

Global Gas Flaring Tracker Report

JULY 2020

Global Gas Flaring Reduction Partnership



© 2020 Global Gas Flaring Reduction Partnership (GGFR) Multi-Donor Trust Fund.

1850 I Street NW
Washington, DC 20006
ggfr@worldbank.org

This work is a product of the staff of The World Bank with external contributions. The findings, interpretations, and conclusions expressed in this work do not necessarily reflect the views of The World Bank, its Board of Executive Directors, or the governments they represent.

The World Bank does not guarantee the accuracy of the data included in this work. The boundaries, colors, denominations, and other information shown on any map in this work do not imply any judgment on the part of The World Bank concerning the legal status of any territory or the endorsement or acceptance of such boundaries.

Rights and Permissions

The material in this work is subject to copyright. Because the World Bank encourages dissemination of its knowledge, this work may be reproduced, in whole or in part, for noncommercial purposes as long as full attribution to this work is given.

Any queries on rights and licenses, including subsidiary rights, should be addressed to:

World Bank Publications
The World Bank Group
1818 H Street NW
Washington, DC 20433,
USA

Fax: 202-522-2625

July 2020

Foreword

The global gas flaring estimates that we produce every year serve as our compass, allowing us to better understand the evolving situation and what we—as a Partnership of governments, companies, and international organizations—must do to end routine gas flaring by 2030.

Each year, this 160-year-old industry practice releases about 400 million tons of CO₂ equivalent emissions. The emissions, which include un-combusted methane and black carbon, are harmful for both people and the planet. Routine gas flaring also represents a lost opportunity to provide communities around the world with much-needed energy, particularly in developing countries, such as Egypt, Indonesia, Mexico, and Nigeria. Indeed, each year, we wastefully flare enough associated gas to power the entire sub-Saharan Africa.

It is now more important than ever to know where we stand and if we are on the right track. The COVID-19 pandemic, economic crisis, and oil price impacts are causing major disruptions in the oil and gas industry. Governments and oil companies may look to retrench and pull back on capital expenditure, investment, and new projects, so there is a risk that sustainability and climate concerns could be sidelined. To minimize COVID-19 impacts, reduce emissions, and accelerate the energy transition, the commitment of governments and companies to end routine gas flaring is essential.

The World Bank's 2019 **Global Gas Flaring Tracker** comes at a time when the tides are changing; government and industry could redouble and accelerate efforts to reduce gas flaring, or abandon investments and projects, in favor of business as usual activities. What we find in our latest gas flaring estimates from satellites orbiting the earth and identifying flares globally is that gas flaring has increased to levels last seen in 2009—a full decade earlier. While 2020 is likely to see a decline in global gas flaring, the data suggests that gas flaring continues to be a persistent problem, with solutions remaining difficult or uneconomical in certain countries.

The World Bank's Global Gas Flaring Tracker is the only global and independent indicator of routine gas flaring. Data is taken directly from a satellite launched in 2012 and monitored by the United States National Oceanic and Atmospheric Administration (NOAA). The Tracker is thus one of the best tools to raise awareness, track progress and drive collective action.

It is our hope that governments and companies will use the data in this report to kickstart projects in their countries and make investment in gas flaring reduction a key priority, significantly contributing to emissions reduction in the process.

