

# AD Ports Group - Project Shamal

## Introduction

Established in May 2006, Abu Dhabi Port's Group (ADPG) is a developer and operator of ports and industrial zones headquartered in Abu Dhabi. ADPG is recognised as a premier trade hub and is one of the most important contributors to trade and the economy in the United Arab Emirates (UAE), providing nearly 4.6% of Abu Dhabi's non-oil GDP as well as supporting 92,000 and 150,000 jobs in Abu Dhabi and the UAE respectively.

ADPG owns, manages and operates 11 ports and terminals in the UAE and Guinea, including the flagship deep water container port, Khalifa Port (KP), and KIZAD (Khalifa Industrial Zone Abu Dhabi). Alongside port and terminal operations, ADPG provides marine services such as vessel traffic services and harbour tug and towing; maritime training; cruise services; digital solutions; logistics; industrial and freezone services such as warehouse solutions and land lease; and, support services including security, fire and rescue, medical emergency, oil spill response and waste management.

It is our continuous endeavour to contribute to the diversification of UAE's economy and realise sustainable development. Our ambitious growth and expansion plans are deeply rooted in the principles of sustainability.

## Overall Project

Project Shamal is a marine port expansion project in Khalifa port, which includes significant sustainable building and infrastructure measures. It is one of the first green port expansions in the region which incorporates unique measures to reduce embodied and operational carbon.

The major buildings in the port expansion will be designed to Estidama 1-Pearl standards, while the Admin building will be ADPG's first net-positive energy building project, one of the first net-positive energy buildings in the UAE, and one of the first net zero carbon projects in the MENA region. The Admin Building will also be designed to 3-Pearl Estidama standards.

With respect to infrastructure measures, the ADPG team have incorporated novel sustainability measures for the terminal area and equipment including shore to ship power to significantly reduce emissions while ships are docked, and GGBS cement for large portions of the concrete infrastructure.

## Project Achievements

Project Shamal is a marine port expansion project in Khalifa port, which includes significant sustainable building and infrastructure measures. It is one of the first green port expansions in the region which incorporates unique measures to reduce embodied and operational carbon.

The project consists of the following:

1. A 465,000 m<sup>2</sup> container terminal (CMA Container Terminal) development for an operator (CMA CGM, hereinafter known as CMA) comprising container stacks, reefers, warehouses, buildings, roads, gate complexes, substations and all other associated infrastructure required to support a container terminal to be operator with electric Rubber Tired Gantries (e-RTG's).
2. A 400 x 580 m plot (Future Container Terminal) which will be used for general cargo in the short term, but which will be designed as part of the scope of services to cater for an expansion of the above container terminal development into this plot.

The ADPG team implemented a strict IDP procedure to ensure that the project aligns with the goal of becoming one of the most sustainable ports in the UAE.

All major buildings within the project were designed to at least the Estidama 1-Pearl performance standard, while the Admin Building was designed as a net positive building and to the Estidama 3-Pearl standard. Targeted measures for the buildings include:

- 1) High performance building envelope enclosure and glazing system.
- 2) Optimal North-South building orientation
- 3) External shading of windows
- 4) Premium efficiency ECM fans for Fresh Air Handling Units and Fan Coil Units
- 5) Enthalpy recovery for the Fresh Air Handling Units
- 6) Premium Efficiency HVAC systems.
- 7) LED Lighting with Occupancy Sensors and Daylight Control
- 8) EnergyStar Appliances
- 9) Low flow and flush fixtures to reduce potable water
- 10) GGBS cement for blockwork and structural concrete to reduce embodied carbon.
- 11) Building materials which are locally sourced and with high recycled content.
- 12) Renewable Energy system for the Admin building

With respect to infrastructure measures, the ADPG team have incorporated novel sustainability measures for the terminal area and equipment including shore to ship power to significantly reduce emissions while ships are docked, and GGBS cement for large portions of the concrete infrastructure.

