back is not an option for us,” he added.**

## The story continues for changes in hose requirements

THE INTRODUCTION OF the Euro 6 standard provided many challenges for engine and cooling system designers and also placed new challenges for both silicone and EPDM hose suppliers.

Compared to the demands of Euro 4 and 5, Euro 6 has a variety of changes that differ depending on manufacturer and, in the worst cases, include higher coolant temperatures and higher cooling system pressures. The greatest challenge has arisen with the introduction of new and more aggressive coolants.

The right choice of hose supplier is more important than ever. Many still offer hoses suitable for Euro 4 applications, with no guarantee or warranty period. Hose failures suddenly became more prevalent than with earlier Euro standards. During the changeover from Euro 3 to Euro 4, and particularly to Euro 5, many vehicle manufacturers changed from traditional EPDM hoses to silicone. Relatively quickly, the market became flooded with inferior quality hoses.

Leyland Hose & Silicone (LHSS) recognised the need to use specific, high-quality, reinforcement fabrics and good quality, minimum liner thickness, vital to ensure superior performance.



*Leyland Hose & Silicone manufactures hoses for extreme conditions and coolants.*

To ensure efficient working under the most severe service conditions, with any type of coolant, LHSS invested in sophisticated test equipment. It commissioned test facilities, specifically designed to simulate as closely as possible, the service conditions found in many

Euro 6 vehicles. This allowed LHSS to develop the most efficient hose design, suitable for today's most extreme conditions, as well as coolants, and to confidently offer long-term warranties on hoses.

The incorrect choice of hose can prove extremely costly in the long term. Problems include burst hoses, discoloured hoses due to coolant permeation, damage to hose liners and excessive dilation due to poor fabric choice or construction.

In some cases, EPDM has seen new demand, offering resistance to many OAT coolants including recently introduced grades. However, it does have certain disadvantages compared to silicone, in particular, long-term ageing, which is accelerated greatly if temperatures exceed 130°C. As with silicone, under Euro 6 conditions, the material quality and construction is equally important in order to guarantee prolonged service.

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# Progress urged on low-carbon future

Calls for governments and the private sector to “accelerate progress” on the implementation of low-carbon power generation and solutions were made during the 2016 edition of Abu Dhabi’s sustainable energy showcase.

**T**HE RENEWABLE ENERGY industry was given a boost at the World Future Energy Summit (WFES) in Abu Dhabi in January as leading players in the international power and water sectors came together to discuss practical ways of moving towards a sustainable low-carbon economic model. With less coal and more gas being utilised across the world, panel session moderator Nick Cochrane-Dyett, special advisor to the chief representative of BP, asked what should be done about the 2°C temperature increase scenario, which the annual *BP Energy Outlook* report said could still occur before 2035.

Speaking during a session comprising government and corporate leaders entitled “Accelerating Progress to a Low Carbon Future”, Cochrane-Dyett urged private and governmental sectors to “accelerate progress” on the issue.

Highlighting the progress made by the UAE since 1995, Dr Matar Al Neyadi, undersecretary to the UAE Ministry of Energy, told the audience and fellow panel members that ADNOC had implemented a zero-flaring policy “wherever possible”, noting that in 2014, Masdar launched a carbon capture and storage scheme, and environmental rehabilitation projects.

During his WFES welcome address, Masdar CEO Dr Ahmad Belhouel said, “The economic case for renewables is clear. Let’s all use this global platform to take action.

“Nowhere is the business potential greater [for renewable development and investment] than in the Middle East and North Africa.”

Dr Belhouel cited Jordan’s first wind power project, Morocco’s target of more than 50 per cent renewables in its energy mix by 2030, and the UAE’s target of 24 per cent renewables by 2021 as examples of the growth and commitment to alternative forms of energy in the region. He said that a report into renewable energy by IRENA estimated that doubling the use of renewables by 2030 could potentially create 24mn jobs.

*A host of international leaders and dignitaries were in attendance during the opening ceremony of WFES 2016.*



Throughout the week, a series of announcements, deals and discussions were made, providing an honest barometer of the region’s commitment to the implementation of sustainable energy projects.

Masdar used the platform to release its *2015 Sustainability Report*, covering the period from October 2014 to September 2015. The report revealed a 64 per cent increase in registered companies in Masdar Free Zone for the period, while the company produced 2,962GW hours of total renewable energy. A total of 1.39mn tonnes of carbon was displaced by Masdar-involved renewable energy projects, while it recorded 33,000 passengers using Masdar City’s personal rapid transport (PRT) system.

The Dubai Supreme Council of Energy signed a Memorandum of Understanding (MoU) with the European Federation of Agencies and Regions for Energy and the Environment (FEDARENE), which will see both sides share their experiences and best practices in energy-related areas such as policy making, technology development, green-financing mechanisms, awareness programmes, green buildings, smart homes, and energy management and efficiency.

At the exhibition, Sharjah-based waste management company held talks with Saudi Arabian government officials, which focused

on how to integrate Bee’ah’s experience in waste management and environmental consulting into the Kingdom.

Bee’ah CEO Khaled Al Huraimel commented, “I believe the summit was of a great importance to stimulate innovative thinking among waste management and energy experts and helped us showcase sustainable development and renewable energy projects.”

The event’s international appeal saw the participation of pavilions from afar afield as the USA, China and South Korea.

Meanwhile, 29 French companies made their presence felt as the European nation aims to become a major player in renewable energy, looking to build an industrial sectors that could represent more than 220,000 jobs by 2020.

During this year’s event, the organisers announced the launch of the Energy Efficiency Expo, which will take place at WFES 2017. It will aim to tap into the growing global energy efficiency investment market, which the International Renewable Energy Authority (IRENA) said was set to reach US\$385bn per year by 2030.

WFES 2016, which was co-located with the International Water Summit and EcoWaste, formed the central focus of Abu Dhabi Sustainability Week. ■

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## Nobel Physics Laureate shares knowledge at Abu Dhabi event

DELEGATES AT THE World Future Energy Summit (WFES) heard from Nobel Physics Laureate and Global Energy Prize recipient, Shuji Nakamura, who shared his expertise on LED lighting and its impact on the clean energy industry.

Nakamura was part of a panel session, "Creating world-class partnerships between research industry, government and academia to build long-term sustainable solutions", with Dr Andre Faaji, academic director at Energy Academy Europe; Alejandro Rios Galvan, director of the Sustainable Bioenergy Research Consortium and professor of practice – engineering systems and management at Masdar Institute; Anup Jacob, partner at Masdar Capital; John Webley, founder, chairman and CEO at Trevi Systems; and Linda Zou, from the department of Chemical and Environmental Engineering at Masdar Institute.

Nakamura was interviewed on stage by Dr Steve Griffith, vice-president for Research at the Masdar Institute.

The session commenced with Nakamura sharing his insight and views on why the invention of light-emitting diodes (LEDs) are important for energy efficiency, and how he was able to achieve commercial success.

"LED light bulbs are more than 10 times efficient than incandescent bulbs and they last for 50 years," Nakamura remarked. "At their current adoption rates, by 2020, LEDs can reduce the world's need for electricity by the equivalent of nearly 60 nuclear power plants."



*Nobel Physics Laureate and Global Energy Prize recipient Shuji Nakamura.*

Achieving access to clean, sustainable energy in developing countries was a strong theme at WFES, and Nakamura discussed the role of LEDs meeting in this goal, "LEDs are also efficient enough to be driven by a simple solar cell powered battery. Now this clean and inexpensive technology can help bring light to millions of people around the world who don't have access to electricity."

He went on to explain why blue LEDs presented a particular challenge to researchers. While green, orange and yellow LEDs were first developed in the early 1970s, it was not until the early 1990s that blue LEDs came to fruition.

"In the 1980s, there were two kinds of materials available to develop a blue LED – ZnSe [zinc selenide] or GaN [gallium nitride]," he said. "Basically, all of the scientists working on blue LEDs selected ZnSe. I selected GaN as I thought that it would be easy to publish papers, because there were only a small number of published papers on GaN at that time." Working with GaN, even though it was unpopular because of its poor crystal quality, worked in Nakamura's favour and he successfully invented the first highly-efficient blue LED in 1993, using GaN-based materials.

In 2015, he received the Global Energy Prize for his invention, development and successful commercialisation of the blue LED. The commercialisation story is an example of how a forward-thinking venture capitalist can help bring innovative technology to a global market. After 10 years working for a small company, where he produced poor-selling infrared and red LEDs, he switched to his breakthrough work with blue LEDs and Nobuo Ogawa was, according to Nakamura, "one of the best venture capitalists for me".

