

A man wearing a white hard hat with 'BWSC' on it and a blue t-shirt is looking down at a clipboard he is holding. He is using a green pen to write on the paper. The background shows an industrial facility with various structures and pipes under a clear sky. An orange circle is overlaid in the top right corner.

Africa

**Your professional
power partner**

BWSC
...

Your advocate for ever better energy in Africa

BWSC has a long history on the African continent, taking active part in developing the African power sector to deliver affordable and reliable energy to local communities so businesses can grow, and population thrive.

BWSC is an expert service provider of technical solutions, projects and advisory services for engines, hybrid, and boiler based power plants, as well as green energy facilities. As an Operation and Maintenance partner we are operating power plants in Kenya, Mali and Benin and are providing

technical services to multiple power plants across Africa.

We advise and recommend the best solution from the customers point of view and strive to engage in long-term partnership with clients and their stakeholders. Plant owners are looking for ways to move towards greener energy and how existing assets can be optimized to improve the current environmental footprint and we have both technologies and engineering capabilities to support the transition into a greener future.

Technical Service Agreement: Keep your plant and equipment running at known costs

Maximise availability of your equipment and plant assets with a tailored long-term technical service agreement (TSA). You have the freedom to choose what fits you best within our scope of services and choose a contract duration which can be extended at any time. We cover everything from maintenance planning and inspections to overhauls, expert troubleshooting support and spare parts supply at a fixed price.

- Project management and overhaul supervision
- Maintenance and logistics planning
- Remote support and monitoring
- Engineering support from BWSC headquarters
- Technical on-site support and troubleshooting
- Spare parts for scheduled and unscheduled maintenance
- Classroom and hands-on training

High availability and lower risk with bankable turnkey O&M contracts

Financial investors, developers and other partners contract us to operate and maintain their power plants. Our O&M team takes a holistic approach to each individual project with focus on achieving sustainable economic growth for plant owners and the local community. Our mission is to make your plant work reliably and efficiently, delivering continuous output. We tailor the solution to your requirements with fixed budget, and at the committed performance level.

- Tailored turnkey O&M contracts
- Secure return on plant assets
 - Fixed Fee structure and guaranteed performance
 - Proven QHSE and lifecycle management programmes
 - Bankable contracts

4 reasons to choose BWSC

Meet your project timeline and budgets with bundled engineering, procurement and installation

Backed by 40 years of experience with every aspect of a power plant we are uniquely positioned to offer project-based engineering, procurement and installation services, taking full responsibility to deliver on agreed terms and conditions for your complete project. A project-based service contract reduces risk of budget overruns, and you can trust that we manage every milestone along the way from contract to delivery.

- Upgrades
- Fuel conversions
- Renewables integration
- Retrofits
- Overhauls and rehabilitation
- Special projects

We help you advance your green energy projects

We work with plant owners worldwide to tackle new challenges around energy storage, carbon capture, power-to-X and related green energy technologies. Having worked with renewable energy solutions for years, we are in a unique position to assist green energy players with the advisory services, engineering, procurement, installation and O&M services we have been perfecting for decades.

- From conceptual study to engineering, installation and full operation
- System integration and close collaboration with key technology developers
- Carbon capture
- Power-to-X (hydrogen and green fuels)
- Energy storage and renewables integration

Our Footprint in Africa

Africa's economies are growing by leaps and bounds, and a reliable power supply is crucial for continued growth on the African continent. BWSC has already been involved in more than 25 successful power plant projects across Africa, ensuring a solid return for our partners.

**Benin • Burkina Faso •
Cape Verde • Egypt •
Gambia • Kenya •
Liberia • Libya •
Mali • Mauritius
Mozambique •
Nigeria • Senegal •
Sierra Leone •
Somalia • Sudan •
Tanzania • Togo**



/// BWSC is a good fit for us, given their strong technical capabilities, commercial approach and complementary skill set. Furthermore, BWSC is engine-agnostic, ensuring that the technology proposed is fit-for-purpose and provides the most cost-efficient solution

— African Infrastructure Investment Managers (AIIM)



Hybrids and captive power

The best of both worlds

Energy suppliers are increasingly looking to renewables to reduce fuel costs, carbon emissions and meet consumer demand. However, when the sun isn't shining or the wind stops blowing, it makes sense to have a conventional power source that can take over and supply power without interruption.

