

# Alternative Energy

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Filling the Energy Information Gap in Africa



July/August 2019

## Building Clean and Green

## Solar Import Tariffs for SA?

## New Bio-Based Polymers Coming to Market

## Africa Spotlight South Africa





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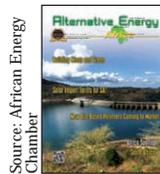
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Source: African Energy Chamber

Maguga Dam in Swaziland

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## Publisher's Note

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It's that time once again when I move off the alternative energy topic to discuss something most all of the African continent gets excited about. For those of you who regularly read my column, that's right, you guessed it, Sports! And not any sport, the Africa Cup of Nations to be exact. What a fantastic tournament this year's edition turned out to be, filled with surprises, sorrows, triumphs and great matches!

Perhaps the most surprising development was Madagascar's run in its first appearance in the tournament. The team made it all the way to the Final 16, leaving its fans feeling proud and looking forward to future performances of their "Barea." And then there was Mauritania scoring its first ever goal in the tournament. The Lions of Chinguetti also held their football powerhouse neighbor, Tunisia, to a draw. Quite a feat for the Mauritanian squad!

On a less upbeat note for the hosting nation, the Egyptian Pharaohs were sent packing after the South African squad handed them a defeat, putting an early end to the tournament's most successful team's run for the cup. Upheaval within Egypt's football world followed with Hany Abu Reida, head of the Egyptian Football Association (EFA), resigning shortly after the loss, and calling on members of the EFA board to also resign, while firing the coaching team led by Mexico's Javier Aguirre.

The most painful moment of the tournament came in the semi-final match between Senegal and Tunisia. At the 100th minute of the 0-0 match, Tunisia's goalkeeper, Moez Hassen, saw the ball bounce off the head of the defender Dylan Bronn and into the net for the only goal of the game, sending the Senegalese squad to the final and leaving the Tunisians in tears.

Perhaps my favorite match was the Algeria/Nigeria semi-final. It seemed for 70+ minutes the Algerians were on the way to taking the match, when Aissa Mandi was given a yellow card for a handball; Nigeria's Odion Ighalo subsequently converted the penalty kick and the match was tied up, breathing new life into the Super Eagles. At four minutes into the extra time period, it looked like penalty kicks were imminent, until the last minute of stoppage time when Algerian star Riyad Mahrez broke the Nigerians' heart with a beautiful free kick placed in the top left corner of the goal with what was practically the last kick of the game, winning the match for the Algerians. To be sure, it was a great, extra-time comeback for the fans!

The much-anticipated final between Senegal and Algeria was over 2 minutes into the match, with Algeria scoring a fluke goal. The team took one shot versus Senegal's 12 shots, and that was enough to land Algeria its second Africa Cup, coming 29 years after their first. Congratulations to El Khadra (The Greens) for the long awaited second victory!

Inside this issue we feature a closer look at South Africa's booming renewable sector, including its opportunities and challenges. In addition, the Markets & Policy article by Segen Solar discusses the potential impacts South Africa's proposed import tariffs on solar panels might have on the country. Finally, smart building is becoming a trend the world over, take a look at some of the latest technologies being incorporated into construction. As always, your comments and suggestions are welcome and can be sent to [info@AE-Africa.com](mailto:info@AE-Africa.com).

**Dianne Sutherland**  
 Publisher

## ALE Helps Boulenouar Wind Project Commissioning

Mauritania has commissioned the €122 million Boulenouar Wind Power Project. To help bring the project to fruition, ALE mobilized their specialist transport services to complete the transportation and installation of two electrical transformers, saving time and costs for a 100-MW wind farm project near Nouadhibou, Mauritania.



Source: ALE

ALE's experience in transportation across a range of sectors enabled them to eliminate a third from the operation's schedule, which also saved costs. The abnormal load transport of the electrical transformers, weighing 95 tons each, crossed over 100 km. The route began at the Port of Nouadhibou and finished at a transformation center.

Once on site, the transformers were unloaded using heavy duty lifting equipment and discharged directly onto rails embedded in concrete. This enabled the transformers to then be rolled on their own wheels to their final position.

ALE was able to mobilize a team at short notice for the operation. For the specialist transport and installation, ALE utilized 6 axle lines of conventional trailer with a 250-ton capacity tractor, then 90-ton capacity hydraulic jacks for the unloading.

The new wind farm will be the second in Mauritania with more than three times as much potential power. It will consist of 39 wind turbines and construction is expected to finish in 2019.

## Kenya Adds 79 MW of Geothermal

A new geothermal plant in Kenya has added 79 MW to the East African country's national grid, according to Kenya Electricity Generating Co (KenGen). The plant will eventually produce 158 MW the firm said. The remaining 79 MW will come online by the end of August.

The Olkaria V plant was first synchronized to the grid on June 28 this year and its first unit has reached its full design output, with a second unit scheduled to come on line.

A significant amount of Kenya's power generation comes from geothermal power, ranking as the second biggest power source.

KenGen, in which the government is a majority shareholder, said the extra output from the first unit of Olkaria V will bring its total installed capacity from geothermal sources to 612 MW.

## Mitsubishi to Aid Togo in Achieving 2030 Goals

Mitsubishi Corporation will distribute electrical services, including off grid solutions to the population of Togo, especially those living in rural

areas. Yas Doida, head of the Japanese multinational in Africa, revealed this information after a meeting with Komi Selom Klassou, Togolese Prime Minister.

"We mainly discussed energy," said the Japanese businessman, adding his company wants to help achieve the country's 2030 goal of energy access for the entire Togolese population. He went on to say, "There are several projects of the off grid; you can have efficient energy with slightly smaller things."

Doida believes that this is the ideal way to illuminate the country and welcomed the Togolese authorities' support for his partnership proposal and announced the imminent realization of this project.

## Voith Launches On-Site Machining in South Africa

Voith strengthened its hydropower service portfolio for Southern Africa with the introduction of its on-site machining and service tools capabilities on August 15 in Witfield, Boksburg, South Africa. The new services include the refurbishment of plant components in installed or independent state by linear and circular milling as well as drilling, boring and welding.

The portable on-site machining equipment ensures increased plant up-time and safety. Cutting assembly, dismantling and transport costs for the refurbishment and maintenance of plant equipment are reduced to a minimum.



Source: Voith

"During the past two years, we built up an extensive range of on-site machining and repair services through the acquisition of equipment and the training of new staff. Now, we can provide cost-effective workshop-quality machining for the largest and smallest on-site machining projects in Southern Africa", says Anton Harris, Head of Service and Managing Director of Voith Hydro in South Africa. "Besides the use in the hydropower sector, the equipment is also applicable to all fields of processing industry in Africa such as the oil and gas or the mining industry. For hydropower plants, the Voith range of services is amplified to assessments, trouble shooting, repair and assembly services – along the whole life cycle of an operating plant."

The on-site machining equipment is stored in sea freight containers on the Voith company premises in South Africa. From there, the equipment is ready to be shipped on the road or on the seaway to any location in Southern Africa.

## Germany Funding PV Plant in Burkina Faso

Germany signed a financing agreement with Burkina Faso worth €39.5 million. The funds will be directed to three projects, two of which are in the electricity and drinking water sectors.

The electrical projects are the construction of a 12-MW capacity photovoltaic power plant and the 225-kV power line that will connect

it to the national electricity grid. A short-term energy storage facility will also be located in Koden, a town south of Bobo Dioulasso, the country's second largest city.

With regard to the drinking water project, the funds will help support phase two of the water supply and sanitation program in small and medium-sized towns in the Mouhoun, Cascades, Hauts-Bassins and Sud regions. The third component benefitting by this support from the German partner is that of financial governance.

### SN Power and IPS to Lead Ruzizi III Construction

SN Power and Industrial Promotion Services (IPS), the industrial arm of the Aga Khan Fund for Economic Development (AKFED), will lead the construction of the Ruzizi III hydropower plant. This comes from an agreement signed between the governments of Burundi, DRC, and Rwanda. All three countries will benefit from the hydropower plant.



Source: SN Power

"Ruzizi III is a truly revolutionary project. This is the first privately funded project in sub-Saharan Africa that will use a common regional resource to generate energy that will be shared equally between three countries," said Galeb Gulam, IPS Executive Director.

The project will provide electricity to 30 million people, 70% of whom live below the poverty line in regions where the electrification rate is on average 6%, say the developers of the plant. The Ruzizi III power dam will have a capacity of 147 MW and will provide power to an estimated 30 million people.

The development of the plant is estimated to cost between \$650 and \$700 million. The developers hope to obtain concessional loans from institutions such as the African Development Bank, the European Investment Bank, the European Union, the German Development Bank KfW, the French Development Agency or the World Bank.

### Egypt's NREA to Launch Tender for Hurghada Solar

Egypt's National Renewable Energy Authority (NREA) plans to launch a tender next month to establish a 20-MW solar power plant in Hurghada, a government official reportedly told *Al-Borsa*. The power plant will use PV cells with a generation capacity of 20 MW and will be the first in Egypt to use an energy storage battery system (BESS) to support the grid at night and during heavy load hours.

The project will be financed through an \$85-million loan from the Japan International Cooperation Agency (JICA).

It is expected that the solar power plant will cut 17,000 tons of carbon dioxide emissions by saving 7,000 tons of oil equivalent.

Moreover, the Hurghada project will include a "Zero Energy Building" information center that will be equipped with all the needed modern facilities to become a leading international training center in the field among private and public sector entities.

The Ministry of Electricity and Renewable Energy seeks to produce 20% of Egypt's energy mix through renewable sources by 2022, targeting \$2.5 billion in investments, supported by the feed-in-tariff (FiT) system.

### Apollo Solar Gains Warehouse Space in West Africa

Apollo Solar, Inc. and Solene-ese entered into an agreement that allows Apollo Solar to use the Solene-ese warehouse and three offices for stocking and supporting Apollo products in West Africa. The warehouse is located in Senegal and the office space is in Senegal, Guinea, and Mali.

With this agreement, Apollo Solar has factory trained support staff located in Dakar, Senegal; Conakry, Guinea; and Bamako, Mali. The Apollo Solar Pure Solar and Hybrid Energy System cabinets and spare parts will be stocked in Dakar in addition to the existing critical parts stores in Nairobi, Kenya.

John Pfeifer, CEO of Apollo Solar said, "Our MNOs, Tower Companies and ESCOs in Africa value the quality of our American made products and now they also have the benefits of local support from our offices in both East and West Africa."

The Director of Solene-ese, Boubacar Sow, added: "Plans are in place to do some of the final assembly of the Apollo Solar systems in Senegal in order to provide rapid delivery to our African customers and to reduce the costs by using local labor. Our depth of experience with installation and support in combination with the robust Apollo products provides the optimum solution for our customers."

### Nigeria Inaugurates First Solar Hybrid Plant

Nigeria inaugurated its first solar hybrid plant. The 2.8-MW capacity plant is located at the Alex Ekwueme Federal University in Ebonyi State. It will operate from solar panels that will be supported by diesel electric generators.

The plant is part of the Energizing Education Program (EEP) implemented by the federal government through the Rural Electrification Agency. The objective of this program is to equip the main education centers with their own power generation units.

This first plant will provide electricity to 7,700 university students and more than 1,800 members of the university administration.

"This program will undoubtedly improve the quality of education, research and health services at universities and university hospitals in our country. I am proud of the role played by women in the successful implementation of this project since the project leader is a woman and the students of the faculty of science have actively participated," said Damilola Ogunbiyi, director of the Rural Electrification Agency, at the inauguration.

### Gaia Signs MoU for Ethiopia Biomethane Project

Gaia has signed a Memorandum of Understanding with Ethiopia-based company 4R Energy Plc to develop a renewable energy solution in Ethiopia based on biomethane production and utilization.

4R Energy Plc is working together with stakeholders, Lem-Ethiopia and Addis Ababa Water and Sewage Authority to develop a green

business concept at the Kaliti and Akaki Wastewater treatment plants which would upgrade the facilities with a modern biomethane production system. The biomethane can further be utilized as a fuel for industries and in household applications. The project aims to replace LPG (liquid petroleum gas), kerosene, and even charcoal and woody biomass which are traditionally being used for cooking. It is foreseen that biomethane can reduce the household fuel costs while bringing a renewable energy option for the people.

