

Carbon Management: Securing the Sustainability of Oil and Gas in the Energy Transition

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A personal introduction

Over 24 years of global oil and gas industry experience in technology, exploration, development and production operations. An industry leader and expert in Carbon Management and Carbon Capture, Use and Storage.



Agenda

Carbon Management



Oil and gas in the energy transition?

Carbon Intensity of



Is all oil and gas the same?

Carbon Policy & Regulations



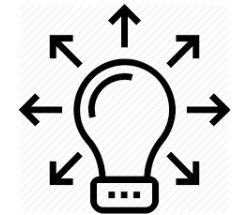
Changing the market?

Sustainable Investment



Increasing pressure to act?

Carbon Solutions



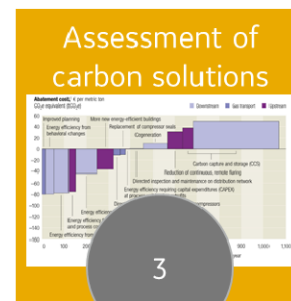
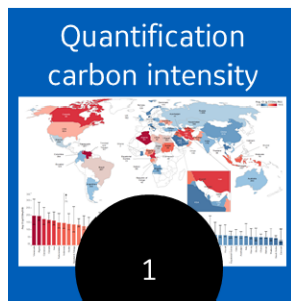
How to transform our business?

Gaffney Cline & Associates Carbon Management Practice

The oil and gas industry leader in providing carbon management advice and consultancy

Mission: Helping governments, energy companies, and the financial community understand and solve energy transition issues related to oil and gas resources, assets and investments.

Practice:

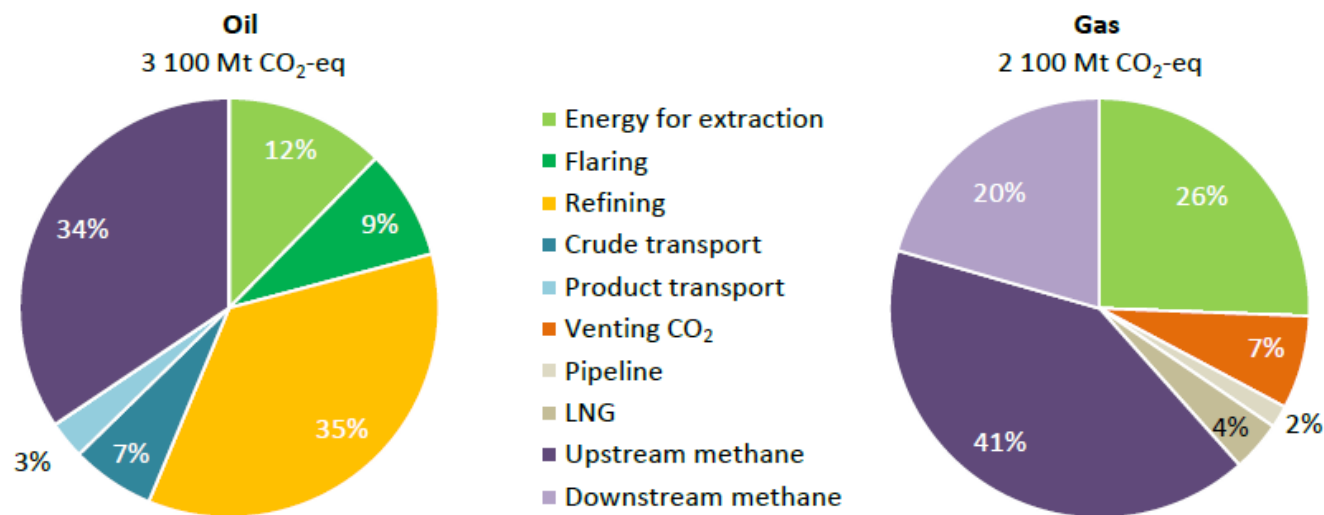


Foundation:

Gaffney, Cline & Associates expertise and experience of providing impartial and confidential advice in oil and gas resource/reserves reporting, field development and fiscal negotiations

Carbon Emissions of Oil and Gas

What are the GHG emissions associated with the supply (not use) of oil and gas?

