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# TECHNICAL REVIEW

## النشرة التقنية - الشرق الأوسط

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Vol 31/Issue Six 2015



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## EDITOR'S NOTE

IN THIS ISSUE of *Technical Review Middle East* we turn our attention to Egypt, the Arab world's most populous nation and a country where increasing stability is leading to growing economic confidence. The power, security and solar technology sectors all get a look in at the upcoming Electricx, MEFSEC and Solar-Tec, which all take place in Cairo from 6-8 December, and we have stories to complement these exhibitions on pages 38 and 50. We also look at the projected economic development of the UAE over the coming years (p18), developments within the MENA region's renewable power sector (p22), and a round-up of news from November's Big 5 in Dubai (p42). Elsewhere, we examine the role of 3D printing within construction (p26), changing trends in the stone market (p34) and the latest innovations within the glass industry (p36).

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



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١٩٨١ من خدمات شركات المنطقة

SERVING THE REGION'S BUSINESS SINCE 1981

## TECHNICAL REVIEW

النشرة التقنية - الشرق الأوسط

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## Briefly

### First ship handling simulator for Qatar offshore operator

#### HALUL OFFSHORE SERVICES

Company has procured Qatar's first offshore support vessel (OSV) ship handling simulator. The Netherlands-built simulator is normally used in training schools and Halul plans to use it to improve the ship-handling skills of its crew.

The simulator will be used to create scenarios for towing operations, such as rig moves, berthing, unberthing and offshore tanker assist operations. It features programmes for conventional and azimuth thruster-powered vessels.

Vivek Seth, CEO of Halul, a wholly-owned subsidiary of Milaha, said, "This simulator will significantly add to our crew's ship-handling skills and help them become better prepared for the next assignment on board our fleet of over 40 vessels."

Halul provides offshore support services to the oil and gas industry and its offshore service vessels include anchor-handling tugs, wire line support vessels, safety standby vessels, construction vessels, wellhead maintenance vessels and diving support vessels.

### UTC and ENSRV Group escalate Qatari presence with new agreements

NEW AGREEMENTS BETWEEN United Technologies Corporation (UTC) and ENSRV Group have created a joint venture partnership for the distribution of Otis escalators and elevators, as well as UTC fire, climate control and security products.

This latest joint venture builds on a long-standing business relationship between affiliates of climate control company Carrier and ENSRV. ENSRV has been distributing Carrier products in Qatar since 1999.

Headquartered in Doha, the new joint venture company will operate as United Technologies Building and Industrial Systems to reflect the broader suite of products on offer.

"The expanded business relationship with UTC allows us to offer new levels of choice and innovation to support Qatar's ambitious growth and infrastructure plans," said Jassim Jaidah, chairman of ENSRV Group.

## Low oil prices impacting on GCC construction industry

THE IMPACT OF ongoing low oil prices could impact suppliers of technology and equipment to GCC construction projects.

Speaking to *Technical Review Middle East* on the eve of his presentation to the International Inspiring Construction conference in London in November 2015, Tom Wilson, managing partner of Squire Patton Bogg, said the "sustained depression" of oil prices is having a knock-on effect on investment in construction projects in the region, which affects suppliers.

With a high proportion of GCC construction projects funded by governments, the cost pressures on development budgets have intensified, according to Wilson.

These cost pressures have, in turn, led to curtailed budgets and governments reducing the scope of some construction projects.

Wilson cited the Saudi Arabian government's extensive austerity measures, such as the prohibition of new furniture and official vehicle purchases and the freezing of public sector salaries, as an example of how serious the financial constraints have become in the region.

Additionally, suppliers to construction projects in the GCC often experience cashflow problems related to longer waits for payments from clients.

"This underscores the urgent need for economies to diversify away from hydrocarbon revenues," said Wilson. "This requires investment in infrastructure, which requires construction activity while dealing with budget pressures."

However, "novel approaches to project finance", including legislation changes, could offer hope to developers and suppliers, and lead to new activity in the construction industry, even while oil prices remain low.

Wilson said that a new law passed in the UAE emirate of Dubai as a potential source of



There is hope for stalled projects. (Photo: Squire Patton Bogg)

opportunity for private companies, which is good news for suppliers to the construction industry.

The law will allow public-private partnerships (PPPs) between the Dubai government and private companies on construction projects without the need for a lengthy and expensive tender process.

After coming into effect on 19 November 2015 the law will allow the emirate to sign deals with private sector companies for such major projects as the extension of the Red Line of the Dubai Metro. Similar PPP legislation has already been put in place in Bahrain and Kuwait.

Wilson said private companies that can "bring money to the market and help governments bridge the fiscal gap" are expected to benefit from relaxed PPP laws in the GCC.

"The private sector will be able to bring ideas for public projects," said Wilson. "Departments will be able to negotiate directly with companies."

## Three-way venture capital cooperation set up in Saudi Arabia

KING ABDULLAH UNIVERSITY of Science and Technology (KAUST), the Islamic Corporation for the Development of the Private Sector (ICD) and Anfaal Capital have signed a joint initiative to establish a Saudi Arabia-focused venture capital fund.

The venture will leverage KAUST's expertise in new technologies, provide funding for Saudi-based tech start-ups and lead early-stage financing rounds aimed at local investors and international venture capitalists.

"The fund will enhance KAUST's role as a catalyst for innovation, research and technology development and support its vision to be a destination for the world's most talented people," said Dr Jean-Lou Chameau, president of KAUST.





Representatives from all sides at the signing of the initiative.

Khaled Al Aboodi, CEO of ICD, the private sector arm of the Islamic Development Bank Group said the agreement will help to develop Saudi Arabia's alternative investment market and contribute to the economic development of a robust private sector.

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## Briefly

### neXus expansion plans for Middle East boosted by new distributor

IT SOLUTIONS COMPANY neXus has received a boost to its Middle East expansion plans following the signing of a wide-ranging distribution deal with Shifra.

Dubai-based Shifra will be selling neXus public key infrastructure (PKI) products across the Middle East region, with a focus on the UAE, Saudi Arabia and Kuwait markets.

PKI products protect business information, communications and IT processes from issues such as data leakage, theft, espionage, fraud, identity theft and unauthorised access.

Lars Petersson, neXus CEO, described the Middle East as an “economically robust region” and said he feels there is “strong demand” for the company’s security solutions.

“We’re happy to bring on board neXus PKI solutions due to their continued excellence in delivering top-notch technology around the world,” said Ahmad Elkhatib, managing partner at Shifra.

### Aquarion Group launches in the Middle East

AQUARION GROUP, A provider of advanced water management technologies for the oil and gas industry in Europe, North Africa and Asia, has now launched its Middle East operations.

Aquarion Middle East is a wholly-owned subsidiary of Aquarion Group and its head office for the region will be in Sharjah.

The company held its launch at ADIPEC 2015 and it plans to focus on serving oil and gas customers across the Middle East and North Africa from its new UAE base.

At ADIPEC, the company showcased technical solutions for treating spent caustics, water reuse, water recycling, produced water disposal and desalination.

David Howsley, Aquarion CEO for the MENA region, said the company’s global reach will benefit customers in the Middle East. “[It] means we are able to provide best in class systems, solutions, technologies and services enabling us to offer custom-made solutions to address and solve our customers’ water treatment challenges,” Howsley remarked.

## Multiple deals made for Bahrain’s Dragon City

BAHRAIN’S DRAGON CITY retail and wholesale development, slated to open to the public on 27 December 2015, is set to benefit from the signing of agreements in relation to warehouse management, logistics and finance.

Diyar Al Muharraq, the Dragon City developer, has signed an agreement with the Banz Group to provide logistics and warehouse management systems.

Under the terms of the agreement, Banz, a Bahrain-based logistics provider and warehouse management provider, will take charge of the 5,000 sqm area allocated for warehousing.

Banz’s logistics operations for Dragon City will encompass inventory management, receiving and distribution, transportation and deliveries. The company will also act as an agent for importers and exporters liaising with all relevant government departments such as Bahrain Customs, Ministry of Health, port and airport authorities, as well as shipping and carrier agents.

In their warehouse-management role, Banz will provide a broad range of services including specialised climate-controlled storage, de-stuffing of containers, quality control, labelling, repacking, distribution of goods to the retail outlets.

Describing the Dragon City development as “colossal in every aspect of its financial and physical structure”, Banz Group CEO Jason B. Smith added, “With Dragon City opening its doors to the public very soon, we eagerly await the start of our operations and look towards doing soon what we do best.”

Diyar Al Muharraq has also signed a part-financing agreement with Al Salam Bank-Bahrain. The total project cost is US\$100mn and the terms of credit facility agreement means that Al Salam Bank will provide finance to fund US\$32mn of that amount.

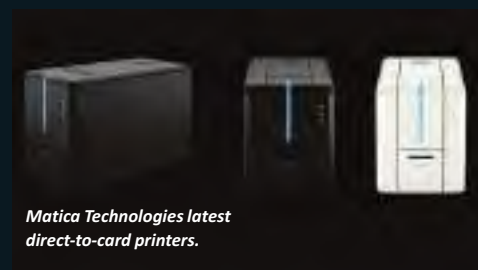
Dragon City will house more than 740 retail and wholesale businesses, as well as a themed Asian dining village over a floor area of 56,000 sqm. The adjacent Dragon Apartments development will add a significant residential component to the project with 300 apartments nearing completion. Chinamex Bahrain Management Company, a wholly-owned subsidiary of Beijing-based Chinamex, will be responsible for the leasing and general operation and maintenance of Dragon City. Chinamex also manages Dubai’s Dragon Mart retail and wholesale development, which has been operating since 2004.



*The Dragon City development is one of the largest retail projects ever built in Bahrain. (Image: Diyar Al Muharraq)*

## Latest generation ID card printers hit Middle East market

DIRECT-TO-CARD printers are gaining popularity in the Middle East market, thanks to factors such as government applications, improved office and university campus security, and the growing popularity of gift vouchers in card form rather than paper. The latest generation of direct-to-card printers are compact and designed for desktop use. Matica Technologies has launched its latest direct-to-card printers to the Middle East market, distributed across the region by EPM



*Matica Technologies latest direct-to-card printers.*

Systems and Solutions from the company’s Dubai office. The Matica S3500 is already on sale in the Middle East and the S3400 will be available in the region in Q1 2016. The S3400 and S3500 comply with Visa and Mastercard requirements, print on both sides, can be adapted to existing technologies, and include magnetic strips and chips, which has proven useful in banking applications. A financial institution in Kuwait has been an early adopter of technology with the installation of the S3500 across its branches to quickly create credit and debit cards for customers. The machines were installed by Al Nawasi, a Kuwaiti partner of Matica. Mohammed Shakeel, business director for Al Nawasi, said the S3500 was selected because the technology allows for seven different card issuance options, good quality embossing and they can be easily integrated under counters in bank branches.

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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)

## GCC healthcare projects worth US\$7.3bn

THE VALUE OF GCC healthcare contracts has been projected to increase by US\$1.45bn in 2015. The figure was revealed in the Ventures Middle East Onsite report, *GCC Healthcare Construction Market Outlook*, commissioned by The Big 5.

In 2014, US\$5.9bn in healthcare construction contracts were awarded and this is set to rise to US\$7.3bn by the end of 2015. Higher birth rates and improved life expectancies across the GCC, along with increased disposable income and a growth in medical tourism, are among the factors creating demand for more healthcare services in the region, according to Josine Heijmans, event director of The Big 5.

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



*The UAE and Saudi Arabia have become leading destinations for health tourists from the GCC and beyond. (Photo: ZouZou)*

## Sodamco factory set to open in 2017

CONSTRUCTION HAS STARTED on Sodamco's latest manufacturing facility in King Abdullah Economic City (KAEC), Saudi Arabia. The factory will supply adhesives, slurry-covered tiles, ready-mixed plastering materials, flooring and concrete repair products to the construction industries of Saudi Arabia and East Africa.

The facility is being built in phase three of the Industrial Valley at KAEC and will be operational by 2017.

Fahd Al-Rasheed, KAEC group CEO and managing director, said the site is ideal for Sodamco because of the technologically advanced infrastructure and public services, as well as access to the King Abdullah Port and the high-speed Haramain Railway.

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

## Bright news for renewable energy in Egypt

INDUSTRY REPORTS ARE predicting multi-billion-dollar opportunities for the Egyptian renewable energy sector over the next five years.

A Frost & Sullivan report noted that with renewables set to play a major role in Egypt's plans to almost double its installed power capacity.

According to the report, Egypt plans to use wind, photovoltaic, concentrated solar power and hydroelectricity to meet 20 per cent of its energy needs by 2020.

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



*Egyptian wind farms are set to play an important role in the growth of the country's renewable energy sector.*

## Future Energy Forum to launch in 2016

THE IRAQI CLUB, a Dubai-based networking group for investors and senior professionals in the Iraqi energy sector, is launching the Future Energy Forum (FEF) in 2016.

FEF is an exclusive, business-focused community, which will aim to connect industry leaders engaged in the development of emerging energy markets.

William Wakeham, Iraqi Club co-founder, said that Dubai's location as a business hub for the Middle East makes it well-placed for showcasing some of the world's leading thinkers on business issues critical to emerging energy players, such as geopolitics and security.

As well as industry events, FEF plans to offer members a private online forum for members to share experiences and best practices in overcoming barriers to doing business in emerging energy economies and in developing solutions to operational challenges.

[www.technicalreview.me/business-a-management](http://www.technicalreview.me/business-a-management)

## Commuter comfort vital for GCC rail projects

ACROSS THE GCC, US\$115bn worth of rail projects are underway and attracting large numbers of commuters will be integral to their success.

Comfortable stations that are well-lit and uncluttered will be vital to meet expectations of growing passenger numbers, according to Frans van de Laak, GM at Hunter Douglas Middle East, an international ceiling manufacturer.

"Ceilings play an important part in enhancing the traveller experience as they can absorb sound, lead travellers towards trains, and make travellers feel safe by providing human-sized proportions and ample lighting," said van de Laak.

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



*The Dubai Metro is proving to be a user-friendly service that is growing in popularity with commuters. (Photo: Philip Lange)*

## Ooredoo Kuwait and Huawei join forces

AN IT AND network managed services contract has been signed by Ooredoo Kuwait and Huawei, the Chinese multinational networking and telecommunications equipment and services company.

Under the 'Future Mode of Operation' (FMO) contract, Huawei will provide managed IT and network operations, network performance management and service quality improvement for Ooredoo Kuwait.

Huawei will provide Ooredoo Kuwait's telecommunications operations with converged solutions to manage IT and equipment as part of the company's drive towards digital transformation, operational excellence and improved customer experience.

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



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# EXECUTIVES' CALENDAR 2015/2016

## DECEMBER 2015

1-3	<b>Oman Minerals &amp; Mining</b>	MUSCAT	<a href="http://www.omanminingexpo.com">www.omanminingexpo.com</a>
6-8	<b>Electricx</b>	CAIRO	<a href="http://www.electricxegypt.com">www.electricxegypt.com</a>
6-8	<b>MEFSEC</b>	CAIRO	<a href="http://www.mefsec.com">www.mefsec.com</a>
6-8	<b>Solar-Tec</b>	CAIRO	<a href="http://www.solartecegypt.com">www.solartecegypt.com</a>
7-9	<b>Gulf Traffic</b>	DUBAI	<a href="http://www.gulftraffic.com">www.gulftraffic.com</a>
8-10	<b>Saudi Mega Projects</b>	RIYADH	<a href="http://www.saudimegaprojects.com">www.saudimegaprojects.com</a>

## JANUARY 2016

10-13	<b>Plastivision Arabia</b>	SHARJAH	<a href="http://www.plastivision.ae">www.plastivision.ae</a>
11-13	<b>HVAC R Expo Saudi</b>	JEDDAH	<a href="http://www.hvacrexposaudi.com">www.hvacrexposaudi.com</a>
17-19	<b>Intersec</b>	DUBAI	<a href="http://www.intersecexpo.com">www.intersecexpo.com</a>
18-21	<b>World Future Energy Summit</b>	ABU DHABI	<a href="http://www.worldfutureenergysummit.com">www.worldfutureenergysummit.com</a>
18-21	<b>International Water Summit</b>	ABU DHABI	<a href="http://www.internationalwatersummit.com">www.internationalwatersummit.com</a>

## FEBRUARY 2016

5-8	<b>Arc-Middle East</b>	ABU DHABI	<a href="http://www.arc-me.com">www.arc-me.com</a>
22-24	<b>PetroEnvironment</b>	DAMMAM	<a href="http://www.petroenvironment.com">www.petroenvironment.com</a>

## MARCH 2016

1-3	<b>Middle East Electricity</b>	DUBAI	<a href="http://www.middleeastelectricity.com">www.middleeastelectricity.com</a>
1-3	<b>Solar Middle East</b>	DUBAI	<a href="http://www.solarmiddleeast.ae">www.solarmiddleeast.ae</a>
7-10	<b>The Big 5 Saudi</b>	JEDDAH	<a href="http://www.thebig5saudi.com">www.thebig5saudi.com</a>
8-9	<b>Middle East Rail</b>	DUBAI	<a href="http://www.terrapinn.com">www.terrapinn.com</a>
14-16	<b>Transport Solutions Middle East</b>	DUBAI	<a href="http://www.transportsolutionsme.com">www.transportsolutionsme.com</a>
14-16	<b>International Conference on Energy Research and Development</b>	KUWAIT	<a href="http://www.ashrae.org">www.ashrae.org</a>

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

## Sustainability and PPP focus at Saudi Mega Projects

SINCE THE FIRST Saudi Mega Projects event was held in 2012, it has gained a reputation for bringing together the public and private sectors with a view to cooperation on projects worth US\$1.02 trillion. The fourth Saudi Mega Projects will take place at the Al Faisaliah Exhibition and Convention Centre in Riyadh from 8-10 December and the organisers have planned to include multiple presentations on sustainability, energy efficiency and plans in Saudi Arabia for more green building projects.