The partnership, in close cooperation with the stakeholders, will develop the carbon market layer of the project and support 4R Energy Plc with technology selection to ensure that selected solutions are on a sustainable basis. In Ethiopia, Gaia works in collaboration with the local partner company Swan Management Plc, which is operated by both Finnish and Ethiopian owners.

4R Energy Plc is an Ethiopian private energy company focusing on a wide range of areas of renewable energy generation. The company is the first of its kind in the country and has initiated a strategy to develop numerous immediate and future solid and liquid waste-to-energy projects. In addition to energy production, many waste sources can provide valuable by-products, such as organic fertilizers which are much needed in the agriculture-based economy of Ethiopia.

“There is a huge demand for affordable renewable energy solutions especially for household cooking needs. Waste-to-energy projects could be a prominent answer. However, the road is long as one of the key barriers in Ethiopia is the lack of experience in biomethane production plants. Therefore, 4R Energy is not only developing the whole value chain of the biomethane production industry but we are also developing quality standards together with Ethiopian Environmental Protection Authority in conformity with ISO standards,” said Benjamin Sishuh, general manager of 4R Energy.

### Swaziland Electricity Company Issues RFQ for Solar/Biomass

The Swaziland Electricity Company has issued a request for the qualification and development of a 40-MW solar PV plant to be developed via the First Tranche Procurement Program along with a 40-MW biomass-to-energy plant to be developed via the Second Tranche Procurement Program.

The request for qualification comes delayed given that Eswatini (Swaziland) has publicized its intent to have a 46-MW solar PV power plant online since 2017. However, the decision is an important one for this developing country and it being it closer towards reducing the country's reliance on imported power from utilities such as EDM (Electricidade de Moçambique) and Eskom.

Eswatini's decision to act on its past commitment to invest in renewable energy and expand the ratio of renewables in the country's electricity to 50% by no later than 2030 can only yield positive results for its population that amounts to roughly 1.42 million.

### Siemens Wins Grid Studies in Egypt

The Egyptian Electricity Transmission Company (EETC) awarded Siemens a series of five-year grid studies to analyze and examine Egypt's transmission network, and to identify the feasibility of deploying different advanced energy technologies.

The studies will look at the potential role of smart technologies to transform the North African country's energy grid. The studies will include a comprehensive training program for the EETC planning team who will jointly execute the various studies together with Siemens.

The cooperation with Siemens will explore the opportunities and challenges facing the national grid, with Egypt's plans to leverage electric mobility. Also included will be the study of Egypt's Benban Solar Park, Egypt-Sudan Interconnection project, and the Ouyat East Development Project.

### Milestones Achieved in Mozambique and Uganda

Two Emerging Africa Infrastructure Fund (EAIF) renewable energy projects celebrated important milestones recently, one in Mozambique and one in Uganda. On August 10 Mozambique's President, Filipe Nyusi, declared the 40-MW Central Solar de Mocuba (CESOM) solar power plant open.

EAIF loaned \$24.9 million of the \$76 million capital cost of the project. The energy being generated will be a catalyst for regional economic development in the north of Mozambique. CESOM is majority owned by the Norwegian energy business Scatec Solar, with Mozambique's public electricity utility owning 25% and the Norwegian investment organization, Norfund, holding 22.5%.

In Uganda, on August 7 the 14-MW Kikagati hydropower station reached financial close. The first tranche of the funding has been released to the Kikagati Power Company (KPC), which will own and operate the plant when construction is complete. The Kikagati hydropower station is being built on the border between Uganda and Tanzania.

The financial close of the \$54 million debt finance package for the Kikagati hydro-electricity station brings closer a new power source that will be equally shared between Uganda and Tanzania. The plant is



Source: Norfund

located on the Kagera River, which is on the border between the two nations. 100% of the energy generated by KPC will be bought by the Uganda Electricity Transmission Company Limited, Uganda's single-buyer and transmission company, which will then sell half the energy on to Tanzania.

EAIF, which is a PIDG company, specializes in providing high value long-term loans to private sector infrastructure projects in Africa. It draws its funds from the governments of the UK, The Netherlands, Sweden and Switzerland and private banks and financial institutions.

### UKCI to Invest \$17 Million in South African Wind

UK Climate Investments (UKCI) has announced a ~£14 million (R253 million) agreement with H1 Holdings to support the development of 254 MW of clean energy projects across South Africa.

UKCI will provide critical financing for the development of the Kruisvallei Hydro project in the Free State province (4 MW), Kangnas Wind Farm in the Northern Cape province (140 MW) and the Perdekraal East Wind Farm in the Western Cape province (110 MW). The financing

will be provided through an innovative funding mechanism developed by UKCI in close consultation with H1 Holdings and designed to support Black Economic Empowerment (BEE) entities.

The projects are expected to be completed by the end of 2020 and provide enough clean electricity to power nearly 200,000 homes each year. During their lifetime, they will help avoid approximately 844,000 tonnes of greenhouse gas emissions per annum.

In addition to promoting cleaner growth, the projects will stimulate rural development by employing and training at least 40 percent of construction, operations and maintenance staff from local communities.

The UK is a world leader in the global transition to a low carbon future. UK expertise in renewables will be key to meeting the UK government's ambitious target of net zero emissions by 2050 and supporting emerging countries to respond to the challenges and opportunities of climate change.

The investment represents UKCI's second commitment in sub-Saharan Africa and fifth investment in total. In January, UKCI and Investec announced that they would act as cornerstone investors in Revego Africa Energy Limited. The dedicated African renewable energy yieldco intends to seek a listing on the Johannesburg Stock Exchange later in 2019, targeting an initial listing size of R2 billion.

UKCI is a joint venture between the Green Investment Group and the UK Government's Department for Business, Energy and Industrial Strategy. UKCI forms part of the UK aid funded International Climate Finance. UKCI is managed by Macquarie Infrastructure and Real Assets, the world's largest infrastructure manager. Established in 2000, H1 Holdings is a majority black-owned and managed developer of renewable energy projects.

### Africa's Largest Wind Farm Officially Inaugurated by Kenyan President

On July 19, Kenya's president Uhuru Kenyatta officially inaugurated the Lake Turkana Wind Power (LTWP) project – Africa's largest wind farm. Standing out across a desert-like, windy landscape in northern Kenya, the 365 wind turbines have been producing up to 310 MW of reliable, low-cost and clean energy to power homes and businesses across Kenya since March 6. The wind farm is providing up to 17% peak demand and 30% off peak demand for electricity in Kenya.

"We feel extremely proud to have been associated with this landmark project and would like to congratulate the Lake Turkana Wind Power team for the successful dedication of this facility to citizens of Kenya," says Krish Iyer, President of Energy & Chemicals Services for Middle East and Africa at Worley, who attended the inauguration. "This project is a fantastic example of developing successful sustainable projects



Source: Worley

with local community engagement and making them part of this legacy." The completion of the project marks the end of a five-year journey for Worley, who has played an integral role in Africa's most prestigious renewable energy project since inception. In November 2014, Worley (then WorleyParsons RSA) was contracted by LTWP to provide overall project management, engineering review and construction management services for the LTWP project. Spanning an area of 160 sq km within the Loiyangalani District, Marsabit West County in northern Kenya, the project scope included 365 wind turbines of 850 kW each, an electric grid collection system and a high voltage substation, upgrades to 210 km of existing road, an internal site road network and a 160-man self-contained permanent village. Worley's project management services included overseeing the total schedule, cost and quality of work as well as supervising and coordinating the five main contractors on the project. By June 2017, despite some logistical, climatic and community challenges, Worley had completed the installation process of the full wind farm and delivered its scope of work within the stipulated timeframe and budget.

Following the completion of the 436-km Loiyangalani-Suswa transmission line by Kenya Electricity Transmission Company (KETRACO), the project reached a significant milestone on September 24, 2018 when the transmission line was completed, and hot commissioning commenced.

Bradley Duncan, Senior Electrical Engineer at Worley and head of the commissioning team for the LTWP project, explains that as part of ramping up to full operations, Worley worked in conjunction with Power Systems Dynamics (PSD) to oversee the commissioning tests, and coordinated with KETRACO and Kenya Power and Lighting Company (KPLC) to ensure that the plant was in compliance with all of the requirements as set out in the power purchase agreement, as well as the grid code. By October 10, 2018 the team had fully hot commissioned three 100MVAR STATCOMs, and by November 23, 2019 all 365 wind turbines had successfully exported power to the grid.

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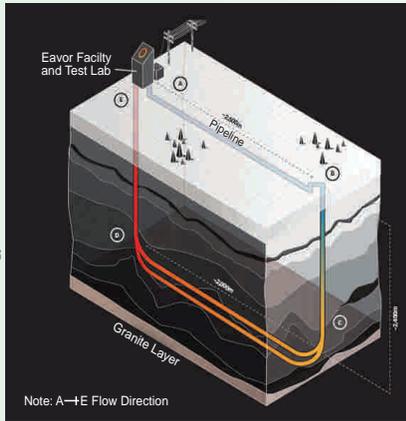
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## Innovative Geothermal System Moves Towards Commerciality

Eavor Technologies Inc. out of Canada has developed an innovative “made in Alberta” geothermal energy solution. In a demonstration project near Rocky Mountain House, the Eavor-Lite™ project uses existing Alberta oil and gas drilling technology and expertise to facilitate a revolutionary and unique energy system known as “Eavor-Loop™.”



Source: Eavor Technology

The Eavor-Loop™ technology harnesses the Earth’s natural heat kilometers underground to be used at surface for heating or to generate electricity. While the gathering of geothermal energy is not new, Eavor’s technology is highly scalable and holds the promise to be a significant global energy source which does not have the intermittency issues of traditional renewable power systems.

The closed-loop system consists of a large U-tube shaped well at 2.4 km depth, with several kilometers of multilateral horizontal wellbores, and a pipeline connecting the sites on surface. Two drilling rigs are operated simultaneously from both sites and used to intersect the multilateral wellbores at depth.

Water is circulated in the inlet well, through the parallel wellbores to extract heat by conductive heat transfer with the rock, and rises up the outlet wellbore at a higher temperature. The density difference between the inlet well and outlet well creates a thermosiphon which completely drives the flow, without any pumping power.

A test facility on surface is designed to measure all relevant performance data and enable optimization of the system. Post completion, the Eavor-Lite™ facility will continue to provide an ongoing test facility for advanced operating fluids and other processes currently under development.

The Eavor-Lite™ demonstration project is designed to showcase Eavor’s unique and proprietary design elements. The demonstration project began drilling in early August and will test the technology at near-commercial scale. The facility, once complete, serves as a testbed and proxy for commercial Eavor-Loop™ implementations globally.

Eavor’s technology and the Eavor-Lite™ facility provides a vital step to re-energizing and re-engaging the Alberta energy services industry. With only minor reconfiguration of existing oil and gas technology, Eavor™ can help the industry take hold of new opportunities, without the reliance of commodity prices or the issues around pipeline infrastructure and regulatory uncertainty.

## ExxonMobil Partnership to Explore New Carbon Capture Tech

ExxonMobil and Mosaic Materials announced that they have entered into an agreement to explore the advancement of breakthrough technology that can remove carbon dioxide from emissions sources.

Mosaic Materials has progressed research on a unique process that uses porous solids, known as metal-organic frameworks, to separate carbon dioxide from air or flue gas. The agreement with ExxonMobil will enable further discussion between the two companies to evaluate opportunities for industrial uses of the technology at scale.

Mosaic Materials’ agreement with ExxonMobil is part of Mosaic’s commitment to accelerate the impact of its innovative, low-cost technology, and is Mosaic’s latest direct engagement with companies across a range of industries to demonstrate both the cost reductions and the environmental benefits of employing Mosaic’s solutions.

This engagement builds upon ExxonMobil’s extensive portfolio – in collaboration with startups, academia and governments – to develop next-generation energy technologies that improve energy efficiency and reduce greenhouse gas emissions. ExxonMobil supports Cyclotron Road, a fellowship for entrepreneurial scientists that is managed in partnership between Lawrence Berkeley National Laboratory and Activate, an independent nonprofit.

ExxonMobil also recently announced a 10-year, up to \$100 million agreement to research and develop advanced lower-emissions

technologies with the U.S. Department of Energy’s National Renewable Energy Laboratory and National Energy Technology Laboratory.

