



Global Gas Flaring Reduction Partnership (GGFR)



Gas flaring – what is it?

- What kind of gas?
 - Gas that is produced in association with oil, but flared instead of used
 - This “associated gas” is a blend of
 - Natural gas used in gas networks – mostly methane gas
 - Heavier types of gas – mostly butane and propane
- As distinguished from “non-associated gas”
 - From gas or gas/condensate fields where the purpose is to utilize the gas



Gas flaring – why does it happen?

- **Infrastructure and markets** that are under-developed and poorly functioning discourage investments in flare elimination
- **Policy environment:** Legal, regulatory, investment, and operating environment often not conducive
- **Distance** from energy users, gas pipelines, and power networks may make investments in gas utilization less attractive
- **Gas characteristics** for the flared gas may be less favorable
 - Often small, scattered, declining, uncertain gas volumes
- Still – utilizing associated gas is in most cases “investment” rather than “cost”



Gas flaring – why should it stop?

Globally

- The large volumes
 - About 140 billion cubic meters annually
 - Enough to produce 750 billion kWh power
 - More than the entire power consumption on the African continent
- The CO₂ emissions
 - About 350 million tons annually
 - Equivalent to about 77 million cars
- The black carbon from flares...
 - Depositing on snow and ice caps, causing melting



Gas flaring – why should it stop?

Other reasons

- Flaring is an oil production problem, but...
 - Perceptions taint the entire *gas industry* as well
 - The “twin brother” of methane leakages in the gas supply chain
 - It’s not only about CO₂, but also impacts from black carbon/contaminants
 - Globally on the snow and ice caps
 - Locally on health
- **It’s a low-hanging fruit in a global climate action plan**
 - Countries are preparing their CO₂ emission reduction plans in preparation for Conference of the Parties to the UNFCCC – COP21 in Paris, December 2015.

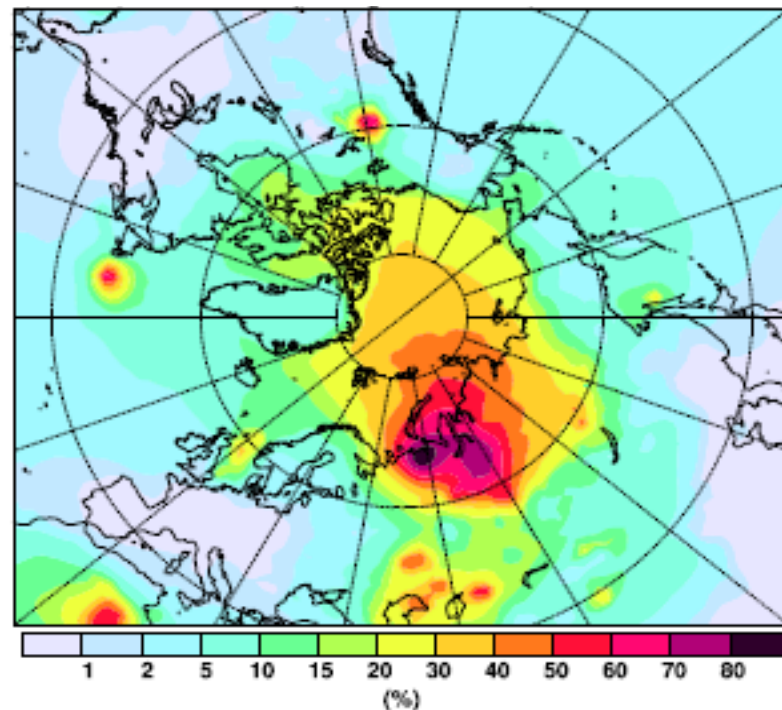


Flaring and Black Carbon

- 2013 study (Stohl et al)
 - Worrisome early-stage research
 - Improved modeling of the impact from gas flaring and household black carbon (BC) emissions in the Arctic
 - Gas flaring may contribute 40% or more to the BC/soot deposition on snow and ice in the Arctic, thus impacting the reflective power (albedo)
 - Study: “Better quantification of gas flaring emissions of BC is urgently needed.”
- GGFR supports research on BC from gas flaring

- Flaring reduction work in Russia even more important

Model estimates of the % contribution of gas flaring to total surface concentrations of Black Carbon



Who works on reducing flaring?