In light of austerity measures introduced by the Saudi Arabian government this year



*Riyadh is home to many construction mega projects.*

in response to low oil prices, the conference will also bring into sharp focus

the increased drive in the country for more public-private partnerships.

The conference will feature presentations on sectors with great potential for mega construction projects involving public-private partnerships including housing, commercial and mixed-use real estate, housing and education.

Plans for improved infrastructure will also be showcased with case study presentations on major projects such as the building of Metro networks for Jeddah and Riyadh, airport expansion and high-speed rail.

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# The UAE: a dynamic business hub



*The UAE's economy has grown strongly in areas ranging from manufacturing to financial services.  
(Photo: Naufal MQ / Shutterstock)*

With its vibrant economy, excellent infrastructure and business-friendly environment, the UAE has become one of the foremost global business hubs. Economist Moin Siddiqi assesses its attractions as an investment destination.

**The opening of Iran's market could add one percentage point to real GDP growth from 2016 to 2018.**

**T**HE UAE HAS cemented its position as a commercial, financial, and logistical Gulf hub, and appears well placed to weather lower oil prices and weaker global growth. This is as a result of prudent policies, progress in economic diversification, a strongly capitalised banking sector (with low non-performing loans), as well as hefty external buffers in terms of central bank reserves and sovereign wealth fund (SWF) assets.

Over the decades, the UAE has achieved robust growth in the areas of trade,

investment (both domestic and foreign), infrastructure, ICT, tourism and social development – thus placing it in the top ranks in terms of global competitiveness. Its GDP swelled from AED6.5bn (US\$1.77bn) in 1971 to AED1.46 trillion (US\$397.5bn) in 2014, according to International Monetary Fund (IMF) figures, driven by expansion and sustainable development of both oil and non-oil businesses across all sectors, especially in manufacturing, heavy industries such as aluminum and petrochemicals, aviation and services.

The lifting of sanctions on Iran could be beneficial for non-hydrocarbon growth, particularly in Dubai, through increased trade and financial flows. Data from the National Bureau of Statistics (NBS), suggests that the opening of Iran's market could add one percentage point to real GDP growth from 2016-2018 through higher non-hydrocarbon exports alone.

The UAE's high rankings in the various global competitiveness surveys reflect its status as one of the most economically-sound countries and attractive investment destinations in the GCC bloc. In the World Economic Forum's *Global Competitiveness*

**“At the end of the day, people want to come where their businesses can do well and where they can also live in a dynamic environment.”**

*Report 2014-15*, it ranked 12th globally out of 144 countries, surpassing countries such as Denmark, Canada and South Korea in many indicators. It ranked first in terms of quality of roads, absence of organised crime and lack of inflation. It also ranked second globally in government procurement of advanced technology, the effectiveness of government spending, the infrastructure and quality of the aviation sector (the country is home to the world's busiest airport – Dubai International Airport) and the lack of trade barriers – the average tariff rate is 3.8 per cent. The efficiency of custom procedures underpins foreign trade.

### A sophisticated economy

In the *Global Innovation Index 2014* issued by New York-based Cornell University, in collaboration with the UN-affiliated World Intellectual Property Organisation, the UAE ranked first in the Arab world and 36th globally out of 143 countries. Attracting advanced technologies through foreign investments and specialised talent in building a skilled-based economy are

**Table 1: UAE macroeconomic indicators**

	2012	2013	Projections			
	2014	2015	2016	2017		
Gross Domestic Product (GDP) US\$bn	373	387	399	353	382	405
Real GDP growth % (year-on-year)	7.2	4.3	4.6	3.0	3.1	3.3
Real non-hydrocarbon GDP growth %	7.1	5.0	4.8	3.4	3.6	3.8
Annual inflation rate (period average)	0.7	1.1	2.3	3.7	3.0	2.6
Overall budget balance (% of GDP)	10.9	10.4	5.0	-5.5	-4.0	1.5
Gross domestic debt (% of GDP)	21.9	16.4	14.3	16.4	15.2	14.2
Gross domestic investment (% of GDP)	23.1	23.2	24.7	22.2	22.0	22.8
Gross national savings (% of GDP)	44.5	41.6	38.3	27.2	27.9	29.0
Exports, FOB (US\$bn)	359.7	374.2	370.7	338.8	361.1	385.4
of which: Non-hydrocarbon	100.0	104.1	112.4	117.0	122.1	130.0
Re-exports (US\$bn)	133.4	140.7	146.7	151.9	160.8	172.0
Imports, FOB (US\$bn)	218.0	230.0	239.8	248.2	262.8	281.2
of which: Free Zones	68.7	77.9	86.6	90.1	94.1	100.2
Merchandise trade balance (US\$bn)	141.7	144.2	130.9	90.6	98.3	104.2
Current account balance (US\$bn)	79.6	71.4	54.6	17.6	22.6	25.4
Current account balance (% of GDP)	21.3	18.4	13.7	5.0	5.9	6.3
Gross official reserves (US\$bn)*	47.1	68.2	78.5	76.8	83.7	91.2
Import cover (months of total imports)	3.5	4.8	5.4	4.9	5.0	5.1
External debt (% of GDP)	38.7	44.4	49.1	58.7	56.0	54.3

\*Excl. foreign assets of Sovereign Wealth Funds

Sources: World Bank, IMF projections, UAE authorities and BP

**Table 2: Trends in FDI inflows to the UAE, net (US\$m)**

	2010	2011	2012	2013	2014	% chg. 2010-14
Foreign Direct Investment	5,500	7,679	9,602	10,488	10,066	83.0
GCC total	42,107	29,840	28,984	23,402	21,741	-48.3
UAE % of regional total	13.1	25.7	33.1	44.8	46.3	
Total FDI stock*	76,175	85,406	95,008	105,496	115,561	51.7
As % of GDP	26.6	24.6	25.5	27.2	29.0	

\* FDI stock represents the value of the share of affiliate enterprise at book value or historical cost, reflecting prices at the time when the investment was made and reserves (including retained profits) attributable to the parent firm, plus net debt of affiliate to parent company

Source: UNCTAD World Investment Reports

overarching national goals. There are plans to transform cities across the emirates into innovative smart cities of the future.

Large-scale public projects are underway to promote smart education based on creativity and innovation, in addition to creating complexes for creativity in the fields of the Internet, media, renewable

energies (solar and wind), and electronics. The capital, Abu Dhabi, is ranked first among Arab capitals in terms of inventions, according to data compiled by the World Intellectual Property Organisation in 2014, with 76 inventions being registered between mid-2010 and mid-2014. The country has successfully diversified its industrial base and attracted innovative small and medium-sized enterprise (SME) industries to the region.

The UAE was ranked first regionally in the Middle East and North Africa (MENA) and 16th globally in the WEF's *Global Enabling Trade Report* (2013) – based on four key indicators: access to the market, border management, transport infrastructure and communications. A 2014 report by the International Institute for Management Development in Switzerland ranked the UAE first globally in the field of administrative efficiency, the quality of government decisions, the absence of bureaucracy, and prudent management of public funds. The

### UAE Fact File

Population (2014)	9.1mn
GNI per capita, 2014	US\$45,200
GNI (PPP), 2014	US\$602.2bn
Area	83,600 sq km
Sovereign wealth rating	Aa2 (Moody's Investors Service; AA (Standard & Poor's)
GDP by sector, 2014	Agriculture 1% Industry (including oil & gas) 59% Services 40%
Proved oil reserves, end-2014	97.8bn bbl
Proved natural gas reserves, end-2014	215.1 trillion cubic feet

Sources: World Bank, IMF projections, UAE authorities, BP



country achieved eighth place globally in labour market flexibility.

In the World Bank's *Doing Business 2016* report (concerning the ease of doing business), the UAE's global rating is 31st (first in MENA) and exceeding some European Union economies, notably Spain, Belgium and Italy. The country scored exceptional marks on indicators such as paying taxes, dealing with construction permits and getting electricity – where it ranked first, second and fourth, respectively, out of 189 countries (*see Table 3*). The United Nations Conference on Trade and Development (UNCTAD) 2014 report ranked the UAE 13th globally and first in MENA among the most promising destinations for investors from 2013 to 2015. The country ranked first in intra-Arab investments during the period 2002 to April 2014, with the total value of projects amounting to US\$217bn.

**The UAE is an ideal location to attract 'vertical' or asset-seeking FDI from transnational corporations.**

**Table 3: Selected business indicators for the UAE**

	UAE	Global Rank (1-189)	Middle East & North Africa	OECD Average
<b>Starting a Business</b>				
		60		
Procedures (number)	6.0		8.2	4.7
Time (days)	8.0		18.8	8.3
Cost (% of income per capita)	16.2		25.8	3.2
Paid in capital (% of income per capita)	0.0		37.7	9.6
<b>Dealing with Construction Permits</b>				
		2		
Procedures (number)	8.0		14.8	12.4
Time (days)	43.5		139.7	152.1
Cost (% of warehouse value)	0.2		3.1	1.7
Building Quality Control Index (0-15)	11.0		9.5	11.4
<b>Paying Taxes</b>				
		1		
Payments (number per year)	4.0		17.7	11.1
Time (hours per year)	12.0		216.1	176.6
Total tax rate (% of profit)	15.9		32.6	41.2
Profit tax (%)	0.0		12.7	14.9
Labour tax and contributions (%)	14.1		16.3	24.1
Other taxes (%)	1.8		3.7	1.7
<b>Getting Electricity</b>				
		4		
Procedures (number)	3.0		4.9	4.8
Time (days)	32.0		82.4	77.7
Cost (% of income per capita)	23.5		931.3	65.1
Reliability of supply and transparency of tariff index (0-8)	7.0		3.2	7.2

The UAE has the "highest" Doing Business Rating in the Gulf Cooperation Council UAE (31); Bahrain (65); Qatar (68); Oman (70); Saudi Arabia (82); and Kuwait (101)

Source: World Bank *Doing Business 2016* report



Abu Dhabi is ranked first among Arab capitals in terms of inventions.  
(Photo: Slava 296 / Shutterstock)





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Barry Johnson, chairman of Global Foreign Direct Investment (FDI) Association, explained, “The UAE in many regards conforms to best practices. FDI is coming to this country not just because they have an economic story to tell, but because they also have a good living story to tell... at the end of the day, people want to come where their businesses can do well and where they can also live in a dynamic environment.”

The UAE’s superiority in all global competitiveness criteria is attributed to its policies of openness and globalisation (adopted since its establishment), effective governance, reliable physical and financial infrastructures, the diversity of the national economy, and the business-friendly climate, as well as its potential as a tax-free base and its track record of socio-political stability.

### Diverse investment flows

The UAE topped *fDi Magazine’s Middle East & African Countries of the Future 2015/16* overall rankings. It ranked first for economic potential, with a low unemployment rate (3.8 per cent), while also enjoying high levels of GDP. According to greenfield investment monitor fDi Markets, the country attracted 1,514 foreign investment projects between 2010 and 2014 – the highest in the Middle East and Africa region. Nearly one-third of companies investing in the UAE cited the ability to grow domestically as their reason for investing. Excluding the hydrocarbons sector, the bulk

of inward FDI flows are dominated by real estate, financial services, hotels and tourism, renewable energy, business services, software and IT services. Top investing countries are the USA, UK, China, India, Japan, Germany, Netherlands, France, Italy, Saudi Arabia and Kuwait.

**“Political stability is a hugely important factor in driving the direction of private capital flows”**

FDI flows remain substantial (*see Table 2*), reflecting the UAE’s perceived safe-haven status and competitive business environment. Following a new law on FDI, which allows 100 per cent foreign ownership for specific sectors outside free zones, several large Emirati companies – including Dubai Investments, Union Properties and Mashreq Bank, have lifted their ceilings on the total value of equity held by strategic global partners.

The UAE is an ideal location to attract ‘vertical’ or asset-seeking FDI from transnational corporations. Such FDI is

export-oriented and involves relocating parts of the production chain to a low-cost location – where output is exported to the investor’s home country and/or the regional market. The infrastructure of its ports and airports, as well as of its shipping fleet, facilitates trading links across the globe. More than 25 per cent of the world’s top 500 corporations have set up their regional headquarters in the UAE.

Anshu Vats, partner at AT Kearney Middle East, said, “The UAE’s traditional strengths of well-developed infrastructure, talent base, strategic location, and ease of doing business offer international investors easy access to many of the world’s fastest-growing markets including the Middle East, Central Asia and Africa.” Dubai has emerged as a natural hub for business meetings and private banking operations between Africa and Asia – with many global banks establishing their wealth management divisions in the emirate.

The implementation of megaprojects and private investment in the hospitality business in the run-up to Expo 2020 in Dubai is expected to support activity over the medium term. The total investment needed for the global event is estimated at US\$8.8bn, including plans to double the number of hotel rooms. Dubai’s role in hosting the Expo 2020 has stimulated a major influx of investors and growth opportunities in the services industry.

The UAE was also the source of 1,003 outward FDI projects, nearly one-third of which were in the financial services sector, with companies such as the NMC Group conglomerate, Dubai Islamic Bank and the National Bank of Abu Dhabi investing abroad, according to greenfield investment monitor fDi Markets.

To sum up, the UAE has positioned itself as a credible business centre in the eye of investors, and remains the leading beneficiary of private capital inflows in the GCC region. Nick Tolchard, head of Invesco Middle East, remarked, “Political stability is a hugely important factor in driving the direction of private capital flows, and the UAE is clearly considered a ‘safe haven’ amid geopolitical upheavals in the region. But beyond short-term trends, there are strong structural reasons for choosing the UAE as a financial centre, partly due to [the] improving reputation of the local regulatory environment, as for example with the Dubai International Financial Centre (DIFC).”

With the economy set to remain buoyant, this trend should continue through 2016 and beyond. ■



The UAE’s ports and airports infrastructure facilitates trading links across the globe. (Photo: Sorbis / Shutterstock)

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*Intelligent trucks are the next big thing, according to Volvo Trucks' Hayder Wokil. (Photo: Volvo Trucks)*

# Heading in the right direction

As the GCC region is seeing a slow but continuous growth in the construction sector, it has also been receiving significant attention from transportation and logistics players from across the globe.

**DUE TO SUBSTANTIAL** investments in infrastructure, investors see attractive opportunities in the logistics industry in the region. Also, local dealers and distributors are aiming to establish a thriving logistics service industry and ensure that regional companies benefit from new opportunities.

According to industry reports, the Gulf region awarded US\$86bn worth of infrastructure projects in 2014, a 78 per cent increase on 2013, with the increased investments fuelling demand for providers of logistics, transportation, materials handling and supply chain solutions.

However, the current economic crisis has certainly had an impact on the transport

and logistics industry in the Middle East, but the market is structurally stable and the long-term outlook is still very promising. The question that needs to be answered is how to master the challenges ahead and benefit from the long-term growth prospects.

## **MAN Truck & Bus**

MAN Truck & Bus celebrated 100 years of existence as a globally-recognised commercial vehicle manufacturer at the recently concluded Big 5 2015 in Dubai. At the show, MAN launched its new telematics system MAN EcoStyle for the Middle East, which has been developed to improve fleet performance. MAN also



*Franz von Redwitz, managing director of MAN Truck & Bus Middle East.*

**There is a need to enact more legislative reforms in GCC nations to further improve and strengthen the region's transport infrastructure, according to Hassan al-Hail, adviser to Qatar's minister of transport.**

showcased the ProfiDrive concept as well as its TopUsed solutions.

Franz von Redwitz, managing director of MAN Truck & Bus Middle East, said, "From a construction standpoint, what sets us apart is our expertise in meeting the varying transportation needs of the industry, including special application vehicles. MAN has a successful track record in this sphere and our engineering team is always ready



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with innovative solutions. Looking at the needs of our customers, that is why we felt it was the right time to also launch our MAN EcoStyle fleet management solution."

MAN Truck & Bus' new generation telematics solution MAN EcoStyle has been designed to help transport operators to improve driving standards, reduce vehicle wear and tear, enhance safety levels and improve vehicle health, as well as reduce overall operating costs, emissions and fuel usage.

According to von Redwitz, The MAN TGX represents the future for the Middle East and has already been fully adapted for the local market. The generation of truck will be more fuel efficient and, at the same time, reduce exhaust emissions significantly due to the optimised exhaust gas cleaning process. Series delivery of this type will be launched in late 2016, he added.

The TGS 41.480 8x8 truck is the most robust vehicle, which is specially designed for usage in rough off-road conditions such as the desert. The vehicle can be used in various applications on oilfields, the maintenance of high-voltage cables, construction crane operations and many more off-road tasks.

Speaking to *Technical Review Middle East* about the current market status with regards to oil and gas pricing in the GCC, von Redwitz said, "This is a core market for us. We see that the major income of this region is based on oil and gas and the price has been dropping. Another setback is several political upheavals in the region like in Iraq currently, which under normal conditions gets sold 10,000 units – that's roughly the size of Saudi Arabia or Iran. This market is now very slow for us and the same applies for Syria and Yemen. We cannot change these markets but just figure out how to work around it."

Talking about the growth rate of the sector in commercial vehicles, the MD added that there is slowed down growth in the truck sector as there is a decline in the construction projects. The UAE is a good market and so is Oman, Bahrain and Kuwait, but in Saudi Arabia the development is negative due to the fact that they have other priorities as the state budgets are released later."