For more than 30 years, ExxonMobil engineers and scientists have researched, developed and applied technologies that could play a role in the widespread deployment of carbon capture and storage. With a working interest in approximately one-fifth of the world’s total carbon capture capacity, ExxonMobil has been able to capture about 7 million tonnes per year of carbon dioxide and has cumulatively captured more of it than any other company since 1970.

## Wave Energy Gets Boost to Pioneer Green Economy

AW-Energy Oy, the world-leading Finnish wave energy technology developer, has taken another major step towards commercializing its WaveRoller® device. The company announced that the United States Patent and Trademark Office (USPTO) has issued an approval for AW-Energy’s patent application covering its WaveRoller® technology.



The patent [PCT/050485] provides AW-Energy with broad IP protection of its latest generation WaveRoller® device including a range of operating improvements made to the device’s system and infrastructure, particularly on failsafe operating improvements to protect against extreme weather conditions.

“This is a significant and exciting decision by the USPTO, and we view this announcement as recognition of AW-Energy’s important contribution to the growing number of renewable energy and sustainable power generation devices that are needed globally to reduce the climate change challenges we face,” said Jussi Åkerberg, CTO of AW-Energy Oy.

AW-Energy anticipates favorable outcomes in other countries as well, since other patent offices worldwide often consider the status of the related USPTO Patent case to be highly relevant to the decision to grant patents. The company already has a strong portfolio of 57

patents awarded, covering a variety of technological aspects and different countries.

The WaveRoller® device is increasingly being favored as a ‘plug-in’ solution to harness the energy which can be extracted from wave power. Certification by DNVGL and Lloyd’s Register, has qualified the technology to mitigate risks and is making the technology bankable for large utility customers in the US as well as across Europe and Asia. Its power unit can easily be adapted to meet customer requirements for different types of grids. WaveRoller® technology also makes it possible to capture energy independently from feeding power to the grid, which then enables customers to tailor the grid support function such as frequency regulation.

In September, the WaveRoller® device is set for deployment in Peniche, Portugal, where many operators and utility companies are watching with interest. It comes at a time when national power grids are being stress-tested and impacted by outages, the most recent experienced in the UK causing chaos and disruption across England and Wales. Other recent power cuts have severely impacted the US in areas such as Wisconsin, Michigan and Texas as well as South America, India and in Australia.

### Vattenfall to Build Hybrid Energy Park with Solar Panels, Wind Turbines and Batteries

Vattenfall is building a new hybrid energy park, consisting of solar panels, wind turbines and batteries at Haringvliet in the Netherlands. The total capacity is 60 MW, enough to deliver renewable energy to 40,000 Dutch households when operational in September 2020. The total investment is EUR 61 million. Through this project, Vattenfall combines wind turbines with solar panels and energy storage.

Gunnar Groebler, Senior Vice President and Head of Business Area Wind, Vattenfall: “Vattenfall wants to enable fossil-free living within one generation and hybrid power plants are an important building block for us in the direction of 100% fossil-free power generation. The complementary wind and solar generation profiles reduce the load on the grid compared to a single generation technology. Hybrid systems provide less pronounced peaks and we see fewer total times without production. This leads to a more efficient use of the network infrastructure. In addition, the costs for grid connection are significantly reduced compared to stand-alone systems. This will reduce the cost of renewable electricity and ultimately benefit customers.”

The first stage of the building work on the energy park involves installing a total of six wind turbines in the north of Goeree-Overflakkee island between Middelharnis and Stadaan't Haringvliet. The power output of the wind farm is expected to be in the region of 22 MW, which is enough to supply green electricity to around 27,000 households. The maximum height of the wind turbines is 150 meters, and preparatory work has now begun.

Once the wind turbines have been installed, the solar farm can then be built, consisting of 124,000 solar panels with a total of 38 MW – enough to supply green electricity to around 12,000 households. The batteries – supplied by BMW and with a capacity of 12 MWh – will be installed in 12 shipping containers on the solar farm. The energy park is expected to be fully operational in September 2020.

### Birmingham Technology could Defend UK against Power Blackouts

Technology developed at the University of Birmingham could protect the UK and other countries from national electricity blackouts. Britain has high-voltage, direct-current (HVDC) transmission links with neighboring countries, including France, Ireland, Holland and Norway – an efficient way of transporting electricity, but vulnerable to alternating-current (AC) faults. Scientists at Birmingham have developed a solution using controllable capacitors that will ensure the system would never have to be shut down – eliminating the risk of power blackouts.

Xiao-Ping Zhang, Professor of Electrical Power Systems and Smart Grid Director of the Birmingham Energy Institute, commented: “The electrical power superhighway is already happening and more HVDC transmission links are in the pipeline. Existing solutions to the problem of AC vulnerability work in some situations, but not in others.

“Our approach is fundamentally different and solves the problem completely. It works whatever the situation, keeping HVDCs operational and bringing the system back to normal very quickly – it will always avoid having to shut down the system.”

Birmingham’s proposed approach involves converting DC power into AC power, which would help to make the system more reliable, as unlike existing line commutated converter (LCC) HVDC technology, the proposed ‘Flexible LCC HVDC’ is not vulnerable to AC faults. The technology was showcased at the recent Purple Mountain International Forum on Smart Grid Protection and Operation

Control, in Nanjing, China. Sponsored by the Chinese Society for Electrical Engineering, the Forum was organized by State Grid Electric Power Research Institute (NARI Group Co., Ltd) and National Key Lab for Smart Grid Protection and Operation Control.

Birmingham experts led by Professor Zhang have published a series of papers on the technology since 2016, which are helping to create significant improvements to LCC HVDC – including higher reliability and flexibility, smaller footprint and lower costs.

Professor Zhang added: “The big challenge we have is that the LCC HVDC system is vulnerable to AC faults. Imagine we had a fault in the UK with the DC links. It would mean neighboring DC links would be affected, and if that happened it could trigger a nation-wide power blackout. The DC system would be shut down.”

### Keppel FELS Tags TMC for Environmentally Friendly Oil Rig

Keppel FELS awarded TMC Compressors of the Seas (TMC) a contract to deliver an advanced energy-saving marine compressed air system to the first mid-water semi-submersible drilling rig the yard is building for Awilco Drilling. TMC has not disclosed the value of the contract, but states that this is a “major contract win for the company.”

TMC’s scope of work is to deliver a complete marine compressed instrument air system that consists of a compressor bank with a combination of both base-load and frequency-controlled TMC Smart Air® instrument air compressors, which reduces energy waste with up to 50 percent compared with other compressors. TMC will also supply associated air dryers and filters. The system will be equipped with peak shaving technology, which reduces power consumption during periods of maximum demand on the on-board power supply. This will reduce energy consumption substantially and keep operational costs to a minimum. Boasting a low environmental footprint, Awilco’s drilling rig is winterized and designed for operations in harsh environments, including the Norwegian Continental Shelf, UK Continental shelf and Barents Sea. According to Keppel FELS, the rig is also equipped with state-of-the-art digitalization, including condition monitoring systems, which will enhance the drilling efficiency and reliability of the rig, while reducing likelihood of downtime. According to Claus Mørch, project director at Awilco, the rig will become the most environmentally friendly drilling rig for harsh conditions.

## Vattenfall Inaugurates Scandinavia's Largest Offshore Wind Farm

HRH Crown Prince of Denmark accompanied by Danish Prime Minister Mette Frederiksen and the Minister of Climate, Energy and Utilities Dan Jørgensen officially opened Denmark's, Scandinavia's and Vattenfall's largest offshore wind farm, Horns Rev 3.

The 49 wind turbines on Horns Rev 25-40 km off Denmark's west coast in the North Sea will increase the Danish power production from wind by around 12 percent; enough to power the yearly consumption in 425,000 Danish households.

The project took less than two years to complete with the first foundation for Horns

Rev 3 placed in the seabed in October 2017 and the first turbines began delivering electricity to consumers on December 23, 2018. During the construction phase, the turbines were shipped from the Port of Esbjerg but from 2024 they will be serviced from the Port of Hvide Sande, where Vattenfall will establish a new service hub.

Vattenfall won the right to construct Horns Rev 3 with a historically low bid in 2015 and has since then continued its effort to deliver investments in renewables while maintaining profitability and low cost.



Source: Vattenfall

In addition to Horns Rev 3, Vattenfall is constructing the offshore wind farms Vesterhav Syd & Nord and Kriegers Flak adding a total of more than 1.4 GW wind energy capacity to the Danish energy system.

## Ireland to Beef-Up Non-Hydro Output

Ireland is expected to attract massive investment as the country is set to add 5.8 GW of non-hydro renewable power capacity over the next decade to reach a total 9.6 GW by 2030 and account for 65% of the country's installed capacity, says GlobalData a leading data and analytics company.

GlobalData's latest report, "Ireland Power Market Outlook to 2030, Update 2019 – Market Trends, Regulations, and Competitive Landscape," reveals that to achieve a 9.6 GW non-hydro renewables capacity by 2030, Ireland will massively increase its investment in offshore wind and solar photovoltaic (PV) capacity.

During the forecast period, offshore wind capacity is set to increase from 25 MW to 1.9 GW at a compound annual growth rate (CAGR) of 48.8%, and solar PV will rise from

25 MW to 1.3 GW at a CAGR of 43%. During the same period, power consumption in Ireland will see a minimal increase, reaching 31.4 TWh in 2030 from 27.9 TWh in 2019 (a marginal 1.1% CAGR).

Arkopal Sil, Power Industry Analyst at GlobalData, comments: "Ireland's offshore wind and solar PV capacity, has considerable potential, which will push the contribution of renewable power to installed capacity to 62% by 2025 and 65% by 2030. This will open up new markets for wind turbines and modules for solar plants, as well as associated equipment required for transmitting generated power to the grid. The market for laying cables under the sea will also be a key business opportunity in the country."

This addition to Ireland's renewable power capacity is being driven by various government

incentives and policies intended to fill the void left by the phasing out of coal in 2025.

Renewable capacity expansion will necessitate grid modernization in order to manage much higher volumes of renewable energy with inherent variability. This, in turn, will involve huge investment in grid infrastructure along with the introduction of energy storage systems to enable a steady supply of power when renewable energy is unavailable.

Sil concludes: "With a minimal increase in power consumption expected, Ireland's gas-based power capacity, which provides the country's base-load power demand, combined with those new renewable resources with integrated energy storage systems are well placed to meet the country's power demands over the next decade."

## ArcelorMittal Exosun Commissions Trackers at Australian Solar Plant

ArcelorMittal Exosun, a leading supplier of advanced solar tracking solutions for ground-mounted photovoltaic plants, has successfully commissioned its trackers on Beryl Solar Plant located in New South Wales (NSW), Australia.

The 110.9 MWp solar plant, built by Downer EDI Limited, a leading provider of integrated services, is equipped with 8,607 Exotrack® HZ structures. Commissioning took place just 12 months after the contract was signed.

ArcelorMittal Exosun LCOE-friendly tracking technology significantly increases the plant's

energy yield and thereby contributes to providing clean and safe electricity to Australian households & public transportation. The majority of renewable

electricity produced by Beryl is being used to meet the operational electricity



Source: ArcelorMittal Exosun

needs of the Sydney Metro Northwest rail link.

## Siemens Takes Two New Contracts to Supply 453 MW to Alfanar

Siemens Gamesa Renewable Energy has secured its first order in India with Alfanar for the supply of 206 units of the SG 2.2-122 wind turbines for two wind farms, for a total of 453 MW. Both projects will be located in Bhuj, Gujarat, where the company will supply 202 MW for one project and 251 MW for the other. The wind farms are expected to be commissioned by 2020.

The SG 2.2-122 is specifically optimized for low wind, low turbulence sites typical of the Indian market, thanks to extremely low power density and high efficiency. This turbine has been crucial to cement Siemens Gamesa's leading position in India having sold over 1 GW in the current fiscal year.

According to GWEC, India is ranked 4<sup>th</sup> in global wind power installed capacity. The onshore potential in the country is promising as it stands at 300 GW of which only 35 GW have been tapped. India's government has established a target of reaching 65 GW of cumulative wind power capacity by 2022.

Siemens Gamesa has operated in India since 2009, and the base installed by the company recently surpassed the 6.2 GW mark. The company has two blade factories in Nellore (Andhra Pradesh), and



Source: Siemens Gamesa

Halol (Gujarat), a nacelle factory in Mamandur (Chennai, Tamil Nadu) and an operations and maintenance center in Red Hills (Chennai, Tamil Nadu).