Companies, countries... and GGFR

The Global Gas Flaring Reduction Partnership – Members:

Oil companies

- BP
- Chevron
- Eni
- ExxonMobil
- Kuwait Oil Company
- Pemex (Mexico)
- Qatar Petroleum
- Shell
- SNH (Cameroon)
- SOCAR (Azerbaijan)
- Sonatrach (Algeria)
- Statoil
- TOTAL

Governments

- Alberta (Canada)
- Republic of Congo
- France
- Gabon
- Indonesia
- Iraq
- Kazakhstan
- Khanty-Mansiysk (Russia)
- Mexico (SENER)
- Nigeria
- Norway
- USA
- Uzbekistan
- Yamal-Nenets AO (Russia)

Institutions, other

- EBRD
- European Commission
- World Bank



GGFR Background

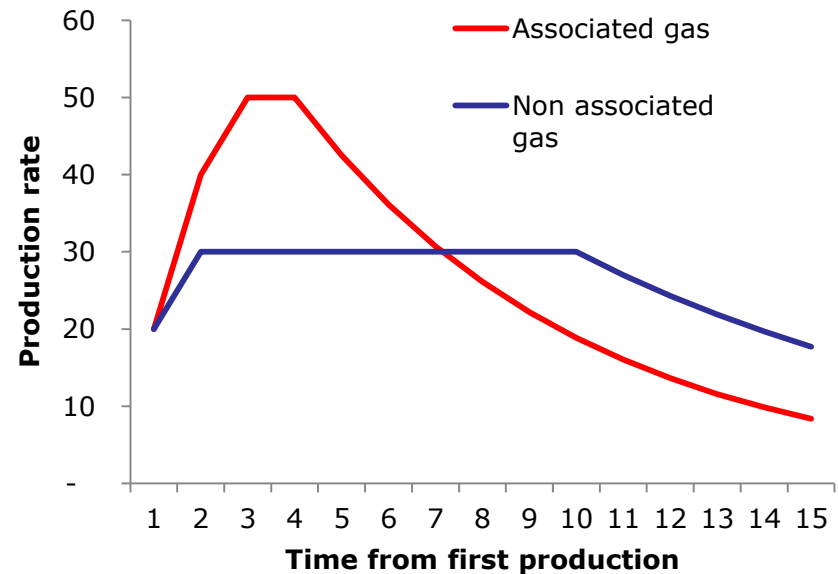
- GGFR launched in 2002 at World Summit on Sustainable Development, Johannesburg
- Initiated by the World Bank and Norway
- Objectives
 - Reduce carbon emissions and environmental impact
 - Improve energy efficiency and access to energy
- Mission statement
 - “GGFR is a catalyst for reducing wasteful and undesirable practices of gas flaring and venting through policy change, stakeholder facilitation, and project implementation”
 - Locational focus: oil production sites
 - Venting not addressed beyond regulation
 - Venting and leakages are larger issue mid/downstream

GGFR Team

- Core Team embedded in the World Bank
 - Regional Coordinators
 - Latin America – Europe/Central Asia – MENA – Sub-Saharan Africa – Asia
 - GGFR Networks
 - Technical – Regulatory – Communications
 - Other staff
 - Manager – Operations Officer – Admin Support
 - Leverages World Bank resources and local presence
 - Leverages partners
 - Consultants