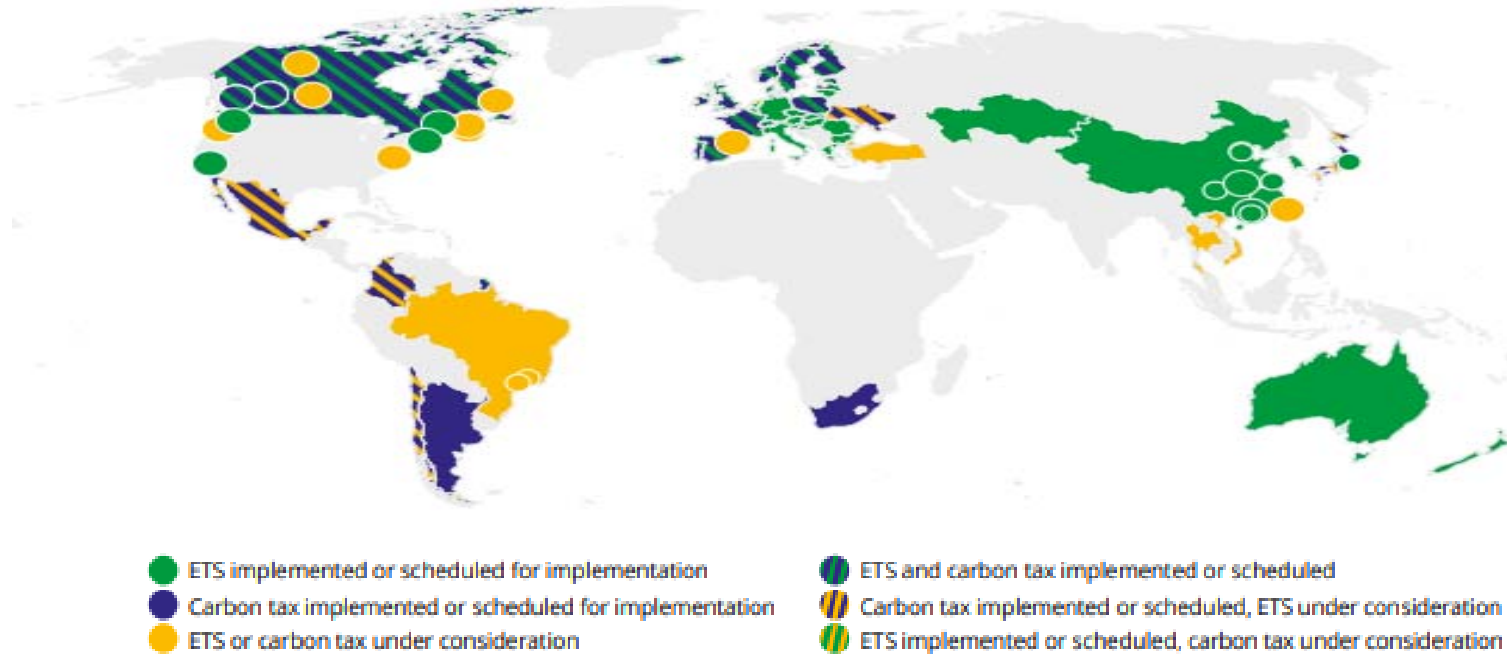


“The extraction, processing and transportation of oil and gas is responsible for nearly 15% of global energy sector GHG emissions today”

Source: International Energy Agency (2018), World Energy Outlook 2018, OECD/IEA, Paris