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## Briefly

### ODICE showcases new fire proof concepts, optimistic about a better market

AT THE BIG 5 2015 held in Dubai, French manufacturer ODICE, specialising in passive fire protection, showcased its wide variety of fire-resistant products.

The range includes intumescent seals, incombustible boards, insulation materials, sealants, fire-resistant ventilation grilles that are necessary for the manufacturers of fire-rated doors, partition walls, shutters, dampers and other passive fire protection constructions.

ODICE director John Peters-Dickie discussed the intumescent fire seal based on the three intumescent technologies — sodium silicate, ammonium phosphate and graphite. He added that the co-extruded seals enhance a good cold smoke tightness and extra decibels for the acoustical insulation.

“ODICE’s products are designed in order to maintain fire resistance in a building for up to 30, 60, 90 and 120 minutes. We build for American, British and European standards. In the GCC, demand is far more competitive than Europe from what we have witnessed. However, cheap products are also killing the competition here.”

Peters-Dickie noted that Middle East governments and private sectors must join hands to create more awareness on the importance of fire-resistant products and help do away with cheap ones.

With regards to the ODICE 2016 plan for the GCC, the director revealed that it would continue to directly sell to the manufacturers and they are looking to build a bigger clientele since it is a huge construction market.

“The company saw a steady growth in 2015 due to its increased presence in export markets. ODICE has also invested in the development of new concepts closely in line with its strategic business partners. The sector we are mainly cater to are buildings — both residential and commercial like airports, hospitals, hotels. We are also hoping to benefit from Expo 2020 and FIFA World Cup in Qatar in 2022,” he said.

Peters-Dickie pointed out that ODICE was currently working on a new thermal insulation products named SEALODICE, which provide higher fire resistance to doors.

## Tekla solutions complement current construction industry, saving time and money

OWING TO THE tremendous increase in construction activities globally, the long-term estimation of the project, increased efficiency, and rapid workflow are some of the other factors that are expected to propel the global BIM industry. In addition, in developing economies, the government regulatory bodies are pushing for the streamlining of construction activities and encouraging the adoption of BIM technology, which is driving the growth of this industry. According to a research study by Transparency Market Research, in 2014, the global building information modelling (BIM) industry was worth US\$2.76bn and is anticipated to touch US\$11.54bn by the end by 2022, exhibiting a rise of 19.1 per cent compound annual growth rate (CAGR) between 2015 and 2022.

At The Big 5 2015, held from 23-26 November in Dubai, Tekla showcased BIM solutions for the growing construction industry in the region.

Paul Walleit, area manager at Tekla, said, “We have launched many solutions this year and are talking here about Tekla Structural Designer. We have also recently incorporated seismic capabilities in our analysis software. This is a fantastic tool because it incorporates three different solutions into one — seismic, wind analysis and BIM integration with Tekla Structures and Revit structures. Then we have concrete and steel design capabilities software that is code-based. Tekla Tedds is powerful software to automate your repetitive structural calculations. It is a design calculation pad for engineers pre-loaded with lots of different standard calculations that can be used for different codes like Euro or the US. We also have a new mobile application called Tekla Field3D. It is an easy-to-use 3D tool for utilising BIM on mobile devices. It works on both Apple and Android devices.”

He added that the impact of oil prices have affected construction market and there would be delay of payments coming through in these projects as a knock-on effect. However, according to Tekla, the leisure industry will see a fantastic growth. He also advised that companies cannot always thrive on oil and they have to prepare for that change, however painful. Therefore, Tekla is looking at creating solutions for more sustainable type of construction and for generating energy.

“As far as how it this has affected Tekla and Trimble, it is that people have begun looking at more efficient ways of working. We are driven and our technology has been developed to make people more efficient, but people are forced to use efficient solutions only when they look for alternatives. Technology can complement workforce. These are some of the decisions contractors need to look at.”



*Tekla Structural Designer complements Tekla Structures to extend the benefits of 3D modeling directly to engineers with an innovative approach that combines analysis and design into a single, seamless process. (Photo: Tekla)*

Walleit revealed the construction industry is still very optimistic about ongoing and upcoming projects. Surely, the implementation may be slower, but surely there will be a push to complete them in view of upcoming global events including Expo 2020 in Dubai and the FIFA World Cup in Qatar in 2022.

Taking about Tekla’s range of solutions for vertical industries in the region, Walleit noted, “In oil, we have many major EPC customers using our solutions, which may not necessarily be BIM. We have solutions for fabrications and engineering too. Lamprell, McDermott, Technip and Petrofac are some of the clientele we cater to. For the noticeable projects in the region, we have the Aldar headquarter in Abu Dhabi, ADNOC in Abu Dhabi, Qatar Museum and Qatar Faculty of Islamic Studies. We are also involved in the upcoming Sheikh Khalifa Masjid in Al Ain, which is going to be complex architecturally and made possible with our technology.”

As Tekla’s technology is progressing, the region is also witnessing a major trend of companies and contractors moving towards mobile technology with low-cost solutions.

“Pushing digital technology with information on hand of the user, rapid response from site to office and back make a great impact on how construction information flows and saves time as well. This is where the things are going. For this, we have developed cloud technology solutions,” he said.

In 2015, the company launched a special way of synchronising models so that can work across the globe and goes through a cloud. This too is available in Android and Apple versions. For the model-sharing based on core products, there is the desktop version.

“Getting the balance is what we bring to the table,” Walleit added.



# Moving “Safety” into the Boardroom

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## MEC and PMV Live bring together biggest industry names

MIDDLE EAST CONCRETE (MEC) and PMV Live 2015, co-located with The Big 5 in November 2015, hosted 38,071 participants from across the globe. The three events reinforced their position as the region's strongest event for the concrete, plant, machinery and vehicles industries.

According to organiser dmg events, the events gave visitors exclusive access to the most innovative concrete and PMV solutions available for the construction industry. The products were designed to offer the latest technology trends, money saving, time saving and sustainable solutions to maximise opportunities in one of the world's most vibrant and lucrative construction markets.

The Big 5 is MENA's largest building and construction event and provides direct access to the region's thriving construction market, which is set for further growth in 2016.

There were 19 CPD certified workshops attended by 797 visitors to learn about the latest updates on concrete and on the PMV industry including decorative concrete, design and construction of precast, preventive maintenance to reduce maintenance costs and increase equipment availability and more.

Also, 39 CPD certified seminars attracted 1,563 visitors to the open theatre at Dubai World Trade Centre, which featured presentations on the industry topics including 3D concrete printing, hot weather concreting, warranty for materials and equipment, deep foundation best practices and more. A full-day workshop on decorative concrete proved that concrete isn't just grey; 143 visitors found out how to add colour into their concrete projects, dmg events added.



Both shows were held at Dubai World Trade Centre from 23-26 November 2015.

Other attractions included 'Selfies at a Height' where more than 300 visitors were able to enjoy a picturesque view of Dubai and take picture at 27 metres above the ground from the platform of a boom lift.

Lucian Peter, production planning engineer BION Industrial, said, "PMV Live has been a real success for us because we have been able to engage many quality clients from GCC and African countries, which are key markets for us."

Lloyd Wang, deputy general manager of Shenyang Sanyo Building Machinery Co. Ltd., added, "This year is even better than last year. It seems the economic opportunities for our business have increased. Since the first day we have seen many potential clients and have been so busy."

Global exhibitor participation included Denmark, UK, USA, Turkey, France, Germany, Italy, Finland, China, India, The Netherlands, among many others.

Middle East Concrete is the largest platform for the construction community to share, learn and source the most innovative solutions for the concrete industry.

PMV Live is an established important heavy construction machinery, plant equipment and commercial and construction vehicles event in the Middle East. It connects PMV professionals who are looking to source innovative and high-quality products and solutions with leading companies from across the industry.



The 'Selfies at a Height' platform was a major attraction at MEC and PMV Live last year.

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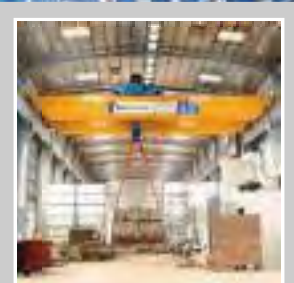
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# MEE set for biggest edition to date

Record attendance figures, a growing exhibitor list and new events are all set to mark the return of Middle East Electricity.

**F**OLLOWING A HUGELY successful 40th anniversary edition, Middle East Electricity (MEE) will return to Dubai World Trade Centre on 1-3 March 2016. The event's organisers have said the 2016 event is set to break all attendance records, bringing together some of the world's leading power companies to showcase their products and services on nearly 65,000 sqm of exhibition space, representing a growth of 4,000 sqm from the 2015 edition.

