

SOHAR ALUMINIUM

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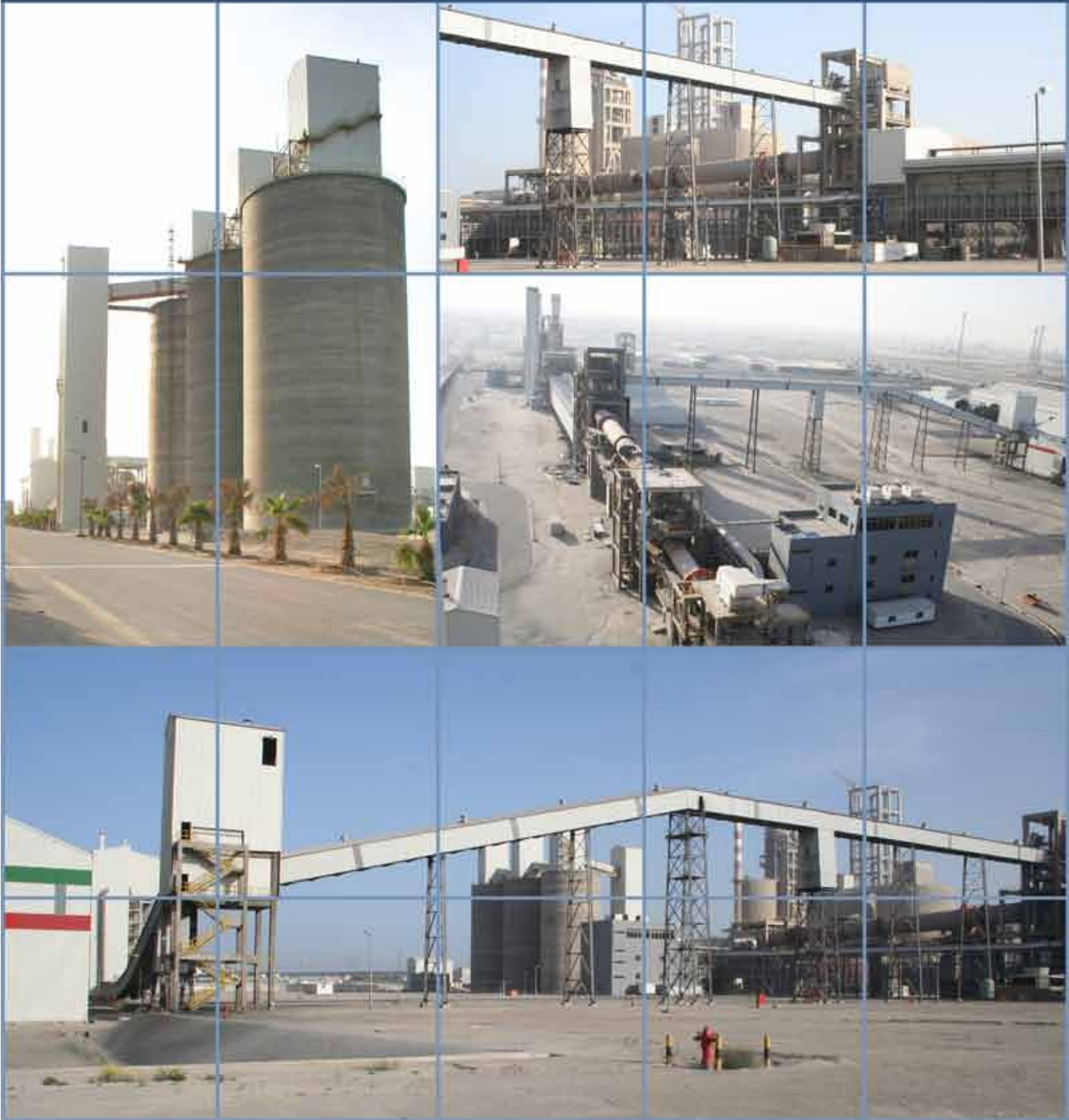
CORPORATE BROCHURE



Energising employment

Oman is on a mission to improve conditions for its citizens and provide meaningful employment opportunities, as Alan Swaby learns in discussion with Sohar Aluminium

Sohar Aluminium in Oman has a relatively new CEO. Henk Pauw has been in the job for just seven months and is still settling into the myriad of new social and industrial situations anyone is bound to experience when moving from the industrial West to the developing Middle East. But it's a pretty safe bet that the political unrest, challenging the status quo in neighbouring Arab countries, was not one of the factors he considered having to cope with when accepting the position.