Carbon Policy and Regulations

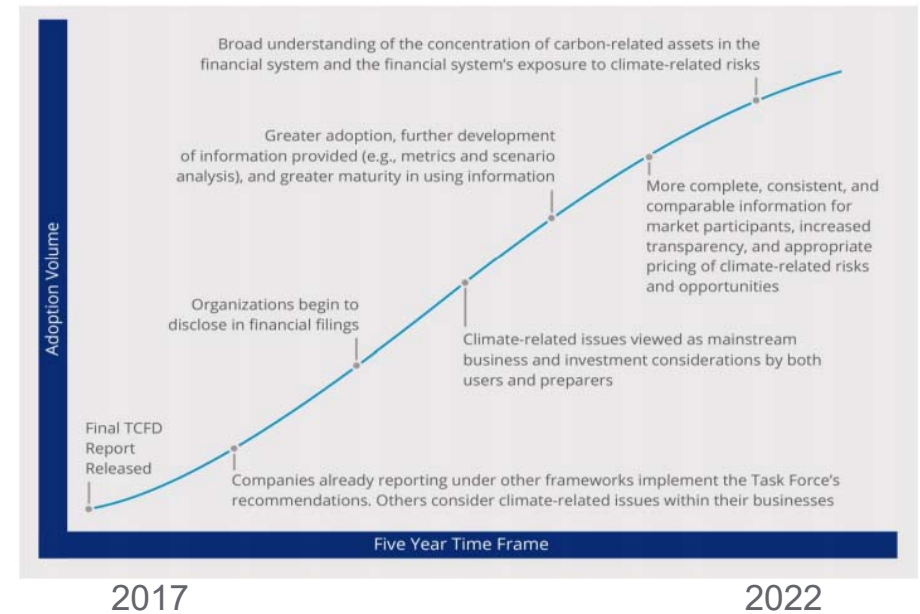
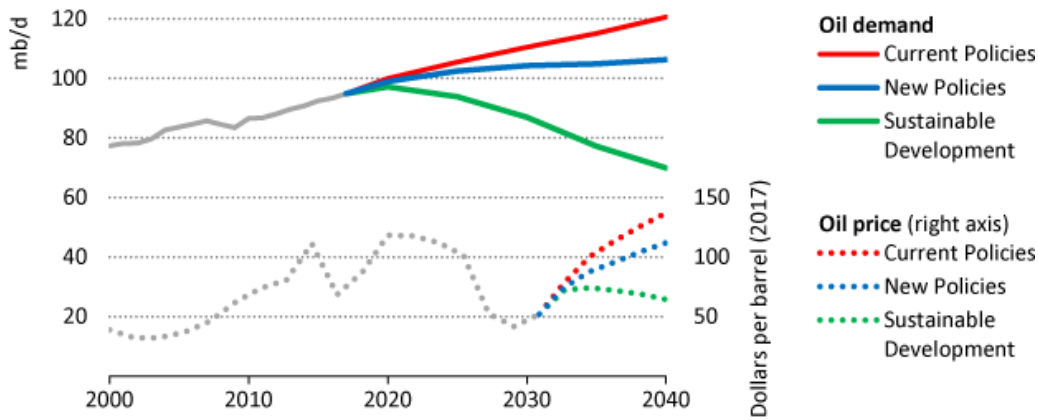
How could carbon policy and regulations impact oil and gas production?



Source: World Bank

Sustainable Investment

Why are shareholder and financial sector sentiment changing towards oil and gas investment?

