

Corporate Profile of BWSC

- The Reliable Power Plant Specialists -

Uzi Frank *

BWSC の製品・技術紹介

- 頼りになる発電所スペシャリスト -

ウッツィ フランク

Burmeister & Wain Scandinavian Contractor A/S (BWSC) は、発電所の建設事業において高い評価を得ている会社である。設立から約 40 年間で 54 カ国、180 以上の発電所を納入し、総設備容量は 4 000 MW に達する。当社は、発電所の建設を開発、設計、建設、運転保守(O&M)の四つのフェーズに分け、その全てに対応している。これにより、発電所建設に伴うリスクを最小限に抑え、建設費と開発費を抑え、そして顧客と利害関係者に単一のプロジェクト契約窓口を提供することができる。

当社が建設する発電プラントには、ボイラー式発電所とエンジン式発電所の 2 種類があり、10 ~ 250 MW 級の発電所の建設を得意としている。英国に 10 の発電所を納入し、北ヨーロッパに多数のボイラー設備を納入している。英国クラムリントンに建設したバイオマス発電所は、木チップ、木の幹、廃材を燃料とし、電力と地域暖房向けの蒸気を併給する。さらに、高効率廃棄物ガス化プラントの建設も手掛けている。2021 年に稼働予定の英国フートンの発電所では、年間約 24 万トンの廃棄物がガス化され、年間 200 GWh を超える電力が発電される予定である。

一方、当社は世界の多くの地域で、信頼性が高く費用対効果の高いエンジン式発電所を供給している。当社は、浮遊式(バージ)発電所を 18 ヶ月以内に製造し、インフラが不足している遠隔地に 60 ~ 150 MW の容量を供給できる。また、25 000 m³ の LNG 浮遊式貯蔵及び再ガス化装置(FSRU)から天然ガスをパワーバージに供給することによって、ガス焚き発電所を提供することができる。

多くの人員や機材を投入する建設現場で、安全性と品質を犠牲にすることなく最も効率的に建設プロセスを進めるには、物流が鍵となる。当社は、発注プロセスの設計と素早いサプライチェーンの構築で大きな進歩を達成し、2018 年 6 月デンマークの産業団体よりサプライチェーン業務の改善についての表彰を受けた。

当社は発電プラントの完成後に、プラントオーナーとの O&M 契約に基づいて現地に子会社を設立し、発電所の商業運転に必要なすべてを提供することができる。当社は設計と建設過程に関与しているため、O&M スペシャリストは上流から下流まで内部の仕組みを熟知している。

当社は、今後も発電事業でターンキーソリューションを提供するとともに、O&M プログラムも合わせて提供していく。ボイラー型では、再生可能資源への需要拡大に対応して、バイオマスや廃棄物を電力に転換する技術の開発に取り組む。一方、発展途上又は広域電力網から孤立した地域への対応として、最先端の高効率エンジン型のソリューションを引き続き提供していく。



(a) ケントバイオマス発電所



(b) ブリッグバイオマス発電所

図 1 BWSC が建設したバイオマス発電所

* Technical Copywriter, BWSC

1. INTRODUCTION

Burmeister & Wain Scandinavian Contractor A/S (BWSC) has made a name for itself by building power plants worldwide. Since its start nearly four decades ago, BWSC has delivered more than 180 power plants in 54 countries. The total installed capacity has rounded 4 000 MW, which provides electricity for millions of people around the world.

2. POWER PLANTS THE FOUR PHASES

At BWSC, we divide power plants business into four phases: development, design, build and operate.

BWSC holds a unique role in the power plant business, because the company gathers the competences and know-how needed to address all four phases. It is why BWSC is often referred to as a turnkey supplier: the company essentially takes care of details large and small, so owners simply have to 'turn the key' to start the facility.

By having an organization that can address these four phases, BWSC can minimize the risks involved with power plant construction; keep construction and development costs down; and provide clients and stakeholders one point of contact.

In the following article, BWSC's ability to address these four phases as well as its products and activities are presented. Finally, the company's goals and strategies for the coming years as well as a message from the CEO are presented.

3. DEVELOP: TURNING EMPTY LOTS INTO POWER PLANTS

Building power plants requires more than engineering expertise. There's a great deal of work that needs to be done, before construction workers can break ground on site. A 50 MW power plant, for example, can easily cost hundreds of millions of euros. To pay for this investment, a payment scheme for end-users needs to be developed. Safety standards and environmental regulations need to be addressed as well. BWSC's in-house development group can address this myriad of issues.