Hosted by the UAE's Ministry of Energy, visitors to MEE can expect a host of new products from the 350 new companies from around the world set to attend the 2016 edition of the show.

For the first time ever, MEE will host a regional Power Congress. The closed-door event will take place on day one of the exhibition, with the agenda focusing on powering purpose built cities and supporting energy innovation throughout the region.

High profile speakers such as His Excellency Suhail Al Mazroui, Minister of



*Alfanar will be among the big names at the 2016 edition of MEE.*

Energy, UAE; Eng. Jamila Matar, Director of Energy Department for League of Arab States; and Dr. Varun Sivaram, Douglas Dillon Fellow, Council on Foreign Relations, will lead discussions on energy development and management, and how it plays a key part in redefining what is possible in urban developments across the Middle East.

Eighty-five per cent of the companies that have confirmed their participation at MEE 2016 will be repeat exhibitors, and key players from across the industry in

attendance will include the likes of Cummins/Stamford AVK, Perkins, Skipper, Alfanar, Ducab and ABB.

The event's key focus areas will include Power Generation, Transmission & Distribution, and Lighting & Renewables.

Aside from the Power Congress, MEE 2016 will also play host to a dedicated conference, The Solar Agenda, and a comprehensive Technical Seminar programme, which will showcase the products and services of leading names in the industry.

Anita Mathews, Director, Informa Energy Group, said, "MEE continues to maintain its growth in spite of the challenging market conditions we are all currently facing. The exhibition has grown by 10 per cent this year compared to 2015 and exhibitor presence from countries such as Germany, Turkey, China and Saudi Arabia is on the rise."

Co-located with Middle East Electricity will be Solar Middle East, a comprehensive gathering of solar technology suppliers in the region, which will open its doors for the fourth time this year. ■

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# DEHN establishes Middle East subsidiary in Jebal Ali Free Zone

AFTER THE FOUNDATION of the 19th subsidiary in Singapore in 2014, DEHN has continued its growth and established a subsidiary in the Middle East in Dubai.

The company, which will be exhibiting at Middle East Electricity 2016 in Dubai this March, said it hoped its investment in the new subsidiary would help its local customers market its products in order to develop customised protection solutions and promote internationally-recognised quality standards in the field of lightning protection, surge protection and safety equipment throughout the Middle East.

DEHN said its increased presence in the Middle East would help it get closer to its customers and would also simplify order processing. The new subsidiary in Dubai plans to offer training courses for customers in the Middle East and will ensure it will be able to reach its contact partner during local working hours. DEHN will have an increased presence throughout the region, offering protection solutions to a broader customer base.



*DEHN's product portfolio includes surge protection for power supply and information technology systems, lightning protection, earthing solutions and safety equipment.*

Moreover, DEHN said it would work on customised protection solutions together with its local partners. The new subsidiary will aim to strengthen cooperation with current distributors, to help them expand their business in the Middle East.

DEHN, a fourth-generation, family-owned company, was founded in Nuremberg, Germany, in 1910. It is active in more than 70 countries worldwide.

DEHN's product portfolio includes surge protection for power supply and information technology systems, lightning

protection and earthing solutions, as well as safety equipment.

DEHN has been present in the Middle East for more than 10 years. As of March 2016, DEHN will now be represented locally with an own subsidiary. The new team is currently being assembled and the first employees have already been hired.

The subsidiary, which will operate under the name of DEHN Middle East FZE, will particularly focus on the region's oil and gas industry, infrastructure projects, the process industry, the telecommunications sector and also increasingly on alternative energies.

With the new subsidiary, DEHN now plans to expand its business in the Middle East. Bassam Zahabi, who has been representing DEHN in this region so far, will become managing director of DEHN Middle East FZE.

DEHN Middle East FZE is a 100 per cent-owned subsidiary situated in the Jebel Ali Free Zone.

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# Power for Telecoms

FG Wilson have announced a new range of generator sets, specifically for telecommunications customers.

**F**OLLOWING CONSULTATION WITH operators, tower companies and hybrid manufacturers, the new range from FG Wilson delivers reliable power for extended running periods of up to six months between service and fuel replenishment intervals. To minimise site visits, 600, 1,000, or 2,000-litre fuel tanks and an extended service interval option can reduce operating costs for the generator set by up to 50 per cent.

## FG Wilson's new gensets are designed to meet a range of technical requirements.

Using market-leading control modules, including built-in mains sensing and changeover systems, the generator sets are designed to be easily and quickly deployed. Complete with the latest Deep Sea controllers, the new FG Wilson Telecom range can be tailored to meet all technical requirements – from configurable alarms and protections, to remote monitoring, control and preventative maintenance.

Plug-and-play options allow upgrading on site when required. With security in mind, the range conceals all fuel pipework and fuel filling connections protecting against fuel theft, and optional security features include lockable door latches and GPS tracking devices. With a new range of acoustic enclosures at different sound attenuation levels, the range is suitable for all applications and locations. And when a generator set needs to be moved to a new location, its modular designed enclosures can easily be



upgraded to ensure it meets all local noise regulations.

Customers now have the choice of two reliable products at different price points.

The new range has also undergone rigorous validation testing to ensure it is built to run for many years. The new range comes with class-leading aftermarket support from 370 FG Wilson dealers spread across 150 countries, all fully trained in technical, maintenance and service support, with ready stock of parts and supported by a 59,500 sqm parts facility, carrying more than 11,500 product lines and dispatching more than three million genuine parts per year. ■

## Schurter launches new IEC appliance outlet for increased power ratings

SCHURTER HAS LAUNCHED its latest IEC appliance outlet. The appliance outlet has insulation displacement contact (IDC) terminals - the 4710 - providing increased power ratings over the popular 6610 series for heavy-duty PDU applications.

The 4710 is a J style outlet according to IEC 60320, rated 20 A @ 250 VAC by UL/CSA and 16 A @ 250 VAC by ENEC. The lower current version, 6610 series, is a style F outlet, rated 15 A @ 250 VAC and 10 A @ 250 VAC respectively.

The 4710 provides IDC terminals for 10 AWG / 6.0 mm<sup>2</sup> in addition to 12 AWG / 4.0 mm<sup>2</sup>, which is the standard wire size for the 6610. The new wire option allows for larger diameter wire for the 4710's increased power capabilities. The snap-in outlets fit panels with a thickness between 0.8 mm and 3 mm.



The 4710 is a J style outlet, rated 20 A at 250 VAC by UL/CSA and 16 A at 250 VAC by ENEC.

The 4710 and 6610 outlets are qualified for use in applications designed to IEC/EN

60950. Ideal for use in power distribution units, and other equipment where multiple outlets are banked in series, these IDC outlets allow wires to be bussed across the terminals, thereby connecting common terminals all at once and significantly reducing labour costs. The IDC terminals are arranged either along or across the connector pin axis for a horizontal or vertical mounting orientation. Wires are pressed into place with the protective back cover or with a tool. Versions with combination IDC and a quick-connect or solder terminal, for separate wiring of the line connection, are also available.

The outlets are offered with light pipe options for status indication. They also mate with V-Lock latching cordsets designed to prevent unintentional disconnection from the power source.





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## Volvo Penta's start-stop function cuts emissions and saves fuel cost

VOLVO PENTA HAS released its new fuel-saving start-stop function for industrial engines on select Stage IV/Tier 4 and Stage III/Tier 3 engines.

First introduced in 2013, the feature is now available for Stage IV/Tier 4 Final D5, D8 and D11 engines, as well as Stage III/Tier 3 D11 engines. For owners and operators, the benefits of the start/stop function include reduced fuel consumption, noise and emissions.

"Start/stop is one of our latest innovations for the off-road market," said David Hanngren, product planning manager at Volvo Penta. "We developed this feature in close cooperation with our OEM customers. With our approach, they benefit from using start/stop as an integrated part of our offer, providing a proven solution that is fully protected by our warranty coverage. It is a winning combination."

The start/stop feature works by shutting down the engine during extended idle periods and turning it back on when the equipment needs to resume its operation again. These features are increasingly common in automobiles, and Volvo Penta was one of the first companies to integrate the function into industrial off-road engines.

The system provides owners with a good return on investment – saving between five and 15 per cent in fuel costs – depending on how much idling there is in a given application.

