

# CO2 Emissions Reduction in Corporate Sustainability

The report from the Carbon Dioxide Capture and Conversion (CO2CC) Program focuses on how companies are addressing their sustainability goals through areas like CO2/GHG emissions reduction (especially through CCUS), carbon reduction, waste recycling and mitigation, and resource utilization.

The report, “The Role of CO2 Emissions Reduction in Overall Corporate Sustainability Initiatives” summarises known corporate commitments by International Oil Companies (IOCs), National Oil Companies (NOCs) and Global Chemical Companies to reduce CO2/GHG emissions.

CO2 emissions reduction is an area that is dominating corporate sustainability initiatives and attracting attention in the hydrocarbon processing industries. Ultimately, it’s becoming more and more clear that sustainability is an increasingly integral and core aspect in both company culture and decision making.

The scope of the report covers crucial efforts that highlight the methods and mentalities being applied to address environmental sustainability to promote clean air and water, responsible use of resources, and promotion of good biodiversity. It highlights that there are many approaches to sustainability, and it is becoming increasingly important to identify:

- How companies define sustainability
- How companies then structure and implement efforts for results
- How companies respond to those efforts and improve results

Sustainability is not a new concept in the hydrocarbon processing industries. Much effort and technological innovation has been required (and will continue to be) to comply with clean air regulations, like reducing NOx and SOx emissions. What has evolved quite quickly is the attention that is being given to the reduction of greenhouse gases (GHG), mainly CO2 and CH4.

The petrochemical and chemical industries have both overlapping and different sets of goals and objectives when it comes to sustainability when compared to oil and gas and refining. Reducing CO2 emissions and then utilizing CO2 as a raw material into traditional products is seen as a “cornerstone of sustainability plans”.

It is worth noting that although the report is a refining (i.e. downstream O&G) and petrochemicals assessment, the linkage to upstream O&G is undeniable in several areas. This falls into 3 categories:

- 1) Carbon Intensity of feeds and fuel supplies. As the facilities look further and deeper into the supply chains and total life cycles, the carbon intensity of supply will be a factor over time in the enterprise’s carbon footprint and CSR scorecard.
- 2) The comparison and contrasts of enterprises that are vertically integrated and as such have a spread of the operational footprint across the enterprise, those contrasts of non-integrated refineries and chemicals facilities will be exposed.
- 3) In the case of emissions controls and technologies (especially in the CCUS landscape) the upstream will be critical to integrate. In the case of CCUS, the CO2 capture facility will need to have a construct to assure safe and permanent storage of the CO2 in geologic formations. This is essential to capture the tax credits provided by 45Q— as well as any long term off take to satisfy the investments made on CO2 capture technologies.

As the technologies mature, the projects become reality, and the market reaches a level of certainty sufficient for individual investment and risk analysis, it will likely enable individual company investment and balance sheet exposure.

Coupled with a global tax on carbon or structured carbon exchange mechanism these investments could then become a reality, but such a transition is difficult to project, but can be considered as impactful in a +/-5 year time horizon.

## Scope of Report

The opening of the report addresses how companies define sustainability and how they

then structure and implement efforts for results. The involvement and strong presence by the investment community has created a marketplace momentum that is undeniable. The effects ripple throughout the global community not just for those that are in the oil and gas and petrochemical world, but suppliers, energy segment providers, investment houses, shareholders, and in general, the court of public opinion.

In the petroleum refining and chemical industries, there are several overall trends taking place to address the reduction of GHGs, including relevant GHG mitigation techniques such as carbon capture and utilization (CCU) and carbon capture and storage (CCS).

In late 2019, Gulf Energy Information conducted a survey ([gulfenergyinfo.com/sustainability-leadership/2019/november/understanding-sustainability-in-oil-and-gas](http://gulfenergyinfo.com/sustainability-leadership/2019/november/understanding-sustainability-in-oil-and-gas)) to try to better understand sustainability in the oil and gas industry. Their survey found:

- 49% of companies have a sustainability initiative
- 29% do not and were not working on creating one

An interesting finding was that the vast majority (65%) view their company’s sustainability initiative as a competitive advantage instead of originating from either social (26%) or investor (9%) pressure.

## Corporate commitments

Ways in which the oil and gas industry is addressing sustainability include organizations such as the Oil and Gas Climate Initiative (OGCI) where funds in excess of \$1B have been pooled to fund early stage research as well as start-up project development to impact carbon emissions, or the Alliance to End Plastic Waste (AEPW) with an investment of similar magnitude to tackle the challenge of 8 million tons of plastic waste entering oceans every year.

Corporate commitments to reducing GHG emissions are largely influenced by the Paris Climate Agreement and the UN SDGs. A variety of technological approaches are being considered or already being utilized in order to reduce CO<sub>2</sub> and GHG emissions, amongst other efforts to improve sustainability.

While numerous European and North American oil majors (the IOCs) have made public commitments to net-zero goals, the same can't be said for National Oil Companies (NOCs). However, they may have actionable plans in place to reduce their CO<sub>2</sub>/GHG emissions but many have not made the net-zero commitment.