They help investors and external developers navigate the regulatory and legal landscape, so a power plant project can secure a green light from authorities. This makes it possible for BWSC to support external developers and partners in all aspects of their project. BWSC's specialists have the expertise to determine the project's scope and set up joint development partnerships in a so-called independent power producer (IPP) arrangement.

And because BWSC has a solid track record accumulated over the years, banks and lending institutions are interested in making long-term investments in projects with which

BWSC is associated. In addition, BWSC occasionally co-invests in power plants, further reducing risk.

4. DESIGN: CREATING SOLUTIONS WITH VALUE

With financing in place, BWSC is ready to assume the role of turnkey contractor, that is, one which is in charge of engineering, procurement and construction (EPC). In these assignments, BWSC takes responsibility for design, purchasing equipment, materials and manpower; and overseeing the construction schedule with its guaranteed completion date. The BWSC organization contains the expertise to design advanced power plants in the range of 10 to 250 MW.

BWSC also ensures testing and commissioning of the plant before hand-over, so the plant is delivered into successful commercial operation.

4.1. Boiler-based power plants

With the acquisition of Burmeister & Wain Energy, BWE, in 2017, BWSC made it possible to provide in-house, state-of-the-art boiler technology in our turnkey projects. BWSC has delivered ten boiler-based plants as turnkey contractors in the UK and numerous boiler lots in Northern Europe.

At Cramlington in Northern England, for example, BWSC designed a power plant which can receive and burn wood delivered as chips or whole tree trunks (Photo 1). Recycled wood is also part of the fuel mix. BWSC applied district heating principles at Cramlington, directing steam produced by the specially designed high pressure boiler to two pharmaceutical firms which can use the steam for their processes. Cramlington demonstrates that by thinking holistically from the start, efficiency is improved and benefits can be gained.

BWSC has begun construction on the Hooton Bio Power facility (Photo 2) as well as a high efficiency waste gasification plant. The facility will gasify some



Photo 1 BWSC Designed the Cramlington Renewable Energy Plant in the UK

Its surplus steam could be directed to two pharmaceutical firms.



Photo 2 3D Visualization of the Hooton Bio Power Facility
The facility is expected to be operational in the second half of 2021.



Photo 3 Mali Power Plant
The 90 MW power plant recently inaugurated in Mali increases the country's power capacity by about 25 percent.

240 000 tonnes of waste per year, generating in excess of 200 GWh of electricity annually enough to power about 50 000 homes. It is the first time the UK market will realize a gasification plant of this size based on fluidized bed technology. The facility is expected to be operational in the second half of 2021.

4.2. Engine-based power plants

In many parts of the world, engine-based power plants meanwhile remain a cost-efficient way to establish reliable power supply.

In October 2018, for example, BWSC inaugurated a 90 MW power plant in Mali, where only about a third of the population has access to electricity (Photo 3). The new power plant is expected to be a catalyst for growth and development in the country, increasing the country's power capacity significantly.

Our engine-based expertise provides a solid foundation for our floating power barge solutions as well. In less than 18 months' time, BWSC can deliver and commission a highly efficient power barge, providing 60 - 150 MW of capacity to remote locations that lack infrastructure. For gas fired operation, BWSC is also able to offer a complete LNG-to-power solution by supplying the power barge with a specially designed 25 000 m³ LNG floating storage and



Photo 4 Power barge and FSRU
In less than 18 months' time, BWSC can deliver and commission a highly efficient power barge that provides 60-150 MW of capacity to remote locations that lack infrastructure.

regasification unit (FSRU) (Photo 4). The FSRU is designed by our sister company, TGE Marine Gas Engineering.

5. BUILD: LOGISTICS ARE THE KEY

During a turnkey project, there can be up to 200 - 300 construction workers on site. Having so many people and heavy lifting equipment on site is extremely costly and places high demands on BWSC's logistical talents. The goal is to secure the most efficient construction process without compromising safety and quality.

And since BWSC is often in charge of the next phase of a power plant business, operate, it makes sense to procure parts that are of the specified quality. All the while, BWSC's construction teams must meet scheduled milestones; missing a deadline is extremely costly even on a daily basis.