Emissions are also reduced, while a reduction in idling keeps the engine-aftertreatment system at a better working temperature. This leads to a more efficient conversion in the SCR-



*Volvo Penta is one of the first companies to integrate start-stop functions in industrial off-road engines.*

catalyst and lower NOx emissions. With the engine turned off when it is not needed, excess noise is also reduced.

The latest generation of start/stop has been updated with new features for added customer benefits. The hardware has been integrated into the engine ECU for greater reliability; a stronger, more robust starter motor is now incorporated which ensures durability; and a battery voltage monitor allows the system to check the battery status and ensure that there is always enough capacity for a restart.

As with all Volvo Penta off-road industrial engines, those fitted with a start/stop system are covered by the company's full two-year, 3,000-hour international or North American warranty.

## Formwork solutions fast-track construction of Abu Dhabi tower

THE CONSTRUCTION OF mixed-use residential and commercial Al Jazeera Tower in Abu Dhabi reached the top of its 40th storey, thanks to the utilisation of a range of temporary equipment solutions, including RMD Kwikform's Rapidclimb climbing formwork.

Contractor Ghantoot Group required multiple solutions to form the walls, columns and slabs of the building on the fast-track project.

RMD Kwikform's Prop Tableform slab system and Rapidclimb climbing formwork were used on the project, along with wall formwork using superslim soldiers and GTX beams, and KwikColumn for the columns formwork.

As the slab support was constructed into tables, the onsite team could simply move tables from one floor to the next with no dismantling or re-erection required, reducing the slab construction cycle time and speeding up the construction process. With the availability of crane support, the cores of the towers could be cast using the integrated Rapidclimb climbing formwork system, with second fixing safely conducted using the trailing access platforms.

Due to the compact nature of Rapidclimb, the onsite team opted to follow the core construction casting slabs as soon as the core section was completed. With site assistance technicians from RMD Kwikform supporting the erection teams, the time needed to complete a core and slab section was

reduced by up to 50 per cent from the initial phases of the project to the 40th floor.

RMD Kwikform's Ahmed Atalla remarked, "The key to this project was to deliver the most time and cost-effective solution.

"When it came to the core formwork, this was the first project in Abu Dhabi to use the Rapidclimb climbing formwork solution. As the project progressed, the team were able to reduce the time it took to complete pours, taking full advantage of the reusable wall formwork panels integrated into the Rapidclimb system."

By providing all of the formwork and shoring equipment for the project, RMD Kwikform engineers were able to optimise the design solutions at every phase to allow the Ghantoot Group site team to take advantage of both cost and time savings.

Project manager Marwan Hilles added, "This project was all about safely achieving fast concrete cycles. Working with the RMD Kwikform team, we were able to hone our erection processes with the site support team to achieve slab cycle times of just seven days. This was only made possible by using the Tableform solution for the slabs and Rapidclimb for the core."



*The 40-storey high Al Jazeera Tower is being constructed next to the Corniche in Abu Dhabi. (Photo: RMD Kwikform)*



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## Dr Fixit's quick fix for waterproof problems in Middle East structures

WATERPROOFING STRUCTURES MAY not be a common design component in the Middle East region, but it is necessary. However, most often, not enough importance is given to this very crucial aspect while constructing new structures.

Indian company Pidilite brings to the Middle East the exact solutions required for waterproofing problems. Some of the solutions by Dr Fixit from Pidilite for the Middle East region cater to podiums, green roofs, basements and wet areas. Dr Fixit's products range from spray applied systems to new generation spray applied waterproofing and proven polyurethane and acrylics, which are base coatings.

According to Ian Dawson, general sales manager, when it rains in the UAE, it pours. And few are ready for the leaking roofs and walls. Even with limited rain, the solutions are still needed since the environment is a highly corrosive one. Airborne salt and saline ground water can damage the structures beyond repair, if not heeded. Waterproofing is not necessarily about liquid. It is about



*The environment in Middle East is highly corrosive with saline water and airborne salt damaging building near water bodies. (Photo: Imre Solt/Wikimedia Commons)*

vapours, airborne moisture and groundwater. With a huge investment in infrastructure projects, there needs to be equal thought given to water-tight materials. Therefore, waterproofing should be incorporated in the design phase.

"We have worked on a number of prestigious projects in the Middle East during the last 10 years, and we are still innovating. Pidilite, in the UAE, has opened a 52,000 sqm

plant that focuses on export to other GCC countries. We have also spent EUR1mn (US\$1.09mn) on installing a state-of-the-art powered production facility. So our expansion for powdered products is on the top of the list."

The company has also invested heavily in R&D with a view to launch new products into the Middle East market and has established Pidilite Qatar in December 2015.

Talking about strategising for the region in the upcoming years, Dawson revealed Pidilite has a very aggressive growth plan in 2016-17.

"What we are looking at is producing far more project-led focused commercial and technical investment in Pidilite in the Middle East since the market is a hotbed for Indian companies and contractors. Due to the commercial link between Middle East and India, we are not coming in as a completely unknown brand. Dr Fixit and the Pidilite brand have opened doors for us here."

"There are volumes of business over here and we are confident that we can take a slice out of that," Dawson concluded.

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## Fila solutions help remove rust and silicone stains, protect surfaces

FILA SURFACE CARE Solutions launched its innovative, regionally inspired new products – FILANO RUST and FILAZERO SIL – for the Middle East market in late 2015.

Francesco Pettenon, managing director at Fila Surface Care Solutions, said, "Our rust stain remover and silicon residue remover have been manufactured to protect and preserve the finest surfaces including marble, porcelain, stoneware, terracotta and wood, and they are strongly needed in a harsh climate in which humidity, wind and condensation have a detrimental impact on surfaces.

"FILANO RUST is a ready to use rust stain remover applicable even on delicate surfaces. FILAZERO SIL is effective at removing residue of silicone, glue, adhesive tape, wax and old labels from any surface."

Pettenon added that there has been a high demand for Fila's products in the region. "With the construction industry growth in the region showing no signs of abating, quality of builds has become paramount, and surface protection and stain removal products have become essential. We have been present in the region for more than 10 years, but since opening our Dubai-based office three years ago, we have seen an exponential growth in the number of industry professionals choosing to protect the quality and finish of their buildings. They use our products to extend the lifespan of their surfaces, avoid blemishes and ultimately save cost," Pettenon noted.



*Francesco Pettenon demonstrated Fila Surface Care Solutions' ranges at The Big 5 in November 2015. (Photo: Fila Surface Care Solutions)*

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## Briefly

### Atlas Copco launches new light towers

ATLAS COPCO HAS launched a new range of light towers – the HiLight V4 and V5 – to be used in a range of industries. The HiLight V4 a leading solution within the 4000W metal-halide light tower segment, while the HiLight V5+ is a premium model incorporating LED lighting technology and increased fuel efficiency. The V5+ offers fuel savings of up to 60 per cent when compared to the typical fuel consumption of 6kW Metal Halide solution, creating industry leading competitive advantage.

The V4 model can illuminate an area of 4,000 sqm and the V5+ can cover approximately 5,000 sqm with an average of 20 lux. The LED lamps in the latter model are designed for both portability and performance, and heavy-duty floodlights benefit from high ingress protection (IP) and impact protection (IK) ratings. In addition, LED lamps offer users higher durability without any deterioration in lux level.

The extended safety features give users complete peace of mind, even in the most demanding conditions. The light towers can be transported with their masts in a vertical position, enabling safer transportation and installation. As a result, it is possible to transport up to 20 units on a single truck, while eliminating the time-consuming and costly problem of bulbs being broken during the shipping process.

The vertical mast also aids the installation process and improves site safety, which is further enhanced with four heavy-duty stabilisers and a level indicator. In addition, the new light towers come with the Atlas Copco HardHat canopy as standard. Other features of the HiLight HardHat range include a 28-gallon fuel tank, which allows the units to run for multiple days without the need to refuel.

Atlas Copco's light towers are equipped with Kubota EPA Tier 4 engines and offer increased serviceability with wide-wing doors and all components easily accessible. Keeping in mind environmental concerns, the engines come with a frame design that prevents oil, fluids and fuel from leaking out and contaminating the ground.

## Borouge Innovation Centre welcomes Emirati students

BOREALIS AND BOROUGE recently hosted a number of young Emirati students at the newly-opened Borouge Innovation Centre in Abu Dhabi.

The joint delegation was led by Mark Garrett, chief executive of Borealis and Abdulaziz Alhajri, CEO of Borouge. Other delegates included Clare Woodcraft-Scott, CEO of Emirates Foundation and Mohanna Al Muhairi, COO of Emirates Foundation. The delegation also included a number of Abu Dhabi students, who are currently participating in the Emirates Foundation's "Think Science" programme and who were invited to experience polymers innovation in practice and first-hand.