Flaring Fundamentals

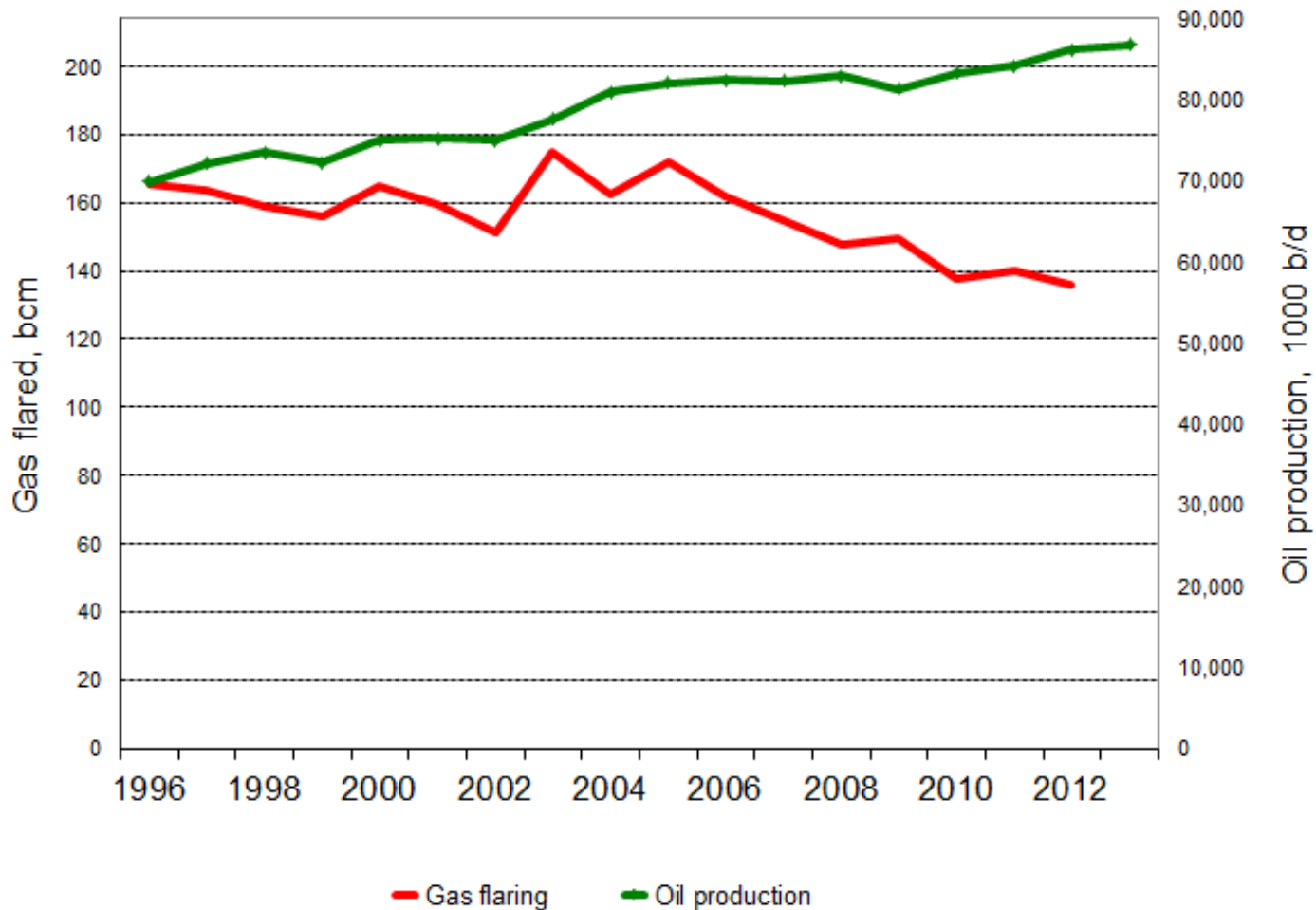
- **Bi-product** – that's what associated gas being flared is considered
- **Uncertainty** – in gas volume and production profile hurts market attractiveness
- **Infrastructure** – often missing
- **Remote locations** – often the case
- **Domestic markets** – often under-developed
- **Return on investments** – high expectations in the oil industry
- **Oil revenues** – governments want to avoid disruptions



- **Technical issues** – relating to reinjection, pressure, etc.

Gas flaring – how are we doing?

