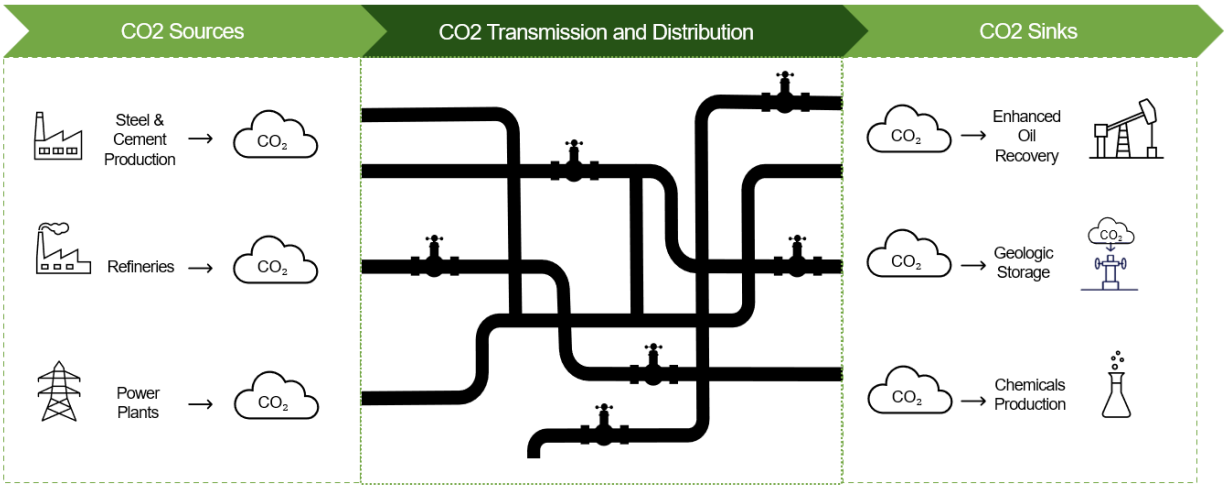
Information Memorandum for CO_2 Pipeline Infrastructure

OQ Gas Networks

December 2025

1. Introduction to Carbon Capture, Utilization, and Storage

Carbon capture, utilization, and storage (CCUS) is recognized as an important solution in the global effort to combat climate change, thereby protecting the environment. This technology is particularly vital in sectors that cannot be easily decarbonized such as the steel industry, cement production, and power generation. CCUS involves capturing CO_2 from point sources or directly from air and transporting it to sinks, where CO_2 can be permanently sequestered in geologic formations or put to productive use.



2. Background on CO2 Pipeline Transportation

2.1. Key Considerations for CO2 Transport Infrastructure

Once captured and conditioned, CO_2 must be compressed or liquified prior to transportation. Depending on factors such as distance, infrastructure availability, and CO_2 properties, transportation can be via pipelines, ships, trucks or rail tankers.

CO_2 can be transported in pipelines in either the dense phase or the gas phase. At sufficiently high pressures and ambient temperature, CO_2 exists in the dense phase, a state where it is neither liquid nor gas but exhibits characteristics of both: density of a liquid and the viscosity of a gas. Thus, this relatively high density makes transporting CO_2 in the dense phase more cost-effective; for a given mass throughput, dense phase CO_2 occupies a smaller volume, hence requiring smaller pipelines. Nevertheless, achieving and maintaining

dense phase CO_2 may necessitate significant pressure boosting to enter the pipeline network and potentially intermediate booster stations along the pipeline.

On the other hand, gas phase CO_2 is transported at lower pressures, but, due to its lower density, will occupy a larger volume and, therefore, pipelines would be larger, increasing costs.

In the United States, pipelines generally operate in the dense phase and the majority of the infrastructure is onshore, drawing on a history of experience from the enhanced oil recovery (EOR) industry. On the other hand, onshore CO_2 pipelines in the EU are primarily in the gas phase and transition to dense phase for offshore transport, governed by more stringent mechanical integrity requirements at sub-sea conditions which are supported by factors such as larger wall thickness and maximum allowable operating pressure.