The students participating in the Borouge Innovation Centre tour are currently taking part in the Emirates Foundation's "Think Science" programme – an initiative developed to encourage Emirati youths to pursue science as a field of study. The programme seeks to develop and connect local talent through national science competitions. It develops young science "ambassadors" who use the power of analytical thinking to propose solutions to global technological issues.

The new state-of-the-art Borouge Innovation Centre was inaugurated in late 2015 with nearly US\$150mn having been invested in it. Located in Sas Al Nakhl in Abu Dhabi, the centre is a key driver in the Borealis and Borouge mission to deliver 'Value Creation through Innovation'. With a Research & Development (R&D) focus on polymer development and application technology, the Borouge Innovation Centre boasts extensive



*The CEOs of Borealis and Borouge with Emirates Foundation delegates and Think Science Ambassadors inside the Borouge Innovation Centre.*

laboratory and resource application facilities on grounds measuring approximately 23,000 sqm.

The innovation centre has filed around 200 patents in the past two years, accounting for nearly 30 per cent of all registrations from the UAE in the World Intellectual Property Organisation (WIPO) database.

While the facility collaborates closely with other Borealis Innovation Centres in Europe and the Borouge Application Centre in Shanghai, the Borouge Innovation Centre is Borouge's global headquarters for product development, advanced product testing and customer service support. Around 15 per cent of products currently produced by Borouge have been developed at the Borouge Innovation Centre. The centre employs approximately 70 technicians, researchers and engineers, of whom 25 per cent are Emiratis. The percentage of Emiratis among all staff is expected to grow to nearly 75 per cent in the next five years.

### Philips paves the way in healthcare innovation

**DIGITAL TECHNOLOGIES ARE empowering people to take more control of their health and lead healthier lives. Data and connected solutions help deliver the relevant information at the right time – enabling healthcare professionals to make first-time right decisions, achieve better outcomes at lower costs, and facilitate care models that put patients at the center of care.**

Philips health solutions, showcased at the recently concluded Arab Health, included the Tele-ICU programme, which transforms an ICU, using a proactive care model. Other applications included the Philips health watch, which tracks heart rate and other metrics of cardio condition. Philips HealthSuite Digital Platform, an open, secure, cloud-based platform, ensures the smooth movement and functionality of the various health programmes put together by Philips. Part of Philips' connected solutions is the IntelliSpace Portal 8.0 – an advanced data sharing, analytics and visualisation platform



*The Minicare Acute handheld testing device by Philips.*

that helps radiologists detect, diagnose and follow-up on cancer treatment.

Lumify, another Philips' smart device solution, is set to make ultrasound technology more accessible to licensed healthcare providers or organisations. The Philips Minicare system is a handheld testing platform, which can show blood test results on the reader display within minutes. The system offers multiplexing capabilities and shows immediate results, enabling doctors to identify high-risk patients earlier.



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## Hi-Force to relocate Abu Dhabi branch

HI-FORCE, THE UK's leading manufacturer of hydraulic tools, offers an extensive product range from cylinders, pumps, manual and powered pumps, manual and hydraulic torque wrenches, stud bolt tensioners, jacks, nut splitters, puller kits, crimpers and many other industry specific tools.

The Hi-Force philosophy of offering a complete service package extends to onsite services, tool rentals, repair, calibration and training. Hi-Force is also approved by the ECITB (Engineering Construction Industry Training Board) for the provision of Mechanical Joint Integrity (MJI) training courses.

Hi-Force established its first UAE operation inside Jebel Ali Free Zone in 1992, followed by a second location in Abu Dhabi.

In early 2016, the Hi-Force Abu Dhabi branch is relocating to a new purpose-built facility. Situated within the existing premises, the new two-storey office block covers more than 5,000 square feet, and houses a significantly larger warehouse and a fully-equipped workshop repair and rental facility.

In the highly-demanding Middle East region, this new facility will enable the company to vastly increase its stock holding and ensure that first-class products and services are exclusively available to its customers. Work on the existing premises is nearing completion and subject to approvals, and the new building will soon be ready for relocation, the company revealed.



*Hi-Force will move to a new location in Abu Dhabi in early 2016.*

## Hormann introduces smoke-tight doors



*Hormann's fire-tight doors are ideal for construction projects in the Middle East.*

**HORMANN MIDDLE EAST** has introduced tubular frame fire-rated quality doors, designed to be used in construction sites, factories and shops. This innovation is mainly for secure planning in construction projects, said the company.

Fire-rated/smoke-tight doors and glazing are available in models of T30, T60 and T90, which assure a high level of safety, functionality and 100 per cent compatible appearance. The fully-glazed smoke-tight T30 and T90 tubular frame parts are available in steel and aluminium, flush-fitting steel fire doors and sturdy doors are made of steel and stainless steel.

"Reliable fire protection calls for adequate new developments and improvements to each and every detail. This is where our qualified development teams demonstrate their expertise time and again. Hormann has continually extended its fire protection programme. Today, as a result, we can offer a complete and fully developed range," said Hormann Middle East managing director Darius Khanloo.

As standard, all fire-rated and smoke-tight doors are equipped with a slide rail overhead door closer on the hinge side, with an integrated door leaf selector for double-leaf doors. The fire testing centre conducts in-house fire tests to examine the required fire resistance and smoke-tightness for buildings.

Fire protection classes are available in T30, T60 and T90 depending on the functions the projects require. In fire tests, these doors must resist temperatures according to the temperature/time curve for at least 30 minutes (T30), 60 minutes (T60) or 90 minutes (T90).

An overall harmonious look is created by a matching appearance independent of the functions of the door. Different options, for example the thickness of the rebate type, the surface or the closing devices can be chosen individually.

Hormann's aluminium fire-rated doors are available either as a coupling construction for simple connection on location, or as complete elements with a vertical/horizontal profile construction. Thus, they can be easily matched to the fitting situation at the construction site. With the Hormann plug-in system, the slim vertical/horizontal profile construction can also be assembled into walls of any size.

## Himoinsa enjoys sales growth in 2015



*Himoinsa has plans to expand its business this year.*

SPANISH GENSET MANUFACTURER Himoinsa's turnover in 2015 grew by 15 per cent, with strong sales figures coming in from the Middle East, Africa, Asia Pacific and Europe.

While Europe emerged as a key market contributing 37 per cent of the total turnover, America followed with a 26 per cent share and Asia Pacific with a 17 per cent share. The Middle East and Africa each contributed 10 per cent to Himoinsa's annual figures last year. The company plans to capitalise on these markets in the coming year, supported by a network of production centres, sales offices, distribution and service network in 130 countries.

New products are expected to be launched in the market this year, revealed the company, which would include power generation systems, diesel/gas gensets and lighting towers. Some of the products are expected to make an appearance at trade shows such as Bauma in Germany and Middle East Electricity in Dubai.

The company, according to executive director Lydia Gracia, has seen major worldwide growth, with employee growth at 11 per cent. One hundred new staff have been appointed in the company's 10 sales offices and nine production centres across five continents.



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## INMARCO's new eco-friendly non-asbestos sheet for gaskets

AFTER SUCCESSFUL TRIAL and testing and certifications, INMARCO has launched its new generation gasketing eco-friendly non-asbestos sheet – NA series in the Middle East region.

At its state-of-the-art manufacturing facility, INMARCO has produced world's first unique technology without the use of toluene and volatile organic compounds (VOC) contents. Besides being cost-effective, the sheet can be used in multi-applications and has excellent sealability at low seating stress with superior gas permeability. The sheets also display good electrical isolation performance and less deformation at high compression load. It can be easily removed for flange protection and is suitable for steam applications as well.

According to gasket manufacturer and supplier, the green technology is mandatory



*The sheets display good electrical isolation performance and are less deformed at high compression load. (Photo: INMARCO)*

and many products in the company conform to these standards.

The NA series also reduces creep and cold flow. It is built in feature of the highest flexibility. The surface finish is extremely high and suitable for flange irregularities in

comparison with conventional jointing sheets. Serving industries from chemical processing to construction and oil and gas, INMARCO has already begun selling the gasketing sheet for various applications in UAE market.

## Oman's OICT unveils new truck appointment system at Sohar Port terminal

OMAN INTERNATIONAL CONTAINER Terminal (OICT) has officially unveiled its much-awaited truck appointment system (TAS) at its operations at Sohar Industrial Port Company.

According to Albert Pang, OICT chief executive officer, TAS promises to revolutionise logistics industries and supply chains throughout Oman. "TAS includes new roads and dedicated truck lanes and brings us a step closer to making the entire logistics system more efficient in terms of our own operations and our customers' supply chains in Oman."

