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King Abdullah Petroleum Studies and Research Center

The Global Methane Pledge: What It Means for the Oil and Gas Industry Post-COP26

Rami Shabaneh

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About KAPSARC

The King Abdullah Petroleum Studies and Research Center (KAPSARC) is a non-profit global institution dedicated to independent research into energy economics, policy, technology and the environment across all types of energy. KAPSARC's mandate is to advance the understanding of energy challenges and opportunities facing the world today and tomorrow, through unbiased, independent, and high-caliber research for the benefit of society. KAPSARC is located in Riyadh, Saudi Arabia.

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After two weeks of climate negotiations in Glasgow, the 2021 U.N. Climate Change Conference of the Parties (COP26) concluded successfully. Representatives of nearly 200 nations agreed to well over 50 decisions (some of which have been pending since COP24), keeping the implementation of the Paris Agreement alive. The COP26 was also marked by a series of surprise announcements, including national net-zero pledges and promises to end deforestation. One of the surprise pledges that may have implications for the oil and gas industry is the Global Methane Pledge, which sets a global goal to slash methane emissions by 30% by 2030 from 2020 levels. The Global Methane Pledge was originally proposed by the United States (U.S.) and the European Union (EU) on September 18, 2021, with the intention of launching it at COP26 to get more countries on board (The White House 2021). By the end of COP26, around 105 countries had joined the pledge, including major oil and gas producers such as Saudi Arabia, the United Arab Emirates and Iraq. At the time of this writing, several major methane emitting countries — including Russia, China, Australia, India and Iran — did not join the pledge, making it challenging to reach the target. China, however, did later commit during COP26 to reducing methane emissions through a separate U.S.–China partnership to boost cooperation in tackling climate change. The joint declaration mentions that China "intends to develop a comprehensive and ambitious National Action Plan on methane, aiming to achieve a significant effect on methane emissions control and reductions in the 2020s" (U.S. Department of State 2021). With these announcements, methane took center stage at COP26, and the final decision text under the Glasgow Climate Pact (one of the main decisions from COP26) even encourages all parties to consider reducing non-carbon dioxide emissions, including methane.

Why Methane?

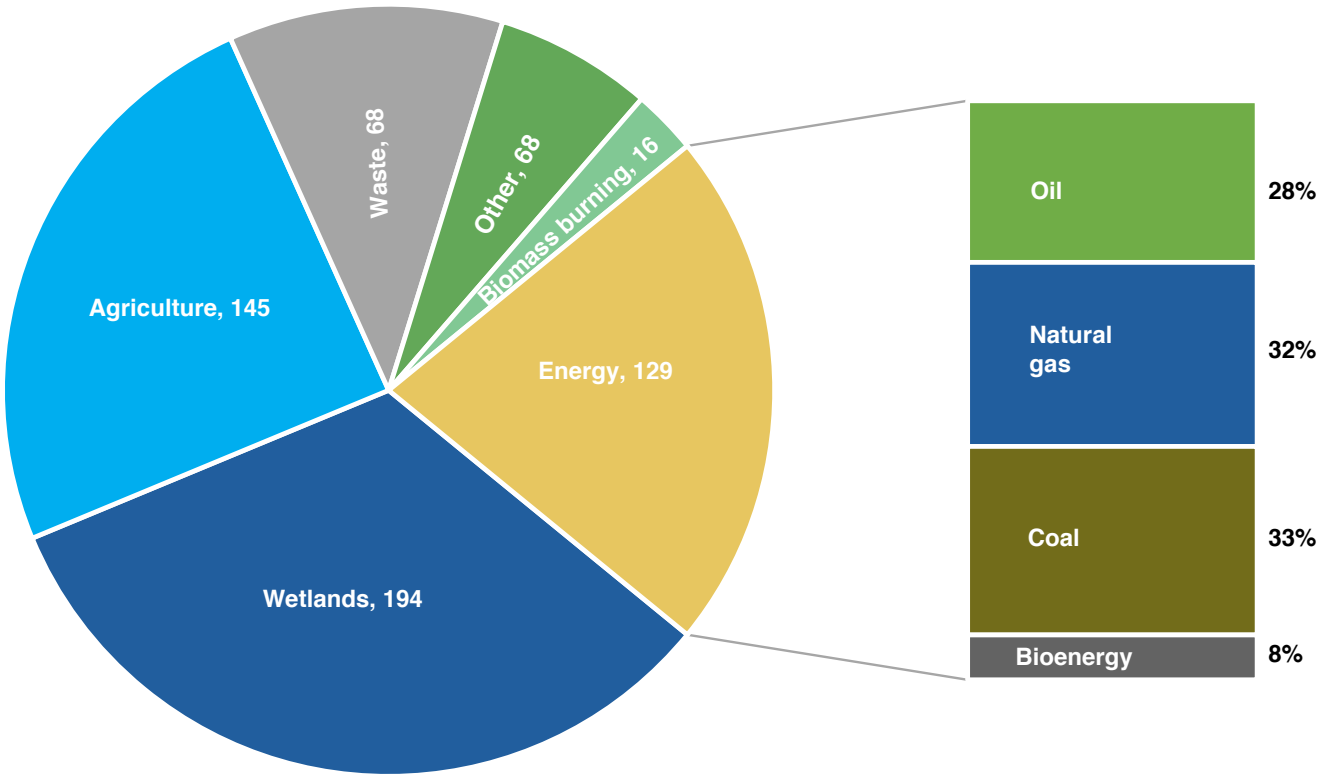
Methane (CH_4) is the second most abundant Greenhouse Gas (GHG) after CO_2. Although methane does not persist in the atmosphere for as long as CO_2, it is more effective in trapping infrared radiation, creating a more amplified greenhouse effect. Considering the amount of energy that gas can absorb over a given time period, the global warming potential (GWP) index was developed to measure the net effect of emitting 1 tonne of gas relative to 1 tonne of CO_2. The GWP of methane, over a 100-year time frame, is around 28 (i.e., methane has 28 times the global warming potential of CO_2). Scientists believe that methane concentrations could return to pre-industrial levels within 50 years if methane emissions were halted (Collins et al. 2013). Thus, a reduction in methane emissions can have an immediate impact on reducing the risks of climate change. The European Commission estimates that fulfilling the 30% reduction in methane emissions under the methane pledge would reduce warming by 0.2°C by 2050 (European Commission 2021).