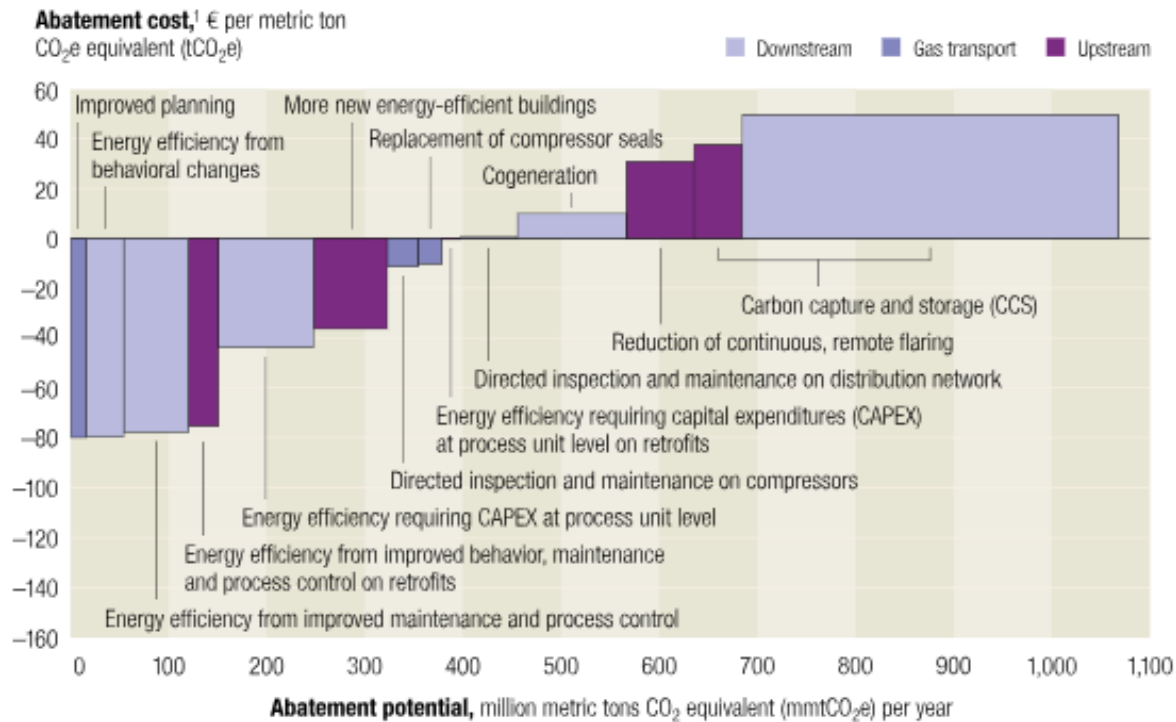


Source: International Energy Agency (2018), World Energy Outlook 2018, OECD/IEA, Paris

Source: Financial Stability Board – Task Force on Climate-related Financial Disclosures (TCFD)

Carbon Solutions for Oil and Gas

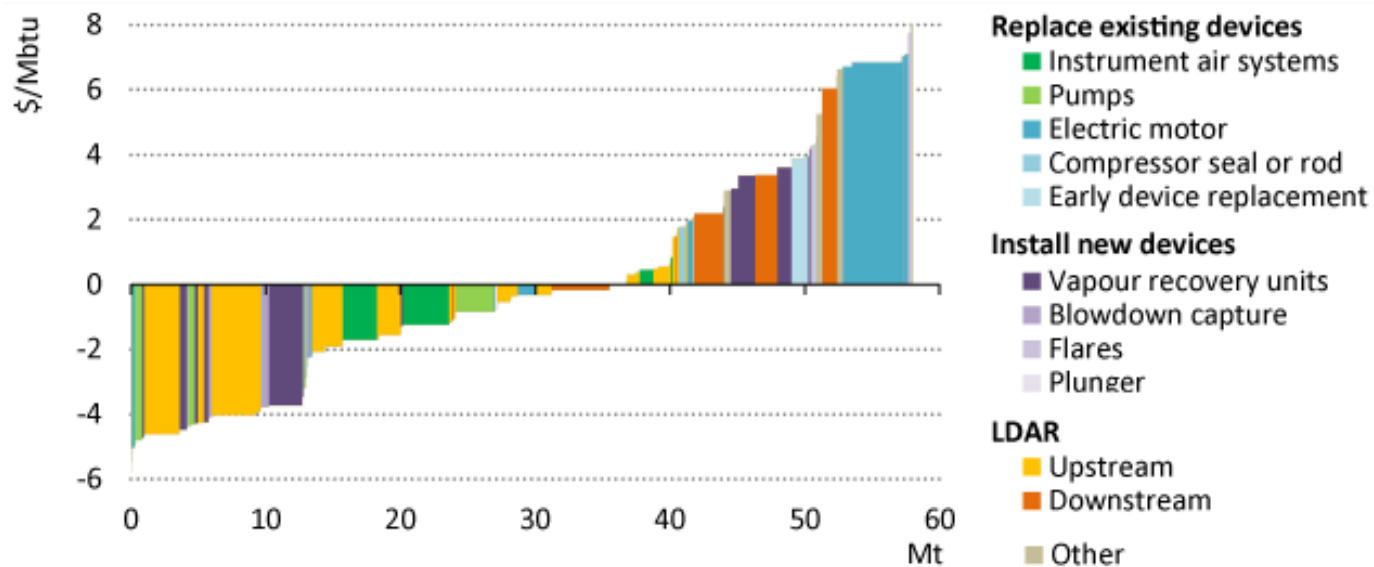
What are the range of solutions available to the oil and gas industry to avoid, reduce, replace, offset, or sequester GHG emissions?