BWSC's hybrid power solutions address these concerns by using renewables' best qualities and supplementing them with our engine-based solutions powered by diesel, natural gas, heavy oil or a suitable mix. Hybrids can also be combined with biomass and waste-to-energy.

The independent contractor

Our unique position as an independent contractor enables us to look at a given energy scenario from an objective point of view, analyse the situation and tailor fit a solution that meets the project's scope. No more, no less.

BWSC offers complete hybrid systems as well as retrofits of existing generation assets and can

assist customers in optimising a hybrid power project for specific conditions.

In this way, our hybrid solutions provide a seamless power supply that is clean and ensures significant reductions in emissions. They have the additional benefit of reducing fuel costs, enabling energy suppliers to budget their operating costs with higher certainty.

Coming to a remote location near you

BWSC's hybrid power solutions are also well-suited as a captive energy supply for remote, off-grid applications.

In off-grid hybrid solutions, solar panels and wind power generate energy, reducing fuel demands for conventional engines. The diesel or gas engines, meanwhile, deliver power to balance the system's power flow. In cases where short-term demand peaks are frequent, energy storage systems such as batteries support the engines, making additional engine capacity investments unnecessary.



BWSC biomass projects in the UK

BWSC is a leading supplier of biomass and waste-to-energy technologies. Our expertise includes all aspects of plant design to rehabilitation, operation, maintenance, service agreements and financing.

Project developers welcome our input, and we have secured exclusive agreements on numerous projects.

BWSC is the main supplier of high-technology biomass power plants to the UK market, using straw, woodchip and waste materials as primary fuels to produce carbon-neutral heat and power. BWSC can deliver biomass plants that have a capacity of 5-70 MWe.

Power plants

Kent	28 MWe + 6 MWth	2016-2018
Cramlington	28 MWe + 6 MWth	2015-2018
Snetterton	44 MWe	2014-2017
Tilbury	40 MWe	2015-2017
Widnes	20 MWe + 8 MWth	2014-2017
Brigg	40 MWe	2013-2016
Lisahally	16 MWe + 6 MWth	2013-2015
Sleaford	39 MWe + 1 MWth	2011-2014
Western Wood	14 MWe	2006-2008



Selected references

KAYES, MALI *ON TIME, ON BUDGET*

With a turnaround time of less than 16 months from winning the contract to official turnover, the power plant at Kayes, Mali serves as another example of BWSC's ability to deliver on time and take a proactive approach to project management. During construction, the project also won the 'Deal of the Year' category during the top industry expo, African Utility Week.

By providing 90 MWe of capacity, the high-efficiency thermal power plant increases the country's electricity capacity by 20 percent. And with a total investment of EUR 125 million, the project is Mali's first independent power producer (IPP) to feed into the national grid, supplying some 780,000 households with a steady supply of electricity and reducing costs to end users at the same time.

In addition to overseeing the plant's construction, BWSC has been commissioned to operate and maintain the facility for 13 years with the possibility for additional service afterward.



Developer BWSC, Redox, AIIIM, IFU
 Owner Albatros Energy
 Lenders IsDB, WaDB, OFID, Investec,
 EPC contractor BWSC
 Contract start June 2017
 Completion October 2018
 Capacity 90 MWe
 Engine Caterpillar, 6 x16CM43
 O&M contract 13 years

MARIA GLÉTA, BENIN *WEST AFRICA'S MOST EFFICIENT POWER PLANT*

In December 2017, BWSC and MAN Energy Solutions (MAN ES) in consortium were awarded the contract to build a 120 MW power plant in Benin – the second major assignment BWSC won in West Africa in 2017.

Valued at EUR 125 million, the contract calls for a turnkey delivery and includes the construction of a completely new power house for seven MAN ES dual fuel engines as well as the corresponding infrastructure. Once completed, it will be the most efficient plant of its type in the region.

Benin's energy demand is growing annually by an estimated six percent and the project, located just outside Benin's largest city, Cotonou, is expected to provide much-needed capacity to the energy sector, strengthen business growth and improve living standards. The dual fuel power plant will provide enough electricity to help meet the government's goal of developing the energy sector in a sustainable manner. Once online, it will be the first step towards helping

Benin meet its goal of securing 70 percent of its energy needs independent of neighbouring countries by 2025. The power plant will be delivered within 18 months from the effective contract.