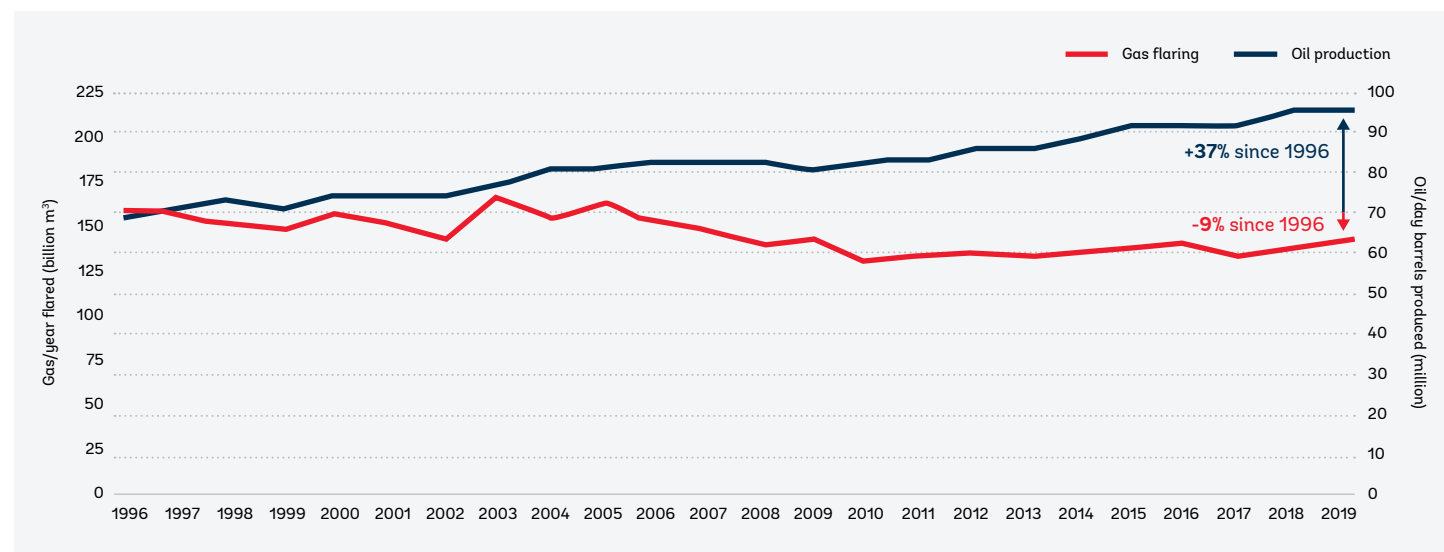


Zubin Bamji
Program Manager
Global Gas Flaring Reduction Partnership (GGFR)
World Bank

Key findings

- Estimates from satellite data show global gas flaring increased to levels last seen in 2009, to 150 billion cubic meters (bcm), equivalent to the total annual gas consumption of Sub-Saharan Africa.
- The 3% rise, from 145 billion cubic meters (bcm) in 2018 to 150 bcm in 2019, was mainly due to increases in three countries: the United States (up by 23%), where oil production increased by 20%; Venezuela (up by 16%), where oil production decreased by nearly 40%; and Russia (up by 9%), where oil production remained flat.
- Gas flaring in fragile or conflict-affected countries increased from 2018 to 2019: in Syria by 35% and in Venezuela by 16%, although oil production was flat in Syria and declined by 40% in Venezuela.
- The top four gas flaring countries (Russia, Iraq, the United States, and Iran) continue to account for almost half (45%) of all global gas flaring for three years running (2017-2019), suggesting there may be systematic and structural barriers to reducing gas flaring practices in these countries.
- When looking at all countries, excluding the top four, gas flaring declined by 9 bcm or 10%, from 2012 to 2019.
- Governments and companies in the [GGFR Partnership](#) performed better at flaring reduction than the rest of the world, with an overall decline of about 5% from 2012 to 2019.
- In the first quarter of 2020, global gas flaring fell by 10%, with declines across most of the top 30 gas flaring countries.
- In the United States, gas flaring reduced significantly in the first quarter of 2020, by 1.2 bcm. This reduction occurred even while oil production continued to increase. This means that gas flaring intensity (gas flared per unit of oil production) declined in the first quarter of 2020 through improved utilization of the associated gas. If these trends continue, we are likely to see a significant drop in gas flaring in the United States in 2020.

Global Gas Flaring and Oil Production: 1996 to 2019 (flaring only at upstream oil & gas and LNG liquefaction plants)