Over 188,000 metric tons of embodied and operational carbon will be saved over the life of the project.

### **Project Shamal contribution to sustainability (socially, economically, and environmentally)**

Project Shamal contributes to sustainability on a social, economic, and environmental level.

**Social:** The ADPG team have ensured that emissions are reduced in the buildings by specifying low VOC adhesives, paints, and carpets. Additionally, ventilation quality and quantity is enhanced compared to traditional buildings. On a regional level, this project reduces carbon significantly and will contribute to pollution and GHG emission reductions in the UAE.

**Economic:** The Admin building within Project Shamal will provide operational savings. An LCC analysis was conducted to ensure that the ROI for the renewable energy system is acceptable. The buildings will also improve occupant productivity because of the IEQ enhancements which in turn will improve operational performance.

**Environmental:** Project Shamal will provide significant environmental benefits. The largest benefit is the reduction in operational and embodied carbon CO<sub>2</sub>. The emission savings is 188,000 MT CO<sub>2</sub>e over the service life. Secondary benefits include reduction in waste to landfill.

Numerous advanced practices have also been incorporated which contribute to the improvement of the green building industry:

**Zero Standards:** The Admin Building within Project Shamal will be one of the first buildings to target the Edge Zero Carbon Certification in the MENA region. This building will set a precedent in the region and will showcase that net-positive and net-zero carbon is practical and achievable. Additionally, Project Shamal includes buildings that meet at least Estidama Pearl 1 performance standards.

**Energy Efficiency:** The team conducted energy modelling and LCC analyses during the design stage to establish the most cost-effective ECM's for the buildings. These measures will be incorporated in future ADPG projects as best practice and will be shared with the green building community in a white paper. Additionally, the project includes shore to ship power which will provide ships with onboard power while they are docking to reduce diesel emissions.

**Renewable Energy:** The team designed Solar PV systems which provide 150% of the operational energy requirements of the Admin building. This practice contributes immensely to the green building industry since more jobs for solar suppliers/contractors are created.

**Embodied Carbon:** The ADPG team conducted a detailed Life Cycle Analysis (LCA) using OneClick LCA to reduce embodied carbon from building and infrastructure materials as practically as possible.

**Construction and Innovation:** ADPG have used a variety of tools including BIM, DesignBuilder, and OneClick LCA to optimize the design for low-cost measures.

### **Project Shamal Contribution to UNSDG**

Project Shamal aligns with the following UN Sustainable Development Goals (SDGs):

- Goal 7: Affordable and clean energy
  - The project includes a shore to ship power system, which will provide ships with onboard power while they are docked. This will reduce diesel emissions and improve air quality.
  - The project also includes a solar PV system, which will provide renewable energy for the Admin building.
- Goal 9: Industry, innovation and infrastructure
  - The project incorporates innovative and sustainable building and infrastructure design measures.
  - The project also uses a variety of tools to optimize the design for low-cost measures.
- Goal 11: Sustainable cities and communities
  - The project will reduce emissions and improve air quality in the UAE.
  - The project will also create jobs in the green building industry.
- Goal 13: Climate action
  - The project will reduce emissions and improve air quality in the UAE.
  - The project will also contribute to the global effort to combat climate change.

Project Shamal is a significant contribution to the UAE's efforts to achieve the UN Sustainable Development Goals. The project is a model for sustainable development and can be replicated in other countries around the world.

## **Conclusion**

Project Shamal is a unique maritime project that incorporates innovative and outstanding building and infrastructure design measures, and which highlights that high performance sustainable buildings and infrastructure are achievable in the MENA region.

The project eliminates a whopping 188,000 MT of CO<sub>2</sub>e emission over the life of the project due to several sustainable features including ship to shore power, high performance buildings, a net-zero carbon building, and green cement.

This project will be used as a best practice example for future green port designs in the AD Ports portfolio, both regionally and internationally.