Owner Ministry of Energy and
 Société Béninoise d'Énergie Electrique
 EPC contractor BWSC
 Contract start December 2017
 Completion August 2019
 Capacity 120 MWe
 Engine MAN, 7x18V/51/60 DF

RABAI, KENYA *DOUBLE UP AS 'DEAL OF THE YEAR'*



When the Rabai Power Plant came online in 2010, the impact was immediate. By providing a stable electricity source to over 400,000 households and businesses, it helped Kenya overcome its electricity backlog, contributing to the country's expanding economy.

Less than a year after financial close, the plant's production made power rationing unnecessary in Kenya's coastal region. The 90 MW Rabai Power Plant is also a major reason the percentage of Kenyans with access to electricity increased by more than a third to 83 percent – the largest jump among African countries monitored between 2006 and 2016.

The plant provides a cost-effective, reliable thermal power supply, and delivers electricity through a power purchase agreement (PPA) signed between Rabai Power Ltd. and the Kenya Power & Lighting Company Ltd.

The plant is a pioneer project in the revitalisation of Kenya's greenfield power scheme which had been dormant for eight years, making it possible to phase out less efficient plants and back-up generators.

BWSC's specialist supervisors have transferred know-how to lift the plant to international standards and secure an impressive safety record. In total, more than 350 Kenyans were involved in Rabai Power Plant's construction, and close to 50 locals have since been involved in subsequent operations and maintenance.

The Rabai Power Project was twice awarded "African Power Deal of the Year" by Project Finance International and Project Finance Magazine.

Developer	BWSC
Owner	Rabai Power Ltd.
Lenders	DEG, Proparco
EPC contractor	BWSC
Contract start	2008
Completion	2010
Capacity	90 MWe
Engine	Wärtsilä, 5x18V46
O&M contract	20 years



MAURITIUS 10 POWER PLANTS IN 20 YEARS



BWSC projects in Mauritius

BWSC has a long-standing connection to Mauritius due to our presence as turnkey supplier of power plants over the last 20 years. During this period, BWSC has supplied 10 turnkey power plants to Mauritius and the state-owned utility company Central Electricity Board (CEB).

The Mauritius contracts are a testament to the CEB’s confidence in BWSC, and we appreciate the number of times CEB has appointed BWSC as the preferred supplier of high-quality power stations.

Power station

Saint Louis (G10-G13)	67 MWe	2016/2017
Fort Victoria, phase 2	60 MWe	2011/2012
Pointe Monnier	2.5 MWe	2011/2012
Fort Victoria, phase 1	30 MWe	2009/2010
Saint Louis (G7-G9)	41 MWe	2004/2006
Pointe Monnier	4 MWe	2003/2004
Port Mathurin	1 MWe	1998/1998
Port Mathurin	1 MWe	1996/1997
Fort George	31 MWe	1995/1997
Port Mathurin	1 MWe	1994/1996

SAINT LOUIS, MAURITIUS *EXTENSIVE REDEVELOPING PROGRAMMES*

In line with the ongoing strategy to renew and develop Mauritius's power supply, the government-owned utility Central Electricity Board (CEB) decided to further increase the capacity and redevelop the Saint Louis Power Station, located outside Port Louis.

The original power plant was redeveloped by BWSC in 2004/2006, which included demolition of the existing power hall and replacing it with a state-of-the-art, medium-speed diesel power station.

In March 2016, BWSC was awarded the second redevelopment turnkey contract for the Saint Louis Power Station.

The contract comprised all services for engineering, procurement and construction (EPC) of the power plant extension, including the required personnel training, transportation of equipment and start-up of the plant.

On 5 October 2017, CEB took over the redeveloped Saint Louis Power Station, now extended with G10, G11, G12 and G13. This was announced following 30 days of reliability tests and well ahead of the contractual

takeover date. The power station was constructed in less than 18 months.