## VARTA Installs Pulse Neo as part of the European WiseGRID Project

Life on an island can be enticing. All the more so, when alongside beach fun a secure power supply is guaranteed. Until now, that has not always been the case on the small Cyclades island of Kythnos in the Greek Aegean Sea. So, in June 2019, in the context of the European WiseGRID project, five VARTA pulse neo systems from the newest energy storage generation were installed in public buildings to stabilize the island grid.

Kythnos town hall, the community center, a medical center and the offices in two yacht harbors have been equipped. Simultaneously, it is the first ever installation of VARTA energy storage systems in Greece. However, the local project partners initially had reservations due to safety concerns since lithium-ion batteries are not as widespread or as popular everywhere in the EU as they are in Germany or Italy. "The name VARTA and the trusting relationship within the project were ultimately able to persuade those responsible that our systems do not pose a danger," explained Bengt Stahlschmidt, new general manager Energy Storage Systems at VARTA Storage.

Grid frequency and voltage fluctuate on the island within a much bigger range than on the mainland. Therefore, on Kythnos the frequency range to be expected extends from 42.5 to 57.5

hertz. One of the tasks of the storage systems is to reduce these fluctuations. As the first step, VARTA Storage had to configure the five pulse neo energy storage systems for the special requirements of the small island so that it was at all possible to use them there. They were furnished with an additional communication software, which establishes communication to a central control system (StaaS-VPP), which was also implemented in the context of the project by VARTA Storage and other project partners. "Together we have found a configuration with which the storage systems function stably. You could call it an 'island grid configuration with extended frequency tolerance'," stated Stahlschmidt.

The WiseGRID project aims to develop new added-value services and consumer-orientated services for intelligent grids in Europe, to increase the total share of renewable energies in the European energy mix and to accelerate the use of electro mobility in Europe. That is to be demonstrated with four pilot projects in Spain, Italy, Belgium and Greece. The project is financed with funds from the European Union "Horizon 2020" research and innovation program.

To achieve these aims the use of energy storage systems, a higher share of green energy sources

and the provision of a charging infrastructure are necessary. "Above all, software poses one of the biggest challenges in bringing together local generators and storage systems in a virtual power plant. Optimal operation of the local distribution energy storage systems must be guaranteed by intelligent forecast and control algorithms," emphasizes Stahlschmidt.

The storage specialists do not only contribute their expertise in regard to the optimal manner of operation for energy storage systems, but they also take on the coordination of the partners participating in the project. In order to test the developed tools also in realistic conditions, the VARTA energy storage systems are deployed in various regions, such as on Kythnos, and are operated in the context of the VPP.

In the context of WiseGRID, VARTA undertook an installation similar to that on Kythnos in Belgium to stabilize the power distribution grid there. WiseGRID began in 2016 and is considered to be a European flagship initiative in the field of smart grids, renewable energies and electromobility. The project coordinated by GRUPOETRA was developed by 21 partners in Spain, Belgium, France, Italy, Germany, Greece, Romania and the United Kingdom.

## Students Refine Solar-Powered Race Car

In Aachen, Germany a team of students presented the new model of a racing car that runs on solar energy alone. The 45 people from RWTH Aachen University and FH Aachen worked for two years on the refinement of the ultra-light speedster.

The “Covestro Sonnenwagen” will take part in the “World Solar Challenge 2019” scheduled in October in Australia, probably the toughest solar race in the world. On board are numerous innovative materials from Covestro, which is also the main sponsor of the project.

“We are going to go back to Australia with high expectations and want to challenge the leading teams of the world from the USA, the Netherlands and Belgium,” said Markus Eckstein, First Chairman of the Sonnenwagen team. The students are well equipped. Last year, they took third place in the “European Solar Challenge” in Belgium with the predecessor model of their solar car and were voted “Best Newcomer” in Australia for the first time in 2017.



Source: Covestro

The international team of students has succeeded in designing the Sonnenwagen in such a way that it weighs less than 200 kilograms and reaches top speeds of more than 140 kilometers per hour. The new model features high-quality plastics and coatings from Covestro in headlamps, steering wheel, engine and paintwork, among other things.

During the race car test, the World Solar Challenge, teams from all over the world will compete in homemade vehicles to overcome the 3,000 kilometer stretch from Darwin in the north of Australia to Adelaide in the south as the fastest – without a drop of petrol. The race has taken place every two years since 1987 and this year runs from 13 to 20 October.

## IEA & EDF Awarded \$98 Million Nebraska Wind Farm

Infrastructure and Energy Alternatives, Inc.(IEA), a leading infrastructure construction company with specialized energy and heavy civil expertise, announced a new wind energy project award valued at approximately \$98 million.

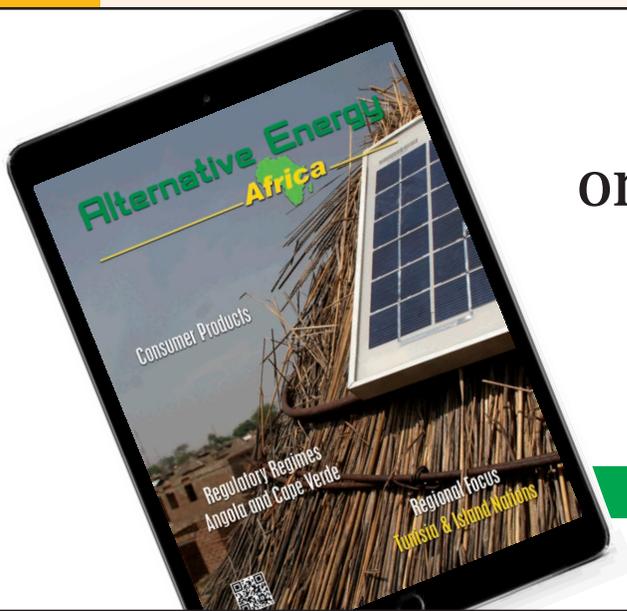
The award is for construction of the Milligan 1 Wind Farm in Saline County in southeast Nebraska. This is a 300-megawatt project that is expected to provide enough energy to power up to 115,000 homes. The power generated by the project’s planned 99 turbines will be delivered into the Southwest Power Pool electrical grid.

The wind farm, which is located near Nebraska’s capital city of Lincoln, will draw upon power generated from a combination of Vestas V110, Siemens 129 and Siemens 145 turbines. Work on the Milligan 1 project is scheduled to begin in September with full operation by November 2020.

EDF Renewables North America is the lead developer on the project. The company delivers grid-scale power: wind (onshore and offshore), solar photovoltaic, and storage projects; distributed solutions: solar, solar+storage, EV charging and energy management; and asset optimization: technical, operational, and

commercial skills to maximize performance of generating projects. EDF Renewables’ North American portfolio consists of 16 GW of developed projects and 10 GW under service contracts. IEA is a leading builder of wind energy projects in the US. The company has assembled more than 7,200 wind turbines across North America.

The scope of IEA’s work on Milligan 1 Wind includes engineering and construction of the turbine foundations, turbine access roads, MV collection system, wind turbine installation and construction of the on-site operations and maintenance building.



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## Import Tariffs Proposed for Solar Panels in South Africa

**O**n March 29, 2019 the International Trade Administration Commission of South Africa published an application proposing the introduction of tariffs on all imported crystalline silicon photovoltaic solar panels.

Inspired by similar policies in the US, the application was lodged by ARTsolar – South Africa’s only 100% locally-owned solar panel manufacturer – which reasoned that a number of photovoltaic module or panel manufacturers had ceased their production operations in the Southern African Customs Union, due to high competition from low-priced imports.

ARTsolar argued that the import tariffs would retain the remaining local production capacity and jobs – enabling the South African solar industry to grow significantly.

### A growing energy crisis

It is clear that radical change is needed in South Africa. Following years of mismanagement and high-level corruption, the major energy crisis in the country has left the grid devastated – with rolling blackouts losing the economy approximately \$284 million dollars every day

To make matters worse, state-owned Eskom – which generates approximately 95% of South Africa’s energy – required an emergency \$355 million bailout to stop a catastrophic debt default when it was already struggling to fix crippling power shortages. According to reports, the ailing power utility has also failed to receive R7 billion in loan payments from the Chinese Development Bank, following fears the cash would be used to plug holes rather than go towards proposed maintenance work.

Eskom’s woes are currently the biggest economic problem facing South Africa – driving the need to explore alternative solutions. But are tariffs the answer?

### Looking to the US

In the past year, the US solar market has grown at a rapid rate and in most places across the country, it is now cheaper to build a new solar farm than to keep an existing coal plant running.

This is partly down to technological advancements, as solar panels have become more effective at generating power. But it is mostly thanks to an economy of scale that solar has become more widely adopted: the cheaper it is, the more people buy – resulting in it becoming even cheaper and purchases increasing.

For solar panel manufacturers in the US who have long grappled with razor-thin profit margins, this growing demand for solar energy

is finally starting to translate into profit. However, it wasn’t an easy ride to get there.

### Policy setbacks

Introduced by the Trump administration in January 2018, the 30% tariffs were intended to boost manufacturing within the US but were met with criticism from industry advocacy groups, who argued that higher costs and uncertainty for the industry would lead to job losses.

As feared, product prices increased and demand declined, resulting in the loss of approximately 18,000 solar jobs by the end of 2018. So, the recent growth – jobs are expected to increase by 7% in 2019 to a total of 259,400 – in the US solar industry is a much-needed turnaround.

### A viable solution for SA?

If passed in South Africa, the import tariffs could see the price of PV modules rise by 10% overnight. But could this really be a viable solution to the country’s energy crisis?

Cost is a major hurdle to overcome. The 10% tariff will, ultimately, be passed down to the customer or installer in the form of increased product prices – which could see demand plummet and profit margins squeezed, particularly for smaller distributors.

But the major problem is government support. In order for this type of tariff to be effective, the policy and regulatory environment must support the growth and supply of the renewables sector. For example, China has seen explosive growth in solar PV power generation due to continually adjusting its solar energy targets upward in line with demand – which increased from 10% in 2012 to 55% in 2017.

Equally, the solar industry comeback in the US is largely down to state initiatives. California’s new solar mandate means all new homes in the state must now be built with solar energy systems already installed, while Hawaii has mandated 100% renewable energy for its electrical grid by 2045. The US also offers tax incentives for renewable energy producers and households powered by renewables.

However, these scenarios seem unlikely in South Africa amid corruption claims. Solar and wind combined make up only 0.1% of the national energy supply, while 70% of the country’s energy is generated by coal; as such, it seems more likely the proposed import tariffs would make it explicitly easier for the state-owned Eskom to keep its monopoly on energy supply in South Africa. [AEA](#)

# New Bio-Based Polymers Coming to Market



Bio-based polymers are gaining increased prominence in the minds of consumers, as increased awareness of climate change and plastic pollution continues to grow. However, the range of bio-based alternatives to the main plastics we encounter in our daily lives continues to limit its potential adoption. Key to accelerating the switch from petrochemical to bio-based plastics is going to be a larger diversity of materials, including commodity polyolefins such as polypropylene and polyethylene. IDTechEx looks at the key manufacturers of bio-based polymers and production methods and capacities in their report, “Bio-based Polymers 2018-2023: A Technology and Market Perspective.”

LyondellBasell, one of the largest plastics, chemicals and refining companies globally, in partnership with Finland-based energy company Neste recently announced a world-first in the bio-based polymer industry, jointly announcing the first parallel production of bio-based polypropylene and bio-based low-density polyethylene at commercial scale.

This venture leverages Neste’s experience in renewable hydrocarbons derived from sustainable biobased raw materials, as well as LyondellBasell’s technical capabilities in large scale chemical production. An initial production run has successfully resulted in the production of several thousand tonnes approved for use in food packaging. The polymer itself is marketed under the brand name Circulen and has been added to LyondellBasell’s circular economy product line.

An independent third party tested the polymer products using carbon tracers and confirmed they contained over 30% renewable content.

“LyondellBasell has an innovative spirit that spans decades, and an achievement like this showcases concrete actions we are taking in support of a circular economy,” said Richard Roudeix, LyondellBasell Senior Vice President of Olefins and Polyolefins for Europe, Asia and International. “Through the use of renewable resources, we are contributing to the fight against climate change and helping our customers achieve their environmental targets.”

