Prioritising Circular Economy for Waste Management Success at QatarEnergy LNG

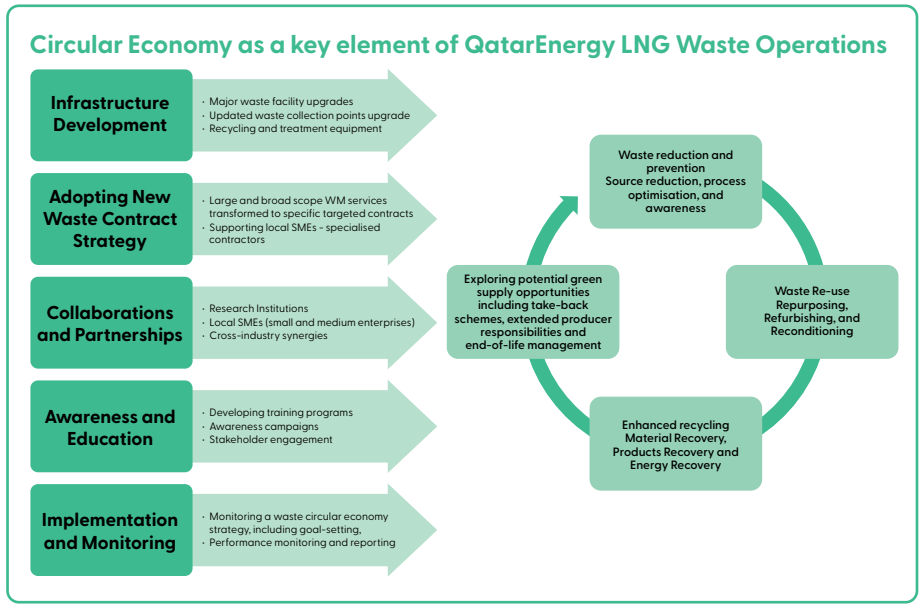
Company makes considerable inroads in implementing environmentally sustainable and cost-efficient waste operations by integrating circular economy strategies.

In recent years, there has been a substantial paradigm shift towards sustainability and circular economy in global business and industry. These concepts have been embraced by responsible operators within the energy sector as a necessary vision of the future.

Sustainability and the circular economy are also recognised and highlighted in the Qatar National Vision (QNV) 2030, which advocates for Environmental Development as one of the fundamental pillars of Qatar's future, along with sound economic management and the responsible exploitation of the country's hydrocarbon resources.

The QatarEnergy LNG Environmental Strategy and Implementation Roadmap, introduced in 2022, provides a pathway for the Company to achieve these QNV 2030 objectives and beyond. One of the Company's primary strategic goals is to achieve more than 70% recycling of all operational waste streams and transition to a circular economy model where every waste stream is considered a resource and therefore has a value that can be utilised, reused or recycled. This essentially means that "one's waste is someone else's resource" and that those resources, albeit finite, can be circulated in extended loops of production cycles. Hence, a range of used and waste materials can expand their useful lives considerably.

The circular economy model can also be interpreted as the next holistic phase of the '4Rs' (Reduce, Reuse, Recycle and Responsible Disposal), principles followed by QatarEnergy LNG in its waste management operations. This expands the Company's focus to look beyond the single waste stream and single activity approach, into complete, integrated cycles and meaningful interactions between them.



The Company's primary focus is to explore and establish local cross-industry partnerships and collaborate with in-country Small and Medium-sized Enterprises (SMEs) to develop waste recycling and upcycling solutions that will be sustainable, economically viable and environmentally beneficial.

In practice, the circular economy approach has allowed QatarEnergy LNG for implement sustainable solutions to a variety of materials that would otherwise be landfilled, ending their useful life cycles, with no economic or environmental benefit to the community.

Since 2018, the Company has prioritised the circular economy approach for a number of previously landfilled waste material streams, researching and identifying best practicable circular solutions with a potential to create in-country economic and environmental value.

This has created highly successful solutions within the principles of sustainability and circular economy, including those for molecular sieves, contaminated sulfur, various hydrocarbon waste streams and several other streams (as shown on page 21).

Enabled by QatarEnergy LNG and its SME partners, these solutions are now embedded into the State of Qatar's ever-expanding loops of circular economy and demonstrate the Company's commitment to QNV 2030 objectives.

Our sustainability and circular economy journey will continue enhancing existing partnerships and further expanding collaborations with local research institutions, SMEs and shareholders, in order to achieve the ambitions and objectives of the QatarEnergy LNG Environmental Strategy.

Success story - Molecular Sieves/Catalyst Recycling for cement production

The Molecular Sieves solution began in 2019 with cross-industry cooperation with a local cement factory, which now utilises QatarEnergy LNG molecular sieves as source material for its base product, 'clinker', which is the main component of cement.

This process was enabled through joint research with the local cement SME to prove its feasibility and to secure the necessary regulatory approvals to implement. Following QatarEnergy LNG's pioneering effort, this solution has now become well established and is also used by other energy operators in Qatar.

Success story - Hydrocarbon Waste Stream Recycling

QatarEnergy LNG's hydrocarbon recycling solution began in cooperation with a newly established local SME, which had a limited initial focus on the treatment and re-use of the Company's used lube oil stream only.

However, this partnership led to further research and successful trials with a wide range of other hydrocarbon waste materials, including those generated from sludge separation, tank decanting,and other similar QatarEnergy LNG processes as well as contaminated hydraulic oil, naphtha, diesel and kerojet.

This collaboration has now resulted in the majority of the Company's diverse hydrocarbon waste streams are recycled by the SME locally, providing financial and social benefits of expanding production cycles within the country.

Success story - Recycling of waste Sulfur for production of Sulfuric Acid

Contaminated sulfur that was previously neutralised and disposed of at hazardous waste landfills has instead become a source for sulfuric acid production at a local manufacturing plant.

This partnership with a local SME was built on mutual understanding of the intrinsic value that waste sulfur possesses and conducting research and field trials to confirm the technical feasibility of utilising this spent sulfur for sulfuric acid production. The successful partnership has led to a reduction of approximately 95 % in spent sulfur that was previously landfilled while supporting the local sulfuric acid market and in-country industry.