### **Ford Trucks**

Commercial vehicles maker, Ford Trucks, aims at a stronger UAE presence with market and a segment-first warranty package. Ford Trucks' range of 2016 Model Year heavy commercial vehicles, including a

1843 T tractor, a 3535M 6x4 chassis mixer as well as a 4135M 8x4 chassis mixer, which were displayed at The Big 5 international building and construction show being held at the Dubai World Trade Centre from 23-26 November 2015.

Last year, Ford Trucks had partnered with Al Tayer Motors to enter the UAE market and opened new showrooms in Dubai and Abu Dhabi. Since then, the brand has been increasing its share significantly in the UAE heavy commercial market with tipper, mixer and tractor sales.

Highlighting the brand's growth plans in the region, Emrah Duman, Ford Trucks international markets director, said, "The Middle East is a priority region in Ford Trucks' growth plans. Following the UAE and Saudi Arabia, where we launched our new facilities last year, we plan to expand our sales and service network into the Oman, Qatar, Bahrain and Iraq markets. We believe our product line-up is well ahead of the competition, offering solutions to different market needs, such as a Hot Climate Package specially developed for GCC region and complete truck solutions for all the Middle East markets. Additionally, our expanded network will provide customers with strong service support and spare parts availability in the near future. We are confident that our world-class products and growing network will lead to a stronger presence of Ford Trucks in the region."

Ford Trucks is the first heavy truck manufacturer to offer three year/unlimited km standard warranty in the UAE. This further contributes to the competitive total cost of ownership of Ford Trucks.

The Hot Climate Package provides comfort in hot and dusty environments with increased air conditioner performance, improved radiator and filtration. During the two-year development period for the Hot Climate Package, vehicle durability tests including laboratory tests that simulate the region's high temperatures, humidity and dusty conditions and also the specific customer expectations were studied and considered with extensive road tests conducted in the region. The Hot Climate



*Ford's 2532D truck is from the Hot Climate Package that provides comfort in hot and dusty environments with increased air conditioner performance, improved radiator and filtration.*

Package is offered across the entire product line-up for GCC countries.

According to Duman, preferred by concrete plants and long haulage transportation, Ford Trucks offers high quality and durability with low initial investment and low operating costs. Popular Ford Trucks models 1843T tractor, 3535M (6x4) and 4135M (8x4) mixer can be customised with transmission and cabin modules for on and off road conditions.

Tractors and construction vehicles are offered with 10mm 500 Mpa chassis frame. The mixer series for construction applications are offered in 6x4 and 8x4 versions with 350 PS power engine. The mixer capacity ranges between 7.7 and 12.7 m<sup>3</sup>. The 1843T tractor model is presented with a 10.3 litre 430 PS powerful engine with Euro 3 emission norms with standard ESP.

Duman added, "We are designing and developing unique products and services for the region that are not available in/for other markets that can compete with temperature, climate and conditions of the region. The growth of the sector in the region is due to construction and infrastructure projects. If we deliver the goods and services and products that are suitable for the market with correct pricing, there is very big opportunity here. We are targeting 25 per cent of our exports in the region in the next year."

### **Volvo Trucks**

Intelligent trucks are the next big thing. Volvo Trucks' Hayder Wokil, director quality and uptime at Volvo Trucks, said that intelligent truck is more similar to a



smartphone on wheels than a traditional vehicle. "In coming few years, for instance, the truck will be able to monitor its own health in real time, promoting easier and quicker service which leads to higher productivity for all concerned – drivers, workshops and haulage firms."

In the future, the truck will also make workshop administration easier by booking its own service as and when necessary, booking the appropriate mechanics for the relevant jobs and advance ordering the necessary parts for delivery to the workshop. Repairs will be able to be performed wherever the truck happens to be and will be carried out at an appropriate time in its working schedule.

"The next generation of trucks will be

increasingly personalised and will, for example, be able to be tailored to match the operator's needs and driving style. It will also be able to update its own configuration to suit specific transport assignments," explained Wokil.

According to Per Adamsson, director strategy and business development at Volvo Group Telematics, today's trucks will follow the trend shown by smartphones now.

Looking forward, the four future trends in the global transport industry include:

- Smart services: In addition to predicting faults, truck manufacturers will in another few years be able to better understand why faults occur in the first place before they occur. The vehicle will

also be able to rectify minor faults on its own and issue an alert and book its own service before a problem arises.

- Less administration: In the future, service will involve far less administration for the haulage firm and workshop since the truck will be able to handle most of this itself, such as booking service and downloading and updating its own on-board software.
- Connected devices: All the products around us, such as watches, jackets and cycle helmets, will be able to communicate directly with one another as long as the connection adds values. Wristwatches will also be able to monitor the driver's pulse and issue an alert and even activate autopilot if something happens to the driver.
- Personalisation: The more information the truck manufacturer has about who is behind the wheel and who owns the truck, the easier it therefore becomes to individually tailor the truck to match specific driving styles and transport assignments. ■

**The UAE is a good market and so is Oman, Bahrain and Kuwait for the truck sector, according to MAN's von Redwitz.**



*With the most ambitious clean energy target, Morocco aiming to become a clean energy superpower. (Photo: Mike Flippo / Shutterstock)*



# MENA solar energy prospects shining bright

**R**ENEWABLE ENERGY, PARTICULARLY solar power, is finally achieving the breakthrough in electricity generation in MENA that has long been forecast for the region by the power industry. According to recent figures from the Middle East Solar Industry Association (MESIA), more than 30 solar projects were awarded across the Middle East in 2014 – a tenfold increase from 2013. By the end of this year, more than 1,500 MW of solar projects will have been tendered.

In November, the European Bank for Reconstruction and Development (EBRD) and two other global financial institutions announced the creation of a US\$250mn funding framework for private sector renewable energy development in the MENA. The

funds, which will be made available through debt and equity funding, will specifically target Morocco, Egypt, Tunisia and Jordan.

One of the bank's two partners is the Climate Investment Funds' Clean Technology programme, which will provide US\$3mn. A third partner, the Global Environment Facility, will provide US\$1mn. In a statement, EBRD's Nandita Parshad said, "For the first time in this region, the private sector is now able to produce and sell clean renewable energy on a commercial basis competing head-to-head with gas and oil-fired generation. We are grateful to our partners in this programme, the Clean Technology Fund and Global Environment Fund and the Union for the Mediterranean for their support in catalysing this development."

Climate Investment Funds programme manager Mafalda Duarte said, "We hope that this programme and the types of projects it finances will serve as a blueprint for other regions seeking to promote private renewable energy investments." Egypt, Tunisia, Jordan and Morocco – the four countries that will be the beneficiaries of the EBRD funding – have all emerged in recent years as the most promising renewable energy markets in MENA.

**More than 30 solar projects were awarded in 2014; a tenfold increase from 2013.**



A proposed 120 MW Khalladi wind farm near Tangiers in Morocco will be the first to receive funding under this framework. The project is being developed by a company jointly owned by ACWA Power, Argan Infrastructure Fund, and UPC Renewables North Africa. Morocco's commercial BMCE Bank is also sponsoring the project to the tune of US\$12mn.

Morocco has the most ambitious clean energy target in the MENA region. It is believed to be on track to become the world's first solar energy 'superpower.' In December 2015, the first phase of the planned Noor 1 renewable energy plant is scheduled to go online outside the city of Ouarzazate. Morocco's environment minister, Hakima El Haite, describes it as "the most important solar plant in the world".

The first phase involves the installation of 500,000 solar mirrors along 800 rows that follow the sun as it moves across the sky. But rather than using photovoltaic (PV) panels, Noor 1 will use mirror technology, or concentrated solar power (CSP). Although this is more expensive, it allows the system to continue producing energy after the sun goes down. Eventually, when the Noor 2 and 3 plants are built, heat energy will be stored for as long as eight hours, which could provide solar energy to the region around the clock.

**For the first time, the private sector is able to produce and sell clean energy on a commercial basis, competing head-to-head with gas and oil-fired generation.**

The planned solar energy mega-complex, which will also eventually include hydro and wind plants, will provide half of Morocco's electricity by 2020. According to The Guardian, the solar plant alone is expected to produce enough electricity to power one million homes. The country is believed to be on track to have 42 per cent of its installed energy capacity coming from renewable sources by 2020, with 2,000 MW coming from solar alone.

The Moroccan Institute for Research on Solar Energy and New Energy (IRESEN) is helping to drive the technology by financing six research and development R&D solar thermal and CSP projects. But Morocco's ambitions go beyond the mere generation of renewable power for its domestic use. It also has ambitions to export its renewable power to countries in the Middle East and Europe. "We believe that it's possible to export energy to Europe," said Maha El Kadiri, a spokesperson for the Moroccan Agency for Solar Energy. New interconnectors would first need to be built. However, some of the groundwork within Europe is already being done.

Earlier this year, the European Union (EU) began the task of establishing cross-border infrastructures between France, Portugal and Spain for delivering "affordable and sustainable" energy. EU nations have been called upon to make 10 per cent of their power exportable by 2020. Ahmed Baroudi, manager of Société d'Investissements Energétiques, the national renewable energy investment firm told *The Guardian*, "We are already involved in high-tension transportation lines to cover the full south of Morocco and Mauritania as a first step."



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*By 2020, Egypt is aiming for wind to provide 12 per cent of its energy needs. (Photo: saraporn / Shutterstock)*



The idea of North African sunshine providing electricity to Europe may not be as fanciful as it may sound. According to proponents of Tunisia's TuNur project solar power from the country could power up to 2.5mn UK homes by 2018, if it goes ahead. TuNur – a partnership between British renewables investor Low Carbon, the developer Nur Energie and Tunisian investors – is developing a solar farm in Kebili Governorate, south-western Tunisia.

TuNur was an associate member of the separate Desertec solar project, which folded in 2014. But TuNur's backers are confident about this project and say that they can provide energy 20 per cent cheaper than other sources.

Meanwhile, Egypt has also set its sights on solar and has announced a target of 2.3GW of solar by 2017. By 2020, Egypt's New & Renewable Energy Authority is aiming for wind to provide 12 per cent of power with eight per cent coming from other technologies like solar power and hydro power. Some US\$3bn worth of solar power projects are now planned for the Aswan region.

Recent renewable developments in Egypt include:

- The Mainstream/Actis joint venture to set up a 250 MW wind energy project
- The Scatec Solar agreement for 250 MW of solar power
- Sterling and Wilson's agreement to build 300 MW of solar PV
- The 2 GW renewable energy deal sealed with ACWA Power
- Sky Power IGD's 3 GW PV deal
- Terra Sola plans for a US\$3.5bn solar power investment

Finally, Jordan also has an active solar power programme. Last year, it awarded 12 solar projects – the most in any country in the region. Jordan's energy minister, Ibrahim Saif, said that his target is for several renewable energy projects with a total capacity of 1,600 MW - 1000 MW from solar and 600 MW from wind power – to be connected to the country's national power grid, "by the end of 2018." The expansion is part of Jordan's wider goal renewable energy goal for 2025, which will require a total of US\$2.4bn in investment.

But a number of industry observers say that the optimism that now permeates North Africa's renewable sector needs to be hedged with a certain degree of caution and an appreciation about the nature of the technical challenges. At least three obstacles have been identified as standing in the way of North Africa's solar power ambitions.

Ironically, the biggest problem is the extreme environment, especially the region's susceptibility to temperatures of up to 50 degrees Celsius. This causes major problems for solar farms that are usually located in remote desert areas, with no protection from the sun.

**When the Noor 2 and 3 plants are built, heat energy will be stored for as long as eight hours, which could provide solar energy to the region around the clock.**

Strong sunlight, combined with high levels of heat, dust and humidity, puts added strain on equipment that must be designed to deal with these conditions for a sustained period of time. GE Power Conversion – a major equipment supplier – has stated that liquid cooling of inverters and IP65 rated equipment that provide a completely sealed enclosure, are necessary in this sort of environment.

Another challenge is how to stabilise solar power on the grid. This is increasingly being dealt with by innovations including CSP that can play a key role alongside more traditional methods in stabilising the grid.

Finally, there is the cost question. Despite solar power becoming competitive with the wholesale price of electricity in many regions across MENA, additional cost reductions are needed to make solar electricity fully competitive against conventional power sources in the long term.

So while many MENA countries are recognising the economic viability of solar, resolving technological issues will be the key to unlocking the role of solar in the global energy mix and driving it to parity with traditional energy sources. ■

– By Nnamdi Anyadike



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# 3D printing with silicones

A huge market for the production of prototypes with silicone rubber is predicted by Germany's Wacker Chemie.

**A**DDITIVE MANUFACTURING (3D printing) is now widely used by product developers and others to manufacture prototypes, "one-off" items and more. So far, use of only plastics and metals has been possible, but Germany's Wacker Chemie in association with enders Ingenieure has developed a method whereby silicone products can now be turned out by this handy technique too.

Recognising the huge potential of additive manufacturing VDI, the Association of German Engineers (*Additive Manufacturing Processes, 2014*), has called for more printable materials to be developed, along with more efficient machinery and greater integration and automation of the processes involved.

Extremely versatile and stable, silicone rubber is an elastomeric material used to dampen vibrations, form medical and dental prosthetics, insulate power lines, seal joints, encapsulate electronic components – and much more. Custom-made products invaluable to product designers and even artists will be available soon.

Until now silicone components could only be produced by means of injection moulding, a costly process which is best suited to large production runs. Now it is possible for those who design prototypes or require very short production runs to quickly – and economically – produce (and modify) 'rubbery' items.

To achieve this, a completely new approach has been required. Silicone is not melted by heat like thermoplastics, and it cannot be applied layer by layer as a powder.

Instead a robot in a glass case deposits tiny droplets (as precisely as inkjet printing) on a base surface from a nozzle side by side to build up the article (the 'additive' bit) layer by layer. A special user-friendly custom program had to be written for the design software to control the robot at the centre of the process so precisely.

The device regularly pauses so that an ultraviolet beam can scan over the deposits, which have merged to form a fine line. Then the silicone is vulcanised to build an elastomeric material in which all the layers are successfully bonded together.

The resulting heat-resistant item is homogenous, pleasant to the touch and significantly smoother than today's printed thermoplastics. The goal is to be able to process about 100 grams of silicone in an hour – enough material for most designers and prototype developers.

To make all this possible, Wacker Silicones had to create a formulation that can be dosed as tiny liquid droplets that remain 'fixed' at the place they are deposited immediately. Not surprisingly Wacker will not disclose any details about the formulation itself, except that it contains a platinum catalyst.

The company points out that 3D printing is much faster than conventional technologies for producing small series and one-offs, such as prototypes and spare parts for the many silicone

3D printing was invented in the 1980s by Chuck Hull, who developed the first 3D printer for stereo-lithography.  
(Photo: Iaremko Sergii)



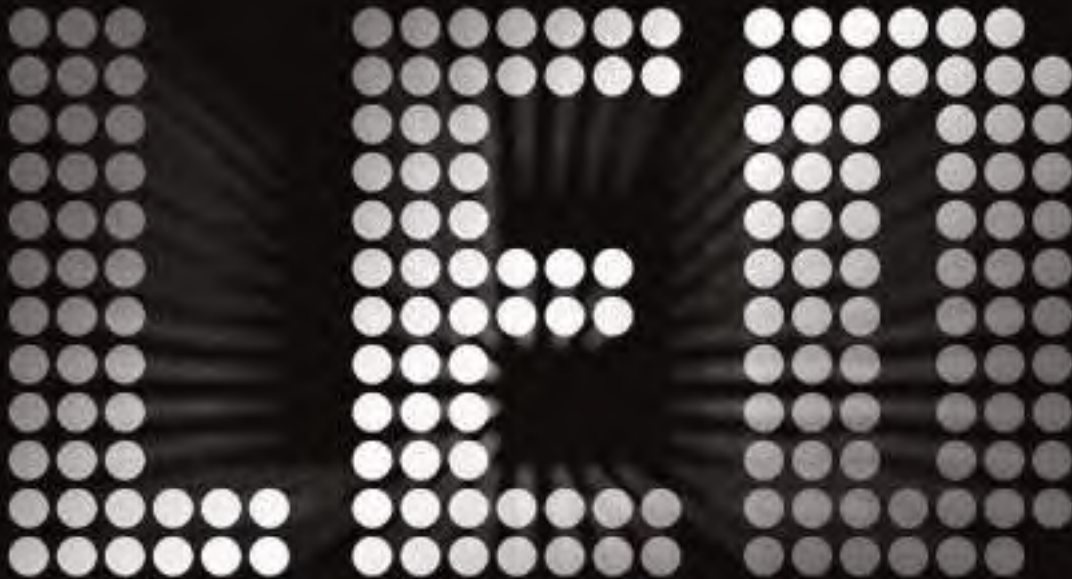
components incorporated in every modern automobile. The medical sector is also interested in the potential because of its combination of biocompatibility with flexibility. Thus implants could be custom-made for a patient, even *during* a medical operation, based on data provided by a technology such as magnetic resonance imaging.

Silicone is both heat resistant and transparent, so optical applications such as 'printed to order' lenses are on the horizon. In short, "there is a huge market for printed silicone", the two companies headquartered in Germany firmly believe.