To make sure the build is done efficiently as possible, BWSC project personnel have fine-trimmed the supply chain. Every nut and bolt needs to be purchased, delivered, manufactured, stored and assembled. To address the complexity significant energy has been dedicated to streamlining processes and creating systems. BWSC has made great strides in planning the procurement process,

creating an agile supply chain that can note and respond to contingencies. The efforts have paid off: in June 2018, BWSC won the Danish Award for improving supply chain operations. But the company is far from satisfied. The improvement efforts continue.

6. OPERATE: GETTING THE MAXIMUM RETURN ON A POWER PLANT

When power plants are commissioned and tested, BWSC can assume an operation and maintenance (O&M) role with the owners to make sure the plants operate safely and reliably for the agreed time period. Since BWSC is typically involved in the design and build process, our O&M specialists know the inner workings from top to bottom.

When BWSC takes on an O&M assignment, the company creates a local subsidiary that can administer personnel, legal and financial matters. BWSC provides everything needed for commercial operation, supply of spare parts and consumables. The staff is trained to handle fuel management. At biomass power plants, that could be straw, pellets or wood chips (Photo 5). Engine-based power plants meanwhile rely on liquid fuels or gas.

BWSC also recruits and manages staff for safe operation and maintenance of the plant and makes sure the facility can meet production and performance guarantees. It goes without saying, that all of these needs to be in place 24 hours a day, every day – regardless of holidays and what might be taking place outside the power plant's perimeter. Staff members' health and safety is, of course, the highest priority. We make sure our on-site staff have the best training possible, so they can address risks and solve unexpected problems. The company is able to deliver spare parts, training, full technical service agreements



Photo 5 Operation and maintenance at Snetterton Renewable Energy Plant in the UK.

BWSC's operation and maintenance staff is responsible for the daily operation and maintenance of power plants around the globe. Here, a staff member monitors the straw used as fuel.

and daily operation and maintenance scheduled and unscheduled maintenance.

BWSC currently has O&M agreements which range from 2.5 to 20 years of service.

7. MAIN TARGET FOR THE FUTURE

In the previous sections, BWSC's ability to develop, design, build and operate power plants has been presented. In the future, BWSC will continue of course to offer its holistic, turnkey solutions. The company will also continue to provide O&M programmes at power plants.

BWSC's boiler specialists will continue to develop solutions that meet the demand for renewable sources. There is also an increased focus on markets where biomass has been an overlooked resource. As the world grapples with an ever-growing garbage problem, waste-to-energy solutions are being developed as a way to dispose of garbage and also produce power. In underdeveloped or isolated areas, BWSC's engine-based solutions will continue to utilize the most advanced, high efficiency engine solutions available on the market.

8. MESSAGE FROM THE CEO

Nearly 30 years have passed since MES acquired BWSC. It's a good opportunity to reflect on the role BWSC plays in its parent company, and the impact MES has on BWSC, says CEO Nikolaj Holmer Nissen (Photo 6).

"When BWSC began, we built a number of power plants that used Mitsui's engines," says Nissen. "Since then, we've expanded our portfolio to include boiler-based solutions. Energy markets are in a state of transition. There is a need for BWSC's competences, which can deliver customized solutions in a highly competitive field."

BWSC has just completed a strategy review, adds Nissen,



Photo 6 Nikolaj Holmer Nissen, CEO

"BWSC's focus in the coming years will be on profitability. We will focus our activities on a few select markets and invest in making our solutions even more competitive."

and in the coming months, initiatives will be rolled out to realize that strategy.

“ First and foremost, BWSC’s focus in the coming years will be on profitability. We will focus our activities on a few select markets and invest in making our solutions even more competitive.”

And while carmakers and other industrial manufacturers have worked on streamlining procedures for some time, it’s a somewhat new process for a company that does not have its own manufacturing facilities and relies on suppliers to deliver components.

For that reason, BWSC will continue optimizing its supply

chain to make it more efficient and responsive. The organization will likewise seek ways to digitize processes and make solutions cost-effective without sacrificing quality.

“ We are convinced that successful execution of our revised strategy will lead us to new opportunities and sound profitability in the years to come,” says Nissen. “ The current year begins a period of transition and the start of a journey towards a BWSC that is better fit for the future.”

〔 問い合わせ先 〕

Corporate Support Officer/Sales Manager, BWSC

TEL +45 48 10 58 38 内田 俊彦