Global gas flaring and oil production



Satellite
detection
of gas flares.
Compilation
for 2013
(VIIRS Satellite)



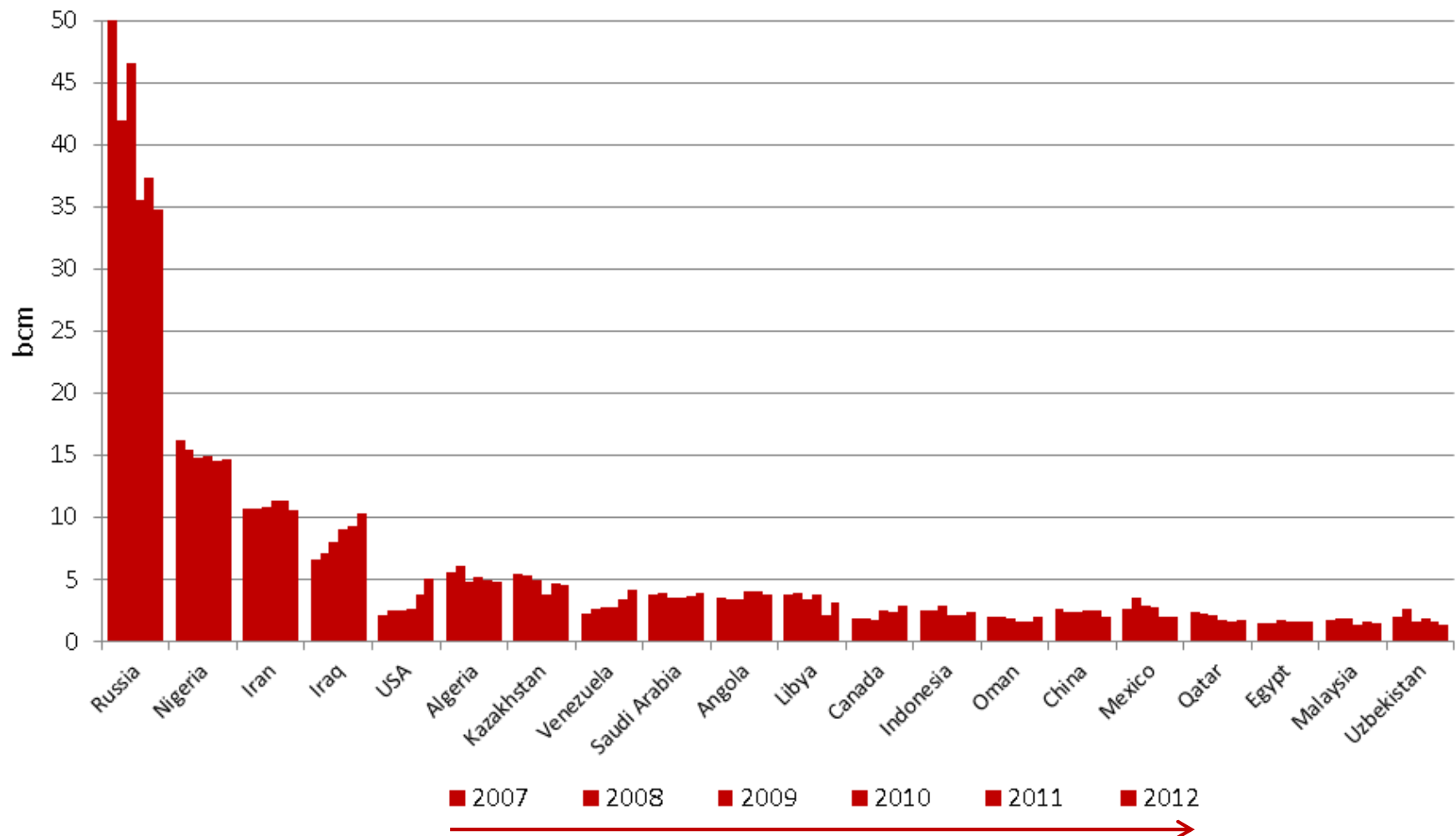
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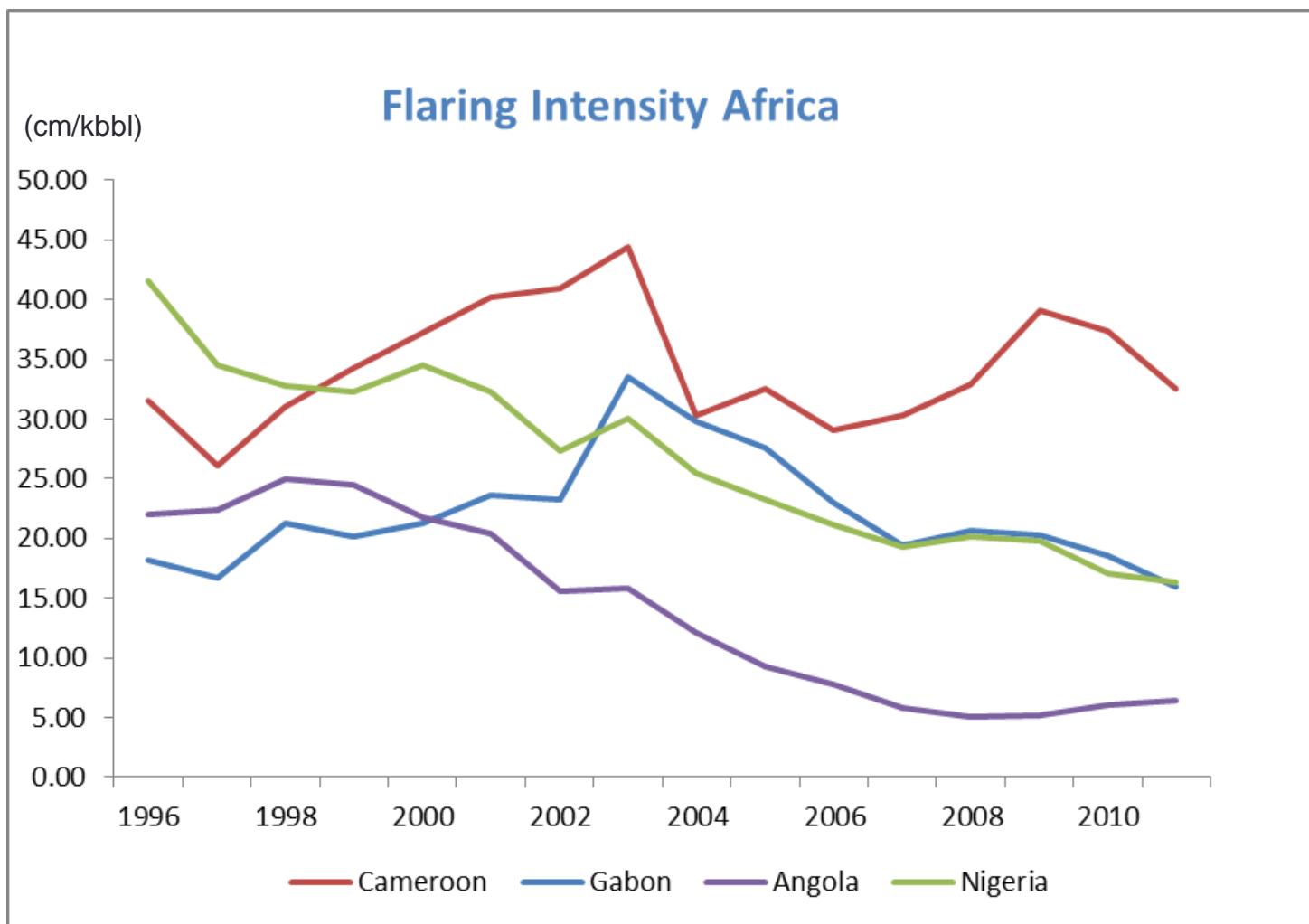