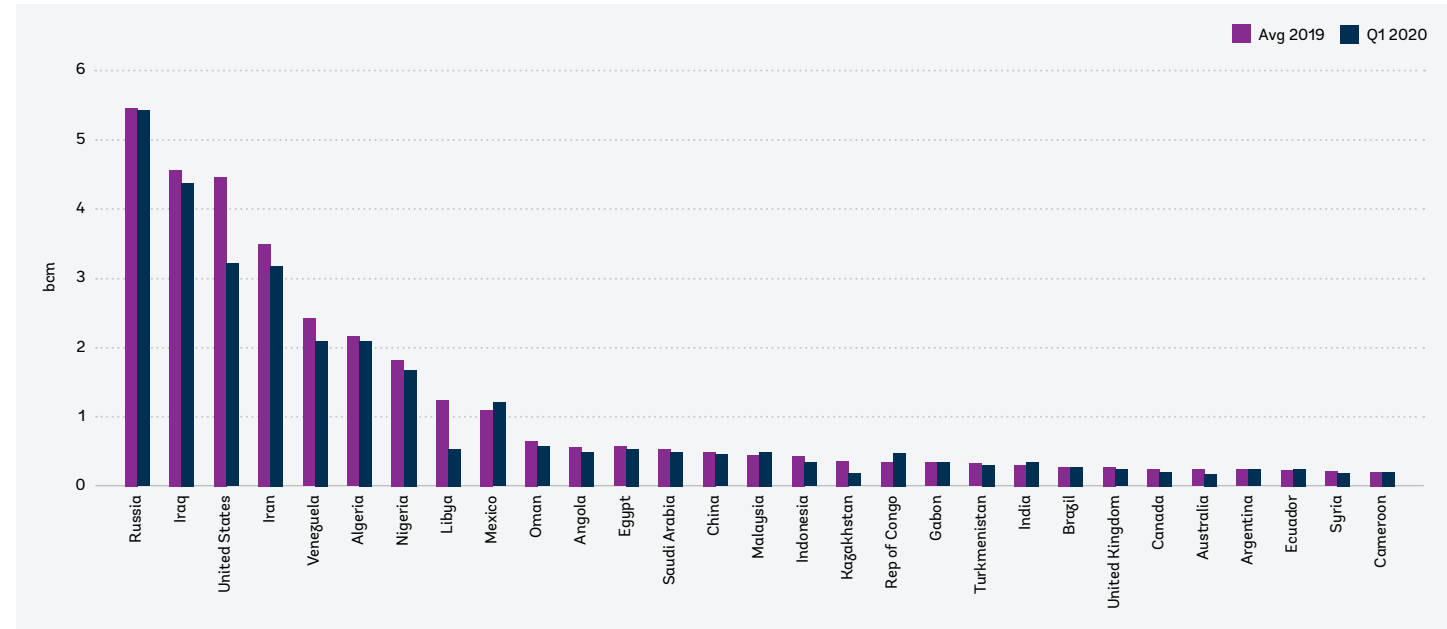
Source: NOAA, Colorado School of Mines, GGFR, BP, EIA

Gas flaring volumes 2015-19 (billion cubic meters)

bcm	2015	2016	2017	2018	2019	Change 2019-2018
Russia	19.62	22.37	19.92	21.28	23.21	1.93
Iraq	16.21	17.73	17.84	17.82	17.91	0.09
United States	11.85	8.86	9.48	14.07	17.29	3.22
Iran	12.10	16.41	17.67	17.28	13.78	-3.50
Venezuela	9.33	9.35	7.00	8.22	9.54	1.32
Algeria	9.13	9.10	8.80	9.01	9.34	0.33
Nigeria	7.66	7.31	7.65	7.44	7.83	0.39
Libya	2.61	2.35	3.91	4.67	5.12	0.45
Mexico	5.00	4.78	3.79	3.89	4.48	0.59
Oman	2.43	2.82	2.60	2.54	2.63	0.10
Malaysia	3.72	3.16	2.83	2.25	2.37	0.12
Egypt	2.83	2.83	2.34	2.26	2.34	0.09
Angola	4.18	4.49	3.80	2.79	2.33	-0.46
Saudi Arabia	2.15	2.38	2.32	2.29	2.10	-0.19
China	2.08	1.96	1.56	1.82	2.02	0.20
Indonesia	2.90	2.77	2.33	2.06	2.00	-0.06
Rep of the Congo	1.18	1.14	1.14	1.58	1.67	0.09
Kazakhstan	3.69	2.67	2.42	2.05	1.57	-0.48
Gabon	1.56	1.56	1.50	1.38	1.46	0.08
Australia	1.14	0.73	0.66	0.86	1.39	0.53
Qatar	1.11	1.08	1.03	1.00	1.34	0.35
Turkmenistan	1.84	1.84	1.67	1.50	1.34	-0.17
India	2.20	2.06	1.50	1.34	1.31	-0.03
Brazil	1.33	1.44	1.10	1.00	1.14	0.13
United Kingdom	1.32	1.34	1.35	1.21	1.11	-0.10
Canada	1.81	1.30	1.34	1.33	1.05	-0.27
Cameroon	1.08	1.10	1.04	1.06	1.04	-0.02
Argentina	0.65	0.56	0.51	0.70	0.94	0.24
Syria	0.52	0.55	1.19	0.69	0.93	0.24
Ecuador	1.06	1.15	1.07	0.90	0.92	0.02
Rest of the world	11.3	10.45	9.22	8.72	8.49	-0.2
Total	146	148	141	145	150	5.0