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Petroleum Coke Industries Company

Petroleum Coke Industries Company (PCIC) is a regional supplier of calcined coke to the aluminium industry. Our plant, the largest horizontal single kiln coke calciner in the world, is located in the Shuaiba Industries Area, south of Kuwait. Plant is constructed inside the Shuaiba port to facilitate logistical advantage and for export purposes, with a production capacity of 350,000 tonnes of calcined petroleum coke per year. In three years of operations to 2011, it has become a leading Middle East petroleum coke calciner.

PCIC has revised its strategy and we are concentrating on growing our clients in the Gulf region and MENA area. This area is our strategic strength from the geographical point of proximity and shipping time, and costs are extremely competitive. We supply various aluminium smelters including Sohar Aluminium in Oman, Dubai & Emal in the United Arab Emirates, Qatalum in Qatar, Inalum in Indonesia, Hydro Norway, BHP Billiton in South Africa and Egyptalum in Egypt.

There is a strong, close and long-term relationship with the Kuwait Petroleum Corporation (KPC) and Kuwait National Petroleum Company (KNPC).

PCIC's facility is directly connected with Shuaiba Port berth by a closed conveyor belt for easy, smooth and safe transportation of calcined coke with the ability to upload 650 MTs/hour.



“There is some dissent in Oman,” he admits, “but the government is much more progressive here than in many Arab countries. There are already plenty of plans and initiatives in place to improve living conditions for Omani people. The fact that it maintains good relations with both Palestine and

Israel says a lot about its style and modernity.”
Conditions have improved enormously in the 40 years since the present Sultan took control of the country. Then, Oman lagged behind its neighbours while today, after a 170-fold increase, GDP has reached a level three times greater than the



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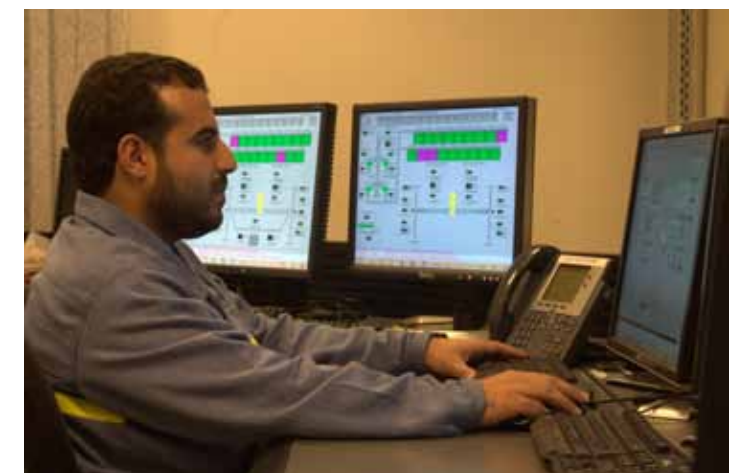
Middle East/North Africa average. A succession of five year plans has gradually improved the infrastructure of the country to the extent that in 2010, the United Nations Human Development Report ranked Oman the world's 'top mover.' In terms of primary health care provision, for example, Oman is in the world's top 10 providers.

These achievements have been made by converting the country's oil and gas resources into new capital projects, the latest tranche of which goes under the title of Vision 2020. A key element of this programme is the building of the Sohar Aluminium plant—a project that took three times longer to discuss and plan than it did to build.

"Aluminium smelting is a process that requires vast amounts of energy," says Pauw. "At least one third of the cost is for energy and in Europe, that figure would be as high as 40 per cent. So it's attractive to countries such as Oman, which can convert the energy it has into aluminium production. The gas used could be sold in the normal way but that wouldn't add value or provide work. The Sohar plant, on the other hand, creates jobs for 1,000 people, 70 per cent of them native Omanis."

