



## Managing our emissions: Energy conservation and beyond

### THE PARIS PUZZLE Managing Our Emissions

This document is one piece of the Paris Puzzle – a series of papers intended to address what we see as key components of efforts to address climate change, and demonstrate our commitment to meeting the challenge. Find the other pieces at [www.ipieca.org](http://www.ipieca.org)



The most economical method of reducing greenhouse gas (GHG) emissions is to reduce energy consumed. Without anticipated improvements in production and end-use efficiency, forecasted energy demand in 2040 would be nearly 15% higher<sup>1</sup>. Yet, there are opportunities to conserve energy and reduce the corresponding emissions throughout the energy system. For this reason, the oil and gas industry focuses on energy conservation as part of its wider efforts to reduce GHG emissions and save costs – efforts that extend to helping consumers save energy and reduce emissions.

#### ENERGY CONSERVATION PLAYS A KEY ROLE IN MANAGING EMISSIONS

Finding ways to conserve energy can make a major contribution towards a low-emissions pathway. Since the 1970s, energy efficiency measures across the world's largest energy consuming countries have reduced energy consumption by an amount equivalent to the annual energy usage of the European Union<sup>2</sup>. To meet the challenge, the industry is investing heavily in new technologies and research, including energy efficient design of plants, advanced computer controls, advanced modelling of reservoirs to increase production efficiencies, new extraction

and processing methods, and improved technologies for monitoring the efficiency of equipment in the field.

Energy costs account for a large proportion of the total cost of operating oil and gas facilities; consequently, there is a strong financial incentive to save energy. While many technological innovations have reduced the cost of finding and producing oil and gas, overall, the difficulty of producing from current fields and therefore the associated energy consumption has increased. Notwithstanding the strong efforts on energy efficiency, oil and gas production and oil refining have become progressively more energy – intensive since the 1990s.

Emissions from oil and gas production, transport and refining between 2005 and 2030 could be reduced by 14% from the business-as-usual case through measures such as process changes and improvements, energy efficiency improvements and carbon capture and storage (CCS)<sup>3</sup>.

#### BEYOND ENERGY EFFICIENCY

Beyond energy efficiency, the oil and gas industry has taken additional measures to reduce the amount of energy used in its operations.

#### KEY MESSAGES

- Improving energy efficiency in the production of oil and gas can make a significant contribution to moving the world onto a more sustainable energy path.
- Conserving energy goes beyond traditional energy efficiency measures; it includes flaring reduction, control of methane emissions and other efforts.
- Oil and gas companies support consumers in reducing their energy usage and greenhouse gas emissions through efforts, including fuel conservation, alternative fuels and developing carbon capture and storage technologies.

#### GLOSSARY OF ENERGY TERMS

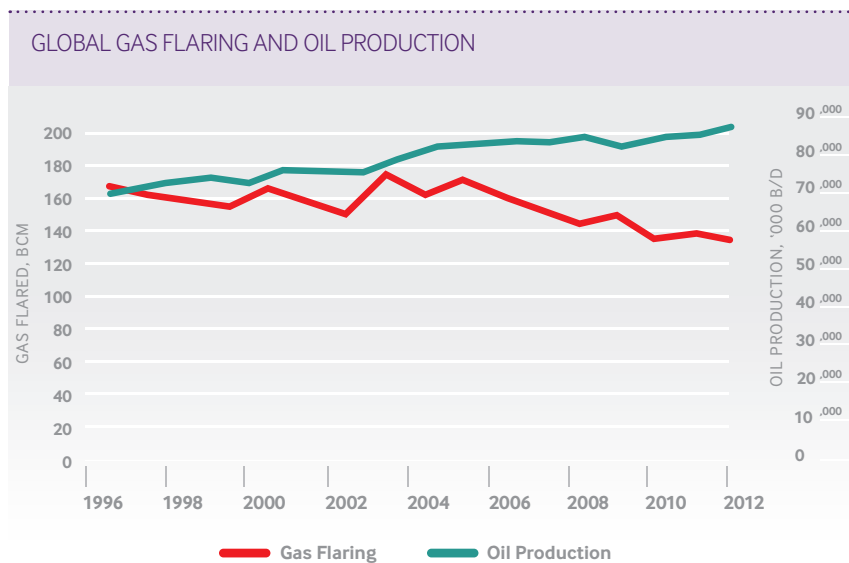
Energy Conservation	Energy conservation refers to reducing energy consumption by using less energy to perform an operation. This can be done by making things more efficient, doing less of something or making better use of the energy resource itself.
Energy Efficiency	Energy efficiency is improved by doing the same work with less energy. It is a form of energy conservation.
Energy Intensity	Energy intensity is a measure of how much energy is required to produce a certain amount of a product.