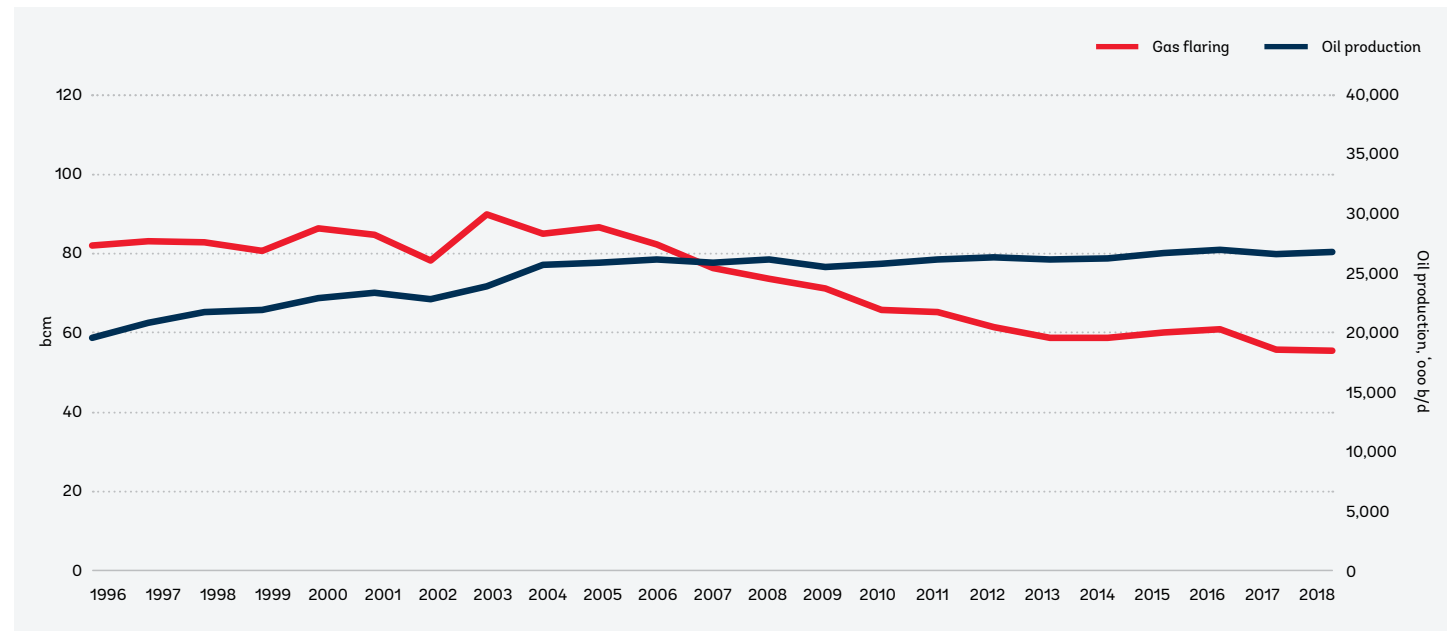
Source: NOAA, Colorado School of Mines, GGFR

Top 30 flaring countries: Average 2019 quarterly and Q1 2020 flare volume estimates