Owner	Central Electricity Board
EPC contractor	BWSC
Contract start	2004/2016
Completion	2006/2017
Capacity	41 + 68 MWe
Engine	Wärtsilä, 3x16V46 + 4x18V46

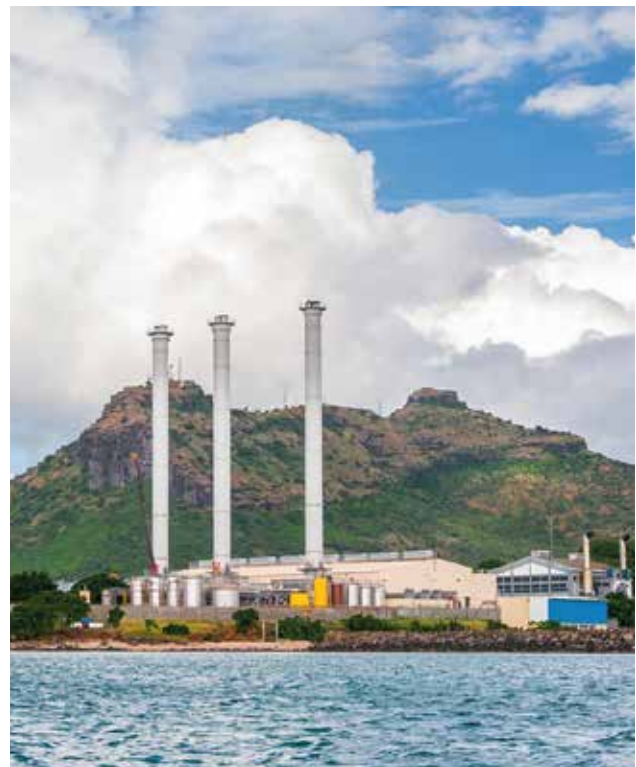
FORT VICTORIA, MAURITIUS *HELPING EXPAND THE LOCAL POWER SUPPLY*

In 2010, BWSC designed, engineered and constructed the first phase of the Fort Victoria Power Station Redevelopment on a full turnkey basis.

Two years later, BWSC designed, engineered and constructed the second phase of the power plant outside Port Louis. The project was part of the overall National Generation Plan to increase power generating capacity in Mauritius.

BWSC has been present in Mauritius since 1994 and has constructed a 30 MWe + 60 MWe power plant extension next to the existing Fort Victoria Power Plant.

Owner	Central Electricity Board
EPC contractor	BWSC
Contract start	2009/2011
Completion	2011/2012
Capacity	30 + 60 MWe
Engine	Wärtsilä, 2x16v46 + 4x16v46



MABRUK, LIBYA *CAPTIVE POWER FOR OIL PRODUCTION*



The Compagnie des Pétroles Total Lybie (CPTL) extended the Great Mabruk Oil Field for new oil production.

This induced a higher demand for electrical power produced from crude oil to ensure the new production capacity.

BWSC was responsible for the equipment design, engineering and supply including units, tanks, piping, engines and generators, the supervision of the installation and test and commissioning of the entire plant.

The equipment was delivered to Misuratah Port seven months after the contract was signed.

Owner	Mabruk Oil Operations (MOO)
EPC contractor	BWSC
Contract start	2004/2009
Completion	2006/2011
Capacity	18 + 9 MWe
Engine	MAN, 3 x 18V32/40

THAR JAHT, SUDAN *RELIABLE ENERGY IN EXTREME CONDITIONS*

The plant is “floating” on a deck supported by 800 piles one meter above ground due to soil conditions.

More than 200 containers (with six engines each weighing almost 100 tonnes) were shipped from Europe to the Sudanese port and trucked to Site, an inland journey of 2,200 kilometres.

The project was a 50 MW (ISO Conditions) plant initiated by White Nile Petroleum Operating Company (WNPOC), an operating company engaged in exploration, development and production in Sudan.

The power plant has a utilisation capacity of 30 MW at an outside temperature of 55°C, plus 15 MW as standby.

The full turnkey project was undertaken by a consortium of BWSC and MAN, with BWSC as Consortium Leader and responsible for the plant design, engineering, supply of balance of plant, transport, erection, construction and test and commissioning. The power plant was completed within the agreed period of 14 months.