The choice of transporting CO_2 in the dense or gas phase is location-specific and determined by risk assessments which consider various factors such as terrain, population density, distance, and certain environmental factors. Based on robust risk assessments, OQGN will adopt a combination of both gas and dense phase pipelines, dependent on the location within the country. As for the operating pressure of the pipelines, OQGN has selected a range of 90 – 129 barg for the dense phase pipelines and 10 – 65 barg for gas phase, in line with international best practices.

Additionally, the integrity of the CO_2 pipelines will be heavily dependent on the quality of the CO_2 stream entering the network. As such, a tight CO_2 specification would minimize such risks and emitters seeking access to the network must therefore consider the specifications at an early stage of the CO_2 capture technology selection and design. OQGN's preliminary view of the network specifications is outlined in the table below.

Parameter	Unit	Value
Carbon dioxide (CO_2)	Mol %	> 95%
Water (H_2O)	ppmv	< 40
Hydrogen (H_2)	Mol %	< 0.75
Nitrogen (N_2)	Mol %	<2
Argon (Ar)	Mol %	< 1
Methane (CH_4)	Mol %	< 1
Carbon Monoxide (CO)	ppmv	< 100
Oxygen (O_2)	ppmv	< 10
Total H_2+N_2+Ar+CH_4+CO+O_2	Mol %	<4
Total aliphatic hydrocarbons (C_2-C_6)	ppmv	< 1200
Ethylene (C_2H_4)	ppmv	-
Formaldehyde (CH_2O)	ppmv	-
Acetaldehyde (C_2H_4O)	ppmv	-
Aromatic Hydrocarbons	ppmv	< 0.1
Volatile Organic Compounds (VOC)	ppmv	-
Hydrogen Sulphide (H_2S)	ppmv	< 5
Carbonyl Sulphide (COS)	ppmv	-
Dimethyl Sulphide ($(CH_3)_2S$)	ppmv	-
Sulphur Oxides (SO_X)	ppmv	< 10
NOx (NO & NO_2)	ppmv	< 2.5
Amines	ppmv	< 5
Ammonia (NH_3)	ppmv	< 10
Hydrogen Cyanide (HCN)	ppmv	-
Mercury (Hg)	ppmv	-
Cadmium (Cd)	ppmv	-

2.2. OQGN's Role in Enabling the CCUS Value Chain

As Oman's exclusive natural gas transmission network owner and operator, OQGN has extensive pipeline expertise both technically and commercially, and is therefore intending to build the CO_2 pipeline infrastructure and is committed to do so to the highest industry standards while also aiming to provide cost-effective CO_2 transportation and leveraging its existing Rights of Ways to build the infrastructure. By acting as a neutral infrastructure provider, OQGN will provide equitable, non-discriminatory access to all users while also ensuring that their requirements are met. Ultimately, as the recognized CO_2 Transporter in Oman, OQGN will own, operate, and maintain all CO_2 pipelines in Oman. As such, any CCUS project developer that has received government endorsement must approach OQGN to align infrastructure requirements, if any, and way forward.

3. Proposed CO2 Network and Routes

Given the limited available information on the potential for CCUS in Oman, OQGN has adopted a robust methodology to forecast the CO_2 market in Oman, comprising of the release of a CO_2 market survey and performing detailed analyses on industrial emitters in Oman. The survey, which was released to 28 industrial emitters in Oman, supported in gaining a better understanding of the locations of CO_2 emission sources, sinks and technical requirements of network users. Alongside the survey, and as part of OQGN's CCUS strategy study that was conducted in 2024, a robust market forecast assessment was completed where OQGN developed its own methodology to analyze the decarbonization pathways of industrial emitters in Oman (those that release more than 0.5 MTPA) and made informed assumptions to shape the CO_2 infrastructure. In addition to this, OQGN also engaged with stakeholders across the CCUS value chain to get clarity on the demand for a CO_2 network. Such activities were instrumental in conceptualizing the CO_2 network.