Source: McKinsey, 2010

Focus on: Methane Solutions for Oil and Gas

What are the range of solutions available to the oil and gas industry to reduce venting, flaring and fugitive methane emissions?

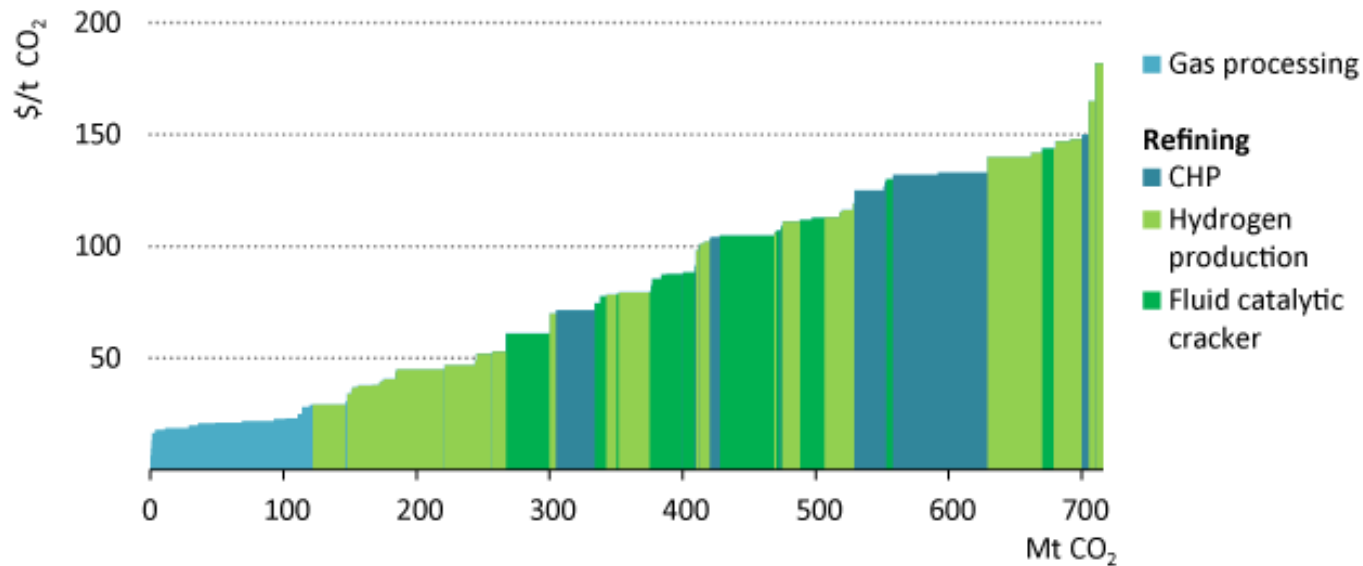


“Leak detection and repair in upstream operations and vapor recovery units on tanks offer some of the lowest cost options to reduce oil and gas related methane emissions”

Source: International Energy Agency (2018), World Energy Outlook 2018, OECD/IEA, Paris

Focus on: CCUS in Oil and Gas supply

What are the range of applications available to the oil and gas industry to deploy CCUS on their own operated emissions?



“Only around 20 Mt of CO₂ emissions are captured from oil and gas operations today. A \$50/t CO₂ price could reduce indirect emissions by around 250 Mt through CCUS”

Source: International Energy Agency (2018), World Energy Outlook 2018, OECD/IEA, Paris

Focus on: National Petroleum Council CCUS Study

What benefits does CCUS provide? What are the barriers? What is the potential? What is needed to unlock investment? What issues should be addressed?