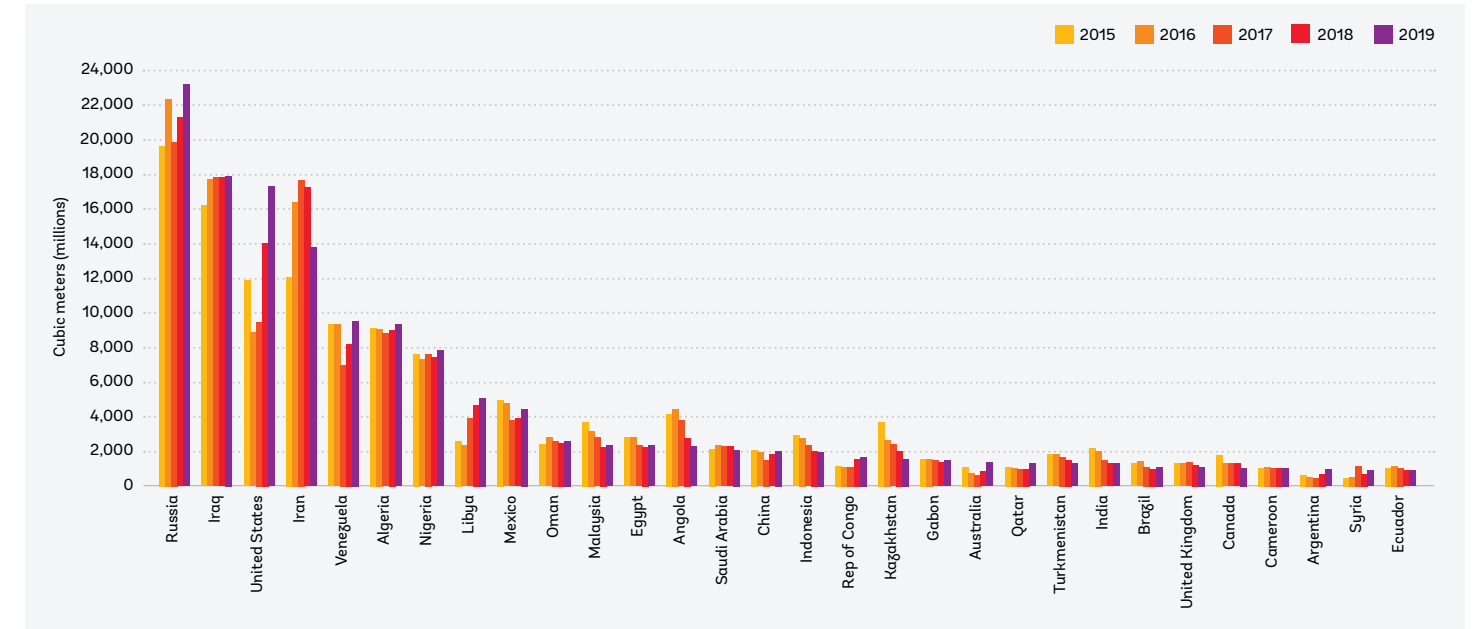
Source: NOAA, Colorado School of Mines, GGFR

GGFR [Partners](#) have reduced gas flaring by about 5% (5 bcm) from 2012 to 2019



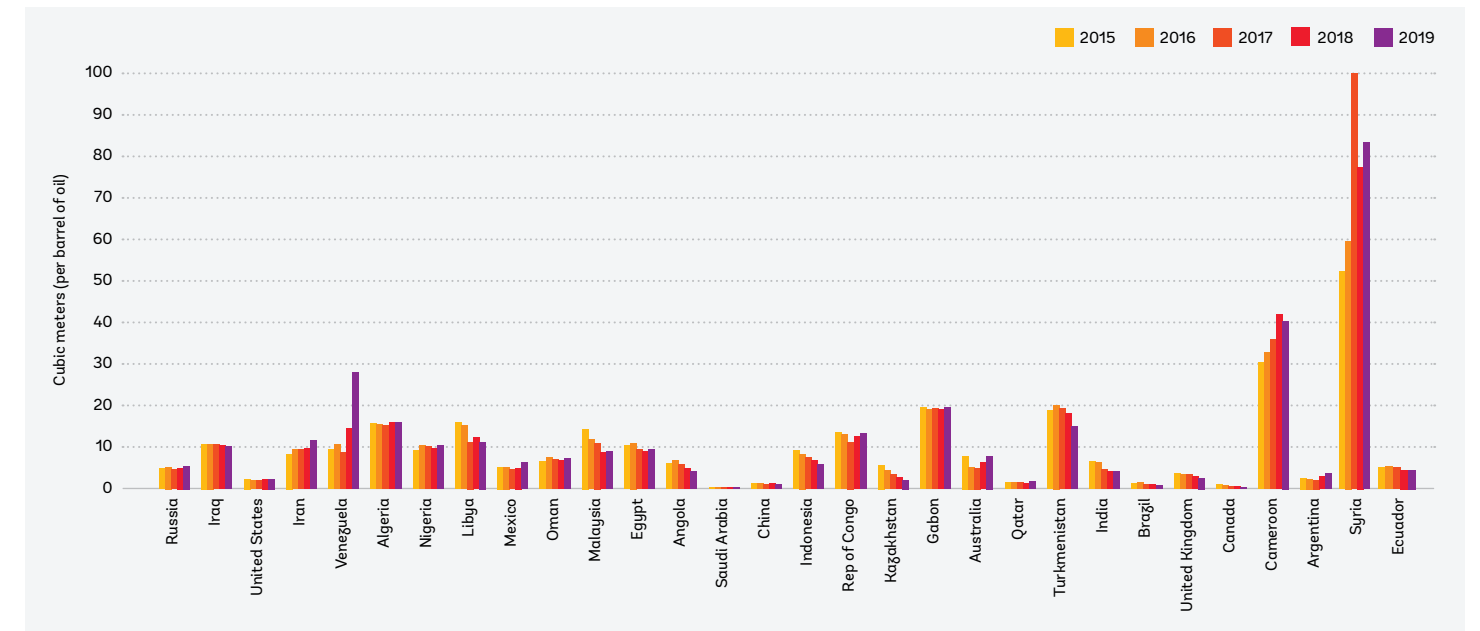
Source: NOAA, Colorado School of Mines, GGFR, BP, EIA