Sohar Aluminium was formed through an alliance between three well established businesses: Oman Oil (40 per cent), Abu Dhabi National Energy Company PJSC – TAQA (a subsidiary of Abu Dhabi Water and Electricity Authority, with 40 per cent) and Rio Tinto Alcan (20 per cent). Ever since the first pot came on line in June 2008, the plant has been breaking records. While its annual capacity of 360,000 tons is only somewhere in the middle ranks, Sohar boasts a single potline measuring 1.2 kilometres. It also has the world's highest known capacity ingot casters and the most innovative elevated walkways in existence, traversing the

Sohar Aluminium



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entire site and keeping man and machinery separate except when absolutely necessary.

Sohar is currently the most modern plant in the world as it was the first smelter to implement Rio Tinto Alcan's benchmark AP36 smelting technology—generally accepted to be the most energy efficient and productive smelting process available.

The entire production cycle consists of refined alumina being landed at the plant's own port facilities which are operated by Sohar Industrial Port Company, a joint venture between the government of Oman and the Port of Rotterdam. Here, vessels of up to 75,000 tons can berth to offload raw materials and export primary aluminium. As well as bulk materials handling systems there is enough storage space for 120,000 tons of alumina plus 30,000 tons of petroleum



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Fives Solios

Within the construction of the Sohar Aluminium smelter, Fives Solios was awarded major contracts: a 36 tph green anode plant implementing for the first time both RHODAX® for dry material preparation and IMC® (Intensive Mixing Cascade) for paste preparation, also including the carbon butts processing unit; two gas treatment centers to treat pot emissions fitted with TGT-RI filters; one fume treatment center on anode baking furnace; four 80 t capacity tilting holding furnaces along with the water cooling system for the casthouse; and a liquid pitch marine terminal with two 5,000 t capacity tanks. This project strengthened Fives Solios' position as a turnkey technology provider for the aluminium industry.

coke and liquid pitch—the raw materials needed to make the anodes used in the electrolytic conversion of alumina into aluminium.

After energy, anodes are the largest consumable component of aluminium refining. However, not every smelter has its own anode manufacturing facilities. It's an area of the business that Pauw knows intimately, having gone to Sohar from an anode making concern. "To put the scale into context," he says, "this one plant uses more anodes than my previous business supplied in total."

With that kind of manufacturing background, Pauw is keen to introduce more modern ideas into Sohar. "We are the most modern plant at the moment," he says, "but already technology has moved on. We ourselves are considering doubling capacity if we can guarantee energy supply, and when we do, the plant will be designed to AP41.

Fives Solios provides **Innovative** and High Performance solutions to the primary aluminium industry in the Carbon, Reduction and Casthouse areas.

Fives Solios, in partnership with its customers, develops processes and equipment to improve the performance of their plant operation and the quality of their product.

For example Fives Solios has developed Amelios, a performance analysis tool which assists operators in improving the performance of their green anode plants, and Xelios, the latest generation of vibrocompactors designed to produce high density anodes.

For the casthouse, Fives Solios can offer a reliable and flexible electromagnetic stirring solution with Genios, which can stir, submerge and cast, all from a single unit.

Fives Solios, designing today the plants of the future.



fives solios

So our current advantages will certainly be short lived. Take out the low cost of energy and our performance is not that productive.”