"We have a lot of ideas and we want to provide our customers with much more than just silicone for additive manufacturing," says Dr Bernd Pachaly, head of silicones research at Wacker. This means that anyone who wants to print a product from this material no longer needs to develop a new process at huge expense. Soon this company will be able to take care of the whole system solution, i.e. provide a suitable machine and the appropriate software. ■



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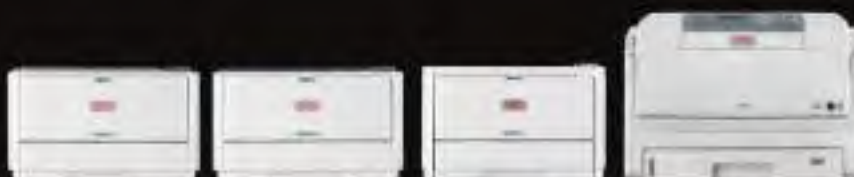


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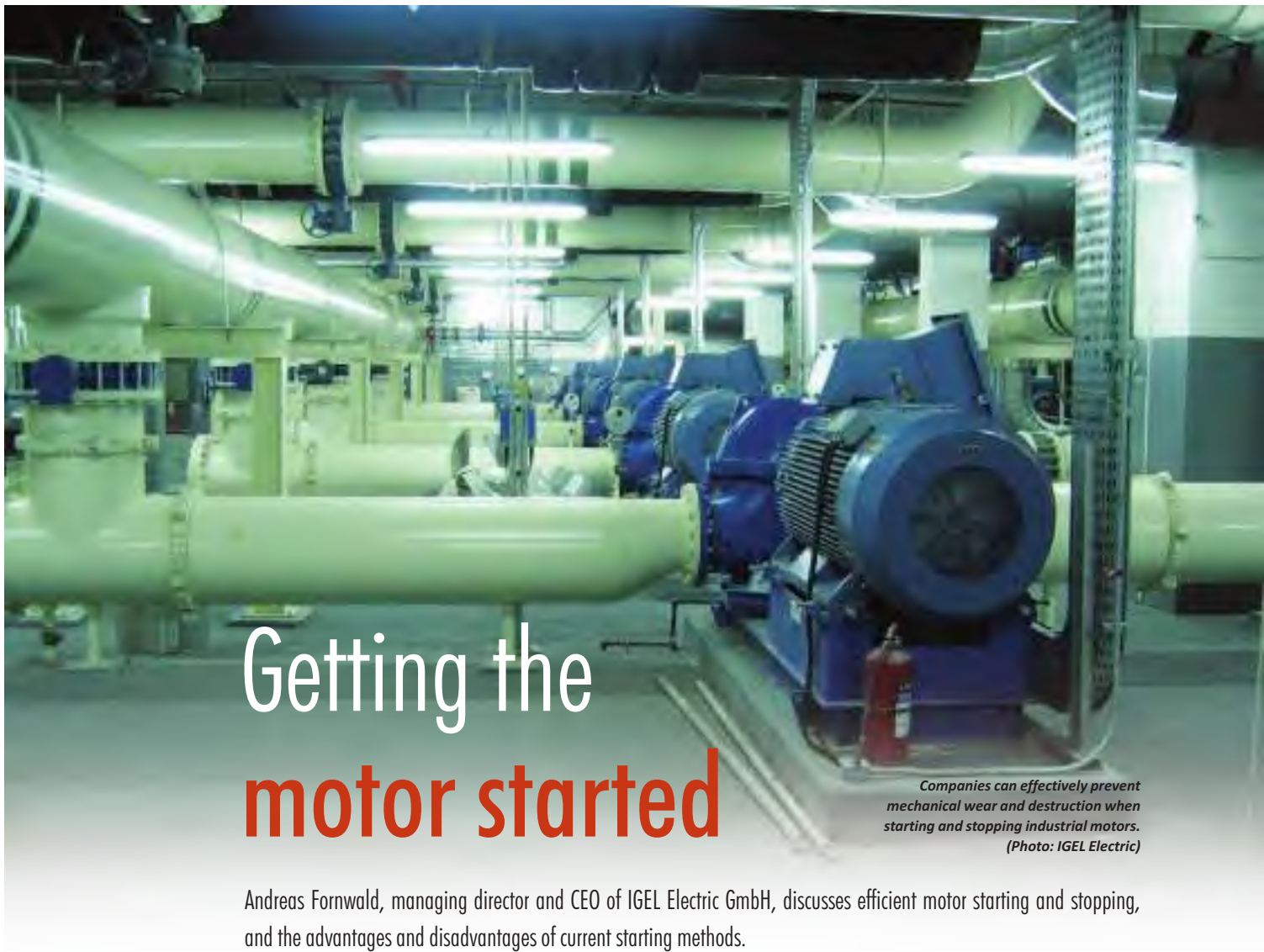
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# Getting the motor started

*Companies can effectively prevent mechanical wear and destruction when starting and stopping industrial motors.  
(Photo: IGEL Electric)*

Andreas Fornwald, managing director and CEO of IGEL Electric GmbH, discusses efficient motor starting and stopping, and the advantages and disadvantages of current starting methods.

**The instability of power grids has considerably increased since adding renewable energy providers.**

**B**OTH IN LOW and medium voltages, three-phase induction motors are the most widely used, due to their availability, simplicity, robustness and low cost. Despite these advantages of the “industrial-standard-motors”, their operation presents great challenges for many companies, especially regarding motor starting and stopping. Companies are able to handle these challenges depending on their specific conditions.

During direct on line (DOL) starting and stopping, low- and medium-voltage motors experience starting currents of up to eight times the nominal current and (high-acceleration rate or high torque). These characteristics cause voltage dips in the network, as well as mechanical wear and, in some cases, destruction of equipment; for example, the gearing, couplings, shafts, belts or fragile parts or products.

One of the most common problems during motor starting and stopping is the so-

called water hammer in pipelines, caused by sudden reduction of flow rate during sudden stopping of the pump. Although the motor-pump combination is hardly under any mechanical stress, this is not the case for the valves and the pipeline. A repair of such equipment is time-consuming and costly.

## Raising regulatory requirements

Utilities and regulatory bodies are steadily raising the requirements for three-phase induction motors. Various EU-regulations aim at reducing energy consumption and CO<sub>2</sub> emissions. The “Amendment 04/2014”, following the IEC 60034-30:2008, deals with the energy consumption, energy efficiency and energy classes (IE) of three-phase induction motors. Hereby, the following classification is established:

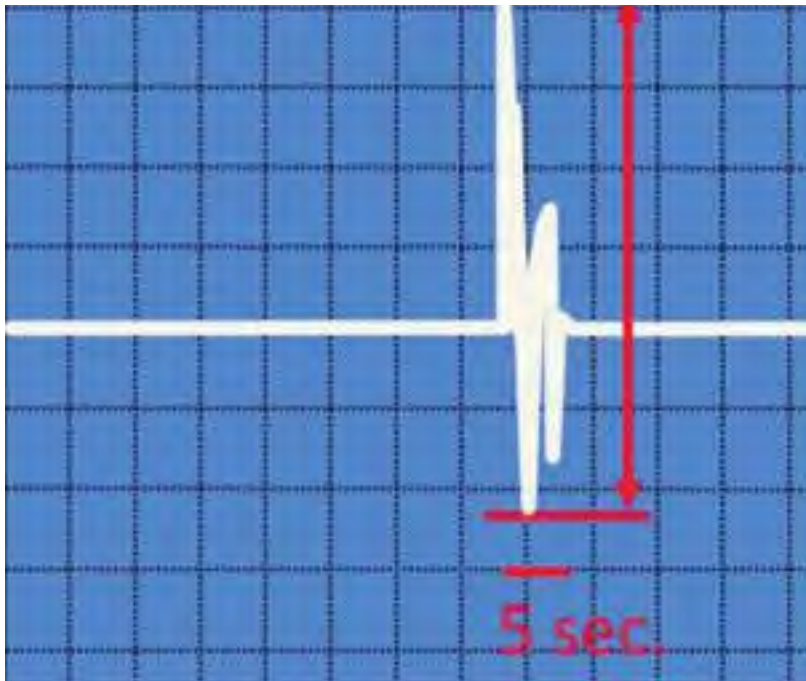
- IE1 (Standard Efficiency)
- IE2 (High Efficiency)
- IE3 (Premium Efficiency)
- IE4 (Super Premium Efficiency)

The certification according to ISO 14001 plays an increasing role for companies within the industry as the demand for efficient and low-loss drive-solutions is continuously growing. The higher the rating in one of the efficiency categories is, the more competitive one's products become.

Additionally, the instability of power grids has considerably increased since adding renewable energy providers. This is why network operators have introduced more restrictive rules for adding new consumers, especially with electrical drives, that use soft starters and frequency converters for motors with a voltage rating higher than 1kV. Most technical instructions and additional requirements already include these regulations.

To start and stop motors in a way that is both technically and energy efficient, several starters and starting methods are advisable: the commonly used star-delta-starter is often given preference, due to its low-space requirement and low cost, as well as its reduced starting current. However, there are also great disadvantages: it offers no adjustable starting characteristics and a soft stop is not possible at all. As the motor requires six wires, the cable costs are not to be underestimated. Also, high torque and current peaks during the switchover are possible. Altogether, an optimal motor protection is only possible with further components, i.e. further costs.

**The certification according to ISO 14001 plays an increasing role for companies as the demand for efficient and low-loss drive-solutions is continuously growing.**



Mechanical stress while DOL start. (Diagram: IGEL Electric)

### Starting with autotransformers

Just as the star-delta-starter, the autotransformer starter offers a reduced starting current. However, it requires a lot of space in the switchboard and is comparatively expensive. The limited allowable number of starts per hour limits the suitability of this solution for more demanding applications. For this reason, and because the switchover of the starting characteristic is only possible utilising electro-mechanical devices, autotransformers starters are used less and less.

### Frequency converters

Many companies use frequency converters for their drives. Strong arguments in its favour are the continuously adjustable motor start keeping nominal torque, as well as the also continuously adjustable and therefore precise speed control. This way, the frequency converter enables a direct regulation of the currently needed torque by permanently adjusting the voltage and frequency. This leads to an improvement of the mechanical efficiency in the entire drivetrain.

However, every light has its shadow. As the frequency converters need a controlling-system, companies are faced with considerable costs. To prevent storage damage, motors, which operate with a frequency converter, need isolated storage space, which increases the cost of the motor. Also, the efficiency of the frequency converter, especially in the lower end application, leaves a lot to be desired. Electrical losses can be as high as five per cent. Furthermore, the converter can be a high EMI-load for the network. The high heat generated alongside reduced torque can also be critical.

### Soft starter

A more economical alternative to the mentioned starting methods is the soft starter. Due to the used semiconductor technology, the soft starter does not need much maintenance and offers different starting and stopping performance. The starting phase lasts for a



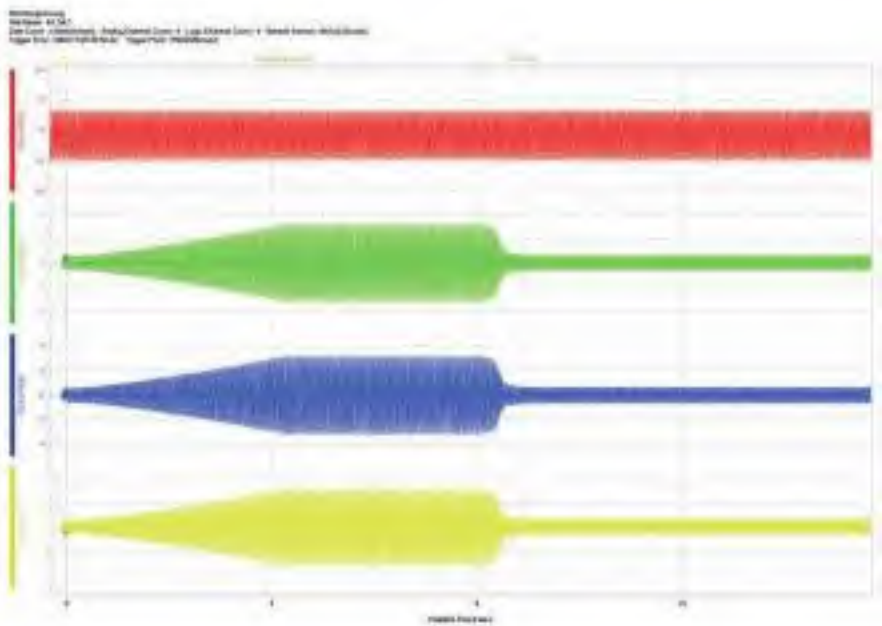
Andreas Fornwald, managing director and CEO of IGEL Electric GmbH.



maximum period in the range of 30 seconds, after which the soft starter is switched to the bypass mode. Accordingly, EMI loads to the network only occur while starting and stopping. In the meantime, heat dissipation is only generated during the short period of starting and stopping phases. This is how the soft starter altogether reduces mechanical stress.

In comparison to the frequency converter, the soft starter is not only of a much smaller build, but also can boast an efficiency above 99 per cent. The settings of starting and stopping-parameters are easy to handle. By this feature voltage control and voltage ramp can be individually defined. Due to these characteristics, soft starters nowadays are used in almost all industrial applications, especially for drives that require a soft torque process or reduction of starting current as well as weak networks.

In comparison to the frequency converter, the soft starter can claim a much lower failure rate, so that its failure rates are considerably below those of the converter. The reason behind this is the built-in thyristors, which are more reliable and soft starters are not equipped with IGBTs.



Typical starting procedure of a motor with a soft starter. (Diagram: IGEL Electric)

### Analogue and digital

For simple applications with small to medium power below 250kW, the manufacturer offers analogue soft starter units with two-phase control, which are generally without integrated bypass contactor. Those units are easier to handle and are promoted as an alternative to the star-delta-starter. An added advantage is that only in-line connection is required, eliminating the need of six-wire connection dictated by star-delta configuration.

In low-voltage and medium-voltage installations, digital soft starter units with three-phase control, are used for demanding industrial applications. The units offer adjustable current-limits and complete motor protection, such as electronic overload protection, under current protection, phase failure/phase sequence protection, and UNDER/OVER voltage protection. Operators can establish communication links with the digital soft starter units utilising the field buses' communication ports installed. In the low-voltage range the units can be configured either as in-line connection or as in-delta connection, mean time bypass-contactors can be added.

### Disadvantages of soft starters

Since soft starting and soft stopping minimises the water hammer effect, a typical application of soft starters is pump starting/stopping. Furthermore, soft starter units are used to soft start/soft stop fans, compressors, milling machines, screw conveyors, blowers, agitators, mixers and, in some cases, belt conveyors.

Compared to the frequency converter, it is not able to control the speed and thus not suitable for applications requiring speed control. When starting loads with high inertial torque, for example in ball mills, it is easily applicable and has to be selected higher in power.

If speed control is not required, and it is only desirable to have a soft starting performance in aim of minimising electric network disturbance and mechanical wear, the soft starter is the obvious choice. Soft starter technology by IGEL Electric has proven itself over the years and is used all over the world, both in low-voltage and medium-voltage applications. Units of up to 14MW have been successfully installed and tested. ■

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# The latest HV circuit breaker testing technologies

Charles Sweetser, PRIM engineering services manager for North America at Omicron USA, discusses the latest developments in diagnostic testing of HV circuit breakers.

**U**NDERSTANDING DIAGNOSTIC TESTING of HV circuit breakers is essential. When diagnostic tests are performed on HV circuit breakers, valuable information can be extracted. From a technical maintenance perspective, these diagnostic tests provide critical information about the condition of the HV circuit breakers.

Standard field tests widely applied today in HV circuit breaker diagnostics include:

- Timing and travel
- Contact resistance (static and dynamic)
- Coil and motor current signatures
- Minimum pick-up

Circuit breaker technology varies depending on the application. Also, different technologies are preferred in different geographical regions of the world. In some regions live tank circuit breaker technology (see Figure 1) is used, whereas in other regions dead tank SF<sub>6</sub>-filled circuit breakers (see Figure 2) and bulk oil circuit breakers are primarily used in HV applications.



Figure 1: HV circuit breaker in live-tank design.



Figure 2: HV circuit breaker in dead-tank design.

Regardless of type and technology, circuit breakers are generally designed with the following three functions in mind:

- Direct current flow between desired sections of an electric power system
- Interrupt current flow under abnormal power system events and conditions, such as faults
- Carry load current under normal power system conditions with minimal losses

These three functions must be performed under normal and abnormal (fault) conditions as well as under strict performance specifications.

Circuit breakers vary by subsystems:

- Insulation system

- Arc quenching method
- Mechanism
- Contact technology
- Control circuit schemes

These subsystems above need to be analysed both separately and as a complete electro-mechanical system.

## Timing and travel

Circuit breaker timing and travel measurements entail three steps:

1. Perform a dynamic timing and travel measurement
2. Calculate performance characteristics
3. Compare results to the manufacturer's recommendations or user-defined limits

Table 1 provides the fundamental tests and calculations involved in circuit breaker timing measurements and diagnostics.

CONTROL	MEASUREMENT	CALCULATIONS
Trip (O)	Displacement	Main Contact Timing
Close (C)	Contact State (Open-Resistor-Close)	Resistor Switch Timing
ReClose (O-C)	Command Coil Current	Delta Timing (Pole Spread)
TripFree (C-O)	Auxiliary Contact State (OW-OD-C)	Velocity
(O-CO)	Battery Voltage	Total Travel
(O-CO-CO)	Phase Currents (First Trip)	Over Travel
First Trip (O)	Dynamic Resistance (DRM)	Rebound
		Stroke
		Contact Wipe
		Close-Open Time
(Dwell Time/TripFree C-O)		Dead Time (ReClose O-C)
		ReClose Timing

Table 1: Circuit Breaker Timing Fundamentals

## Contact resistance (static and dynamic)

Contact resistance can be a complicated subject. Contact assemblies can consist of main and arcing contact components. To see both components, the contact resistance is analysed, statically and dynamically, respectively.