TAS will allow truck drivers to schedule collection and delivery of cargo at the container terminal in advance of their arrival, either through a mobile app, a dedicated website, or an interactive voice response number.

Meanwhile, the system will not only allow Omani logistics companies to view peak periods and schedule their trips to the port accordingly, creating cost savings through productivity gains, we will also enable OICT to better plan and allocate resources in real-time.

"We continue to expand our container handling capabilities as part of our commitment to cater to the world's largest container ships. At

the same time, we recognise the importance of facilitating smoother land transportation. The TAS system will enable us to do just that," Pang added.

The launch of the new system follows total investments made by OICT in the expansion of infrastructure at Sohar Port of over US\$184mn, and is part of a long-term vision.

"We remain committed to building a modern container terminal that contributes to the overall efficiency at Sohar Port. Part of this will be realised through reduced wait-times for drivers through TAS. We also expect to be able to identify trends and potential bottlenecks before they arise and take appropriate action," he added.

TAS is now available and will serve logistics companies linking up with some of the world's biggest shipping companies, including United Arab Shipping Company, CMA CGM and APL, which operate out of OICT.

Meanwhile, Sohar Port and Freezone has signed a new deal with Warehousing Solutions LLC, a newly established company that is owned by Saudi Arabian logistics provider Warehousing Projects and Logistics LLC (WPL), for developing and managing a new warehouse park at Sohar Freezone, which is one of WPL's first major ventures outside the Kingdom.

The signing marks the beginning of the construction of WPL's planned 50,000 sqm warehouse park in the freezone. Another 50,000 sqm has been reserved for Phase II, taking the total size of the land lease agreement up to 100,000 sqm. Warehousing Solutions will also construct ready-built warehouses.

The new deal comes at the time when the throughput at Sohar Port has increased dramatically over 2015, with an average of close to one million tonnes of cargo a week recorded last year. Also, the new highway connecting Sohar directly to Saudi Arabia is due to open in Q1 2016; and this year the first 200 km of the GCC rail network in Oman will start construction, linking the port to the border of the UAE in Buraimi, with onward rail links to Abu Dhabi.

Sohar Freezone CEO Jamal Aziz said, "The logistics sector in Oman is projected to grow beyond the US\$12bn mark by 2017, and we have set out to make 2016 our 'Year of Logistics', to attract more 2PL and 3PL providers to Sohar."



*OICT CEO Albert Pang (right) explains the TAS system to authorities at Sohar Port in Oman. (Photo: OICT)*

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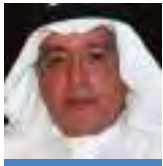
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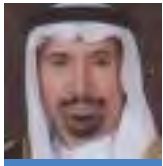
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**Ministry of Water & Electricity**



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**Ministry of Water & Electricity**



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المزلاج إما آلية إعتاق ميكانيكية أو قيمة تستخدم للتحكم في النظام الهوائي أو الهيدروليكي.

ويتم تنفيذ هذا الاختبار لكل ملف من ملفات التحكم الموجودة بقاطع الدائرة الكهربائية. وينبغي مراعاة الاعتبارات المختلفة لقواطع الدوائر ذات التشغيل الجماعي للأقطاب في مقابل القواطع ذات التشغيل المستقل للأقطاب (IPO). كما ينبغي اختبار جميع ملفات التحكم بشكل مستقل. وقد يستلزم قاطع الدائرة ذو التشغيل المستقل للأقطاب (IPO) مزيداً من الاختبارات، بحيث يشمل جميع ملفات التحكم.

### مجموعة الأدوات المحسنة

تعد أدوات اختبار التشخيص الحديثة أكثر من مجرد نظام لتحصيل البيانات. فمجموعة أدوات قاطع الدائرة يجب ألا تقتصر على إمكانات القياس فحسب، بل يجب أن تشمل أيضاً على مصدر طاقة مُعزّز. ولا بد من وجود مصدر الطاقة هذا من أجل مقاومة الملامس والحد الأدنى للتيار. وإضافة إلى ذلك، يمكن تشغيل دوائر التحكم والملفات والمحركات عند عدم توفر تيار المحطة الفرعية، وذلك من خلال توفير مصدر الطاقة هذا.

وينبغي أن توفر مجموعة الأدوات التشخيصية لقاطع الدائرة ثلاث وظائف

هي:

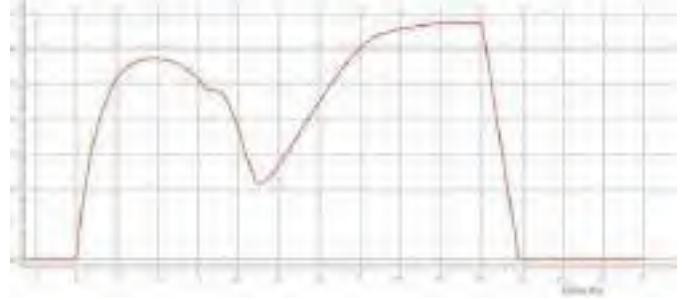
- مُحلل ضبط الوقت والحركة
- قياس ميكرو أوم (مقاومة الملامس)
- مصدر طاقة مُعزّز

وتساعد هذه الوظائف الثلاث، عند دمجها في عِدّة واحدة، على توفير الكثير من الوقت أثناء عمليات القياس التي تُجرى على قواطع الدوائر الكهربائية كبيرة الحجم، وذلك نظراً لتقليل الجهد اللازم لتجديد الأسلاك الكهربائية. ولهذا، تتيح الوظائف إمكانية أداء الاختبارات التالية:

- ضبط الوقت والحركة
- مقاومة الملامس (المقاومة الاستاتيكية والديناميكية)
- تسجيل قراءات تيار الملفات والمحركات وتحليلها
- الحد الأدنى للتيار

ولا تقتصر فائدة هذه الاختبارات على مراقبة أداء قواطع الدوائر فحسب، بل تشمل تحديد مؤشرات الحالة الأساسية. ويكون استخدام مجموعة الأدوات المحسنة والملائمة، ضرورياً عند تحديد مدى سلامة قاطع الدائرة وتقييمها. ومن المهم أيضاً أن ندرك قيمة جميع أدوات التشخيص المتوفرة، ليس بغية ضبط الوقت والحركة فقط، ولكن أيضاً لتنفيذهما بشكل مناسب. ويمثل فهم فوائد اختبارات ضبط الوقت والحركة ومقاومة الملامس (المقاومة الاستاتيكية والديناميكية)، وتسجيل قراءات تيار الملفات والمحركات وتحليلها، والحد الأدنى للتيار، عنصراً أساسياً لتوسيع نطاق عملية إطالة عمر قواطع الدوائر، والمحافظة على تشغيلها بصورة صحيحة.

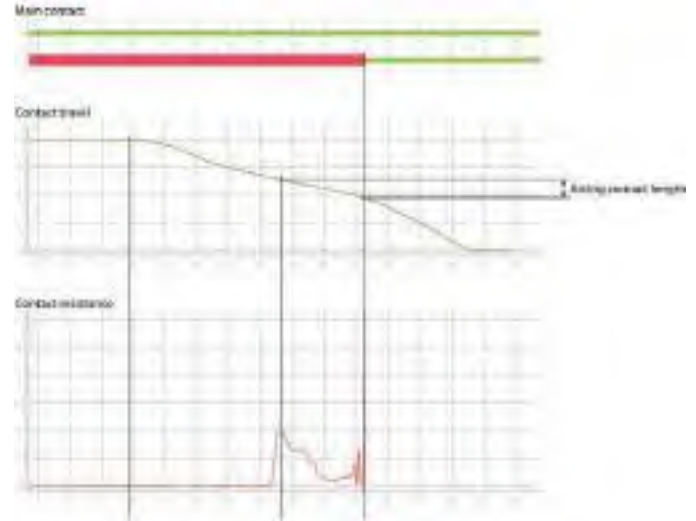
وغالباً ما يُستخدم تياراً مباشراً بقدرة ١٠٠ أمبير على الأقل.



الشكل ٣: ترجمة المنحنى وفق إدارة الحقوق الرقمية

### تسجيل قراءات تيار الملفات والمحركات وتحليلها

يمكن استنباط المعلومات المتعلقة بالتشخيص، وأداء الملفات الكهربائية، وتشغيل المزلاج، عن طريق تحليل قراءات ملف التحكم. ومن السهل تحديد مشكلات التشخيص في هذا الصدد. وحين يتحرك عضو إنتاج التحكم، يتم إنشاء قراءة متوقعة لملف التحكم (انظر الشكل ٤).