“We are excited to enable the plastics industry to introduce more bio-based material into its offering. It is very satisfying to see Neste’s renewable hydrocarbons performing perfectly in a commercial scale

production of bio-based polymers, providing a drop-in replacement option to fossil materials,” said Neste’s President and CEO Peter Vanacker. “This pioneering collaboration with LyondellBasell marks a major milestone in the commercialization of Neste’s renewable polymers and chemicals business focusing on developing renewable and circular solutions for forward-looking sustainable brands.”

In Q3 2018, Neste partnered with Ikea to pilot commercial-scale production of bio-based polypropylene to help Ikea realize its goal of fully substituting the plastics used in its products with recycled or renewable materials by 2030.

In Q3 2018, Neste partnered with Ikea to pilot commercial-scale production of bio-based polypropylene to help Ikea realize its goal of fully substituting the plastics used in its products with recycled or renewable materials by 2030.

To date, technological advancements in biobased polymers have focused on developing either drop in replacements or indirect substitutes of polyesters and polyamides; largely in part a result of metabolites that are currently readily produced by microorganisms. Propene and ethene, the monomers used to create polypropylene and polyethylene, are not common metabolites produced by microorganisms, but can instead be synthesized from sugar cane fermented to produce ethanol. Although few companies have engaged with developing bio-based polyolefins, they are in considerable demand as packaging alternatives for food, drinks and cosmetics. The joint venture between Neste and LyondellBasell places them at the forefront of bio-based polymer innovation, helping to create a more sustainable alternative to petrochemically derived commodity polymers.

With the industrial production of bio-based polypropylene, IDTechEx projects that the market size for bio-based polymers will be 2.7 Mt by 2023. Bio-based polyolefins look set to benefit from a CAGR three to four times as large as their petrochemical equivalents, as consumers increasingly become aware of the benefits of using bio-based alternatives. [AEA](#)

### About IDTechEX

*IDTechEx provides independent market research, business intelligence and events on emerging technology to clients in over 80 countries. Understand the latest trends in Green Technology with IDTechEx and find out more about bio-based polymers with their recent report “Bio-based Polymers 2018-2023: A Technology and Market Perspective.”*

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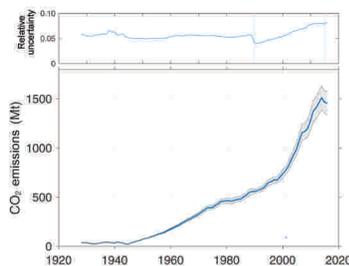
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# Building Clean and Green

*Building clean and green is helping to mitigate the construction industry's impact on climate change.*

It used to be that smart buildings were those that used automated processes to automatically control a building's operations including heating, ventilation, air conditioning, lighting, security and other systems. But in recent years, this has evolved to include green, energy efficient components and now Smart Building, Green Building, Eco-Building and Sustainable Building are increasingly becoming interchangeable.

Buildings made of concrete are one of the main contributors to climate change and the pressure is on for new construction buildings to use resources efficiently and in a sustainable manner to address climate change. After fossil fuels and deforestation/land-use change, concrete is the third-largest source of anthropogenic emissions of carbon dioxide, according to Robbie M. Andrew in his report "Global CO<sub>2</sub> emissions from cement production."



Global process emissions from cement production, with 95% confidence interval. A step change in uncertainty occurs in 1990, reflecting a significant change in data availability.

Andrew's report goes on to say, "Global cement production has increased more than 30-fold since 1950 and almost 4-fold since 1990 (see figure to left), with much more rapid growth than global fossil energy production in the last two decades."

Great strides are being taken to reduce the footprint left on the environment by new construction. Increasingly, architects and builders alike are incorporating energy-saving designs and materials into new projects. As a result, smart building materials have become a multi-billion-dollar opportunity for manufacturers. According to Carbon Cure, a US-based company that looks to turn waste carbon dioxide into concrete, "in 2005, only 2% of commercial construction was green. Since then, the demand for green building products has doubled every three years."

Globally, similar efforts in building sustainably are being made. South Africa is inarguably the most advanced country in the Build Green effort out of Africa. Toward this goal, the Green Building Council South Africa (GBC SA) was established in 2007 to lead the transformation of the South African property industry to ensure that buildings are designed, built and operated in an environmentally

sustainable way. According to GBC SA, key measures to incorporate in new building construction include:

- Careful building design to reduce heat loads, maximizing natural light and promoting the circulation of fresh air;
- Energy-efficient air conditioning and lighting;
- Using environmentally friendly, non-toxic materials;
- Reducing waste and using recycled materials;
- Water-efficient plumbing fittings and water harvesting; and
- Using renewable energy sources.

While many domestic builders and organizations have taken the initiative to go green and sustainable, the South African government came on board in 2011, enacting new legislation requiring more sustainable building practices. The law called for all new buildings to use solar water heaters, heat pumps or similar technologies, while ceilings, walls and windows became required to meet minimum requirements in insulation, to minimize heating in winter and cooling in summer. Buildings must also be fitted with energy-efficient heating, air conditioning and mechanical ventilation systems.

South Africa has come a long way since the GBC SA was established and the government mandated more sustainable building practices in 2011. In every major city you can now find green-star rated new construction, from residential complexes to industrial parks.

Woolworths became the first retail outlet in the country to receive a 5-star rating from the GBC SA for its sustainable Palmyra Junction facility in Cape Town, its flagship green store. Woolworths says: "We have developed our own rating model for stores based on the number of sustainability features they include. This allows new and existing stores to be classified as silver, gold or platinum level stores, with platinum level being the highest category for stores with the most sustainability features. Our Palmyra Junction store in Cape Town is our flagship green store. It brings together our plans to save energy, conserve water and manage waste better. We have also had Palmyra independently verified by the GBC SA, achieving a 5-star rating using the existing building tenant tool."

In November 2017 the 78 Corlett Drive project was awarded a 6-Star Green Star SA Office Design Rating as well as a Net Zero Carbon Pilot Rating from the GBC SA. Developed by Legaro Properties, the three-story project is situated on a brownfield site and is well connected to local amenities and existing public transport

Source: Solid Green



Portland cement was targeted as an average across all concrete mixes, together with a 60% recycled content of all steel by mass on the project and 50% (by cost) of all timber products used in the building and construction works were specified to be Forest Stewardship Council (FSC) Certified Timber, reused or recycled timber. More project details on this 6 Green Star project can be found on the Solid Green website – [www.solidgreen.co.za](http://www.solidgreen.co.za).

### Not Just South Africa

While South Africa is miles ahead of its continental counterparts in the sustainable building realm, with global

and infrastructure. The building design showed an improvement of 100% (net zero operating emissions base building) over a SANS 10400 notional building. All enclosed spaces are individually switched, making it easy to light only occupied areas; and hot water will be provided efficiently with small, high-performance electric under-counter geysers installed in each bathroom, which alleviate the need for long runs of insulated hot water pipes. Geysers electric requirements will be supplemented by the PV array on the roof.

organizations promoting sustainable building practices, efforts to transfer technologies and build capacities for these newcomers are underway. This can be seen with the World Green Building Council’s mentorship to African nations. As a result, numerous nations have formed their own Green Building Councils or equivalencies – Egypt, Ghana, and Morocco, for example – while Nigeria, Africa’s most populous nation, officially launched its first Building Energy Efficiency Code (BEEC) in 2017. That said, most have yet to make an impact, but it is a start.

A project specific Waste Management Plan was developed to minimize the contribution of waste going to landfill during construction and operations. A 40% reduction of the quantity of

Thus far, Morocco, heavily dependent on energy imports, has made the most progress in its sustainable building quest. In March 2016

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# Monthly Focus

## HQE™ Certification Basics

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- *High-quality and sustainable local developments.*

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It adds value to certified projects thanks to:

- *Technical schemes that cover all categories of non-residential buildings (logistics, retail outlets, hotels, etc.).*
- *The ability to issue certificates worldwide by combining generic criteria, specific criteria, and common indicators, thereby allowing all assets to be compared.*
- *Full third-party certification, which is the most reliable way to ensure that the high-quality nature of a project is recognized.*

Source: Cerway

the Morocco Green Building Council launched its Green Academy in partnership with Cerway. In 2017, LafargeHocim Morocco, a leading manufacturer of construction materials in Morocco, inaugurated the Smart Construction Lab. A multidisciplinary team of 50 engineers, architects and construction technicians will work to develop future sustainable products, solutions and construction systems. The Smart Construction Lab received an HQE™ certification during an inauguration ceremony held by Cerway, the operator of the certificate. HQE is a standard for green building that is based on the principles of sustainable development.

Cerway has HQE-certified dozens of projects across North Africa, mostly in Morocco, but also in Algeria and Tunisia. It has also certified a few projects in sub-Saharan Africa, including projects in the Democratic Republic of Congo (DRC), Republic of Congo (ROC) and Gabon.

Out of North Africa, Algeria boasts the continent's first HQ building on the continent. The Algerian head office of BNP Paribas, located in the Bab Ezzouar business district of east Algiers, was completed in September 2015. BNP Paribas El Djazair was the first building in Africa to be awarded certification under the HQE green building standard.



Source: BeHQE

The business sector is picking up the green gauntlet in some of the most environmentally sensitive regions around the continent. The Mon Trésor Business Gateway, the first Green Star certified project in Mauritius, achieved a 4-Star Green Star SA Office Design v1.1 certification in July 2018. Located in the forward-looking southern part of Mauritius, Mon Trésor is a smart, sustainable coastal town reconciling urban intelligence with nature, and technological innovation with eco-responsibility. It comprises both residential and commercial property developments that are accessible, connected, healthy and safe.



Source: Montresor

Mon Trésor is the only development in the southern hemisphere to be awarded a BREEAM certification – the world's leading design method and acknowledged international assessor for a Sustainable Built Environment – it ensures best practices across all stages and life cycles of buildings and infrastructures.

From the tourism front, Egypt features the El Mandara Sustainable Eco-Lodge located along Lake Qarun in the Fayoum Oasis, southwest of Cairo. Adjacent to the resort are famous ancient sites such as the Hawara archaeological site and Wadi Rayan (the largest waterfalls in Egypt). El Mandara, a pre-existing structure, was totally renovated using environmental building materials, such as mud bricks and palm fronds for coverage, while avoiding the use of industrial concrete.

The above discussion only scrapes the surface of the new emergence of smart, green, eco-friendly building efforts across the continent. While less developed nations tend to lag behind in implementing new technologies, Africa is taking this effort seriously as it stands to significantly suffer from the effects of climate change. With less than 11 years left to prevent irreversible damage from climate change, expect to see a significant increase in sustainable projects out of the continent. Many African nations are looking to do their share in the sustainability effort while protecting themselves from the potential devastating outcomes a warming climate can have on their countries and people. **AEA**

# Africa Spotlight



**President:** Matamela Cyril Ramphosa (since February 2018)  
**Independence:** May 1910 (UK)  
**Population:** 57.73 million (2018)  
**Real GDP Growth Rate:** -0.7% (Sept. 2018 est.)  
**Per Capita GDP:** \$13,661 (2018 est.)  
**Debt – external:** \$176 billion (Q1 2019 est.)  
**Industrial Production Growth Rate:** 0.5% (2017 est.)  
**Minister of Mineral Energy Resources:** Gwede Mantashe (since February 2018)  
**Electrification rate:** 93% urban and 66% rural, combined 86% (2018 est.)  
**Electricity – installed generation capacity:** 51.309 GW (2018 est.)



Cyril Ramaphosa

Source: IASIM News Agency

Source: Stats SA, World Bank, Trading Economics, Ministry of Energy South Africa, Climatescope

# South Africa

## Politics and Economy

South Africa was one of the continent's first colonized nations to 'officially' receive its independence from the yoke of colonialism. Unfortunately, this did not mean native South Africans were totally free and the transition to a truly free nation took decades to achieve. To say the country experienced racial strife from the outset of independence would be putting it mildly.