Using a dc current source, a static contact measurement is performed on each phase. Typical measurements are less than 100  $\mu\Omega$ ; however, the manufacturer's literature should help determine the actual expected value. Considering all breaker types, experience has shown measurements range from 10 to

150  $\mu\Omega$  depending on the type, with low-voltage vacuum breakers associated with very low measurements and higher voltage SF6 dead tank breakers producing the higher measurements. At least 100A dc should be injected for this test. Also, if the breaker is equipped with CTs, it may take several seconds to stabilise the opposing effects. Take precautions to ensure that the injected high primary current does not affect protection circuits.

The dynamic resistance measurement is a diagnostic tool to assess the condition of the arcing contacts in SF6 nozzle style interrupters. By measuring the current, voltage, and displacement associated with the contact assembly, it is possible to determine the wear level and integrity of the arcing contacts (see Figure 3).

Like the static contact resistance measurement, this measurement requires high-current injection to be successful. Common practice is to use at least 100A DC.

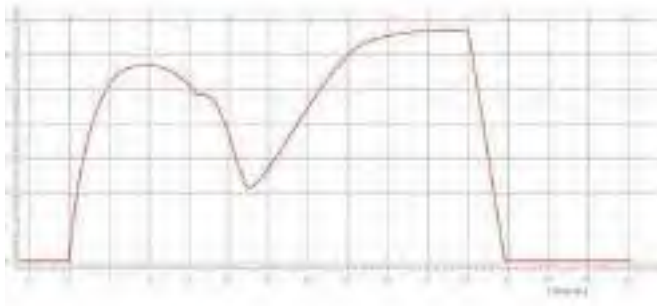


Figure 3: DRM curve interpretation.

### Coil and motor current signatures

Information regarding lubrication, electrical coil performance, and latch operation can be extracted by analysing the command coil signatures. Lubrication problems are easiest to identify in this scenario. As the armature of the command moves, an expected command coil signature is generated (see Figure 4).

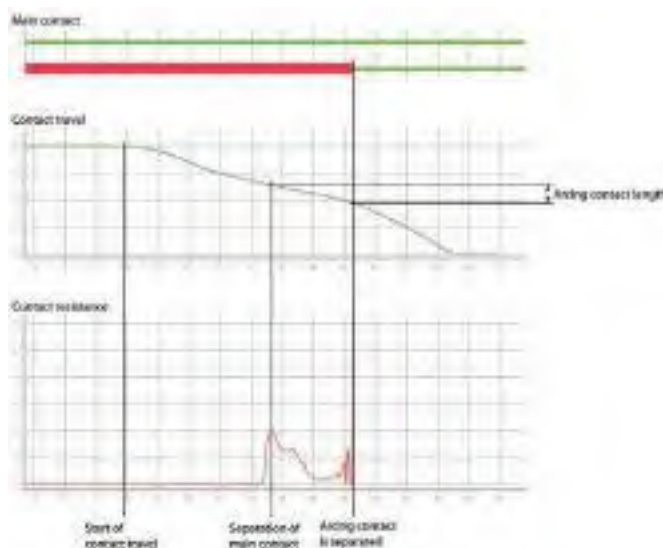


Figure 4: Typical command coil signature.

## Modern diagnostic test instruments are more than just a data acquisition system.

With motor current signatures, the behaviour of the motor current shows you the power needed and how it is consumed by the motor. Unusual current levels and motor timing indicate a potential electrical fault in the motor.

### Minimum pick-up

The minimum pick-up measurement is performed to determine the minimum command coil voltage (trip or close) required to operate the circuit breaker. This is the minimum energy need for the command coil to release the latch. The latch can either be a mechanical release mechanism or a value used to control a pneumatic or hydraulic system.

This test is done for each control coil of a circuit breaker. Different considerations must be given to ganged versus independent pole operation (IPO) circuit breakers. All command coils should be tested independently. The IPO breaker may require several more tests to include all command coils.

### Optimised toolset

Modern diagnostic test instruments are more than just a data acquisition system. The circuit breaker toolset must include not only measurement capabilities, but also an advanced power source. This power source is needed for contact resistance and minimum pick-up. In addition, by having this power source it is also possible to operate control circuits, coils, and motors when the substation power is unavailable.

The diagnostic circuit breaker toolset must provide three functions:

- Timing and travel analyser
- $\mu$ -ohm meter (contact resistance)
- Advanced power supply

When these three functions are integrated within one piece of equipment it helps to save a lot of time during measurements on large circuit breakers, because the rewiring effort is minimised. Therefore, the functions will provide the ability for performing the following tests:

- Timing and travel
- Contact resistance (static and dynamic)
- Coil and motor current signatures
- Minimum pick-up

It is beneficial to not only monitor the performance of circuit breakers, but also to determine key condition indicators. Utilising an optimised and pertinent toolset is essential when determining and assessing circuit breaker health. It is important to recognise the value of all available diagnostic tools, beyond just timing and travel, and to implement them appropriately. Understanding the benefits of timing and travel tests, contact resistance (static and dynamic), coil and motor current signatures, and minimum pick-up is a key component to extending the life and maintaining proper operation of circuit breakers. ■

Local demand is helping to fuel growth in the Middle East's stone industry. (Photo: kesipun)

# Solid prospects

Dimension stone is used for prestige buildings throughout MENA and the prospects for developing the local extraction and processing industries are good.

**T**HE “DIMENSION” (BUILDING) stone extraction industries of the Gulf region remain concentrated in Iran, Oman and Saudi Arabia. Large shipments of dressed stone, however, still arrive regularly from China (many types including durable paving materials), India (gabbros amongst others), Spain and Italy (limestone and Carrara marble). But there is an indigenous supply industry just waiting to be developed right here in the UAE too, according to a recent 212-page report available from the Department of Geology & Mineral Resources in Abu Dhabi\*.

When taken together, the emirates is one of the region's top markets, especially for interior and exterior veneers, cladding and flooring applications.

What is needed, say authors Clive Mitchell and team, is to make contact with possible stakeholders, to circulate tile-sized specimens widely amongst clients and specifiers, to produce promotional literature highlighting the sheer size of the local market, and to use more local materials in the state's own large-scale construction programmes.

The main resources here are the limestones of the north including Ras al-Khaimah, along with the harder igneous materials of the centre and south (Hajar highland and Oman border regions especially).

The materials identified as having the highest priority for development are the Musandam 2, Dhera and Jebel Qamar formations, the report says. Ophiolites include gabbro from Fujairah and Kalba, along with durable harzburgite. Relatively easy-to-work sedimentary materials like limestone and marble are the current favourites amongst architects working in the Gulf; their creamy colouring and thermal absorption capacity suit the climate well. Locally-produced dimension stone materials tick many other boxes when it comes to ‘green building’ credentials, too. They can be locally sourced, and the unavoidable by-products are often invaluable as low-cost road and building aggregates.

Apart from the technical qualities of the different materials themselves, the important questions to ask are about how they will be finished – sawn, hone, hammered, polished or whatever. Equally important is to know how well they will weather in harsh Gulf and North African climates. Many stones actually improve with age, but their workability (e.g. for restoration) can change over time.

And if you want to know more? The thriving North American

industry produces a useful *Dimension Stone Design Manual*, which covers just about everything the newcomer to this ages-old activity needs to know, including preparing for the latest uses (such as how to secure vertical cladding, wet-room applications and modern techniques of maintenance and restoration). Details are available at [www.marble-institute.com](http://www.marble-institute.com), while another good online US source of information is [www.naturalstonecouncil.org](http://www.naturalstonecouncil.org).

An excellent place to inspect a selection of local stones, discuss their applications and investigate processing is of course the annual Saudi Stone Tech show in Riyadh, usually held in October. This is a favourite with regional suppliers such as Tanhat Mining and the Al Harbi Group, and those who want to supply extraction and dressing machinery from overseas. Another product-packed event is Middle East Stone in Dubai which, along with its comprehensive training programme (and now ceramics coverage too), will next be held from 28 September-1 October 2016.

Natural Stone in Istanbul (Turkey is a major supplier to several Gulf projects) is scheduled for 16-19 November next year. And finally, globally, the key trade show with full international reach is the Stone Design & Technology exhibition and trade fair in northern Italy (next event: 28 September-1 October 2016).

As part of its 50-year celebrations, Verona will be hosting the world's first International Stone Summit within a major conference running through to 6 October (the ISS itself will end on the 3 October). This will “bring together the main international associations in the natural stone sector...to develop content and encourage discussion on this field”, say the organisers. Confindustria Marmomacchine is the Italian industry's specialised trade association, many members of which are well known in the Middle East (details at [www.marmomacc.com](http://www.marmomacc.com)).

The Gulf states are already key destinations for most of the world's top stone merchants. And remember that the world's dimension (as distinct from free-form) stone industry was launched not far away, in ancient Egypt. So now is the time to restore a major activity of the past; never has the local demand been higher. ■

\*Assessment of the dimension stone resources of the UAE, 2012, BGS/NERC Open Research Archive eprint 19388; [geology@moenr.gov.ae](mailto:geology@moenr.gov.ae) or visit [www.moenr.gov.ae](http://www.moenr.gov.ae)





*Glass is often used by architects looking to make a powerful statement through their building designs. (Photo: Pawel Szczepanski)*

# Glass for light and strength

Today's glass industry has plenty to offer designers working in the MENA region. The high-tech end of float production is already established locally. And there are new materials in the pipeline.

**L**ANDMARK BUILDINGS LIKE the Louvre Abu Dhabi and Jeddah's future Kingdom Tower make extensive use of high-tech glass in their construction and function. Whether it is for weatherproof cladding, internal partitioning or as a special architectural feature, glass is today's material of choice for making a building statement.

The Gulf's own architectural glass industry is still at its early stage; conventional float glass production usually follows on from packaging as has been seen in both Saudi Arabia and the UAE. But being so energy-intensive, architectural-glass making is a good building-materials industry to have a stake in here, with excellent growth prospects based on import substitution, as long as the right technology partner is chosen.

Standard annealed float glass up to 20mm thick is the industry's core product all over the world, being almost perfect optically (parallel sides) and well suited to today's many coating processes such as self-cleaning and emissivity control. However the annealing (heat treatment) process produces a low-stress material that shatters into dangerous shards, so use of the conventional product is usually restricted to 'safe' applications. These specifically exclude frameless doors, bathrooms and low windows.

The standard alternative is toughened glass that shatters on impact into small square pieces, suited to any location where safety is a prime requirement. Vehicle glass is a good example and the automotive industry has led where many special architectural applications have followed. The tempering (strengthening) process is used when thermal resistance and safety are requirements.

An alternative strengthened product is laminated glass, which is manufactured by bonding thin layers of float glass with a PVB film or strengthening steel mesh between. When broken, the interlayer keeps the material in one piece, safely in place in its frame. It is used where tempering is not an option, as in the case of a car's hazard-exposed windscreen where internal stresses have to be avoided. Effective but limited sound insulation can be a useful side benefit in construction applications.

Special low-emissivity glass is permanently coated with a substance that reflects radiant (IR) energy, keeping the adjacent interior cool

through the heat of the day while allowing the maximum amount of light to pass through. This material finds applications in cold rooms, too.

## Energy efficiency

Several types of energy-efficient evacuated glazing are now available from glass suppliers located overseas. These are strong sealed-unit products which are manufactured as sheets of suitable float glass, permanently combined with a perfect vacuum between. To retain their parallel external surfaces (without which optical distortion occurs) some kind of micro 'pillar' has to be regularly placed between; this is normally some kind of near-invisible stainless steel spacer arranged in a grid pattern. Glazing units made from such material are thinner than conventional double-glazing, which incorporates an inert gas insulator, and provide excellent sound exclusion at the same time.

Finally, various types of self-cleaning glass are proving particularly popular in desert regions, because they keep down the cost of maintaining the exterior (and/or roof) of any high structure, especially one exposed to wind-blown salt. There are various types referred to as hydrophilic and photocatalytic (repelling moisture and nanoparticles respectively).

Low-tech glazing bricks apart (ideal for see-through/illuminated paving), the above are the standard high-specification materials available to architects and constructors in the Gulf today, some available from advanced local producers in Dubai and Jeddah. Further afield there are some interesting new materials on the way, too.

First comes improved solar control glass which can both withstand the toughening process and be supplied in large coated sheets (photo- and electrochromic). It is, therefore, suitable for many, including low level, locations.

Next comes clear non-reflective glass available in cladding-size sheets, intended to reduce the disruptive 'mirror' effect of so many high-rise developments. Improved sound exclusion is an area of progress, especially useful in the design of internal partitions. And finally there's the new so-called 'daylighting' feature, designed to provide distribution of natural light internally by means of reflective louvres within a sealed double unit. Watch for developments in the slimming of these. ■



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*Electricx, Solar-Tec and MEFSEC, which will take place in Cairo on 6-8 December 2015, will all benefit from an increased onus on the country's market potential in the power, energy and security sectors.*

# Electricx celebrates 25 years

Egypt's longest running power event, along with sister events Solar-Tec and MEFSEC, will focus on new technologies, the latest cutting-edge developments and networking between manufacturers, system integrators, consultants, government officials and key decisions makers.

**"The 25th anniversary of Electricx will be more exciting and in-depth than any that have come before it."**

**Anita Mathews, director of Informa Energy Group**

**E**LECTRIX, SOLAR-TEC AND MEFSEC, Egypt's leading power, energy and security exhibitions respectively, will take place in December in Cairo, and are set to place an increased onus on the country's market potential, providing both local and international corporations with a platform on which to discuss how to tackle expected growth leading up to 2020.

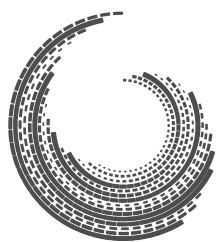
The group of exhibitions have witnessed unprecedented growth since last year, with the upcoming edition posting a 184 per cent increase in the number of international exhibitors set to be on the show floor – the most growth the exhibition has seen since opening its doors back in 1991.

Egypt's energy industry is also going through a growth phase. The country plans to double installed power generation

capacity to around 60,000MW by 2020, while also putting a large onus on renewable energy as it aims to source 20 per cent of its electricity from renewable sources by the end of the decade.

"With such incredible growth plans in the pipeline, we are always searching for ways to better serve our stakeholders by offering a cutting-edge platform for both exhibitors and visitors. For the first time ever, we will be hosting a Euro-Med Green Energy Business Roadshow, in partnership with GACIC. There will be a number of workshops running through the two-day event covering a wide variety of renewable energy and investment topics," said Amr Shawki, chairman of Egytec Engineering.

Anita Mathews, director of Informa Energy Group, said that she believed the strength of the show derives from its long-standing place in the Egyptian event



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calendar, and how its uniqueness as a networking platform will keep the shows growth plans in place.

"The 25th anniversary of Electricx will be more exciting and in-depth than any that have come before it," Mathews explained. "Electricx 2015 will be witnessing a 184 per cent growth in international participation and exhibitors from more than 23 countries will be exploring their potential in this highly-developing market.

"Having recently signed a co-partnership, Egytec Engineering and Informa Exhibitions have a solid growth strategy to expand the event in the coming years. National pavilions from Saudi Arabia, India, China and Turkey will be among the highlights that the 2015 edition of Electricx, Solar-Tec and MEFSEC will offer."

Another first-time training seminar being organised this year will be the 'Designing Grid Connected PV Systems' session, which has been organised in association with the Solar Energy Institute (SEI). The one-day training seminar by Kristopher Sutton, SEI's PV technical director, will focus on components required for various system designs and the role each component plays. The intent is to assist engineers, technicians and other interested observers in their understanding of how to design and specify systems that will best fulfil a project's applications and load demands.

Set to attract companies from China,



France, Germany, India, Saudi Arabia and Turkey among others, leading companies such as ABB, Aksa Jeneratör, Cummins, Ducab and SDMO will be exhibiting at Electricx. Conergy Asia & ME and Schletter GmbH will both be among the exhibitors

taking part in Solar-Tec, while Watania Group and NAFFCO Misr will be showcasing their latest security-related procedures and products at MEFSEC.

For the first time ever, Electricx will play host to the Saudi Export Development Authority (SEDA), which will be organising a Saudi Arabian pavilion that will include a number of the country's largest power companies under one umbrella.

Electricx attracts thousands of energy industry professionals from around the globe including engineers, managers, technicians, contractors, consultants, developers and investors. ■

**"Having recently signed a co-partnership, Egytec Engineering and Informa Exhibitions have a solid growth strategy to expand the event in the coming years."**

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# The Big 5 push to better business

The construction sector is showing resilience to the falling oil prices and the show led the way with its growth agenda for local and international exhibitors.

**I**N 2016, THE GCC's construction industry is set to reach a record high of US\$126bn, growing at a CAGR of 11 per cent, according to the recent *GCC Construction Industry 2015* report by Alpen Capital.

Complimenting this notion, The Big 5 2015, believed to be the Middle East's largest construction event, ended on a high note after four days of deals and product launches. Rains on Day 2 did not dampen the spirits of the exhibitors and visitors who visited the show in large numbers.

"With the addition of the Focus Hall this year, we saw an increase in exhibitors, taking it over the 3,000 mark for the first time," said Josine Heijmans, event director for The Big 5.

The show held the largest-ever free CPD-certified education programme along with more than 75 workshops and seminars.

Heijmans added, "It has been a strong show with great exhibitors, fantastic sponsors and our biggest ever educational programme. The Big 5 is the strongest construction and build event for the Middle East, Africa and Asia and this show is the jewel in the

## 'Sustainability, knowledge transfer and technology' main focuses at The Big 5

**Technical Review ME:** What were the core focuses of The Big 5 show this year?

**Josine Heijmans:** We had a new exhibition hall available, called The Big 5 Focus. This area covered five main sectors of The Big 5 among others like HVAC, marble and stone, ceramic, glass and other vendor stores. We are happy that we could accommodate more exhibitors, which was great. Some of the key seminar theatres were held in this hall as well, which were very well attended over the four days of the show.