الشكل ٤: قراءة نموذجية لملف التحكم

ويوضح لك سلوك تيار المحرك، إلى جانب قراءات تيار المحرك، الطاقة اللازمة وكيفية استهلاك المحرك لها. وتشير مستويات التيار غير العادية، وتوقيت المحرك، إلى العطل الكهربائي المحتمل في المحرك.

### الحد الأدنى للتيار

يتم إجراء قياس الحد الأدنى للتيار لتحديد الحد الأدنى لجهد ملف التحكم (الإعتاق أو الإغلاق) اللازم لتشغيل قاطع الدائرة الكهربائية. ويمثل ذلك الحد الأدنى اللازم من الطاقة لملف التحكم لتحرير المزلاج. ويمكن أن يكون

تجاوز مدى الحركة	تيارات الطور (عملية الإعتاق الأولى)	(O-CO-CO)
الارتداد	المقاومة الديناميكية (DRM)	عملية الإعتاق الأولى (O)
الشوطة		
مسح الملامس		
وقت الإغلاق - الفتح		
(وقت المسح المتقطع/مؤمن ضد الإعتاق C-O)		
الزمن الميت (إعادة إغلاق OC)		
توقيت إعادة الإغلاق		

الجدول ١: أساسيات توقيت قاطع الدائرة

### مقاومة الملامس

#### (المقاومة الاستاتيكية والديناميكية)

مقاومة الملامس من الموضوعات المعقدة، إذ يمكن أن تتكون مجموعات الملامس من مكونات الملامسات الرئيسية وملامسات القوس. وللإطلاع على مكونات كليهما، يُجرى تحليل مقاومة الملامس، المقاومة الاستاتيكية والديناميكية، على التوالي.

ويتم إجراء قياس المقاومة الاستاتيكية للملامس في كل مرحلة من المراحل باستخدام مصدر تيار مباشر. وتكون القياسات النموذجية دون مستوى ١٠٠ ميكرو أم. ومع ذلك، ينبغي أن يساعد كتيب الشركة المُصنعة في تحديد القيمة الفعلية المتوقعة.

وبمراجعة جميع أنواع قواطع الدوائر، أظهرت التجربة أن نطاق القياسات يتراوح من ١٠ إلى ١٥٠ ميكرو أم حسب النوع، وأن استخدام القواطع الفراغية منخفضة الجهد المرتبطة بالقياسات المنخفضة للغاية وقواطع دوائر الخزانات الممتلئة بغاز سادس فلوريد الكبريت (SF6) عالية الجهد غير الموصلة بالكهرباء، ينتج القياسات الأعلى. وينبغي حقن تيار مباشر بقدرة ١٠٠ أمبير على الأقل من أجل هذا الاختبار.

وإذا كان القاطع مجهزاً أيضاً بمحولات للتيار، فقد يستغرق تثبيت التأثيرات العكسية ثواني معدودات. كما يجب اتخاذ الاحتياطات اللازمة لضمان أن التيار الرئيسي العالي المحقون لا يؤثر على دوائر الحماية.

ويُعد قياس المقاومة الديناميكية أداة تشخيصية لتقييم حالة مُلامسات القوس في القواطع ذات نظام فوهة غاز سادس فلوريد الكبريت (SF6). وبقياس التيار والجهد والإزاحة المرتبطة بمجموعة الملامس، يمكن تحديد مستوى التآكل وسلامة ملامس القوس (انظر الشكل ٣). ويستلزم هذا القياس، تماماً مثل قياس المقاومة الاستاتيكية للملامس، حقن التيار العالي ليتسنى نجاحه.

وبشكل عام، تُزود قواطع الدوائر، بغض النظر عن نوعها أو التقنية المستخدمة بها، بالوظائف الثلاث التالية:

- تدفق التيار المباشر بين الأقسام المطلوبة من نظام الطاقة الكهربائية
  - قطع تدفق التيار في حالة تعرّض نظام الطاقة لظروف غير عادية، مثل حدوث أعطال
  - نقل تيار التحميل في ظل الظروف العادية لنظام الطاقة بأقل الخسائر
- هذه الوظائف الثلاث يجب تنفيذها في ظل الظروف العادية وغير العادية (حدوث أعطال) ووفقاً لمواصفات الأداء الصارمة.

كذلك تختلف قواطع الدوائر حسب الأنظمة الفرعية:

- نظام العزل
  - طريقة إخماد القوس الكهربائي
  - الآلية
  - تقنية الملامس
  - مخططات دوائر التحكم
- ويجب تحليل الأنظمة الفرعية سابقة الذكر كل على حدة وبصفتها نظاماً كهروميكانيكياً كاملاً.

### ضبط الوقت والحركة

- تستلزم قياسات ضبط الوقت والحركة لقاطع الدائرة إجراء ثلاث خطوات:
- إجراء قياس ديناميكي لضبط الوقت والحركة
  - حساب خصائص الأداء
  - مقارنة النتائج بتوصيات الشركة المُصنعة أو الحدود التي يعيّنها المستخدم
- يقدم الجدول ١ الاختبارات والحسابات الأساسية المشمولة في تشخيصات وقياسات ضبط الوقت لقواطع الدوائر.

#### الجدول رقم ١

التحكم	القياس	الحسابات
إعتاق (O)	إزاحة	توقيت التماس الرئيسي
إغلاق (C)	حالة الملامس (فتح - مقاومة - إغلاق)	توقيت تحيل المقاومات
إعادة الإغلاق (O-C)	تيار ملف التحكم	توقيت دلتا (انتشار القطب)
مؤمن ضد الإعتاق (C-O)	حالة الملامس الإضافية (OW-OD-C)	السرعة
(O-CO)	جهد البطارية	الحركة الكلية

# الارتقاء بأحدث تقنيات اختبار قواطع الدوائر عالية الجهد

في هذا المقال، يناقش تشارلز سويتسر، المدير الرئيسي للخدمات الهندسية لأمريكا الشمالية بشركة micron الولايات المتحدة الأمريكية، أحدث التطورات في مجال الاختبارات التشخيصية لقواطع الدوائر عالية الجهد.

● تسجيل قراءات تيار الملفات والمحركات وتحليلها  
● الحد الأدنى للتيار

وتقنية قواطع الدوائر تختلف حسب الاستخدام، هذا علاوة على أن بعض التقنيات يتم تفضيلها عن غيرها في المناطق الجغرافية المختلفة من العالم. ففي بعض المناطق، تُستخدم تقنية قواطع دوائر الخزانات الموصلة بالكهرباء (انظر الشكل ١)، بينما تُستخدم قواطع دوائر الخزانات الممتلئة بغاز سادس فلوريد الكبريت (SF6) غير الموصلة بالكهرباء في مناطق أخرى (انظر الشكل ٢)، وتُستخدم قواطع الدوائر بملاسات الزيت بشكل أساسي في الاستخدامات ذات الجهد العالي.

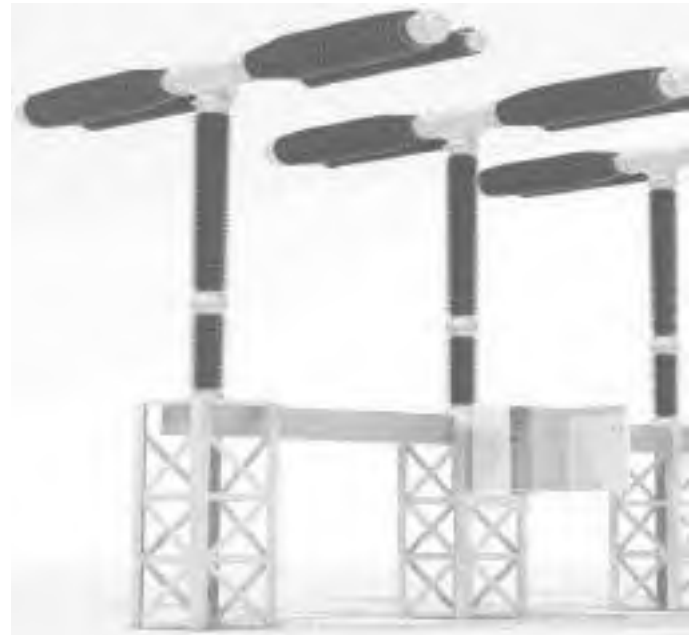
يمثل فهم الاختبارات التشخيصية لقواطع الدوائر عالية الجهد ضرورة أساسية، إذ يمكن استنباط معلومات ذات قيمة عند إجراء الاختبارات التشخيصية على قواطع الدوائر عالية الجهد. وتوفر هذه الاختبارات التشخيصية معلومات مهمة بشأن حالة قواطع الدوائر عالية الجهد حسب منظور الصيانة الفنية.