Europeans began migrating in the mid-1600s. Racial conflict between the white minority and the black majority led to apartheid being instituted in 1948 by the National Party and an enactment of apartheid laws made racial discrimination the main institution in the country. This gave birth to some of Africa's most known activists of the 20<sup>th</sup> century like Bishop Desmond Tutu and Nelson Mandela. It was these men, and many others, who led a bitter struggle to end apartheid. The apartheid laws began to be repealed or abolished in 1990, bringing about the inauguration of Nelson Mandela as South Africa's first black president in 1994. Today the country's politics are dominated by the African National Congress (ANC). Mandela was followed by fellow ANC party member Thabo Mbeki as president. Mbeki was one of the executive faces of the South African government from 1994 with his two terms as president lasting from 1999 to 2008.

Mbeki was followed by his former vice president Jacob Zuma who succeeded him in the presidential office, despite charges of corruption against him and his administration, as well as his personal life

making the news on a regular basis. In August 2017 the South African president narrowly survived his sixth vote of no confidence from the country's parliament, although his luck eventually ran out. In February 2018 Zuma finally resigned after defying orders from the ANC to leave office on the eve of another no-confidence vote in parliament. Cyril Ramaphosa was elected by parliament as the next president and remains in office today.

Ramaphosa's road so far has not been an easy one as he inherited a struggling economy, a divided party, and endemic corruption. The May 2019 general elections gave the ANC and Ramaphosa additional time to tackle corruption and boost South Africa's economy. As long as the public does not become disillusioned as they were with his predecessor, Ramaphosa does have the opportunity to make a difference. The high unemployment rate is at the top of the agenda along with reforming the ANC as voters have become increasingly disenchanted with the status quo, as voter turn-out has shown in recent elections.

President Ramaphosa has put in place a number of stimulus measures including an extension of the employee tax incentive through 2029, an allocation of R600 million to support rural entrepreneurs, and another R600 million allocated to the clothing and textile sectors. He also has cited changes made to visa regulations for tourists and highly skilled professionals, and the creation of industrial parks as evidence of his government's efforts to secure economic growth and deal with unemployment.

# Africa Spotlight

## Renewable Energy Sector

Despite the challenges South Africa faces, it does have one of the most developed renewable energy sectors on the continent and boasts numerous wind and solar farms online and supplying the grid. According to a November 2018 update by USAID's Power Africa initiative, South Africa currently has 51,309 MW of installed capacity and 5,568 MW in the project pipeline. Projects under the Power Africa initiative are responsible for 138,891 new grid connections to date.

Over 2018, the government signed 27 new renewable energy projects under the Renewable Energy Independent Power Producer Procurement Program (REIPPP), representing 2,130 MW of generation capacity. Power Africa supports the REIPPP through its Southern Africa Energy Program. The USAID-funded Southern African Energy Program is a five-year project that is designed to increase the supply of, and access to electricity in Southern Africa.

According to Power Africa, the biggest challenges to bringing more power online in the country are macroeconomic forces, an outdated integrated resource plan (IRP) and local content requirements. The Ministry of Energy is working on an updated IRP which will determine the energy mix needed to address demand to 2050. The Portfolio Committee on Energy invited interested individuals and stakeholders to submit written comments for up to a period of two months on the Draft IRP. Power Africa said the new IRP focuses on increases in photovoltaic solar panels while reducing coal-fired generation and no new civil nuclear power plants.

Under the IRP 2018, non-hydro renewables including biopower, are expected to contribute approximately 30% of the country's installed capacity and around 20% of its annual power generation by 2030, while scrapping an earlier proposal to increase installed nuclear capacity, and moving away from coal-based power plants which will see end of life functionality by 2040, according to GlobalData's report, "South Africa Power Market Outlook to 2030, Update 2018 – Market Trends, Regulations, and Competitive Landscape."

## Funding

There are a number of governmental and institutional investors in South Africa's energy industry, too many to name, but over the past year or so there were a number of notable developments. This April, the New Development Bank (NDB) signed a \$300 million loan agreement with the Development Bank of Southern Africa (DBSA) for the Energy Sector Development and Greenhouse Gas Emissions Reduction Project in South Africa. The NDB will provide this amount to DBSA without the need for a sovereign guarantee. This amount is the first part of a two-tranche loan that will be used to finance sub-projects identified by the DBSA in the wind, solar and biomass sectors in particular. These projects will be implemented in South Africa and will contribute to increasing the sustainability of the electricity sector through structural transformation utilizing renewable energies. The main goal of the project is to facilitate investments in this type of energy by unlocking private financing

for them, and by increasing the availability of long-term funds for the country's energy projects.

It was announced in August 2018 that African Infrastructure Investment Managers (AIIM) acquired through its IDEAS Managed Fund, stakes in nine new solar and wind power plants in South Africa. When all nine power facilities are fully operational, expected at the end of 2020, they will provide an additional 800 MW of renewable energy capacity into South Africa's national power grid. This additional clean power capacity has been added under Round 4 of REIPPP, which is committed to securing 2,300 MW of new renewable electricity for South Africa's national grid over the next five years.

AIIM's IDEAS Managed Fund, which is one of South Africa's largest domestic infrastructure equity funds, has acquired a 50.01% equity stake in each of the following: Bokamoso 67.9 MW; Waterloo 75 MW; Droogfontein II 75 MW; Zeerust 75 MW; Greefspan II 55 MW; and De Wildt 50 MW. The Fund has also acquired stakes in three wind farm projects: Roggeveld 147 MW; Perdekraal 110 MW; and Kangnas 140 MW.

Vantage GreenX Fund Managers, through its second renewable energy fund, Vantage GreenX Note II, has provided R2.05 billion of funding to a combination of six solar and wind energy projects with a combined capacity of 433 MW. All the projects form part of Round 4 of the REIPP procurement program. The GreenX funding was provided to four projects developed by BioTherm Energy and two projects developed by OMLACSA and ACED. All six projects reached financial close in the last two weeks of July 2018.

GreenX Note II is Vantage GreenX's second generation renewable energy debt fund. The R3 billion fund has a mandate to provide Consumer Price Indexed (CPI) linked senior debt to sustainable projects that form part of the REIPP, Small Projects Independent Power Producers, Co-Gen and Gas procurement programs run by the South African Department of Energy. CPI-linked debt, although not new to the local market, has for the first time provided a significant portion of the total senior funding to projects in this round.

The R2.1 billion GreenX Note I is fully invested across eight solar and wind projects located in the South African provinces of the Eastern Cape, Northern Cape and Limpopo. The completion of the six GreenX Note II transactions takes the total number of investments made by the fund to 14 across the two funds.

Marubeni issued notices of expressions of interest to energy developers in South Africa this past July, wanting to participate in the next phase of the national renewable energy program. The first call for expressions of interest concerns companies with solar or wind power plant projects, with a capacity between 1 and 200 MW, whose sites have already been determined, but not yet acquired. The company hopes to be able to partner to co-develop a project.

## Project Updates

### Wind

A number of projects from the Round 4 REIPPP saw action over the past year either with the start of construction or with the start of operations. One of the highlights from South Africa's wind industry over the past year came in November with the \$205 million Perdekraal East Wind Farm coming partially online and feeding into the country's electrical distribution network. The 110-MW wind farm project is made up of 48 wind turbines, spanning 3,055 hectares.



Source: perdekraaleastwind.co.za

*Perdekraal East Wind Farm construction*

When fully online, the Perdekraal East Wind Farm will generate enough clean electricity to power up to 95,000 South African homes. In addition to zero carbon emissions and reduced use of fossil fuels, the country will benefit from almost zero water consumption that is required during the generation process of the wind farm. The project will supply the full 110 MW of power to the national grid by late-2020. Independent utility-scale wind and solar power plant developer Mainstream Asset Management will manage operations at the wind facility.

Enel Green Power RSA (EGP) was awarded five wind farms for a capacity of around 700 MW. Three of these wind farms, totaling 420 MW, began construction this year, starting with the 140-MW Nxuba wind farm in the Eastern Cape province in February. The construction of Nxuba, which is expected to be completed by September 2020, will involve an overall investment of more than €200 million.

Once fully up and running, Nxuba is expected to generate over 460 GWh per annum, avoiding the emission of around 500,000 tons of CO<sub>2</sub> into the atmosphere each year. EGP RSA will employ innovative tools and practices to build Nxuba such as advanced digital platforms and software solutions to monitor and remotely support site activities and plant commissioning, digital tools to perform quality controls on site and smart tracking of wind turbine components.

In May Enel got started on the Oyster Bay wind farm, with a capacity of around 140 MW, located in the Eastern Cape province. The Oyster will see an Enel investment of about €180 million and is expected to be fully online in Q2 2021. The 41-turbine Oyster Bay is expected to generate around 568 GWh per year, avoiding the annual emission of around 590,000 tons of CO<sub>2</sub> into the atmosphere.

EGP also began construction on another 140-MW wind farm – the Garob – in the Northern Cape province. Garob, EGP's fifth wind project in the country, will involve an investment of over €200 million. The 46-turbine Garob wind farm facility is due online by H1 2021 and is expected to generate around 573 GWh per year, avoiding the annual emission of around 600,000 tons of CO<sub>2</sub> into the atmosphere.

The Garob wind farm, which is the group's first wind project under construction in the Northern Cape province, is situated in an area fast becoming a renewable energy hub in South Africa due to the growing number of both solar and wind farms in the region. Concrete towers will be built on-site at Garob, instead of pre-fabricated steel towers, improving local employment rates during the construction phase.

The remaining two EGP wind farms – Soetwater and Karusa – are to be located in the Northern Province and are expected to start construction later this year, with operations scheduled for H2 2021. Vestas Wind Systems, under contract to EGP, will install these wind farms with a combined capacity of 294 MW. All 70 turbines are expected to be delivered and installed by H2 2020.

The EGP group's operational South African wind farms are the 88 MW Nojoli and the 111 MW Gibson Bay, both in the Eastern Cape.

In July 2018, BioTherm Energy (later acquired by Actis) reached financial close on a 284-MW portfolio of wind and solar projects in South Africa as part of the Fourth Round of the South Africa's REIPPP. The four projects are estimated to be fully operational by 2020.

BioTherm's pipeline of projects includes the 120 MW wind farm at Golden Valley. The project is expected to begin commercial operations by Q4 2020. Another wind project, the Excelsior wind farm will produce 32 MW of energy and is expected to begin operation in 2019. The EPC for these two wind farm projects was provided by Goldwind.

The total cost for the portfolio of projects is approximately \$500 million. All four projects have 20-year inflation linked power purchase agreements (PPAs) with Eskom, the South African national utility, and are backed by sovereign guarantees provided by the National Treasury.

### Solar

South Africa saw its first floating PV project completed and online this past March. The floating PV farm was undertaken by New Southern Energy, with the installation operating at a dam next to a fruit farm just outside of Franschoek in the country's Western Cape province.

The floating PV project has a generation capacity of 60kW and will help produce clean energy to the farm, while also minimizing evaporation from the farm's dam and saving valuable agricultural land.

# Africa Spotlight



*Marlenique floating solar*

The first phase of the installation, which also included the land-based solar installation on the Marlenique farm, will allow the facility to run 90% of its energy intensive cold storage, irrigation and wedding venue facilities off of the traditional electrical grid. A second phase, which features energy storage assets, will remove the farm from the electrical grid entirely.

Enel Green Power is also active in the South African solar sector. EGP already has more than 520 MW in wind and solar plants in operation in South Africa. The company's fully operational solar plants are the 10 MW Upington and the 82.5 MW Adams in the Northern Cape province, the 82.5 MW Pulida in the Free State province, the 66 MW Tom Burke in Limpopo, and the 82.5 MW Paleishuwel in the Western Cape.



*Enel goes big in African solar*

In addition to its wind projects, BioTherm Energy is taking on the Konkoonsies II solar PV farm. The project will produce 86 MW of power and is expected to achieve commercial operations in Q1 2020. The second solar project is the Aggeneyns, which will provide the country with 46 MW of solar power. The project is expected to be up and running by Q3 2020. The EPC for both the solar projects was provided by ET Solutions AG.

## Manufacturing and Local Impacts

Another very beneficial aspect of implementing a renewable energy program seen in South Africa is with a number of manufacturing and service companies emerging, spurring job growth and stimulating the economies. In addition, emphasis by many developers has been put on of the betterment of the lives of the people within the communities in which they work, resulting in a number of social programs.

