

CASE STUDY: AMAGER BAKKE



A waste-to-energy plant unlike any other

Amager Bakke is conveniently located just five kilometers from Copenhagen's Town Hall Square.

JMA Wireless Provides Unprecedented Mobile Communications at Amager Bakke

Overview: Unique Facility Requires a Unique Wireless Network

Amager Bakke is not your typical waste-to-energy plant. Instead it serves a two-fold purpose – energy production and recreation. Inside the plant, equipment is burning 400,000 tons of municipal waste annually, supplying electricity to 62,500 homes and providing 160,000 households with district heating. A special feature of this facility is the chimney, which emits its exhaust continuously in the form of “smoke” rings. However, these rings are water vapor, not actual smoke. Outside, the plant offers a 440-meter ski slope known as Copenhill. It extends

from the roof of the building and is the longest ski slope in Denmark. In addition, there is a ski center, 3,000 m² of green space and soon there will be one of the world's highest climbing walls at 80 meters tall.

It is only fitting that Denmark's largest technical installation company, Kemp & Lauritzen, was hired to ensure employees operating this green energy plant have the best in cellular connectivity. Kemp & Lauritzen knew it needed a DAS (distributed antenna system) that could enable mobile communications in a challenging environment; therefore, they turned to global wireless innovator, JMA Wireless. The company's TEKO DAS is the industry's fastest growing DAS and has proven repeatedly that it can stand up to just about any type of environment to ensure subscribers have powerful cellular coverage anywhere, anytime.

Each year Amager Bakke turns 400,000 tons of waste into:

- 99% energy efficiency.
- District heating for 160,000 households.
- Electricity for 62,500 households.
- 100 million liters of spare water recovered through flue gas condensation.
- 90% reuse of metals from waste amounting to 10,000 tons of metal a year.
- 100,000 tons of bottom ash reused as road material, which saves large amounts of gravel.

Source: B&W Volund website

Situation: Industrial Environment Challenges

Supplying powerful wireless connectivity in a waste-to-energy plant comes with many challenges. First, the facility is constructed of steel and concrete. And, steel is present throughout the plant as well with turbines and steel structures in the ceiling where the furnaces and boilers sit. Both steel and concrete are materials that impede cellular signals from entering and leaving the building.

Furthermore, the plant not only houses large boilers and furnaces, but also 850 pumps, fans and compressors, 1,800 valves, 3,300 measuring instruments, and

approximately 10,000 alarm points and visual systems. This extensive amount of equipment is often accompanied by competing wireless technologies, and many moving parts, presenting further challenges for the wireless network. Powerful cellular communications are often necessary for keeping employees informed and safe while in the plant.

The Amager Bakke facility runs 24 hours per day, 365 days per year, supplying energy every day to thousands of Denmark's residents; therefore, it was often challenging for the team to work around the equipment and employees in the plant. There was never downtime when the team could easily deploy the equipment without causing interruptions.

Since the plant is operating around the clock, it was critical to deploy a wireless network that could be upgraded easily and is future-proof. Extensive downtime is not an option when upgrading it to accommodate new technologies and/or bands.

Finally, the Amager Bakke facility presented challenges regarding the number of available spots to mount the antennas. There were limited options where equipment could be mounted yet cellular coverage and capacity are necessary throughout the plant.



Solution: The TEKO DAS Prevails

Even though industrial environments, such as Amager Bakke, present many challenges to enabling powerful mobile communications, JMA Wireless still prevailed with its TEKO DAS. The result was 100 percent in-building cellular coverage. The multi-band, multi-carrier DAS platform is enabling coverage for 3G. The mobile operators, Telenor and TDC, are supported on the in-building network. Along with the modular master unit (MU), two very high power remote units (RUs) were deployed to support the one sector.

Since Amager Bakke operates 24 X 7 it was often difficult for the team to receive access to the building to deploy the equipment. However, since each remote unit only required a single fiber to connect back to the master unit less time and manpower were needed than competitive offerings. In fact, the TEKO DAS uses up to 75 percent less fiber than other solutions in the market today.

JMA Wireless built the TEKO DAS with the future in mind. When new bands, technologies and operators are added, the system can be easily upgraded. There is no need to “rip and replace” every time there is a change in technology. Instead, its transparently adaptable modulation allows new

technologies to be added without the need for additional hardware or configuration changes. Existing fiber can be leveraged too as new 5G technologies are launched into the market. Furthermore, the platform’s modular sub-rack is designed to easily support new sectors and services as the system expands.

Result: Better Connected, More Efficient

The TEKO DAS has proven to be the perfect solution for enabling wireless communications for the employees at Amager Bakke. This cost efficient, future-proof offering is helping to ensure daily operations are running smoothly so the thousands of households depending on the waste-to-energy plant are receiving electricity and being heated today and will continue to be in the future.

“ We selected the cost efficient TEKO DAS platform from JMA Wireless for this high-profile deployment because it is has proven repeatedly it can enable powerful cellular coverage and capacity in challenging environments. Since its installation last summer at Amager Bakke it has not disappointed.”

Michael Balslev
Section Manager
Kemp & Lauritzen



About JMA Wireless

JMA Wireless is the leading global innovator in mobile wireless connectivity solutions that ensure infrastructure reliability, streamline service operations, and maximize wireless performance. Employing powerful, patented innovations their solutions portfolio is proven to lower the cost of operations while ensuring lifetime quality levels in equipment and unrivaled performance for coverage and high-speed mobile data. JMA Wireless solutions cover macro infrastructure, outdoor and indoor distributed antenna systems and small cell solutions. JMA Wireless corporate headquarters are located in Liverpool, NY, with manufacturing, R&D, and sales operations in over 20 locations worldwide. For more information see jmwireless.com.



About Kemp & Lauritzen

Kemp & Lauritzen was founded in 1882 and has grown to become Denmark's largest technical installation company with over 2,000 employees. Our core competencies are within all technical fields, and we offer all types of technical solutions across disciplines. As your technical partner, we improve your business – and not only by solving technical challenges. We think big and have a broad scope. So you get a business partner with the widest range of technical expertise in Denmark, and avoid time-consuming coordination. We take responsibility for the whole process from A to Z and target our services to your specific needs, whether it's a one-off project, a unique technical specialty, or a comprehensive interdisciplinary technical enterprise. Our headquarters are based in Albertslund, near Copenhagen, but we have offices all over Denmark, so we can service your company wherever it is located. The principle is: one entrance, many possibilities. For more information visit <https://www.kemp-lauritzen.dk/international>.



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Amager Bakke is visible from most of Copenhagen with its giant smoke stack and the rings of water vapor it emits every day.