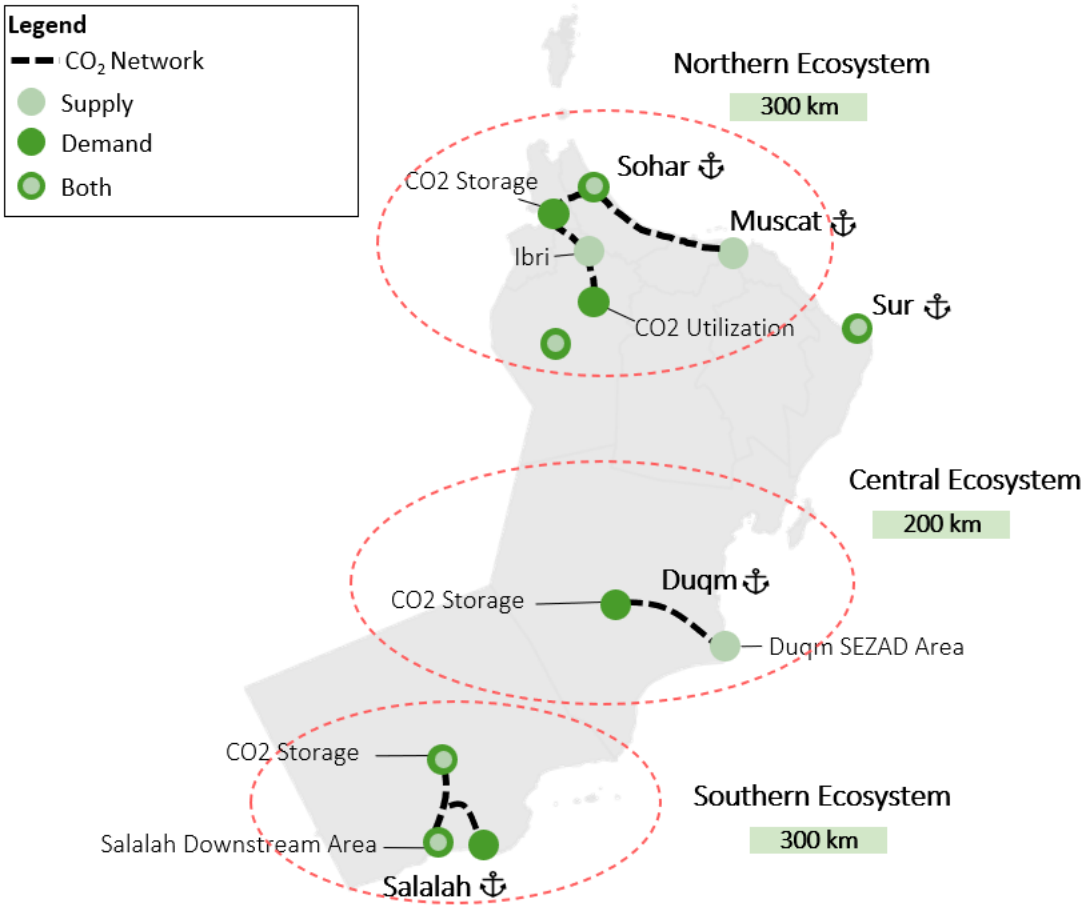
Accordingly, OQGN envisions three independent CCUS ecosystems in Oman: Northern, Central, and Southern. Each will potentially have unique characteristics.

The Northern CCUS Ecosystem aims to enable the decarbonization of the growing Sohar Industrial Area, the largest emitting cluster in Oman, and nearby regions, such as Ibri. To develop a CCUS value chain, reliable CO_2 sources must be secured and transported via a ~ 300 km (excluding Muscat) CO_2 pipeline to appropriate CO_2 sinks, such as long-term geological storage or utilization. The Northern CCUS Ecosystem will require coordination between multiple stakeholders, including the Sohar Industrial Port Company (SIPC), tenants within the port area, CO_2 capture technology providers, OQGN, and potential storage and utilization players. Once established, the Ecosystem will allow Sohar Industrial Area to grow

while addressing the critical need to reduce emissions. Moreover, CCUS infrastructure can attract investments into the port and freezone area for low carbon products while also enabling companies within the port area to attract low-carbon premiums for their products.