The Big 5 not only focuses on bringing together exhibitors from all around the world, but we also put a lot of effort in putting content together in the form of the extensive seminar programme. The region has been developing very fast in the construction sector and we believe it is very important to provide the industry professionals with the latest information on technologies and products available in the Middle East market.

Sustainability is one key topic that keeps coming back at The Big 5 and this year was no different. It is also one of our main topics in the workshops, where we had six workshops on that topic.

**TRME:** Are you seeing a shift from your exhibitors and workshop participants towards sustainability, in terms of more sustainable products or solutions being showcased at the event now?

**JH:** Of course, and it also had to do with the fact that more and more GCC governments are embracing building sustainable buildings. Now, even in affordable housing projects, there is now a tangent to the use of sustainable products.

At The Big 5 we announced the winners of the GAIA Award, which is an award dedicated to the use of sustainable products in the Middle East. This year we saw a 41 per cent increase in the number of product entries for the award, compared to last year.



According to Josine Heijmans, there are still positive developments and a lot of new contracts being awarded in the region. (Photo: dmg events)

We started with more than 300 entries, shortlisted them to 54 and reduced that to 18 finalists.

**TRME:** How has the show grown in terms of numbers of exhibitors and visitors this year?

**JH:** Because we opened up new halls, we could accommodate more exhibitors. This year at The Big 5, we had more than 3,000 exhibitors, compared to 2,800 last year, which is a good increase. The feedback we got from exhibitors was that they are really happy with the quality of the visitors, because they got a lot of business and positive talking done. We had more than 81,000 visitors last year and we expect the number to be close to that figure again, maybe a bit more, but we are really happy that we have quality visitors now.

**TRME:** What do you expect next year's edition of The Big 5 to be like?

**JH:** There is still positive development and a lot of new contracts being awarded in the region, so I don't see a negative change in the way the show will be. We are also going to try and improve the exhibitor and visitor experience and take it to the next level. We are already the leading show for the

construction industry in the region, but we don't want to be complacent so we are working on some new plans for 2016 already, which are being very positively received. We are going to make some changes to the layout of the show. Right now, many of the international companies are within the country pavilions, but next year we will move to a fully sector-wise layout that would make it easier for visitors. If you are looking to source a specific kind of product, you can just go to a specific location to find it.

Also, the new hall is not in full use currently, but by next year, it will be fully ready and we will have the benefit of additional space as well, in addition to the existing 85,000 sqm.





Close to 90,000 people attended the Big 5 2015. (Photo: dmg events)

crown for The Big 5 series, which also takes place in Indonesia, Kuwait, East Africa, Saudi Arabia and India."

### Push to go green

The construction and design industry working hard to turn Dubai into a sustainable and smart city and the green building regulations introduced for all new builds in 2014 are having a real and significant impact, according to Abdulla Rafia, assistant director general, planning and engineering for Dubai Municipality.

Speaking at the Design Summit on Day 2 of The Big 5, Rafia explained the accelerating pace of buildings being permitted in the city. In 2012, the city permitted some 25mn square feet of built area, a figure which rose to 100mn square feet by the end of 2014.

"You don't see this around the world," he said. "This is what compelled us to go for green building regulations and we are building so much each year. Now, we want every new building that comes up to come up green."

**Counting both ongoing and planned construction projects, the GCC's construction pipeline totals US\$2.8 trillion, according to a Deloitte report.**

With rising energy and water demands, sustainable design and construction is going to be essential if cities of the future will be built to last. While Rafia expected resistance to the introduction of the regulations, their reception was warmer than anticipated.

"We ran an awareness campaign with 1,100 meetings between 2010 and 2014. Once they were certain that the regulations were coming in, all the suppliers bought into them. So really we owe it to the private sector and to our suppliers that all the materials we needed [to go green] were here," he noted.

Rafia added that future challenges for the city would likely include the retrofitting of many of its existing buildings in order to improve their energy usage. Highlighting his confidence that if the industry rallies around the idea again, the investment in retrofitting will be worthwhile.

Salim Mohammad Zid, senior building services engineer for Dubai Municipality, also spoke about Dubai's green building regulations during one of the interactive sessions.

### Perfect platform

From sustainability and 3D printing to interiors and marble, The Big 5 event showcased versatility in its entirety.

Saudi Arabian exhibitor alfanar was the only transformers company at the show and general manager Bassam Naes said that the event has provided them with a platform on which to meet with prospective clients and further its business in the country with its new CE-certified LED light solutions.

Ranjit More, managing director of India-based and UAE-focused company Universal Construction Machinery, remarked that The Big 5 has definitely given the firm an impetus to showcase its equipment and the event had been good for its business in respect to finding dealers and partners in the region.

Francesco Pettenon from Italian company FILA Solutions, which makes protective solutions for flooring and walls, commented that as it was already active in the Middle East, The Big 5 has helped boost its brand awareness in the region.

This year, the company introduced its newest innovation, the PW10, a specific chemical intended for use on surfaces, which is able to deal with the harsh and arid climate of the GCC region.

Elsewhere, Polish company Techmatik signed a US\$2.7m deal with Consent LLC for the purchase of a concrete block machine.

As thoughts turn to next year's exhibition and conference the event's organisers have confirmed that many of this year's exhibitors have already booked their spaces for 2016.

Next year, The Big 5, MEC and PMV Live will return to Dubai World Trade Centre and will take place from 21-24 November. ■

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## Low oil price has made GCC construction market 'conservative but its not tough'

A FAIRLY NEW entrant in the Middle East market selling construction steel since July 2015, International Trade Solutions (FZE) is a sales agency representing brands like CLIFFORD and EUROLIS S.p.A, among others, in the Middle East and the GCC, respectively. Most of the equipment includes grating products, wire rollers, rebars and straightening and cutting machines. With a big clientele list that make construction steel, Graham Raynor, owner and general manager at International Trade Solutions, feels that the construction industry has been taking a conservative approach due to falling oil prices. The problem lies both on the demand and supply side as prices of steel have decreased.

"When the crash happened in 2008, it was a different scenario. This time companies are taking a very conservative approach to buying products as steel prices have fallen. Surely, existing projects have slowed down and there are not many new ones coming up, but the market is not too bad. I believe the UAE, in particular, has learnt its lesson and the next two years are going to be relatively tough for the market. But the good news is that the market is not as bad as it was eight years ago. Recessions and cutbacks are the cycle of business."

Raynor added that he is excited to be in the UAE as it keeps him close to his clients, which is the objective of opening a base in Sharjah. Having sold US\$8mn worth of equipment in the last four months and US\$2.5mn alone at this year's Big 5, Raynor reiterated that the region lacked the representation of good steel companies

and this is what the Middle East market was crying out for. The buyers need the assistance and good advice in terms of what machines they need to buy.

Showing optimism towards falling oil prices and a livelier construction market, Raynor said that he felt the UAE was the leader in moving beyond its oil dependence as the main source of revenue and other GCC countries were following the example.

"I see a lot of construction happening in Saudi Arabia," he noted. "It is going to be steady though and not like it used to be 10-15 years ago in the UAE. Political stability is always a concern in this part of the world but the leaders in the GCC are making sure that is place is good to live in and do business."

International Trade Solutions' biggest markets lie in the UAE and Saudi Arabia and the best selling products include grating welders,



VITARI series of straightening machines (top) and CLIFFORD's grating welder sold by International Trade Solutions in the GCC (bottom). (Photo: International Trade Solutions)

fins machines, rolling lines and straightening and cutting machines. The company also pays a lot of attention to the HSE with regards to worker safety.

Raynor said, "The companies that I represent have built safety aspects in their machineries. Sometimes, there is a bit of resistance from potential customers with regards to the cost as it becomes pricier, but we can make them see that it is important to ensure that workers can run the machines in a safe environment. The people I do business with come from regions that have HSE ingrained in their psyche."

With a set base and positive feedback, Raynor said that the company strategy in the Middle East is to now build relations.

"I need to build up the trust in my customers so that the machineries I recommend answer their problems. I want to give them solutions and good return on investments."

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## MAN Truck & Bus celebrates centenary at PMV Live in Dubai

MAN TRUCK & BUS (MAN) celebrated its 100th anniversary as a commercial vehicle manufacturer at this year's PMV Live. At its stand, MAN showcased a truck manufactured in 1961 to reflect its long history, three robust construction vehicles from its current range and launched a new truck for the Middle East market, the MAN TXG. The company also launched its new telematics system, MAN EcoStyle, for the Middle East during the show. MAN showcased the ProfiDrive concept and its TopUsed solutions, while a digital walk-around educated visitors about the latest MAN truck safety features.

The new truck launched by MAN was the EURO 5 TGX 6x4 tractor head, which is not only 'greener', but also more powerful than previous models with up to 540 hp. With a gross vehicle weight of 33 tonnes and gross combination weight of 180 tonnes, MAN said it was ideal for the heavy transport requirements of the construction industry and is also capable of catering to long-haul operations. MAN said that this generation of truck would be more fuel efficient and at the same time, reduce exhaust emissions significantly due to the optimised exhaust gas cleaning process. Series delivery of this type will be launched in late 2016.

From its current range, MAN brought to the show its most robust vehicle, the TGS 41.480 8x8 truck which is specially designed for usage in rough off-road conditions such as the desert. The vehicle can be used in various applications such as oilfields, maintenance of high-voltage cables, construction crane operations and many more special off-road tasks. The smaller version of this truck, also exhibited on the stand, is the TGM 18.240 4x4, which comes with a cargo body and crane for off-road works in difficult terrains. The third truck of the current range was the TGS 40.360 6x4, mounted with a nine cu/m concrete mixer for efficient and reliable concrete transport.

Franz von Redwitz, MD of MAN Truck & Bus Middle East, said, "From a construction standpoint, what sets us apart is our expertise in meeting the varying transportation needs of the industry, including special application vehicles. MAN has a successful track record in this

*The MAN Truck & Bus stand at PMV Live 2015.*



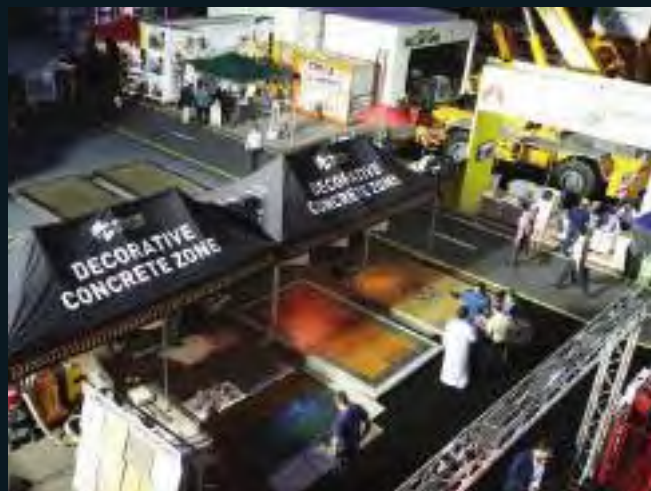
sphere and our engineering team is always ready with innovative solutions. Looking at the needs of our customers, that is why we felt it was the right time to also launch our MAN EcoStyle fleet management solution."

MAN EcoStyle, the company's new generation telematics solution, was launched with its partner, Microlise. The system has been designed to help transport operators to improve driving standards, reduce vehicle wear and tear, enhance safety levels and improve vehicle health, as well as reduce overall operating costs, emissions and fuel usage.

The ProfiDrive training model is a specialised training programme, designed to raise the level of knowledge so that drivers can adopt the best driving practices for prevailing road or traffic conditions. Through a training seminar, drivers learnt predictive driving techniques such as how to recognise dangerous situations, calculate the optimum stopping distance and evade obstacles that suddenly emerge. An off-road training module was included to cover all aspects of truck operation in the region.

## MEC exhibitor wins 2015 GAIA Award for sustainable innovation

MIDDLE EAST CONCRETE (MEC), a showcase of machinery, technology and solutions for the concrete industry, was co-located with The Big 5. On display at the show was everything from concrete batching equipment to construction equipment



*The outdoors live decorative concrete display saw a steady flow of visitors.*

and chemicals, cranes to cutting and coring equipment, formwork and scaffolding to ready mixed concrete, fluid technology and accessories, as well as live demonstration area for decorative concrete.

With a focus on educating both exhibitors and participants, MEC also organised 37 seminars, which were a mixture of technical sessions, panel discussions and case studies, as well as 18 specially-designed workshops on various topics involving performance, testing and applications, all of which were CPD-certified.

MEC received a further boost when an exhibitor at the show, Basalt Rock Composite FZE (Basalt Rock), won the overall prize at the 2015 GAIA Awards, for innovation in sustainability and green technologies for the construction industry. UAE-based Basalt Rock won the top spot for its basalt composite rebar at a ceremony held during The Big 5 on 24 November 2015.

Beating about 300 other entries to the top-spot, it will receive US\$50,000 in the form of marketing support for its basalt fibre-based rebar. The product is more ecological than other composite materials, with some of its benefits being that natural gas and electricity can be used in furnace feeders, little waste is produced, no chemicals or mediums are required in manufacturing processes, and there are no hazardous agents in air or water.



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*The outdoor area featured a large number of exhibitors including Volvo, Bobcat, Schwing Stetter, JCB and Komatsu.*

# ‘Make in India’ strikes a chord at Excon 2015

The five-day show witnessed construction and equipment majors from across India and the world grasp the potential of the market in the months to come, and drove home the concept of manufacturing in India.

**“Excon is happening at an opportune time when Indian manufactured products are being recognised internationally.”**

**S**OUTHEAST ASIA’S BIENNIAL construction event Excon 2015 concluded in Bangalore, India, on 29 November 2015, highlighting the great potential of the Indian construction sector.

The show, held over five days at the Bangalore International Exhibition Centre (BIEC), witnessed more than 35,000 business visitors from across the world who were keen to explore the myriad opportunities being offered by the country’s construction industry. Prime Minister Narendra Modi’s “Make in India” theme resonated across the show as a slew of solutions, products and innovations were presented. According to

the event’s organisers, more than 200 product launches took place during the course of the show and 810 exhibitors covered 220,000 sqm of exhibition space.

Indian minister for road transport, highways and shipping, Nitin Gadkari, who inaugurated the show on its first day, said, “Excon is happening at a very opportune time when Indian manufactured products are being recognised nationally and internationally, and domestic consumption as well as exports have been increasing.”

Some of the major product launches at the event were made by JCB, Tata Motors, Caterpillar and Mahindra. JCB, aside from



displaying 25 machines and technological advancements, also showcased its range of ecoXcellence backhoe loaders. On display was the JCB 220LC Xtra Tracked Excavator, the 455 ZX Wheeled Loader and its new Master Loader.

**“We have renewed product programmes for the market here and are looking for opportunities to expand our presence in the months to come.”**

Caterpillar launched the Cat 216B3 model, which has been manufactured at its Indian plant in Thiruvallur, Tamilnadu. Additionally, the construction major also showcased the Cat 424B Backhoe Loader as well as the multipurpose Cat B20 Breaker.

Mahindra displayed its new pick-and-carry crane and loading machines at Excon 2015. The Mahindra Load Master and Mahindra Lift Master use DITEC turbocharge intercooled diesel and 4495 PCC BSIII CEV engines respectively.



*Organisers said that there were more than 800 exhibitors at the show.*

Kobelco displayed the large capacity Turbo Charger SK500 with advanced technology and enhanced fuel efficiency.

The platform was ideal for brands like Volvo and Tata Motors, which introduced some of their major products. Volvo Trucks launched dump trucks FMX 520 and FMX 480. In addition, Volvo Trucks showcased a customised coal haulage solution along with the FMX 440. Volvo Penta showcased its new range of D5 and D8 engines, which power a range of applications in construction, material handling and agriculture.

Company representatives felt that they have received a positive response from the show. Volvo Penta vice-president Jonas

Nilsson said, “This is an opportunity for us to present our strengths, and interact with potential and existing customers. We have renewed our product programmes for the market in India and are looking for opportunities to expand our presence in the months to come.”

The earthmoving and construction market in India is expected to grow by almost 25 per cent over the next few years to reach 330,000 units sold by 2020, said CII president Sumit Mazumdar. A potential US\$20bn market has helped make India an attractive investment destination, with a slew of foreign investors making a beeline to leave their stamp on the upcoming Indian construction scene. ■

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*The World Future Energy Summit attracted more than 32,000 participants in 2015.*

# Egypt's renewable energy sector gaining traction

The Egypt Energy Forum, set to take place during Abu Dhabi Sustainability Week in January 2016, is set to provide a platform for developments and opportunities in the Arab world's most populous country.

**“There are more than 4,000MW in renewable energy projects currently under development in Egypt.”**

**E**GYPT'S RENEWABLES ENERGY sector presents a potential opportunity of more than US\$10bn for private sector financing over the next five years, according to leading experts on the industry. As Egypt's installed power capacity is set to nearly double from 31GW in 2013 to 60GW in 2020, renewables will play a key role and present an opportunity of US\$13bn in investment and development, according to Frost & Sullivan.

In particular, Egypt plans to reach 20 per cent of its total power for a total of 11.32GW from renewables by 2020, across wind, photovoltaic, concentrated solar power and hydroelectric projects, according to a report by the Regional Centre for Renewable Energy and Energy Efficiency.

“There are more than 4,000MW in renewable energy projects currently under development in Egypt, split between wind and solar, procured under a newly established Feed-in-Tariff regime and

competitive tenders,” said Bakr Abdel-Wahab, managing director of infrastructure private equity at EFG Hermes, one of the Arab World's largest banks.