The latest statistics show that global methane emissions reached around 590 million tonnes (IEA 2021). Assuming a GWP100 of 28, this amounts to about 16.5 gigatonnes of CO_2 equivalent. About 40% of methane emissions occur naturally, the majority coming from wetlands, and the remaining 60% are anthropogenic, largely from the agricultural and energy sectors. As Figure 1 shows, the energy sector is responsible for 129 million tonnes (22% of total), within which the oil and gas industry is the largest contributor, accounting for 60% of energy sector emissions.

Methane in the Energy Sector

While the Global Methane Pledge focuses on human-made emissions, assessments indicate that the most effective methane emissions savings can be achieved in the energy sector (European Commission 2020). There are a wide range of monetization pathways for methane, and solutions to locate and fix fugitive methane emissions are widely available, particularly in the oil and gas sector (UNEP 2021). The International Energy Agency (IEA) estimates that around 33.2 million tonnes of methane, approximately 60 billion cubic meters,[1] could be captured from this sector with no net costs (IEA 2021).

Figure 1. Methane emissions by source, including a breakdown of the energy sector (million tonnes).



Source: KAPSARC illustration of IEA data (IEA 2021).

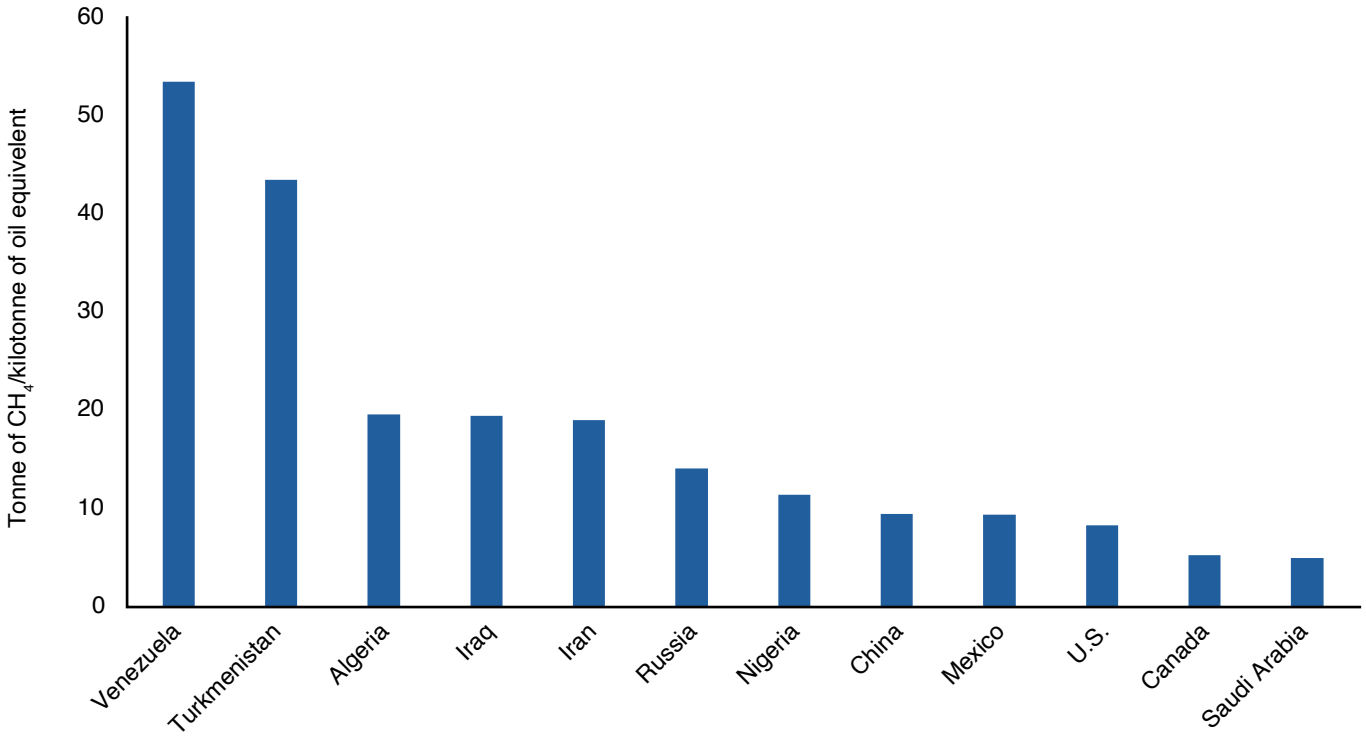
[1] Author's calculation: assumed 0.554 kilograms per cubic meter of methane.

