



# Efficient and reliable solution for harsh operating conditions

📍 Riyadh, Saudi Arabia

Located in the Saudi Arabian capital, Riyadh, Yamama Cement Company is regarded as the oldest cement company in the central region of Saudi Arabia and one of the largest in the entire kingdom.

When Saudi Arabia announced the Saudi 2030 Vision in 2016, Yamama Cement Company turned to Wärtsilä for a solution that would be in accordance with the vision's regulations requiring more efficient power usage. As Yamama Cement Company started negotiations with Wärtsilä in 2014, it compared the viability of using gas turbines with Wärtsilä's internal combustion engine (ICE) technology – ultimately favouring ICE.

## Increased efficiency with waste heat recovery system

Under engineering, procurement & construction (EPC) contract, Wärtsilä delivered a 161 MW Flexicycle™ power plant featuring 10 Wärtsilä 18V50DF dual-fuel engines with one reductant engine (N+1 configuration). Additionally, the company ordered two more engines in 2023, making the plant's total output 198 MW.

The plant has a steam turbine generator that uses the waste heat from ten of the twelve engines to generate clean and free energy. Additionally, it has four static frequency converters (SFCs) that were delivered under Wärtsilä project. The SFCs convert power from 60Hz to 50Hz to cater one of the customer's production lines.

The dual-fuel power plant operates primarily on natural gas with light fuel oil and crude oil as backup fuels. The plant will provide power to run the Yamama facility, contributing significant energy generation for Saudi Arabia's cement sector.

As a full EPC project, Wärtsilä was responsible for handling all aspects of the construction and delivery of the plant. A 5-year Operation & Maintenance (O&M) agreement with a 10-year spare parts supply agreement was signed to cover every aspect of the day-to-day operation and all related maintenance and administration tasks.

Challenge	Solution	Benefit
<ul style="list-style-type: none"><li>• Harsh operating conditions</li><li>• Need for more efficient power usage</li><li>• Need to align with Saudi 2030 Vision</li></ul>	<ul style="list-style-type: none"><li>• 198 MW Wärtsilä Flexicycle™ power plant with waste heat recovery system</li><li>• 12 x Wärtsilä 18V50DF engine generating sets with N+1 configuration</li><li>• A 5-year Operation &amp; Maintenance agreement and a 10-year spare parts supply agreement</li></ul>	<ul style="list-style-type: none"><li>• Using excess heat from the exhaust gas to power a steam turbine and generate more electricity</li><li>• Maximised efficiency</li><li>• Complete reliability and availability</li></ul>

Meeting customer needs

Yamama Cement is Wärtsilä's first gas-fired Flexicycle power plant in Saudi Arabia, and it has been a continuation of Wärtsilä's successful record in the country. The plant is a landmark power plant in Saudi Arabia because of its combined cycle and dual-fuel capabilities, and it is Saudi Arabia's largest-to-date engine plant installation. The project was achieved through Wärtsilä's emphasis on customer centricity - where customer interests and satisfaction come first.

The operating conditions in Saudi Arabia's desert climate are harsh, making efficient power usage more difficult. The environment presents its own challenges, with high ambient temperatures, dust and scarce water resources. Usually, cement plants are located in remote areas, and most of the cement industry in Saudi Arabia is powered by captive power plants like Yamama Cement.

While the plant's ability to operate with light fuel oil and crude oil as a backup is nothing new, its real benefit lies in the waste heat recovery system that will use excess heat from the exhaust to power a steam turbine and generate electricity, maximising the plant's efficiency. The solution combines excellent efficiency with complete reliability and availability, providing a great return on investment. Wärtsilä's offer complied with all of the customer prerequisites – technically, economically and operationally.

**Customer:**  
Yamama Cement  
Company

**Location:**  
Saudi Arabia

**Scope:**  
EPC (Engineering,  
procurement, construction)

**Delivery:**  
2018



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"Wärtsilä has a reputable track record in Kingdom of Saudi Arabia and they have offered an efficient and reliable solution for harsh operating environment. We consider this relationship a strategic partnership and hopefully it will be rewarding for both parties."

**Mr. Jehad Abdul Aziz Al Rasheed**  
General Manager, Yamama Cement Company

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