According to former Minister of Energy Jeff Radebe in 2018, "Renewable IPPs have created already 38,701 job years for youth, women and citizens from the surrounding communities ... local

communities have already benefited from over R1 billion spent by IPPs on education such as upskilling of teachers, extra teachers and classrooms, and 600 bursaries to students from disadvantaged communities, the provision of health facilities and medical staff, social welfare such as feeding schemes, support to old age homes and early childhood development and support to and establishment of more than a 1,000 small enterprises."

"Black South African equity shareholding in the REIPP program has progressively increased with each bidding round. The South African equity shareholding across Bid Window 1 to Bid Window 4 and Smalls Bid Windows 1 and 2 equates to 52% (R31.4 billion) of total equity (R60.9 billion), which is substantially more than the 40% requirement."

One such company making a long-term investment in the country is Chinese solar PV manufacturer Seraphim who inaugurated a \$14 million, 300-MW solar PV module manufacturing facility in South Africa in August 2018. Plans are in place to ramp this up to 1.5 GW over the next three years and add 300 MW of cell production. Seraphim brought the project to fruition in conjunction with ILB Helios Southern Africa and the Industrial Development Corp. (IDC) of South Africa. Both standard framed, dual-glass and bifacial modules are manufactured at the facility, both with mono- and poly-crystalline. To date, the project has seen over 100 direct jobs created.

In February it was announced that the Spanish manufacturer of GPTech inverters will implement a production line in South Africa. The new assembly plant will be managed by RWW Engineering, a designer and local manufacturer of electrical equipment. GPTech claims a backlog of more than 400 MW including 200 MW from the South African energy market. With the implementation of this production line, it plans to expand its market share in the countries of sub-Saharan Africa.

While hydropower has not been discussed in the context of new projects in South Africa in this article, the country does have hydropower contributing to its energy mix, and many of its regional neighbors are very reliant on the resource. As such, Voith recently strengthened its hydropower service portfolio for Southern Africa with the introduction of its on-site machining and service tools capabilities in Witfield, Boksburg. The new services include the refurbishment of plant components in installed or independent state by linear and circular milling as well as drilling, boring and welding. The portable on-site machining equipment ensures increased plant up-time and safety. Cutting assembly, dismantling and transport costs for the refurbishment and maintenance of plant equipment are reduced to a minimum. The on-site machining equipment is stored in sea freight containers on the Voith company premises in South Africa. From there, the equipment is ready to be shipped on the road or on the seaway to any location in Southern Africa.

Enel Green Power will launch Enterprise Development initiatives in the communities living in the proximity of the Garob wind farm



Source: Voith

*Line Boring Application*

once operational. One such initiative is the Herbal Lean Incubation Program, which provides mentoring and support services to start-ups in the agro, bio and food technology field. In addition, the company has committed to ensure job creation in the community surrounding Oyster Bay, while also prioritizing education, a key

driver of socio-economic development, by supplying schools with clean energy through mini-PV systems, awarding scholarships in Science, Technology, Engineering, and Mathematics (STEM) subjects to local students and supporting school feeding programs in the Kouga municipality. Enel promotes STEM in the community, also by supporting the employment of three fulltime teachers.

Sustainability projects that Enel Green Power implemented in the Northern Cape include the installation of an artificial turf football field that captures and stores rainwater. A water purification facility is used to clean the rainwater, addressing water shortages and providing clean drinking water. Other initiatives include free Wi-Fi to local communities, in an effort to support public authorities' plans to roll out free Wi-Fi networks in under-served communities.

Biotherm, in addition to the local jobs that will be created during construction offering employment prospects for the surrounding communities, has committed a percent of revenues towards economic development and socio-economic development initiatives in education, rural development, the empowerment of women, healthcare and enterprise development for each of its projects.

AiIM, through its IDEAS' position as the lead sponsor of wind and solar projects in the country, facilitated social and economic benefits which include 100% SA ownership, 50% direct black ownership, greater than 65% black ownership including indirect black ownership, and 40% black participation EPC contracts, and the transition to majority black-owned operations and maintenance contractors. [AEA](#)

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## SolarEdge Co-Chairman and Founder Guy Sella has Died

SolarEdge Technologies, Inc. issued a statement in late August, announcing the untimely death of Mr. Guy Sella, co-chairman and founder.



Source: SolarEdge  
*Mr. Guy Sella*

“It is with a very heavy and sad heart that we notify of the passing of our dear friend and inspiration, Guy Sella. All of us who had the privilege to work with Guy and be witness to his unwavering drive and infinite levels of energy and passion for what he did know what a huge loss this is, not only to SolarEdge. Guy has left an incredible legacy and his spirit will live on forever in SolarEdge. The entire SolarEdge family mourns his loss. On behalf of our Board of Directors, management team and employees, we extend our deepest sympathies to Guy’s family,” the statement read.

## PowerGen Picks-Up Rafiki from E.ON

PowerGen Renewable Energy, a developer, builder, and operator of micro-utilities in Africa, announced that it has closed the acquisition of Rafiki Power from E.ON Off-Grid Solutions. The acquisition combines two leading micro-grid companies in Africa and will help build momentum for private utilities on the continent.

The acquisition will combine two leading players in the sector, and provide PowerGen with micro-grid assets, project pipeline, software IP, and human resources from E.ON Off-Grid Solutions. PowerGen now has over 10,000 utility customers under management, serving over 50,000 people with clean and reliable energy across several African countries.

Aaron Cheng, President of PowerGen, commented: “PowerGen and E.ON Off-Grid Solutions have shared a common vision for a long time: to transform lives by building the energy system of the future in Africa. We are excited to combine our experience, knowledge, resources, and cultures in order to further our progress towards this shared vision. We greatly admire the E.ON Off-Grid Solutions team and are thrilled to be working closely with them as we build the smart, clean energy system of the future in Africa through micro-grids.”

PowerGen and E.ON Off-Grid Solutions are pioneers in the new sector of private utilities who bring efficiency, technology, and customer service to un-electrified Africans through clean, modern micro-utilities. These micro-utilities

offer high quality alternating current electricity to towns and villages in order to reduce poverty and enable economic development, while building the clean energy system of the future in Africa from the grid edge inwards.

## Perdekraal East Wind Farm Keen on Gender Equality

Gender equality in the construction and energy sectors is an important component of South Africa’s energy transformation agenda. Perdekraal East Wind Farm, one of the Western Cape’s largest wind farms currently under construction, supports this agenda, with women taking up a number of key roles in the team, the company said in a recent news release.



Source: Perdekraal  
36-year-old Kgalalelo Olivia Maduna, from Mahikeng in North West Province is a qualified Civil Engineer, who started working in construction in 2007. She is now the Quality Control Inspector at Perdekraal East Wind Farm’s construction project site, enjoying the thrill of being part of a clean energy generation project and working to help transition the country to renewable power.

Addressing gender equality and her experience of working in male dominated teams, she says, “I have never felt threatened or disregarded and believe gender synergy is a strength that should be harnessed in the industry.” She added, “Men and women in construction are like two hands that need each other, there are some things the right hand can’t do alone without the help of the left hand.”

Assistant Project Manager Aniqah Misbach, also encourages women to seriously consider construction and especially the renewable energy industry as a career option, as it offers remarkable opportunities. “Don’t assume that this is only a career option for men; it allows opportunities to travel the country and across our border, as the technology is the same the world over, plus the renewable energy industry is growing at a fast pace due to countries transitioning away from coal to cleaner wind and solar options,” said Misbach.

Other members of the team include Environmental Site Officer, Chandré Kok;

Economic Development Manager, Jo-Anne Brown; and Leona Smith, the Construction Safety Practitioner.

“Engineering and construction is a broad field, with many career opportunities for young girls, although it is not always an easy road when you are a mother or a wife because of the travel requirements,” concluded Maduna.

The 110-MW Perdekraal East Wind Farm spans 3,055 hectares and will generate enough clean electricity to power up to 95,000 South African homes. In addition to zero carbon emissions and reduced use of fossil fuels, the country will benefit from almost zero water consumption that is required during the generation process of the wind farm.

## Ghana: REDAVIA in Partnership with Lendahand

REDAVIA launched a crowd funding initiative to fund 10 upcoming solar units in partnership with Lendahand. To date, REDAVIA has installed 21 solar units and contracted 25 further solar units at diverse businesses in Ghana.

With a €500,000 first funding tranche from Lendahand’s crowd funding platform, REDAVIA will pre-finance, procure, import, and install 10 more solar Units of 84 kWp each at commercial and industrial customer sites in Ghana, impacting a total of 15,000 employees and other stakeholders.

This is the first of up to 10 tranches that REDAVIA intends to raise on the Lendahand platform, totaling €5,000,000 over the coming years.

“Anytime there’s a chance to contribute to true innovation in the solar sector in Africa, we get excited by the opportunity to enable our crowd to be a part of it,” stated Tobias Grinwis, Head of Investments at Lendahand. “The opportunity to support the pioneering work REDAVIA is doing to support businesses, create jobs and improve people’s lives through their solar farms is something we’re incredibly proud to be a part of.”

“Access to affordable and clean energy in the commercial and industrial sector is paramount to the sustainable development of a country,” stated Erwin Spolders, CEO and Founder of REDAVIA. “As REDAVIA continues to grow, we are excited to see support from crowd funders who want to promote the social and environmental benefits of our work.”

### Fronius to Open the “24 Hours of Sun ACADEMY”

Fronius International GmbH will be opening the new training center in September at the company’s headquarters in Wels (Upper Austria). Small groups of learners, content tailored to individual requirements, communicated by passionate experts, personal support and buildings kitted out with the latest technology – this is some of what awaits attendees at the “24 hours of sun ACADEMY.”



Source: Fronius

“We have a clear goal,” explains the Global Director Solar Energy, Martin Hackl. “We want to give installers the very best support and equip them so they can expertly support their customers in their personal energy revolution.” To achieve this goal, in September Fronius International GmbH will be opening a new training center at its headquarters in Wels. A team of experienced PV experts at the “24 hours of sun ACADEMY” will cover key topics based on real-life examples and share specialist know-how relating to renewable energy solutions for homes and commercial applications. Participants will be taught practical aspects covering configuration, planning, commissioning and maintenance for all fields in energy sector integration, including photovoltaics, storage systems heating/cooling and e-mobility as well as monitoring and analysis. Qualification training will also be held for Fronius System Partners. Training modules are specifically tailored to the requirements and wishes of the customer.

The center is equipped for every challenge. “The energy revolution means new and complex areas are increasingly opening up

such as e-mobility, battery and heat storage technologies plus the interconnection of sectors that demand a high degree of new know-how,” explains Head of Training & Education at Fronius Solar Energy Volker Haider. “We help installers to get equipped for the challenges of today and tomorrow.” The latest teaching and learning methods will be applied in the ‘24 hours of sun ACADEMY’, including a mix of presentations, workshops and practical exercise units, that are precisely tailored to the requirements and wishes of the group. The participants will work on real devices and practice situations they will be confronted with in real life. “These methods will help us to effectively communicate the key information,” continues Haider. The concept is supplemented by an extensive portfolio of webinars, e-learning courses and training videos that trainees can follow online.

### GABF Launches Funding Commitment for Africa Focus Startups

The Germany Africa Business Forum e.V. (GABF), in collaboration with private partners from the energy industry, launched a multi-million Euro funding commitment to invest in German energy startups that focus on Africa. The funding commitment, which pledges funds to German startups with exposure to African energy projects, will be the first such intra-regional initiative.

Anchored in the private sector, the GABF brings together Africa’s foremost executives with German companies, investors and innovators with the aim of driving change. Founded in 2017 as a “private for privates”, the GABF encourages German investors to consider the African continent as a profitable and important investment destination. Through a series of initiatives, the GABF draws together African business and political leaders with Germany’s preeminent innovators to develop fresh investment concepts that shape German and African business ties, as well as economic thought.

“Our initial goal is to support the investment in German companies and to start with funding allocations by the end of this year,” said Sebastian Wagner, co-founder of the GABF. “Through our partners, we will immediately get involved in investing in solutions-driven German startups with pragmatic business models to solve Africa’s energy challenges through the provision of German technology and innovation,” he added.

“The future of Africa’s energy industry will depend on technology and innovation. When German start-ups and Africans work together, we can build something unique for both our peoples. I applaud the GABF for this well-thought-out initiative. I believe it is in line with the goals of the *G20 Compact with Africa*, driven by Germany,” stated NJ Ayuk, a pan-African energy dealmaker, CEO of Centurion Law Group and Executive Chairman of the African Energy Chamber, a supporter of the initiative.