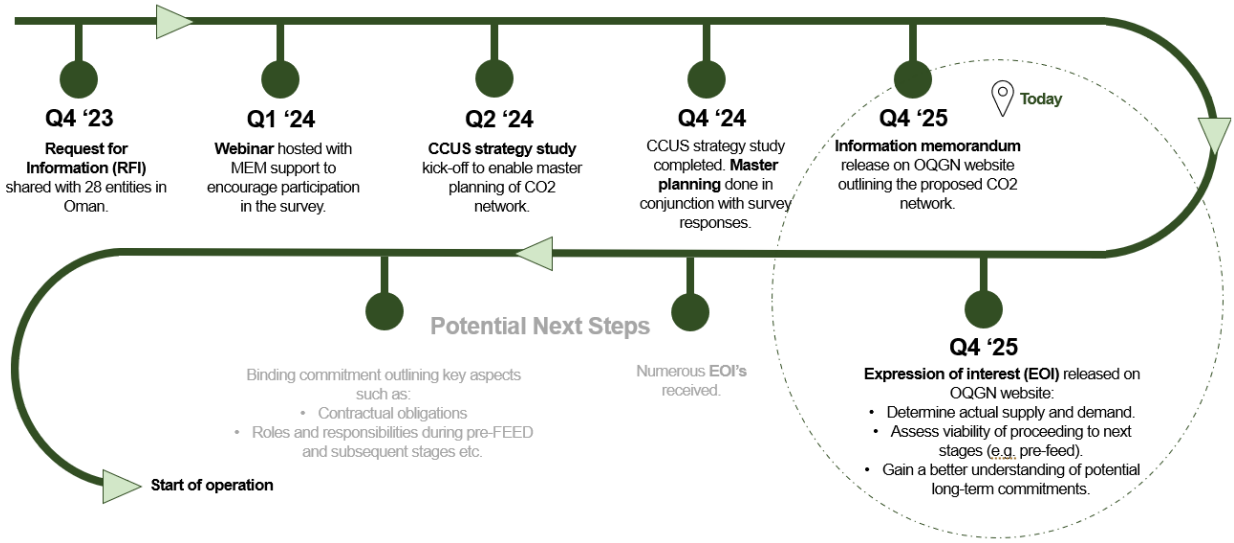
The Central CCUS Ecosystem aims to cater to existing and emerging Duqm users. Potential storage sites in Oman's largest oil concession area, Block 6, may be used as sinks with an estimated pipeline length of ~200 km. Additionally, the Southern CCUS Ecosystem aims to cater to the Salalah Industrial Area with the storage sites in southern Block 6 being used as sinks, with an estimated pipeline length of ~ 300 km.

Lastly, the integration of Sur within the Northern and Central CCUS Ecosystems was assessed, but it was found more cost-effective to deliver CO_2 captured in Sur to more local sinks. Therefore, OQGN is collaborating with emitters in Sur to determine suitable and more appropriate CO_2 sinks in closer proximity to these emission centers.



4. How to Contribute: Next Steps and Participation Process

While significant progress has been made to drive the CO_2 infrastructure development in Oman, there are yet to be key milestones realized before the infrastructure can be ready and operational.



4.1. Non-binding Expression of Interest

Further studies will be crucial in detailing the CO_2 pipeline network. This includes determining the optimal pipeline sizes, establishing operational pressures and temperatures, CO_2 specifications, and identifying the anticipated start dates for construction.

All interested parties are invited to complete an Expression of Interest (EOI) on OQGN's website stating that they are willing to provide necessary information to allow their requirements to be assessed in future studies.

Sharing this information will enable parties to have more seamless access to the future CO_2 transportation network. If a party chooses not to submit an EOI at this stage, there may be challenges in the future to cost-effectively access the network.

This EOI is open to all parties wishing to participate, allowing OQGN to refine the CO_2 pipeline infrastructure developments based on market interest. The EOI is confidential and

OQGN shall exercise reasonable measures to prevent unauthorized use or disclosure of information shared through this EOI.

Engaging in this EOI is **non-binding**; completing the request does not oblige your organization to any future commitments from OQGN to deliver any services.

Upon submission of the EOI, OQGN may contact you to sign a Non-Disclosure Agreement (NDA) to share further project information, if required.

4.2. Transition to Binding Commitments

The next stage would be to transition to binding commitments, which will outline legal and contractual obligations to formalize decisions made in earlier stages. This will be dependent on factors such as the readiness of parties involved.

For any further enquiries, please contact CCUS@oqgn.om.