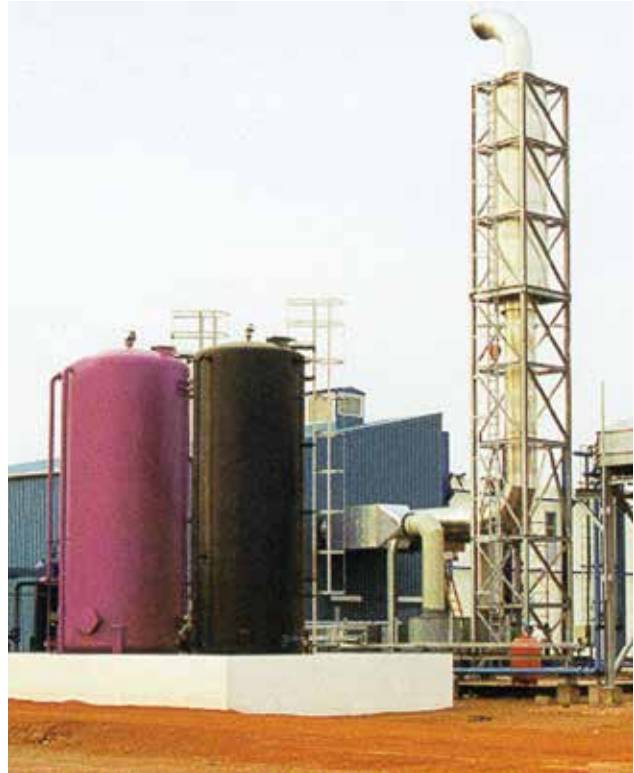
Developer	BWSC
Owner White Nile Petroleum Operating Company (WNPOC)	
EPC contractor	BWSC/MAN B&W Consortium
Contract start	2005
Completion	2006
Capacity	50 MWe
Engine	MAN, 6 x 18V32/40

KOSSODO, BURKINA FASO *FAST-TRACK POWER FOR DEVELOPMENT*

The Danish Government, represented by the Ministry of Foreign Affairs (DANIDA), decided to provide a grant to the Government of Burkina Faso for an emergency fast-track extension of the power production capacity in Ouagadougou to ease the critical power supply situation.

The ambitious programme for this fast-track project set the start of electricity production only five months after signing of the contract. The construction was followed by 28 days of successful reliability test and immediate issuing of the Taking Over Certificate (TOC). The Ouagadougou power plant was completed in March 2000.

OwnerSONABEL
 EPC contractor BWSC
 Contract start1999/2005
 Completion2000/2007
 Capacity 3.8 + 18 MWe
 Engine MAN, 18V28/32H + 18V48/60B
 Other technical service and training



GAMBIA *AN UNBEATABLE WORKHORSE*

When the two-stroke engine at the Kotu Power Plant came to life in 1988, few people would have predicted that it would still be pumping out 7 MWe three decades later. Solid engineering and a careful maintenance plan have extended the power plant's effective service, however. Today, the plant's status as a reliable electricity source has earned it iconic status in Gambia.

So while BWSC specializes in deploying the latest state-of-the-art power plants, the K6 serves as a good example of how our specialists can extend the service life of a power plant well past its original timeline.

Client DANIDA,
 end-user: Utilities Holding Corporation (HUC)
 OwnerNAWEC Gambia Limited
 EPC contractor BWSC
 Contract start1988
 Completion1990
 Capacity 6.8 MWe
 EngineMAN, 1 x 8L42MC-S





Burmeister & Wain
Scandinavian Contractor A/S

BWSC Headquarters

Gydevang 35, 3450 Allerød, Denmark
P: +45 4814 0022 · bwsc.com

BWSC Panama

La Locería, Arturo del Valle St,
BWSC Building, N°2, Panama City, Panama
P: +507 388 4478 · bwsc.com

BWSC Generation Services UK Ltd.

Unit 3, The Point, Lions Way, Sleaford
Lincolnshire NG34 8GG, United Kingdom
P: +44 (0) 1529 417580 · bwsc.com

About BWSC

Headquartered near Copenhagen, Denmark, BWSC provides specialized consultancy, engineering, installation, operation and maintenance services at power plants and green energy facilities worldwide.

Forty years of experience with energy infrastructure, a diverse staff of seasoned experts, full technology independence and our big-picture approach make us uniquely able to help customers define their ambitions and reach them through expert design and continuous improvement of their facilities.