“There will be strong medium- to short-term growth, but to date it has been a slow process due to some volatility and clarification regarding the government regulatory frameworks.”

Accordingly, the World Future Energy Summit (WFES) 2016, hosted by Abu Dhabi-based renewable energy company Masdar and part of Abu Dhabi Sustainability Week, has added to its extensive programme to allow for a country-specific focus in the Egypt Energy Forum.

The event will be a platform to learn about the latest developments in the power, water, gas, solar, wind and waste management sectors of the Arab world's largest economy, while enabling attendees to hear how the country's leaders articulate their 10-year vision for the nation.





*Bakr Abdel-Wahab, managing director of EFG Hermes.*



*Egypt President Abdel Fattah al-Sisi was in attendance at WFES 2015.*

"There are many regional conferences on renewables, but WFES has a reputation for bringing in high-level developers and investors, providing a forum to give feedback to governments," Bakr Abdel-Wahab, who will be presenting at the Egypt Energy Forum and WFES, added.

Among the key issues to be discussed are practical measures envisaged to accelerate renewable energy adoption across the country, including a proposed feed-in-tariff program, and the rollout of solar rooftops.

**"WFES has a reputation for bringing in high-level developers and investors."**

There will also be discussion around the status of key public-private-partnership (PPP) programmes and how they will be accelerated in 2016, such as the New Cairo Wastewater Treatment Plan, the Helwan Wastewater Treatment Plan, Recycling Solid Waste project, and Sharm El Sheikh sea desalination plant.

Finally, developers, operators, manufacturers, and contractors will hear from experts in the finance sector about its appetite for Egyptian project finance.

The new forum will draw top speakers, joining forces with those from the country's private sector energy, investment, and finance industries to form an unparalleled global platform on the country's energy future.

WFES 2016 will take place at the Abu Dhabi National Exhibition Centre on 18-21 January 2016, and will be co-located with the International Water Summit and EcoWASTE. Co-located WFES events will also include the Solar Expo and Sustainable Transport Zone. ■

## World Future Energy Summit

The World Future Energy Summit (WFES) is a leading event in the field of advancing future energy, energy efficiency and clean technology. Held annually at Abu Dhabi National Exhibition Centre, WFES is hosted by Masdar Institute.

In 2015, the WFES exhibition and conference attracted 650 companies from 40 countries, and more than 32,000 attendees from 170 countries participated in the event.

## Abu Dhabi Sustainability Week

Abu Dhabi Sustainability Week is a global forum that has been designed to unite thought leaders, policy makers and investors to address the challenges of renewable energy and sustainable development.

With the global population set to reach nine billion by 2050, Abu Dhabi Sustainability Week aims to promote collaborative thinking and development to accelerate the sustainable solutions needed to support rapid economic and population growth.

An Abu Dhabi government initiative, Abu Dhabi Sustainability Week is the largest gathering on sustainability in the Middle East and a significant forum in stimulating international dialogue and action.

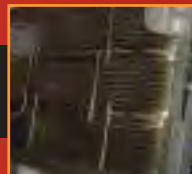


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# Fifty Years of Powering the World



**F**OUNDED IN 1966 by Fred Wilson with just six employees, the FG Wilson brand reaches a half century milestone in 2016. The world has changed much in that time, but the FG Wilson formula of quality, support and value still remains the same.

The current range of FG Wilson generator sets build on that long heritage. All products see extensive research and development testing in modern world-class facilities and are built to a design which has been tried and tested in the toughest of environments. From 6.8 kVA to more than 2,500 kVA, today FG Wilson offers one of the widest ranges of diesel-fuelled generator sets, built in modern facilities in Europe, Asia and Latin America.

FG Wilson generator sets have been installed in more than 150 countries worldwide, in hospitals, banks, airports, data centres, factories, construction sites, hotels, offices and telecommunications networks. Standard products come with a wide range of options and there is flexibility across the range to meet almost every need. For the most complex large projects, the FG Wilson Power Solutions Team works together with customers to develop custom-designed diesel, gas, bi-fuel and high-voltage generator sets on a project-by-project basis. Products can be customised with bespoke enclosures, cooling systems and specialised control systems to suit every

need and are available with a 50°C package option, to ensure efficient operation in high ambient temperatures.

However, FG Wilson is about more than just the metal – developed over 50 years, FG Wilson has a local network of 370 dealers spread across 150 countries, supporting customers with everything from product selection to installation and a lifetime of service. Generator sets are the primary business focus for dealers and they are specialists in the assessment of individual power needs. FG Wilson dealers are supported with a wealth of technical assistance, from generator set sizing tools to product data sheets, and dealers are equipped to provide customers quickly with detailed quotations and specifications. Dealers have highly-trained electrical and mechanical engineers, not only to specify generator sets, but to also carry out expert and hassle-free installation.

Together with its dealers, FG Wilson offers high levels of support before, during and after each power installation. Trained and supported by the company, dealers are experts in serving product maintenance needs, including emergency breakdown coverage and routine servicing. They carry ready stock of parts for hassle-free fast service and are supported by our 59,500 sqm parts facility, carrying more than 11,500 product lines.

When you buy an FG Wilson generator

set, you can be confident that it has undergone extensive prototype testing. Before a new product reaches one of the customers, it has undergone rigorous testing on load acceptance, cooling, vibration, noise and water ingress. Validation facilities include Europe's largest fully-automated, hemi-anechoic chamber with state-of-the-art acoustic research and test capabilities. Eleven witness test cells allow FG Wilson to carry out special testing of open and enclosed generator sets, and high-voltage testing and string testing can be offered to simulate conditions when generator sets are installed in the field.

Since 1990, 600,000 of FG Wilson generator sets have been at work for customers, in a multitude of applications and in all environments.

As FG Wilson reaches its 50th birthday, we would like to thank our customers, dealers and suppliers, but especially our customers for working with us over the last 50 years. Our business, expertise and knowledge have been built on our work with customers, project by project, and our customers today all benefit from that hard-earned experience.

And if you haven't considered FG Wilson yet, next time you're thinking of buying a generator set, we would like to invite you to visit our website, [www.fgwilson.com](http://www.fgwilson.com) where you'll find your nearest dealer. We promise you'll be well looked after. ■





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## Ossia and Si-Ware Systems unveil wireless charging system

OSSIA INC. (OSSIA) has unveiled its wireless charging transmitter and 'client' receiver chips developed by Cairo-based Si-Ware Systems (SWS). Unlike wireless charging on a pad, which requires close proximity, Ossia's Cota Wireless Charger, built around SWS' transmitter chip, powers all enabled mobile devices within a 9.14 metre radius.

SWS' charger chip (SWS1410) is being used to build the Cota Wireless Charger, which can deliver more than 10 watts of remote wireless power. The receiver chip (SWS1420), which will be embedded in portable devices and batteries, is capable of receiving up to six watts of power to charge devices such as mobile handsets, remote control units and keyboards.

SWS worked closely with Ossia, through its ASIC Solutions business, to transform the system-level concept of the Cota technology into an integrated, commercially-viable two-chip solution that meets the strict cost, size and efficiency requirements necessary for high-volume consumer technology. The advanced first-generation chips are designed and manufactured on mainstream CMOS technology from partner GLOBALFOUNDRIES, with no special manufacturing process steps, in order to ensure high yield and low cost. The companies worked to produce a high-level chipset which was robust and commercially viable.

Hatem Zeine, CEO of Ossia, commented on the collaboration with SWS, stating, "SWS had the deep understanding of our needs and was able to deliver an innovative silicon chipset in less than one year that was operational in a real environment. They were highly responsive, worked with us closely through all development phases, and were committed to offering a complete approach, from concept to manufacture."



As the mobile sector expands, demand for remote wireless charging has increased, especially with the arrival of wearable devices and 'smart' networked appliances at home, office and industrial environments. By 2018, the total market for wireless charging could exceed US\$8.5bn, according to IHS Research.

"SWS is committed to being at the forefront of the wireless charging movement, with the company's strong RF and mixed-signal design capability," said Hisham Haddara, CEO of SWS. "Our close partnership with Ossia, from design requirements to packaged chips, has been a rewarding endeavour, and we look forward to the success of Ossia and Cota in this emerging industry."

The system will be displayed at Consumer Electronics Show in Las Vegas in January 2016. Charger ASIC samples (SW1410) will be available in Q1 2016 and receiver ASIC samples (SWS1420) in Q2.

## Honeywell's Solstice liquid blowing agent for insulation comes to GCC market

HONEYWELL AND BAYER Pearl have come together to introduce Honeywell's Solstice liquid blowing agent (LBA) technology in the Middle East market. The new polyurethane spray foam insulation system will be offered to homeowners in the region, and will provide thermal insulation and reduced energy consumption, along with a reduced global-warming impact.

Foam blowing agents allow closed-cell polyurethane foam insulation to expand and provide the majority of the foam's excellent insulating properties. Honeywell and Bayer Pearl (a JV between Bayer MaterialScience AG and Pearl Insulation Materials Industries), developed the new polyurethane spray foam system using the new blowing agent to be economical and competitive when assessed by performance and overall cost efficacy. Insulation made with Solstice LBA has been shown to provide 10 per cent better thermal insulation performance than hydrocarbon blowing agents and four per cent better performance than



*The Solstice LBA is being applied to villa roofs in Al Ain.*

hydrofluorocarbon (HFC)-based insulation foam. Foam made with Solstice LBA meets the sustainability requirement of GWP less than five, as mandated under the Estidama program. Estidama is a mandatory program in Abu Dhabi and aims at constructing and operating buildings and communities more sustainably. The Bayer Pearl spray foam insulation system has already been used in residential applications, with the system applied to the roofs of residential villas in Al Ain, by Water Seal. "As one of the

leading spray insulation companies in UAE, we have experience using all types of foam blowing agents for spray foam," said Muhammad Asghar, MD of Water Seal. "We have found Bayer Pearl's product with Solstice LBA to be the best available polyurethane spray foam solution in meeting sustainability requirements without compromising on insulating properties." Solstice LBA, which is based on hydrofluoro-olefin technology, has an ultra-low global warming potential of 1, which is 99.9 per cent lower than blowing agents it replaces. It is also non-ozonedepleting and non-flammable. With an overall cost 74 per cent lower per square metre than comparative water-blown systems, the new spray foam system is also cost effective, the manufacturer said. Honeywell's blowing agents are being used in a wide range of applications, including spray foam insulation, household refrigerators and freezers, insulated architectural panels and refrigerated shipping containers.



## New generation of controllers from Phoenix Contact help optimise plant operations

THE NEW GENERATION of Axioccontrol controllers from Phoenix Contact ensure easy start-up, instant and continuous provision of process data and reliable service life.

Combined with the Axioccontrol AXC 1050 PLC, Axioline is an automation solution that meets the very highest demands, according to the Germany-based company. The AXC 1050 is designed for application areas, such as wind and solar parks, water and wastewater management, infrastructure projects and machine engineering that pose ongoing long-term challenges on a system and its components.

With a processing speed of 90 microseconds per 1,000 instructions, the AXC 1050 is suitable for small and medium-scale control applications. What is more important is the time needed for completing the entire process. This involves not only the controller's cycle time, but also the response time. When combining the Axioline I/O system with an Axioccontrol unit, fast response times can be achieved. The



*The AXC 1050 controller is suitable for extreme environmental conditions. (Image: Phoenix Contact)*

controller architecture is designed for the I/O modules to be directly connected to the PLC. This ensures that data is available within a few microseconds for outputting or re-inputting for processing in a subsequent controller cycle.

The AXC 1050 is also designed for the mechanical stress in harsh environmental conditions. Resilience against extreme weather is a must and an extended temperature specification for all of the components used in the Axioccontrol PLC, as well as a protective coating on the PCB,

ensure that the AXC 1050 operate flawlessly under such conditions.

Another way to maximise the smooth running of a plant is to fit it with an uninterruptible power supply (UPS). Phoenix Contact has built a UPS directly into the Axioccontrol unit, which does not act as a power buffer to ensure ongoing operation of the application. It does, however, give the PLC a chance to react to voltage dropouts. After the Axioccontrol unit has been disconnected from the power supply, it remains operational for several seconds. With such applicative measures, overall downtime can be minimised.

The AXC 1050 supports a wide range of IT protocols, which in combination with the built-in Ethernet ports make it easy to integrate the controller into a company network and provide quick access to production data. Data can be exchanged via standard protocols such as Profinet or Modbus, meaning that local I/O stations as well third-party devices can be integrated seamlessly with the system.

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العارضين الصينيين الآخرين: شركة «حاجان تريدينج أند اندستريال سيرفيسز»، والتي تقوم بتوريد بطانات وطلاءات الخزانات والتوربينات والمضخات والخرسانة وتصلبجات التسريب. وشركة «زينجزو كيفيد ماشينري»، وهي أكبر مورد لمعدات الطحن ومحطات الجرش. وقد ظهر موردو المعدات وشركات التعدين الأوروبية بشكل كبير في الخليج. حيث تقوم شركة «فلاروكس أوي» الفنلندية، مُصنِّع الصمامات والمضخات الصناعية ذات الخدمة الشاقة، بالتوسع في المنطقة. ويتمثل طموح الشركة، تحت قيادة الرئيس التنفيذي الجديد جوكا جوسكيلا، في تحقيق هدف عالمي للمبيعات يبلغ ١٠٠ مليون يورو (١٠٩ ملايين دولار أمريكي) بحلول عام ٢٠٢٠. كما تشهد شركة «جيوتيك سبا»، المساهمة الإيطالية مزود الخدمات الجيوتقنية والتعدين، فرص نمو في المنطقة لمجموعة خدمات وتقنيات التعدين المتخصصة.

وهناك أيضاً عددٌ من الشركات المحلية يقوم بتنمية الخبرة في قطاع التعدين. وهذه الشركات تشمل:

- شركة المشرق المتطورة للتعدين (AMMCO) بالملكة العربية السعودية. وهذه الشركة، التي تقدم خدمات التعدين، تصبو إلى إنشاء حافظة مشروعاتها في المنطقة وتوسعتها.
- مختبرات العامري، والتي توفر الاختبار المعمل للمعادن والمياه في المملكة العربية السعودية ومنطقة الخليج عموماً. وهي تصف نفسها من بين رواد الصناعة في اختبار المياه، والثانية في مجال الاختبار الخاص بالمعادن. وهي تعكف الآن على برنامج لتطوير المناجم، وتقوم حالياً بإنشاء مرافق مختبرات جديدة.
- مصنع علي سالم الراددي لرمال السليكا في تبوك، وهو يقوم بنشاط متنوع داخل قطاع التعدين بمنطقة مجلس التعاون الخليجي من أجل تلبية الاحتياج المتزايد لمنتجات وبودرة الرمال الخام والمغسولة.
- شركة الوسائل الصناعية، وهي تقدم حلولاً لاستخدامات المياه بما يتضمن أنظمة الأنابيب الكاملة لتطبيقات الضغط، وتقوم حالياً بشق طريقها في مجال التعدين. وفي سبتمبر/أيلول، أطلق على شركة الوسائل اسم سابق لتكون بذلك إحدى الشركات التي اختارت بارادتها أن ترم علاقة تسويق استراتيجية معها. ولكن على الرغم من التفاؤل الذي ظهر جلياً في الرياض في شهر أكتوبر/تشرين الأول من العام الحالي، فإن قطاع التعدين بمنطقة مجلس التعاون الخليجي - إلى جانب قطاع التعدين في منطقة الشرق الأوسط وشمال أفريقيا (MENA) على نحو أوسع - على مشارف فترة صعبة، وذلك في أعقاب التباطؤ الذي يعانيه الآن النمو الاقتصادي في الصين.
- الأوسط وشمال أفريقيا، إلى جانب أفريقيا جنوب الصحراء، من المتوقع أن يعاني «أكبر تأثير من التباطؤ الاقتصادي في الصين». فنسبة ما بين ٢٠ إلى ٣٠ في المائة تأتي من عائدات التعدين المحققة من منطقة الشرق الأوسط وشمال أفريقيا، وأفريقيا جنوب الصحراء، إما مباشرة أو بصورة غير مباشرة من الصين.

وتقول «مؤسسة موديز» إن شركات المعادن والتعدين أكثر عرضة لهذا التأثير سواء فيما يتعلق بأحجام الصادرات أو التأثير المتوالي لانخفاض الأسعار. وفي المؤتمر السنوي لبورصة لندن للمعادن (LME)، الذي عُقد في شهر أكتوبر/تشرين الأول، اتفق المحللون الصينيون، والغربيون على حد سواء، على أن الطلب الصيني على المعادن الخسيسة، سيتلقى ضربة شديدة في ٢٠١٦، ستكون لها تبعات لا يمكن تجنبها على قطاع التعدين والمعادن في منطقة مجلس التعاون الخليجي. وفي كل الأحوال، من غير المتوقع أن يتحسن الطلب على المعادن في الصين بصورة كبيرة حتى النصف الثاني من عام ٢٠١٦ على أقل تقدير. ومن الممكن أن يعمل هذا التباطؤ في الصين - والتي كان الطلب بها، على مدار العقد الماضي، العامل الرئيسي للنمو المُعزَّز في قطاع التعدين بمنطقة مجلس التعاون الخليجي - على تأخير اتخاذ بعض القرارات المتعلقة بمشروعات التعدين في الخليج لمدة عام. ومع ذلك، فإن شركات التعدين بالمنطقة تحدها الثقة المتعقلة من أنها يمكنها النجاة من هذه العاصفة الحالية، واتخاذ وضع يساعدها على الاستفادة من التحسن المتوقع الذي تم التنبؤ بحدوثه في أواخر عام ٢٠١٦.