Methane emissions in the oil and gas sector can be categorized into methane *venting, flaring*, and *fugitive* emissions (Stern 2020). Venting methane in oil and gas operations is the deliberate release of unburned methane into the atmosphere. This occurs during several types of operations, including well completion and maintenance, and through the use of pneumatic equipment (CAPP 2021; Methane Guiding Principles 2019). Methane emissions from flaring are also deliberate. These emissions happen when producers burn natural gas (comprising mainly methane) produced as a by-product of oil production through a flare stack. While burning natural gas releases CO_2, inefficient flare stacks result in incomplete burning of natural gas, resulting in significant volumes of methane emissions. Unlike venting and flaring, fugitive emissions are unintentional and result from methane leakages across the petroleum value chain, including the well-head, pipelines, liquefaction, and regasification facilities.

Current data on methane emissions are patchy, and the different reporting standards and methodologies adopted by reporting agencies has resulted in data discrepancies (Stern 2020). As part of the Global Methane Pledge, there was a call to move toward a more harmonized methodology to quantify methane emissions. On the eve of COP26, the International Methane Emissions Observatory (IMEO) was launched at the G20 Summit by the United Nations Environment Programme (UNEP) and the EU. The objective of the IMEO is to produce a global dataset of methane emissions, initially from the fossil fuel sector, that is verified through empirical observation (European Commission 2021). The IMEO will consolidate input from oil and gas company reporting, remote sensing data, national inventories and direct measurement data from scientific studies to get an accurate global recording of methane emissions by country.

The increased focus on methane will certainly put pressure on oil and gas producers to follow stricter protocols to reduce emissions along their value chain to enhance the value of their assets. This will be particularly important for Middle East oil and gas producers looking to transition their production portfolio toward more natural gas and low carbon fuels, such as blue hydrogen, where upstream methane emissions are expected to be part of the emissions accounting. The methane intensity (which is the ratio of methane emissions to methane produced) in the Middle East varies, with Iraq and Iran ranked amongst the highest in the world, as seen in Figure 2. This is partly due to the large amount of gas flaring taking place in Iraq and Iran, which the World Bank ranks as the second and third top flaring countries in the world.

Figure 2. Methane intensity of selected major oil and gas producing nations.



Source: IEA (2021).

Saudi Arabia, however, is ranked as having one of the lowest methane intensity rates globally (Figure 2). Policies to reduce flared gas have been implemented since the 1970s, and rigorous monitoring under Saudi Aramco's methane leakage detection and repair program have brought down methane intensities to as low as 0.06% in 2018 (Pinheiro 2020). The UAE (not shown in Figure 2) also claimed significant improvements in methane intensities, down to 0.01%, due to reduced volumes of gas flaring (WAM 2021).

The Global Methane Pledge is a step in the right direction to lower GHG emissions. However, governments need to identify solutions by developing roadmaps and strategies aimed at lowering methane emissions. Most importantly, strong institutional capacity is the key to enabling policies that can reduce emissions, particularly in the oil and gas sector. In addition, the role of independent third-party verification of company-level methane emissions will be essential to ensuring complete and accurate data reporting.

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