For the Chemical Industry, the sustainability strategies will obviously differ from oil majors. For one, chemical companies typically have lower Scope 1 and 2 emissions when compared to their upstream peers.

### Low carbon and clean energy investments

Capital expenditure on low-carbon, clean energy innovations and technologies is a marker showing long-term commitment to a pathway of GHG emissions reduction. A broad range of efforts would be required to decarbonize the refining and petrochemicals sectors and to ensure their long-term sustainability.

CCUS represents at least a low-carbon option for numerous industries and can make a significant impact in certain "hard to abate" industries like steel and cement production.

The CCS supply chain starts from sources of CO<sub>2</sub> emissions from industrial or petrochemical manufacturing and power generation activities. Technologies and projects that capture and store CO<sub>2</sub> would likely have the knock-on effect of further commercialization and cost reduction to less than \$20/ton CO<sub>2</sub>

According to the Global CCS Institute, cost reductions are one of the prime reasons why investment in CCS today is important as the learning that results from deploying CCS will inevitably deliver cost reductions. The report summarises corporate capital CCS investments to date.

### Metrics

Emissions can be classified into three categories based on their source across the lifecycle. The U.S. Environmental Protection

Agency's classification for emission scopes were used. These are:

- Scope 1 emissions are direct emissions, includes on-site fossil fuel combustion and fleet fuel consumption.
- Scope 2 emissions are indirect emissions from sources, includes emissions that result from the generation of electricity, heat or steam.
- Scope 3 emissions are from sources not owned or directly controlled by the source but related to its activities such as employee travel and commuting, solid waste disposal and wastewater treatment and other consumption associated emissions from the value chain.

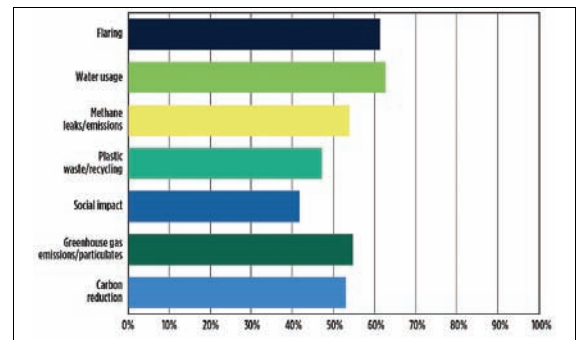
The measurement of sustainability is crucial towards improvement and in the achievement of targets and benchmarks in a competitive marketplace, as well as in achieving long-term continuous progress.

The 2030 Agenda for Sustainable Development adopted in 2015 by all United Nations forms the basis of all sustainability-related activities across economies and economic sectors. The Agenda is defined by 17 Sustainable Development Goals (SDGs), which are an urgent call for action by all countries in a global partnership.

### Outlook

There are many challenges to consider when it comes to measuring the contribution to real shareholder value and competitive differentiation that go beyond compliance in CO<sub>2</sub> Emissions Reduction and Corporate Sustainability:

- Contribution to real shareholder value and competitive differentiation are questionable in investments that go beyond compliance and could be a useful back check on company performance. The circular economy and plastics are very likely worthy of the most attention given the impact on supply and demand for the gas and oil businesses.
- When it comes to assessing CO<sub>2</sub>/GHG emissions reduction strategies, examples show how companies are reducing CO<sub>2</sub> emissions in their products, their plants, and their supply chains. Capital spending on areas like renewable energy, carbon capture, utilization, and storage (CCUS), biofuels, plastics recycling



Key technologies and issues for the oil and gas industry to address which can improve sustainability. (Source: Gulf Energy Information survey; see link in text)

and/or the circular economy, and resource conservation are analyzed.

- There is significant work being done in the areas of ocean and river clean ups where waste is prevalent and contributes to the global view of plastics. The ability to create a circular economy that can return such waste to a feedstock that can be competitively aggregated and costed will be a driving force for long term viability of the industry.
- Water consumption is becoming an even greater challenge for process industries and the ability to create a circular economy in the use of water will also be critical.
- Land use and community impact continues to be a challenge when moving investments into emerging markets and countries.

### Next articles

This is a series of articles summarising recent key reports from The Catalyst Group Resources Carbon Dioxide Capture and Conversion (CO<sub>2</sub>CC) Program. Look out for forthcoming issues featuring: Progress Towards Operating a Viable Business in CO<sub>2</sub>; Catalogue of Most Important Scientific Advances in CCUS Over the Past 3 Years; and Permanent Sequestration of CO<sub>2</sub> in Industrial Wastes/Byproducts.

### More information

More information about this report and other services of the CO<sub>2</sub>CC Program can be found at:

[www.catalystgrp.com/tcg-resources/member-programs/co2-capture-conversion-co2cc-program/](http://www.catalystgrp.com/tcg-resources/member-programs/co2-capture-conversion-co2cc-program/)