#### Footnotes

<sup>1</sup> International Energy Agency (2014) *World Energy Outlook 2014 Fact sheet*. [Online] Available from: <http://bit.ly/1CwEHWe>. [Accessed: March 3 2015]

<sup>2</sup> International Energy Agency (2014) *The Energy Efficiency Market Report 2014 (EEMR 2014) Executive Summary*. [Online] Available from: <http://bit.ly/1vrq5d1>

<sup>3</sup> McKinsey & Company (2009), VERSION 2 OF THE GLOBAL GREENHOUSE GAS ABATEMENT COST CURVE. Pg 62.



Source: GGFR from NOAA satellite observations

For example, the industry has made substantial improvements in reducing the gas associated with oil production that is flared. Flaring can occur in the oil and gas industry for many reasons, ranging from initial start-up testing of a facility to unplanned equipment malfunctions, and where the gas flared cannot be sold or re-injected into a well<sup>4</sup>. To assist companies in these efforts, IPIECA has produced guidance on reducing flaring in oil and gas operations.

Efforts are underway to continue to reduce gas flaring, for example through the World Bank's Global Gas Flaring Reduction (GGFR) partnership. Many IPIECA members are working with GGFR and local governments to develop policies and mechanisms to promote infrastructure development, regulations, availability of finance and other factors critical to large-scale energy conservation. As the graph above shows, global gas flaring has been generally declining over time, despite an increase in oil production.

Conserving energy also means reducing atmospheric emissions of usable hydrocarbons. A focus has recently been placed on methane emissions. This is because methane is both the principal component of natural gas and a powerful GHG. Companies are taking a range of actions to reduce methane emissions, including replacing and upgrading field equipment, improving leak detection and employing new techniques for production. For more information about methane emissions and the industry's efforts to reduce them see the IPIECA fact sheet, *Exploring Methane Emissions (2015)*.

#### HELPING CONSUMERS LOWER THEIR EMISSIONS

As suppliers of the world's energy, oil and gas companies have a responsibility to provide

energy in an environmentally responsible manner and at an affordable price. However, the industry's efforts go beyond this – we also support our consumers as they manage their energy usage and GHG emissions. Consumers are a critical part of the energy life-cycle. When oil and gas are used to make transportation fuel, approximately 80% of the total GHG emissions from the use of these fuels come from the tailpipe of the vehicle<sup>5</sup>. Similarly, when gas is used for power generation around 90% of its associated GHGs are emitted during conversion to electricity<sup>6</sup>.

The industry works extensively with motor vehicle manufacturers to create products that help increase engine performance. This includes participating in vehicle engine research and design to produce gasoline and diesel formulations that increase modern engine efficiency while lowering emissions. It also involves supporting partnerships such as the Global Fuel Economy Initiative, which IPIECA engages with through membership of the UN Environment Programme Partnership for Clean Fuels and Vehicles. Oil and gas companies are also producing new advanced lubricants that reduce engine friction and increase fuel economy.

The industry also supports consumer education to achieve more efficient energy use. An example of this is the "Save more than fuel" campaign, sponsored by European fuel producers in conjunction with the European Commission. This campaign provides drivers with tips to improve their fuel efficiency and save money while reducing their GHG emissions.

Developing and using lower-carbon fuels is also an important way to reduce overall emissions, with natural gas producing around 50% less emissions than coal when used for power generation. The industry is continuing to explore and develop new natural gas resources and technologies to help lower its costs and emissions. Beyond this, companies are also continuing to invest in low-carbon and alternative fuels and technologies, including biofuels, solar and wind power as well as developing CCS<sup>7</sup>.

**The oil and gas industry will continue to strive to reduce GHG emissions while expanding its energy supply portfolio to meet the world's energy needs. It is committed to reducing the energy required for its operations and working with end-users to improve efficiency in the use of its products. Through new technologies as well as established practices, there are opportunities for both the industry and energy consumers alike.**

#### Footnotes

<sup>4</sup> For a fuller description of the various reasons for flaring, see the IPIECA Energy Efficiency database: Flaring Classification [www.ipieca.org/energyefficiency](http://www.ipieca.org/energyefficiency)

<sup>5</sup> European commission Joint Research Centre, Institute for Energy and Transport (2014) *Well-To-Wheels Analysis Of Future Automotive Fuels And Powertrains In The European Context*. JCR Technical Reports. Report number: 4.a. [Online] Available from: <http://bit.ly/1yV3a7j>

<sup>6</sup> US Department of Energy, National Energy Technology Laboratory (2014) *Life Cycle Analysis of Natural Gas Extraction and Power Generation*. [Online] Available from: <http://1.usa.gov/1KC21cU>

<sup>7</sup> The Paris Puzzle CCS fact sheet

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IPIECA is the global oil and gas industry association for environmental and social issues. It develops, shares and promotes good practices and knowledge to help the industry improve its environmental and social performance.