حُصص الفوسفات لشركة معادن من شركة معادن للفوسفات (MPC) - وهي عبارة عن مشروع مشترك مع الشركة السعودية للصناعات الأساسية (سابك) والتي تمتلك شركة معادن فيه نسبة ٧٠ في المائة في حين تمتلك سابك ٣٠ في المائة - ومشروع وعد الشمال. وتقوم شركة معادن حالياً بإنشاء سبعة مصانع فوسفات ضخمة في مشروع وعد الشمال. ومن المتوقع أن ينتج هذا المشروع الطموح، فور الانتهاء منه، حوالي ١٦ مليون طن سنوياً من المنتجات التي تشمل الفوسفات المركز، وحامض الكبريتيك، وحامض الفوسفوريك، وترايپوليفوسفات (ثلاثي بولي فوسفات) الصوديوم. وتقدر هيئة المساحة الجيولوجية السعودية أن طبقات الفوسفات في المملكة العربية السعودية تمتلك في النهاية إمكانية جعلها «إحدى أكبر خمس دول منتجة للفوسفات». كما يُنظر إلى المعادن الصناعية باعتبارها نشاط أعمال تجارية مستقبلياً واعداً. وتقوم شركة معادن بتقييم إمكانات طبقات المعادن الأساسية العديدة بهدف توسعة وزيادة حافظتها المعدنية بحيث تشمل: الصلصال الحراري والبوكسيت من النوعية الرديئة والكيانبات والجرافيت والحجر الجيري النقي ومنتجات كربونات الكالسيوم الأراضى (PPC) والبوتاس وخام الحديد. من جهة أخرى، لا تزال الموارد المعدنية في عُمان - بالرغم من كونها متواضعة مقارنة بالملكة العربية السعودية - تتألف من كميات أساسية من مركب الكروميت والنحاس وحجر الدولوميت والزنك والحجر الجيري والرخام وكبريتات الكالسيوم المائية والسليكون والذهب والكوبلت والحديد. علماً بأن صناعة التعدين واستغلال المحاجر في عمان تنمو حوالي ٢٣ في المائة بمعدل نمو سنوي مركب. وتظهر الدراسات أن ولاية ينقل تمتلك احتياطات من النحاس تصل إلى ٢٥ مليون طن، في حين تُقدر احتياطات الفحم في عمان بحوالي ١٢٢ مليون طن. وتعد سلطنة عُمان الدولة الخليجية الوحيدة التي تمتلك احتياطات ذهب كبيرة، بخلاف المملكة العربية السعودية. وقد نُقبت الشركات الفرنسية واليابانية عن الذهب في الأجزاء الشمالية والشرقية من السلطنة، واكتشفت حوالي ١٢ مليون طن من الذهب والنحاس. كما أن هناك بعض الشواهد على وجود الماس في حوش الكهف، شرق عمان. وفي سبتمبر/أيلول، أعلنت شركة سافانا ريسورسيز، المدرجة في سوق الاستثمارات البديلة (AIM)، أن صياغة النتائج المستخلصة من مسح كشف عن وجود إمكانات لمجموعات عنقودية من خام معدن الكبريتيد البركاني الضخمة (VMS) - تتكون في الأساس من النحاس والزنك - في شمال عمان. ويبرر هذا المسح القرار الذي اتخذته شركة سافانا ريسورسيز باستثمار مبلغ ٦,٣ مليون دولار أمريكي لتمويل التوسع في حزام النحاس عالي الإمكانيات في عمان. وآلآن، يتواكب موردو معدات التعدين المتخصصة إلى منطقة مجلس التعاون الخليجي، تقودهم الصين، مدفوعين بالنمو المتوقع في نشاط المعادن والتعدين اللافلزي. وتعتبر شركة «أنهواي سويباو هيفي اندستريز ماشينري» أحدث الشركات وصولاً إلى المنطقة، وهي حاصلة على شهادة الأيزو ٩٠٠١ في عام ٢٠٠٨. وتقوم الشركة - والتي عرضت أداؤها في المعرض والمؤتمر السعودي - بتوريد العديد من الكسارات والمناخل وماكينات التلقيم، إلى قطاع التعدين واستغلال المحاجر. ومن بين



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# التعدين في منطقة الخليج يخرج من عباءة المواد الهيدروكربونية

ظلت دول الخليج العربية، على مدار عدة سنوات، تكافح من أجل تنمية صناعة المعادن والتعدين بحيث يكون لها ثقل موازن لقطاع المواد الهيدروكربونية المسيطر في المنطقة. وفي هذا المقال، يبحث نامدي أنياديك في الإمكانيات الكامنة بهذا القطاع.

ما بين ٢٧-٢٩ أكتوبر/تشرين الأول في الرياض، وعد السيد خالد السالم، رئيس البرنامج الوطني لتطوير التجمعات الصناعية (NICDP)، المستثمرين بأنه سيكون بإمكانهم الاستفادة من الميزة التنافسية للمملكة في الطاقة، وأيضاً من الحوافز المالية. وقد تم الكشف عن عدد من المبادرات، وهي تشمل التوسع المقرر في أنشطة التعدين لشركة التعدين العربية السعودية (معادن)، وهي كيان التعدين السعودي الذي تمت خصصته، والمدرجة الآن في السوق المالية السعودية (تداول). وتعتبر هذه الشركة، التي تمثل آلة الرئيسية لأنشطة التعدين بالمملكة العربية السعودية، نشطة في قطاع الذهب والمعادن الصناعية والفوسفات والألومنيوم وفي مجال البنية التحتية. وتقوم شركة معادن للذهب ومعادن الأساس (MGBM)، التابعة والمملوكة لها بالكامل، بتشغيل خمسة مناجم ذهب في المملكة العربية السعودية.

إلا أنه قد ورد في مستندات الشركة، التي اطلعت عليها النشرة التقنية - الشرق الأوسط، أن أعمال الذهب بها قد شهدت توسعاً مع دخول منجمين جديدين نشاط العمل وهما: السوق والدويحي. وفي شهر أكتوبر/تشرين الأول ٢٠١٥، بدأ الإنتاج التجريبي في مشروع الدويحي، والذي سيكون أكبر منجم ذهب لشركة معادن. وقد تقرر بدء الإنتاج التجاري به في الربع الأول من عام ٢٠١٦. ومن المتوقع أن ينتج المنجم، مع وصوله لطاقته الإنتاجية القصوى، ١٨٠ ألف أوقية ذهب سنوياً. وسيؤدي هذا إلى بلوغ إجمالي الطاقة الإنتاجية للذهب لشركة معادن ٣٤٠ ألف أوقية سنوياً. ويعد منجم الدويحي بهذا مجرد أحد مناجم الذهب العديدة التي تقوم شركة معادن بتطويرها في المنطقة المركزية للذهب وسط المملكة. وإلى جانب الذهب، تقوم شركة معادن أيضاً باستخراج ما يقرب من ٩٠٠ طن من النحاس، و٤٠٠٠ طن من الزنك و ٢٨٠ ألف أوقية من الفضة من منجم مهد الذهب كل عام. وقد شكلت شركة معادن مؤخراً، في عطاء لدعم تطوير قطاع تعدين النحاس، مشروعاً مشتركاً مع باريك للذهب (باريك) لتشغيل منجم النحاس بجبل صايد. ومن المتوقع دخول المنجم حيز التشغيل في عام ٢٠١٦، وينتظر له أن ينتج ما بين ١٠٠-١٣٠ مليون طن من النحاس خلال كل عام من الخمسة أعوام الأولى للتشغيل. ومن المقرر أن يستمر الإنتاج لمدة عشرة أعوام أخرى بعد ذلك. وعلى صعيد صناعة الفوسفات، تسعى شركة معادن، في الوقت الحالي، إلى دعم نشاط أعمالها التجارية. ففي شهر سبتمبر/أيلول، دخلت الشركة في مباحثات مع عدد من البنوك المحلية والإقليمية والدولية بشأن إمكانية استبدال ديونها القائمة بتيسيرات دين جديد بشروط أكثر ملاءمة وتتألف

كانت المعادن كثيفة الطاقة، مثل الألومنيوم والفولاذ، أولى خطوات واضحة في دفع صناعة التعدين نحو المقدمة في منطقة الشرق الأوسط، وقد انطلقت عمليات تطويرها خلال أعوام التسعينيات من القرن الماضي. وتزايدت وتيرة نمو هذا القطاع وتطوره، مدفوعاً بانخفاض أسعار النفط والغاز. وقد افتتحت شركة بكتل الأمريكية - مؤخراً - مكتباً لها في دبي لدعم قطاع التعدين والمعادن لديها في الإمارات العربية المتحدة. وتكمن أفضل الإمكانيات المحتملة لصناعة التعدين، في منطقة مجلس التعاون الخليجي، في المملكة العربية السعودية، حيث ينمو النشاط التعدين غير النفطي بمعدل ١٠ في المائة سنوياً. وتحظى المملكة بموارد معدنية أكثر من أي بلد آخر في منطقة الخليج، إذ يوجد بها طبقات ضخمة من البوكسيت والنحاس والذهب والحديد والرصاص والفضة والقصدير، وكذلك المعادن اللافلزية. وقد تعهدت حكومة المملكة العربية السعودية بتحفيز قطاع التعدين، وهي لهذا تخصص ما يقرب من ١١,٩ مليار دولار أمريكي لانفاقها على تطوير هذا القطاع على مدار الأعوام الخمسة المقبلة. ولتيسير دخول الاستثمارات الأجنبية في هذا القطاع، تم إعداد قاعدة بيانات شاملة عن التكوينات الجيولوجية، والموارد المعدنية للمملكة، بما يتضمن الخرائط وقواعد البيانات والمحفوظات الأرشيفية والتقارير، وافتحتها للامة. وفي معرض ومؤتمر المعادن والتعدين السعودي لعام ٢٠١٥، والذي انعقد في الفترة



التعدين غير النفطي ينمو في السعودية بمعدل ١٠ في المائة سنوياً

والشفافية، إلى جانب حماية الصالح العام. بالإضافة إلى ذلك، فإن الاقتصادات التي تم تصنيفها في مرتبة متقدمة حسب مؤشر Doing Business تتجه إلى تحقيق أداء جيد في تقارير البيانات الدولية، مثل تقرير التنافسية العالمي، ومؤشر الفساد الخاص بمنظمة الشفافية الدولية.

أنشطة الأعمال التجارية في المنطقة، إلى المرتبة الخامسة والستين. كما شمل التقرير بيانات حول لوائح أسواق العمل؛ مثل التدريب في موقع العمل وتأمين البطالة. ووفقاً للتقرير، كانت الاقتصادات الأفضل أداءً هي تلك التي تضم لوائح جيدة تسمح بأداء الأعمال والعمل في الأسواق على نحو يتسم بالفاعلية

## تاتا ستيل تعلن شراكتها مع الشركة العالمية للتطوير في الشرق الأوسط



الشركة العالمية للتطوير تعقد شراكة مع تاتا ستيل لتوفير منتجات الأخيرة لعملائها في الشرق الأوسط

لا يوجد تأثيرٌ على قدرة شركة تاتا ستيل في توفير أنابيب عالية الجودة لعملائها في مجال الطاقة. استثماراتنا على مرّ العام الماضي هي برهان التزامنا في هذا المجال، وسوف نستمر في مساعدة عملائنا في تقليل التكلفة الإجمالية للملكية المشروعات بدون التأثير على الجودة».

الموثوقة، وكذلك تحسين عملية التحكم بالضغط باستخدام النظام (O)، والاستثمار في تراكيب ليزر جديدة بقطر ٤٢ بوصة وفقاً للمقياس الكبير لأنابيب القوسية المغمورة في هارتلبول. وقال بروتون: «من المعروف أن هذا الوقت مليء بالتحدي في مجال صناعة الصلب في أوروبا، ولكن

دعمت شركة تاتا ستيل من تواجدها في الشرق الأوسط عن طريق توقيع شراكة مع الشركة العالمية للتطوير (IDC) بعد إدراك ضرورة وجود تمثيل محلي لها في أبو ظبي. وستدعم الشركة العالمية للتطوير شركة تاتا ستيل وتساعد على الحصول على موافقات شركة النفط الوطنية لتعرض منتجاتها وخدماتها في مجال الطاقة والكهرباء، بما يشمل خطوط الأنابيب الملحومة، والمنتجات المساعدة، من معامل الأنابيب في المملكة المتحدة. وأوضح ريتشارد بروتون، المدير التجاري للطاقة والكهرباء في شركة تاتا ستيل، أن شركة تاتا ستيل سوف تقدم إمكانات الدعم لديها لشركات النفط والغاز في المنطقة، موفرة لها فرصة العمل مع مورد له سجل ممتاز من توفير مشروعات خطوط الأنابيب على اليابسة وفي مياه البحر حول العالم. وقد أعلنت عن شراكتها بعد التركيز المتزايد على الإنتاجية في مناقصة لتقليل التكلفة الإجمالية للملكية الخاصة بمشروعات عملائها. وقد قامت الشركة بعدد من الاستثمارات الهامة في معدات الإنتاج الخاصة بها، بما يشمل تحسين معدات اللحام، وأدوات التوسيع المحسنة، واختبارات

## مفكرة إجمال الأعمال

### ديسمبر/كانون الأول

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٩ - ٧ ..... المؤتمر الدولي لهندسة البرمجيات ICSEE. 2015 ..... دبي

### يناير/كانون الثاني ٢٠١٦

٢١ - ١٨ ..... القمة الدولية لطاقة المستقبل ..... أبو ظبي



شبكة ترام مدينة لوسيل بحلول عام ٢٠٢٠ وهي ستضيف ٣٨ كيلومترا أخرى إلى مساحة التغطية و٣٧ محطة إضافية. وستضم المرحلة الثانية من مشروع المترو إنشاء الخط الرابع.

وقالت شركة السكك الحديدية القطرية في بيان لها: «ستتمكن الجماهير الحاضرة لمباريات كأس العالم لكرة القدم عام ٢٠٢٢، من الانتقال إلى الاستادات بواسطة مترو الدوحة العصري، وترام مدينة لوسيل، اللذين تم إنشاؤهما لتوفير رحلات تتسم بالفاعلية والراحة، وذلك في سياق الجهود القطرية المتواصلة لإحراز تقدم ملحوظ بشأن استكمال المرحلة الأولى في نهاية عام ٢٠١٩. فبحلول وقت إقامة كأس العالم بقطر، سيكون متوسط زمن الرحلة بين المحطات المتجاورة هو ثلاث دقائق فقط، وفقا لما صرّحت به الشركة».

ويضمن الخط الأحمر أن تستغرق الرحلة من المطار إلى مدينة لوسيل، التي ستقام بها المبارتان الافتتاحية والختامية من كأس العالم، ٣٦ دقيقة فقط. بينما سينقل الخط الأخضر الجماهير إلى أماكن استضافتهم وإلى استاد مؤسسة قطر واستاد الريان، إذ أنه يمتد من المنصورة شرقا إلى الرفاع غربا. ولا يزال هذان الاستادان قيد الإنشاء حاليا. أما خط المترو الذهبي، فسوف تنتقل الجماهير بواسطته من مشيرب، التي هي المحطة التبادلية الرئيسية ونقطة تجمع الجمهور بالقرب من سوق واقف، إلى المدينة الرياضية التي تضم استاد خليفة الدولي المتوقع استكماله العام المقبل.



مترو الدوحة سيجعل التنقل سهلا لمشجعي كرة القدم الذين سيحضرون كأس العالم في ٢٠٢٢

## إنجاز المرحلة الأولى من مترو الدوحة في الربع الرابع من عام ٢٠١٩

صرحت شركة السكك الحديدية القطرية (الريل) بأنه من المتوقع انتهاء المرحلة الأولى من مشروع مترو الدوحة في الربع الرابع من عام ٢٠١٩. وتجدر الإشارة إلى أن أعمال البناء تسير على قدم وساق. فقد أنهت الشركة حوالي ٦٠ في المائة من أعمال حفر الأنفاق من أصل ١١٣ كيلومترا باستخدام آلة حفر. كما تم توظيف أكثر من ٢٧ ألف شخص في أعمال البناء. هذا وستضم المرحلة الأولى خطوط المترو الأحمر والذهبي والأخضر ليتم افتتاحها في عام ٢٠١٩. وسوف تغطي هذه الخطوط ٨٠ كيلومترا عبر الدوحة: ٦٣ كيلومترا منها في الأنفاق، وتتكون من ٣٧ محطة. كما أنه من المتوقع إتمام

## البنك الدولي يصنف الإمارات كأفضل دولة للأعمال التجارية في المنطقة

أعلنت مجموعة البنك الدولي في تقرير ممارسة أنشطة الأعمال التجارية لعام ٢٠١٦ (Doing Business) أن الإمارات العربية المتحدة هي الأولى في سهولة ممارسة أنشطة الأعمال التجارية في منطقة الشرق الأوسط وشمال أفريقيا. وتم تصنيف الإمارات العربية المتحدة في التقرير السنوي، الذي يركز على حالة سلامة الاقتصاد بناء على التشخيصات التفصيلية للخصائص الجلية والمتضمنة، في الطليعة، متقدمة على البحرين وقطر وعمان. قدم التقرير بيانات لـ ١٨٩ نظاماً اقتصادياً ومعلومات شاملة من ١٠ لوائح لنطاقات أعمال؛ مثل بدء الأعمال، والحصول على الكهرباء، والتجارة عبر الحدود، وتسوية حالات الإعسار. وعالمياً، تم تصنيف الإمارات في المرتبة الحادية والثلاثين، في حين هبطت البحرين؛ ثاني أسهل دولة في ممارسة



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