Meeting Sustainability Challenges in the State of Qatar

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As the globe comes to grips with the fact that climate change is happening at a more rapid pace than predicted, we are all looking at ways we can be part of the solution.

Qatar is in a unique position. It is a desert environment, one of the largest producers of liquified natural gas in the world, and home to an extremely small population. This has resulted in Qatar hitting the headlines in recent years as the country with the highest CO-2 emissions per capita.[1] Yet in total output, Qatar only accounts for 0.3% of global emissions.[2]

So, what are some of the things Qatar is doing to minimise its carbon footprint?

Green Buildings

As the country rapidly develops, there has been a focus on green buildings, with major projects achieving LEED (Leadership in Energy and Environmental Design) certification[3] or the more recently developed and regionally focused Global Sustainability Assessment System (GSAS) certification.[4]

QNCC – the main venue for the WSCM 2023/24

The Qatar National Convention Centre (QNCC), which will host the majority of the activities for the WSCM 2023/24, was the

first building in Qatar to achieve LEED gold certification back in 2012. Beyond the 40,000 square meters of exhibition space, there are 10 performance venues, a 4,000-seat conference hall and 2,500 seat theatre.

Elements of the design and infrastructure that helped QNCC achieve this LEED gold certification include the installation of 3,500 square meters of solar panels on the roof. And to dramatically increase energy efficiency, occupancy sensors, LED lights, and zone-based air-control systems were implemented throughout the complex. These features work together to ensure substantially more sustainable energy use.

Qatar National Convention Centre © Qatar Tourism Association

Many other significant building projects, including most of the stadiums for the FIFA World Cup in 2022, feature sustainable design and operation and have achieved GSAS certification.

District Cooling

Another target area that has been identified to improve sustainability and reduce environmental impact is in the air conditioning of large commercial and residential towers. Qatar, being a desert country, has lovely, mild winters, but very hot and often humid summers.

With increased densification and the growth of high-rise buildings in Qatar, it was clear that cost-effective and more environmentally friendly cooling options were needed. Plans for district cooling started in the early 2000s and the world's largest district cooling plant was commissioned in 2010, supplying the island district known as the Pearl with all its air conditioning needs. More district cooling plants have been installed in major developments in the main commercial West Bay area of Doha, the new city of Lusail, and the Msheireb development area in the old city.

This major investment in district cooling plants ensures the use of high efficiency coolers and dedicated pipelines to feed buildings within a neighbourhood, drastically reducing the amount of energy required to make the buildings comfortable. One district project alone is estimated to "save 12.6 million kWhs per year compared to similar conventional coolers."[5]

Qatar district cooling © Susie Billings

Mangrove protection

Most photos of Qatar feature picturesque rocky outcrops in the north or the plethora of sand dunes in the south of the country, but Qatar also has a small and fragile ecosystem of mangroves on its east coast, 60km north of the capital city, Doha.

Globally, scientists have been gaining and promoting a greater understanding of the benefits of mangroves for carbon capture and as a habitat for birds, fish and other animals. Current estimates are that mangrove forests sequester carbon at five to eight times the rate of boreal or tropical forests. In addition to carbon sequestration, Qatar’s mangrove is an important stop for a variety of migratory bird

species, including flocks of flamingos.

Steps have been taken in recent years by the government to protect Qatar's coastline, with 40% of it being designated as protected area.[6] The Ministry of Municipality and Environment monitors the mangrove forest at Al Zakhira and has been repairing damage caused by visitors' previously unlimited access. There is now an elevated walkway for exploring the mangroves without damaging the plant life's delicate root systems.

Qatar Mangrove © Susie Billings

Desalination plants

While Qatar has a number of underground aquifers that were traditionally used to sustain life in the desert, the explosive population growth and development of first oil and then natural gas industries required a greater volume of water and a more sustainable and reliable source.

Qatar first started desalinating sea water in 1955 and continues to expand production and storage capacity rapidly. With a population growing from 500,000 people in early 2000 to over 2.7 million today, reliable desalinated water is essential for survival. However, there is a significant energy cost to produce clean, potable water. Qatar is currently investing heavily to improve the energy-intensive, thermal desalination

systems currently in use and expanding capacity with new plants that use the more energy-efficient, reverse-osmosis desalination process.[7]

Doha Metro Card © Susie Billings

Research & Development

Qatar's primary source of wealth is fossil fuels, predominantly cleaner-burning natural gas; however, the national leadership also recognises that Qatar has a wealth of sunshine, is natively water-poor, and is currently reliant on gas reserves that will not last forever.

Partnerships and investments in research projects at the Qatar Science and Technology Park[8] (QSTP) are fundamental to Qatar's future. Since 2010, projects investigating new solutions for solar energy, water conservation, food security, and other technological innovations have been undertaken under the roof of the QSTP. The focus of this collection of institutions is to find solutions to problems specific to Qatar and the region, such as complications in the

implementation of solar energy. There is an abundance of sunlight throughout the year in Qatar, but there are also regular sandstorms that coat, cover, and can scratch traditional solar panels, significantly reducing their performance. Research for innovative, cost-effective solutions continues on this and other locally pertinent issues of sustainability.

As we all seek ways to change the world for the better, Qatar looks forward to continuing to be a force for change, most recently joining with the USA, Norway, Saudi Arabia, and Canada to form a Net-Zero Producers Forum to work more cooperatively to develop pragmatic, net-zero emission strategies.[9]

Msheireb tram © Susie Billings

Visitors to Qatar for WSCM 2023

Qatar continues to actively introduce new infrastructure with a focus on sustainability. When visiting Qatar for WSCM 2023/24, you can fly Qatar Airways which operates one of the youngest and most fuel-efficient fleets and is part of the IATA carbon offset program.[10] Once in Doha, you can travel on brand new public transport systems including an

underground metro system, above ground tramways, and soon to be introduced electric buses.[11]

“When Qatar bid to host the FIFA World Cup 2022, it did so with a vision to use the tournament as a catalyst for sustainable, long-term change in Qatar and across the Arab world”, said the Qatar22 Chairman, HE Hassan Al Thawadi.[12] With the World Symposium on Choral Music coming just one year after Qatar hosts the FIFA World Cup, symposium attendees will benefit from the substantial and ongoing efforts in Qatar to create and live more sustainable lives.

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[1] https://ourworldindata.org/per-capita-co2

[2] https://ourworldindata.org/co2/country/qatar

[3] First developed by US Green Building Council in 1993

[4] Starting in 2007 a Middle East North Africa standard was created – projects that have been certified can be seen here https://www.gord.qa/gsas-projects

[5] https://www.utilities-me.com/article-2605-msheireb-opts-for-district-cooling

[6] https://forestsnews.cifor.org/13101/qatars-mangroves-why-they-matter-to-climate-change?fnl=

[7] H Rahman, Syed Javaid Z. Desalination in Qatar: Present Status and Future

Prospects. Civil Eng Res J. 2018; 6(5): 555700. DOI: 10.19080/CERJ.2018.06.555700.

[8] https://qstp.org.qa

[9] https://www.energy.gov/articles/joint-statement-establishing-net-zero-producers-forum-between-energy-ministries-canada

[10] https://www.qatarairways.com/en-us/about-qatar-airways/environmental-awareness.html

[11] https://www.sustainable-bus.com/news/yutong-mowasalat-fifa-world-cup-2022-qatar/

[12] https://www.fifa.com/what-we-do/sustainability/strategy/