وتشتمل الاختبارات الميدانية القياسية، التي تخضع لها تشخيصات قواطع الدوائر عالية الجهد على نطاق واسع في وقتنا الحالي، ما يلي:

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- مقاومة الملا مس (المقاومة الاستاتيكية والديناميكية)



الشكل ٢: تصميم قاطع دائرة الجهد العالي في خزان غير موصول بالكهرباء



الشكل ١: تصميم قاطع دائرة الجهد العالي في خزان موصول بالكهرباء

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## أوراسكوم ستحوّل محطات الطاقة بمصر بتكلفة ٤٢٠ مليون دولار

وافقت شركة أوراسكوم للإنشاء على إبرام عقد بتكلفة ٤٢٠ مليون دولار أمريكي لتحويل محطات الطاقة البسيطة الحالية إلى محطات طاقة تعمل بنظام الدورة المركبة. فسيتم تحويل محطتي الطاقة، اللتين تم إنجازهما حديثاً في منطقتي أسيوط بقدرة ١٠٠٠ ميغاواط وغرب دمياط بقدرة ٥٠٠ ميغاواط، إلى محطتي طاقة تعملان بنظام الدورة المركبة، ما سيعزز السعة بنسبة ٥٠ في المائة دون أي كميات وقود إضافية.

وقال الرئيس التنفيذي للشركة، أسامة بشاي: «نحن نفخر بقيادتنا المستمرة في مجال تطوير قطاع الطاقة بمصر، ويسعدنا مواصلة العمل في محطتي توليد الطاقة بمنطقتي أسيوط وغرب دمياط بعد ما تحقق في كلا الموقعين. كما نتطلع إلى مزيد من النمو لأعمالنا في مجال الطاقة عبر جميع أسواقنا الرئيسية بصفتنا شركة مقاولات وتطوير».

وستنفذ شركة أوراسكوم للإنشاء أعمال الهندسة والشراء والبناء والتشييد للمحطات ذات الدورة المركبة، فضلاً عن تدير الموارد المالية للصفحة. وإلى جانب العمل في مشروع الطاقة بمصر، تُشيد شركة أوراسكوم أيضاً محطتين من أكبر محطات توليد الطاقة في العالم بالتعاون مع شركة سيمنس، كما دخلت في اتحاد مع شركة الاستثمارات البترولية الدولية، ومقرها أبو ظبي، لبناء محطة تعمل بالفحم بسعة تصل إلى ٣٠٠٠ ميغاواط.

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النظام العمال بصاحب العمل بشكل فعال، ويجعل من الصعب على العمال تغيير وظائفهم دون الحصول على موافقة رؤسائهم.

ويتوافد غالبية العمال العاملين في قطاع الإنشاء في دول الخليج، من دول جنوب آسيا، مثل الهند وبنجلاديش ونيبال.

من جهة أخرى، اتخذت دول الخليج أيضا عددا من الخطوات لتحسين ظروف العمل فيها. فقد أدخلت المملكة العربية السعودية، وهي أكبر قوة اقتصادية في المنطقة، هذا العام عدداً من التعديلات على قانون العمل لديها، حيث تنص على فرض عقوبات أو تشديدها على الانتهاكات المتعلقة بالعمل. وقد أقرت دولة الإمارات العربية المتحدة بعض الإصلاحات بدأ العمل بها من تاريخ ١ يناير/كانون الثاني ٢٠١٦، تهدف إلى تشديد الرقابة على عقود التوظيف.

كما أجرت قطر أيضا، التي تعرضت لانتقادات شديدة بشأن ممارسات العمل بها منذ فوزها بحق استضافة كأس العالم لعام ٢٠٢٢، تغييرات على سياسات العمل.

لقد حولت أحدث التوصيات التي تقدمت بها المنظمة الحقوقية، ومقرها نيويورك، توجيه الأنظار نحو أصحاب العمل، وهدفت إلى معالجة بعض المشكلات الكبرى التي يعاني منها ملايين من العمال في المملكة العربية السعودية والإمارات العربية المتحدة وقطر وبقية الدول الست الأعضاء في مجلس التعاون الخليجي.



تقول منظمة هيومان رايتس ووتش إن المبادئ التوجيهية تعمل على ضمان الحقوق الأساسية للعمال المهاجرين وفقا للقانون الدولي

## مبادئ توجيهية لقطاع الإنشاء في دول مجلس التعاون الخليجي

حثت المنظمة الشركات على تعيين مراقبين خارجيين لضمان تمتع العمال بأوجه الحماية الأساسية أثناء مزاولتهم لعملهم.

وقالت سارة ليا ويتسن، المديرية التنفيذية لقسم الشرق الأوسط في منظمة هيومن رايتس ووتش: «في مواجهة الإساءات المتفشية، واستغلال حقوق العمال في دول مجلس التعاون الخليجي، على شركات الإنشاء أن تعزز حماية القوى العاملة لديها».

ويعمل العمال المهاجرون في دول الخليج في ظل نظام رعاية يعرف باسم «الكفالة»، ويربط هذا

أصدرت منظمة هيومن رايتس ووتش - مؤخرا - مجموعة من المبادئ التوجيهية التي يتعين على شركات الإنشاء في دول مجلس التعاون الخليجي اتباعها لضمان توفير ظروف عمل أفضل للعمال المهاجرين. وتشمل هذه المبادئ ضمان سداد المقاولين، والمقاولين من الباطن، جميع رسوم استقطاب العمال، وتوفير أماكن لهم لحفظ جوازات السفر، وتوفير أماكن إقامة لائقة لهم، والالتزام بشروط ساعات العمل القصوى، والأجر الإضافي، ودفع أجورهم كاملة في الوقت المحدد. كما

## عمان تطلق مشروع تعدين بتكلفة ٢٦٠ مليون دولار أمريكي

المبدئي العام بحلول الربع الثاني من عام ٢٠١٦». وأضاف بأن شركة تنمية معادن عمان ستكون مستثمرا جزئيا في مشروعات التعدين، وأنهم يبحثون عن شركاء على الأصعدة المحلية والإقليمية والدولية، ولكنه لم يوضح مكان إقامة المشروعات، ولم يعط أية تفاصيل أخرى.

وذكرت وكالة الأنباء «رويترز» أن عمان تسعى إلى إشراك القطاع الخاص، بشكل أكبر، في مشروعات التنمية الاقتصادية الكبرى، وذلك نظرا لتدهور الوضع المالي لها بسبب انخفاض أسعار النفط. كما أعلنت مؤخرا خطة اقتصادية مدتها خمس سنوات تركز على الشراكات بين القطاعين العام والخاص، بحيث تكون نسبة ٥٢ في المائة من إجمالي الاستثمارات خلال هذه الفترة من القطاع الخاص.

يعتزم صندوق الاحتياطي العام لسلطنة عمان، بالتعاون مع بعض المستثمرين الحكوميين ومن القطاع الخاص، تأسيس مشروع تعدين. ووفقا للمصادر، صرح عبد السلام المرشدي، الرئيس التنفيذي لصندوق الاحتياطي العام للدولة، بأن رأس مال شركة تنمية معادن عمان سيبلغ ٢٦٠ مليون دولار أمريكي، وستقوم كذلك بإنشاء شركات مخصصة لاستثماراتها في المواقع المختلفة.

وستشارك ثلاث شركات حكومية أخرى، وهي الصندوق العماني للاستثمار، وشركة النفط العماني، والشركة العماني لتنمية الاستثمارات الوطنية، مع صندوق الاحتياطي العام للدولة، في المشروع بحيث تحصل على حصة نسبتها ٦٠ في المائة من شركة تنمية معادن عمان. وقال المرشدي: «سيتم طرح نسبة أربعين في المائة من الشركة للقطاع العام. كما أنه من المتوقع أن يكون الطرح

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إنشاءات: معدات الوصول.

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الشرق الأوسط

## الاختبار التشخيصي للجهد العالي

تشارلز سويتسر، المسؤول في Omicron الولايات المتحدة، يناقش أحدث التطورات في مجال الاختبارات التشخيصية لقواطع الدوائر عالية الجهد. أيضا تضم هيئة دولية مبادئة توجيهية لقطاع الإنشاء في دول مجلس التعاون الخليجي، وعمان تطلق مشروع تعدين وطنياً كبيراً.