Flare volumes for the top 30 flaring countries from 2015 to 2019 (Sorted by 2019 flare volume)



Source: NOAA, Colorado School of Mines, GGFR, BP, EIA

Flaring intensity for the top 30 flaring countries from 2015 to 2019 (Ranked in order of the top 30 flaring countries)



Source: NOAA, Colorado School of Mines, GGFR, BP, EIA

Nigeria: a case study

In Nigeria, a country with significant gas flaring and low levels of energy access, oil producers flare between [7 and 8 billion cubic meters of gas a year](#). We continue to work with the government on the development and implementation of the 2018 gas flare regulations, which underpin the Nigeria Gas Flare Commercialisation Programme (NGFCP). The NGFCP relies on market principles to commercialize associated gas while providing direct benefits to Niger Delta communities by reducing air pollution and creating jobs. The NGFCP will also contribute to the Nigerian economy by enhancing the delivery of additional volumes of gas to the domestic market for use by various sectors of the economy and to the global efforts to mitigate greenhouse gas emissions. We have partnered with the International Finance Corporation (IFC) to work on a market study for commercializing flare gas for use by the Ministry of Petroleum Resources.



The World Bank's role in routine gas flaring reduction

The World Bank's Global Gas Flaring Reduction Partnership (GGFR) works closely with governments and oil companies to help develop policies, regulations, and capacity to end routine flaring by 2030. We are also continuing to secure commitments for the [Zero Routine Flaring by 2030 initiative](#), building upon the 86 endorsers that, together, account for over 60% of global flaring. Ending routine gas flaring is critical if governments and companies are to deliver their products in the cleanest manner possible, meet "zero emissions" targets, and maintain their license to operate, especially in developing countries where millions lack access to energy.

To do this, we must test and scale innovative approaches while considering new solutions that treat associated gas as an asset. Such approaches must also be tailored to the unique circumstances and context of a particular country. We need to work collaboratively with governments and oil companies to develop holistic policies, considering a range of carrots and sticks, incentives and penalties, to finally put an end to this practice.

Methodology for estimating flare gas volumes from satellite data

The Global Gas Flaring Tracker is produced on an annual basis by the World Bank-managed [Global Gas Flaring Reduction Partnership \(GGFR\)](#), which comprises governments, oil companies, and international institutions working to end routine gas flaring at oil production sites around the world. GGFR, in partnership with the United States National Oceanic and Atmospheric Administration (NOAA) and the Colorado School

of Mines, has developed global gas flaring estimates based on observations from a satellite launched in 2012. The advanced sensors of this satellite detect the heat emitted by gas flares as infrared emissions at global upstream oil and gas facilities. The Colorado School of Mines and GGFR quantify these infrared emissions and calibrate them using country-level data collected by a third-party data supplier, Cedigaz, to produce robust estimates of global gas flaring volumes.

The satellite data for estimating flare gas volumes is collected by NOAA's satellite mounted Visible Infrared Imaging Radiometer Suite of detectors (VIIRS). VIIRS has multiple, high-resolution detectors which:

- respond only to heat emissions and hence are not affected by sunlight, moonlight, or other light sources;
- respond to wavelengths where emissions from flares are at a maximum; and
- have excellent areal resolution.

The ability of VIIRS to detect only hot sources, such as gas flares, enables flares to be detected automatically with minimal manual intervention. Emissions from non-flare hot sources (e.g. biomass burning) can be removed from the data by selecting only emissions with temperatures above 1100 deg C as other hot sources burn at lower temperatures. Indeed, flares burn hotter than any other terrestrial hot sources, including volcanos. Over the past seven years of operation, VIIRS has automatically detected approximately 16,000 flares annually around the globe.

In the coming years, a new and improved web-based application will map global gas flaring data in a reliable, standardized way, and will be publicly available in 2022 with the support of the Oil and Gas Climate Initiative (OGCI).