### SOLA Secures R400M to Finance PV Projects

The SOLA Group has secured R400m in order to build commercial and industrial solar PV facilities across Southern Africa. The renewable energy fund, Orionis, will enable 40 MW of solar PV projects to be built without capital expenditure by the electricity off-takers.

The deal is a result of a partnership between the SOLA Group, African Infrastructure Investment Managers (AIIM), and Nedbank Energy Finance, who have partnered to provide affordable solar PV solutions for businesses that are in dire need of electricity security.

Chris Haw, chairperson of the SOLA Group, believes that the clean energy solutions created by the fund are timeless. “This partnership brings together three highly experienced entities whose combined skills offer consumers clean energy solutions at a time when our country desperately needs it,” he said.

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## Tunisia's President Dies, Chahed to make Presidential Bid

Tunisian President Beji Caid Essebsi passed away at age 92 in a military hospital on July 25. Essebsi had previously been hospitalized in late June for a "severe health crisis." The next day, a presidential adviser said that his condition was improving.



Source: UN Photo/Cia Pak

Reports also had it that he phoned the prime minister to discuss the bombings that took place the previous day. Less than a month later, on July 24 he was readmitted to the

hospital and subsequently died from his illness. Essebsi was buried at a state funeral on July 27.

President Essebsi was the country's first freely elected president following its 2011 pro-democracy uprising that started the Arab Spring. Essebsi had announced before his death that he would not seek re-election in the upcoming November polls, saying a younger person should lead the country.

Following Essebsi's death, the speaker of parliament, Mohamed Ennaceur, was sworn in as interim president to lead the country to a new election. Tunisia's liberal prime minister, Youssef Chahed will be a candidate for president in the country's next election. The presidential election was due to be held in November but will now be held on September 15 due to Essebsi's death. The news of Chahed's plans came from his Tahaya Tounes party on July 31.

Slim Azzabi, secretary-general of the Tahya Tounes party, confirmed it would nominate Chahed as its presidential candidate. The party is Tunisia's largest liberal group and governs in coalition with the moderate Islamist Ennahda Party and a smaller liberal group.

## Deadly Airstrikes and Drone Hits Displace Thousands in Libya

Intensifying clashes in the southern Libyan town of Murzuq involving air and drone strikes left at least 90 people dead and displaced thousands of "terrified" civilians, the UN said on August 20.

"Casualties on all sides of the fighting have continued as a result of airstrikes by planes

and drones, indiscriminate rocket attacks and shelling, and direct fighting on the ground," said Jens Laerke, spokesperson for the Office for the Coordination of Humanitarian Affairs (OCHA).

OCHA's warning over the small oasis town echoes concerns by the UN Support Mission in Libya (UNSMIL) and other UN agencies. The alert followed reports by local media that the clashes involved tribal opponents of the self-styled Libyan National Army (LNA) of commander Khalifa Haftar, which began an offensive on the southern outskirts of Libya's capital, Tripoli, in April.

## 24 Killed in Burkina Faso Terrorist Attack

According to reports, 24 people were killed in an August 19 attack in Burkina Faso with more being wounded. The attack took place in Burkina Faso's northern province of Soum. This is the deadliest attack in the country since the beginning of the year.

The attack was carried out by about 30 gunmen in broad daylight and hit people who had joined for a weekly market in the village of Gasseliki. The gunmen reportedly crashed into shops and started shooting at people.

## URP Candidate Wins Mauritanian Presidential Vote

On June 22, about 1.5 million Mauritians went to the polls to cast their vote for president. Mohamed Ould Ghazouani, from Mauritania's ruling party, Union for the Republic Party (URP), won the election taking 52% of the vote.

Biram Dah Abeid, Ghazouani's nearest rival, and the anti-slavery campaigner, amassed 18.58% of the vote, while the remaining candidates were in single digits. Three of the losing candidates lodged an appeal, alleging irregularities in the voting process. The African Union, acting as observer, was satisfied the process was transparent.

This election represents the country's first peaceful transfer of power by elected presidents since the country gained its independence from France in 1960, albeit both were from the URP.

## Sudan: Power Sharing Pact and Coup Attempt

General Hashim Abdel Muttalib Ahmed and several other officers in Sudan's army were arrested after a coup attempt in July, according to state media reports. The state news agency, SUNA, said that the military council that took



Source: African Union

over after Omar al Bashir was overthrown arrested 16 active and retired military officers over an attempted coup on July 11.

The military "revealed a coup attempt involving General Ahmed, head of the joint chiefs of staff, and several high-ranking officers from the armed forces and the National Intelligence and Security Service, along with leaders of the Islamic Movement and the National Congress Party," SUNA said on July 24.

According to the report, the men were detained and investigations are ongoing.

"The failed coup attempt's goal was to abort the people's glorious revolution and return the former National Congress regime to power, and to disrupt the path before the expected political solution that aims to establish a civilian state," SUNA cited the military as saying.

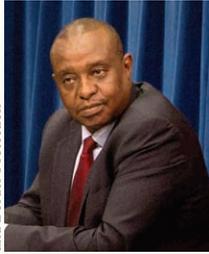
The coup attempt came just weeks after the military council and a coalition of opposition and protest groups in Sudan came to an agreement on power sharing. The groups have agreed provisionally to share power for three years. The agreement is seen as the first step towards moving Sudan beyond its history of dictatorship. It also gives rise to hopes of a peaceful transfer of power.

The two sides agreed to "establish a sovereign council by rotation between the military and civilians for a period of three years or slightly more," African Union mediator Mohamed Hassan Lebat told a news conference.

The council will be led for the first 21 months by the military, and for the final 18 months by civilians, a statement from the Sudanese Professionals Association (SPA) said. The council will be Sudan's highest authority. It will comprise five military members and five civilian appointees, with an additional civilian member agreed by the two sides. The deal will be finalized by July 8, the SPA said

### Kenya's Finance Minister Arrested

In an ongoing corruption probe in Kenya, the country's Finance Minister, Henry Rotich, was arrested on suspicion of financial misconduct. The suspected crimes revolve around the construction of two dams.



Henry Rotich

Source: U.S. Customs and Border Protection

Charges against Rotich, announced on July 22, stem from a police investigation into the misuse of funds in a dam project overseen by the Italian construction company CMC Di Ravenna. Both Rotich and CMC Di Ravenna have in the past denied any wrongdoing.

Rotich and his co-accused face eight charges, ranging from conspiring to defraud and financial misconduct, Noordin Haji, the director of public prosecutions, said. The minister and other officials will have to resign immediately, he said at the time.

### Libya's GNA Retakes Gharyan

According to regional reports, forces allied to the UN-recognized government in Libya, armed with weapons from Turkey, were able to retake Gharyan, located just south of the capital of Tripoli, in late June. This town is strategic to opposition military commander Khalifa Haftar's troops, the Libya National Army (LNA). The LNA is largely backed by the UAE, Saudi Arabia, France and Egypt.

Government of National Accord (GNA) spokesman Mustafa al-Mejji, told the AFP, "Gharyan is under our total control." He also said 18 LNA soldiers were taken prisoner and dozens were killed.

The battle between the LNA and GNA has heated up considerably over the last two months. LNA has a self-stated goal of taking over the country and has been lobbying Washington for support. It has gone so far as to hire PR firm Linden Government Solutions, to help put on a good face.

The GNA, for its part, has called on the US to exert pressure on its allies to stop supporting Haftar's Libyan National Army. "We urge the US administration to use its leverage to end the support provided by Egypt and Saudi Arabia to Haftar," Ahmed Mitig, deputy head of the Libyan Presidential Council, said on Fox News earlier in June.

Meanwhile, despite Egypt, France and UAE backing Haftar, the three joined with Italy, the US and the UK in issuing a joint statement calling for a cessation of hostilities on July 16. "The governments of Egypt, France, Italy, the United Arab Emirates, the United Kingdom, and the United States of America reiterate their deep concern about ongoing hostilities in Tripoli, call for an immediate de-escalation and halt to the current fighting, and urge the prompt return to the UN-mediated political process. There can be no military solution in Libya."

The statement continued, "We fully support the leadership of UN Special Representative of the Secretary-General Ghassan Salamé as he works to stabilize the situation in Tripoli, restore confidence in order to achieve a cessation of hostilities, expand his engagement throughout Libya, promote inclusive dialogue, and create the conditions for the resumption of the UN political process..."

### Somaliland Makes Gains on Recognition Quest

Somaliland made a diplomatic breakthrough with the state visit of the country's president Musa Bihi Abdi to Guinea at the invitation of President Alpha Conde. The visit is a sign of Somaliland's rapid acceptance across the African continent and its growing economic and trading links with other nations as it looks for recognition as an autonomous territory. During the meeting, both presidents pledged to find ways working together in trade and fostering cooperation.

The Somaliland government is steadily building its case for recognition based on trade and business opportunities with its fellow Africans, arguing that an independent Somaliland capable of trading with African and international

partners will be a benefit to all and strengthen peace, prosperity and security.

Somaliland's Minister for Foreign affairs and International Cooperation, Yassin Haji Mohamoud, said the mission to Guinea is to build the same kind of close relations with West African countries as Somaliland enjoys with East African nations. "Of course the two countries will be discussing matters of mutual interest during our stay in Guinea," the Minister said.

### AU to Launch Operational Phase of AfCFTA, Host Nation Named

The African Union launched the operational phase of the AfCFTA on the July 7 in Niamey, at an Extraordinary Summit of Heads of State and Government. The launch was part of a series of statutory and technical meetings being held in the Nigerien capital from July 4-8, which included the first coordination meeting between the AU and the Regional Economic Communities (RECs).

The launch of the AfCFTA follows the coming into force of the trade area on May 30, after the deposit of the required minimum of 22 ratifications by member states of the AU. Since then three more instruments of ratification have been deposited, bringing the total number of countries that have ratified the AfCFTA to 25.

With the launch of the operational phase, traders across Africa will be able to make use of preferential trading arrangements offered by the AfCFTA, with the understanding that the trade transactions are among the Member States that have deposited the instruments of ratification and those that conform to the provisions on rules of origin governing trade in the AfCFTA.

The Assembly also decided on the location of the AfCFTA secretariat which will have the principal function of implementing the agreement, with Ghana being named the host nation. Actual trading under AfCFTA is expected to begin a year from now and aims to unite 1.3 billion people, creating a \$3.4 trillion economic block that could usher in a new era of development.

# Conferences

View news items in their entirety at [www.AE-Africa.com](http://www.AE-Africa.com)

## September 2019

10-13	Cyber Security for Energy & Utilities Masterclass	Singapore	<a href="http://www.equip-global.com">www.equip-global.com</a>
17-19	Sugar & Ethanol Africa	Nairobi, Kenya	<a href="http://www.bit.ly">www.bit.ly</a>
17-18	Future Energy East Africa	Nairobi, Kenya	<a href="http://www.future-energy-eastafrika.com">www.future-energy-eastafrika.com</a>
24-26	Power Nigeria 2019	Lagos, Nigeria	<a href="http://www.power-nigeria.com">www.power-nigeria.com</a>

## October 2019

7-9	7 <sup>th</sup> Annual HOMER International Microgrid Conference (HIMC)	Cambridge, USA	<a href="http://www.microgridconference.com">www.microgridconference.com</a>
16-17	Renewable Energy Cyber Security Forum	Berlin, Germany	<a href="http://www.bisgrp.com">www.bisgrp.com</a>
29-31	5 <sup>th</sup> Annual Southern Africa Power Summit 2019	Cape Town, South Africa	<a href="http://www.ssapower.com">www.ssapower.com</a>

## November 2019

5-8	Key Energy (Renewable Energy Expo)	Rimini Fiera, Italy	<a href="http://www.en.keyenergy.it">www.en.keyenergy.it</a>
7-7	Renpower Ethiopia	Addis Ababa, Ethiopia	<a href="http://www.euroconventionglobal.com">www.euroconventionglobal.com</a>
12-13	Future Energy Nigeria	Lagos, Nigeria	<a href="http://www.future-energy-nigeria.com">www.future-energy-nigeria.com</a>

## December 2019

2-3	Regional Energy Summit: West Africa	Dakar, Senegal	<a href="http://www.res-west.com">www.res-west.com</a>
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