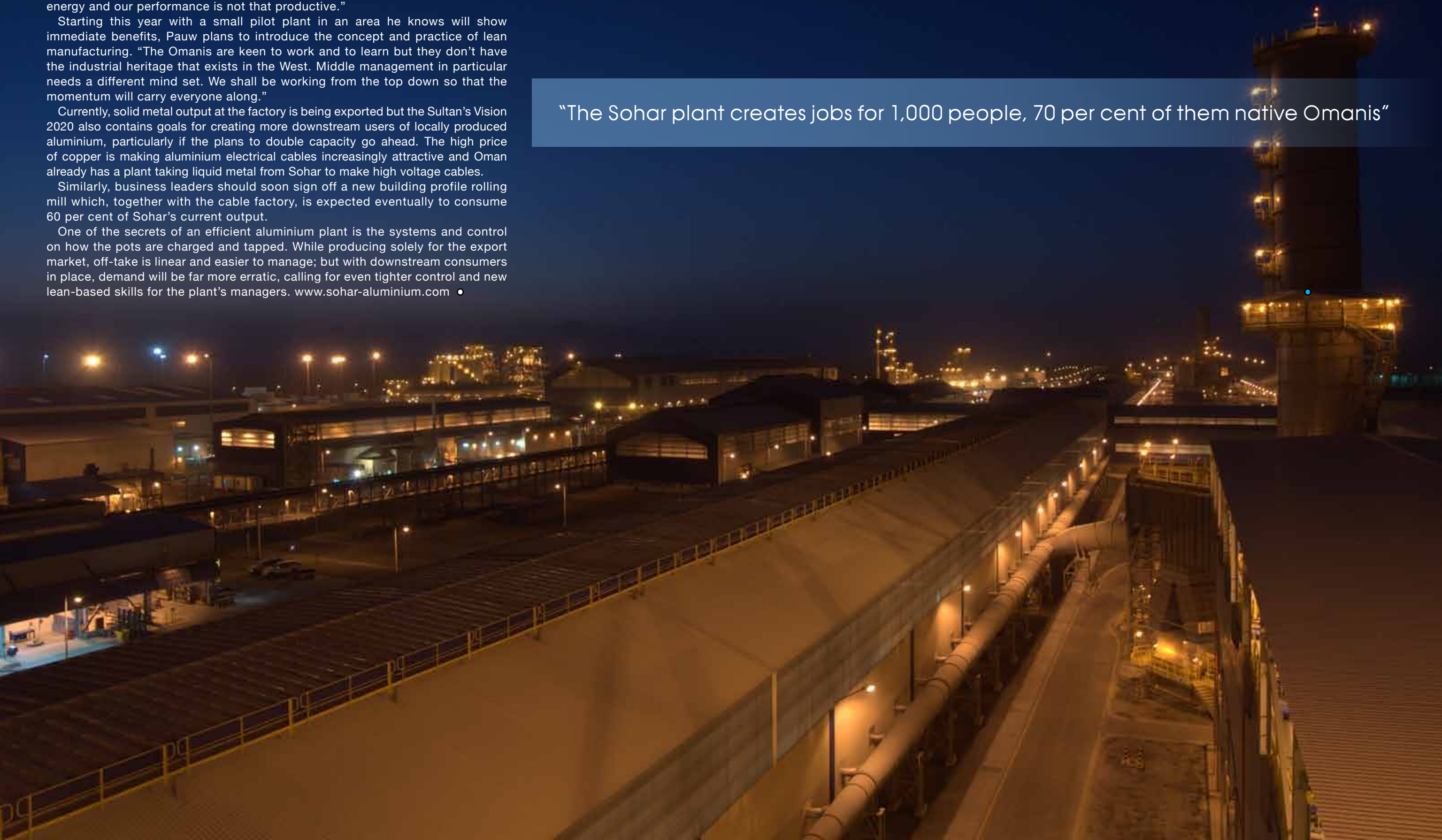
Starting this year with a small pilot plant in an area he knows will show immediate benefits, Pauw plans to introduce the concept and practice of lean manufacturing. “The Omanis are keen to work and to learn but they don’t have the industrial heritage that exists in the West. Middle management in particular needs a different mind set. We shall be working from the top down so that the momentum will carry everyone along.”

Currently, solid metal output at the factory is being exported but the Sultan’s Vision 2020 also contains goals for creating more downstream users of locally produced aluminium, particularly if the plans to double capacity go ahead. The high price of copper is making aluminium electrical cables increasingly attractive and Oman already has a plant taking liquid metal from Sohar to make high voltage cables.

Similarly, business leaders should soon sign off a new building profile rolling mill which, together with the cable factory, is expected eventually to consume 60 per cent of Sohar’s current output.

One of the secrets of an efficient aluminium plant is the systems and control on how the pots are charged and tapped. While producing solely for the export market, off-take is linear and easier to manage; but with downstream consumers in place, demand will be far more erratic, calling for even tighter control and new lean-based skills for the plant’s managers. www.sohar-aluminium.com •

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