Who flares gas? Top 20 countries



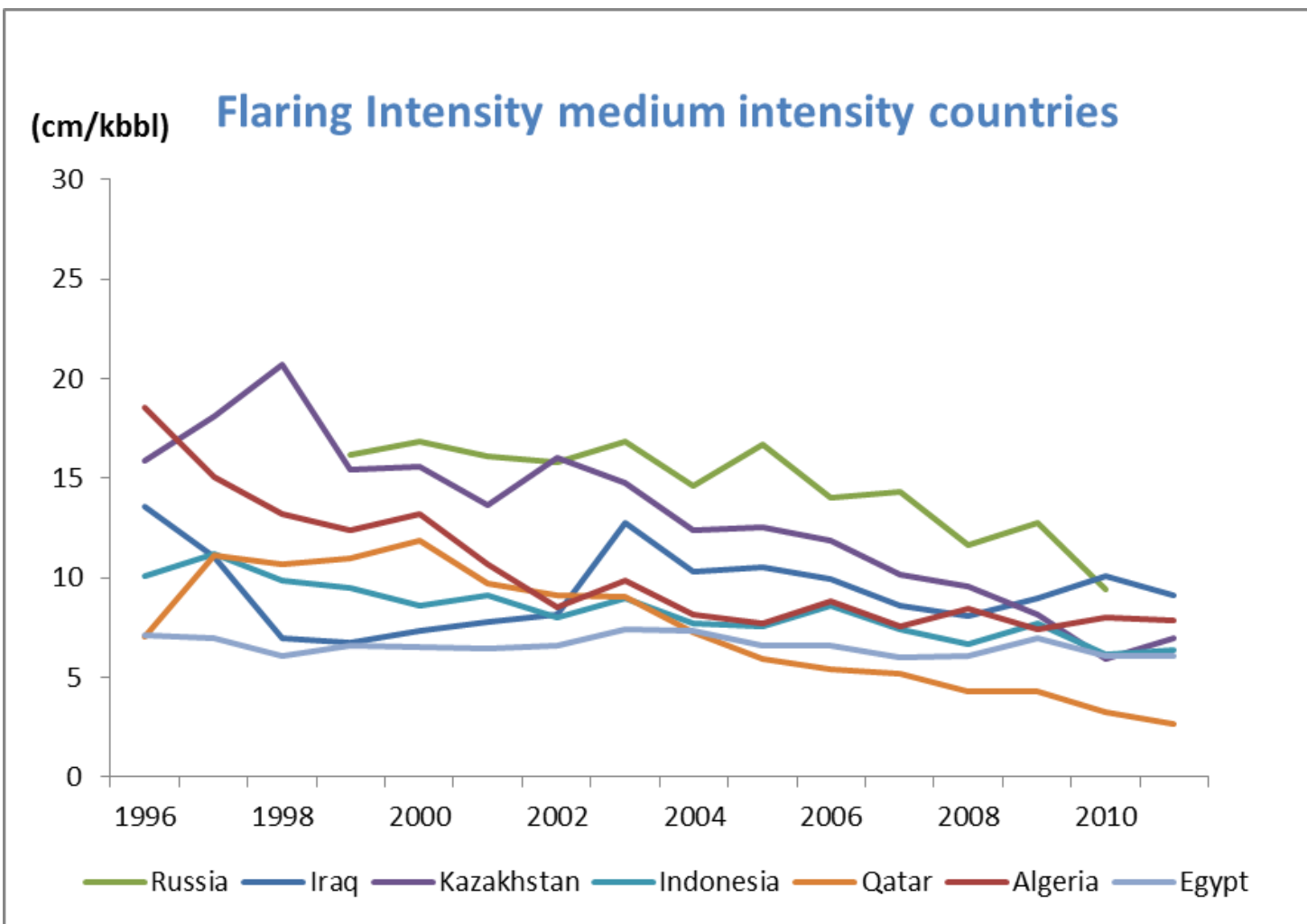
Flaring Trends - Intensity

Gas flared per unit of oil produced (cubic meters of gas per 1000 barrels of oil)



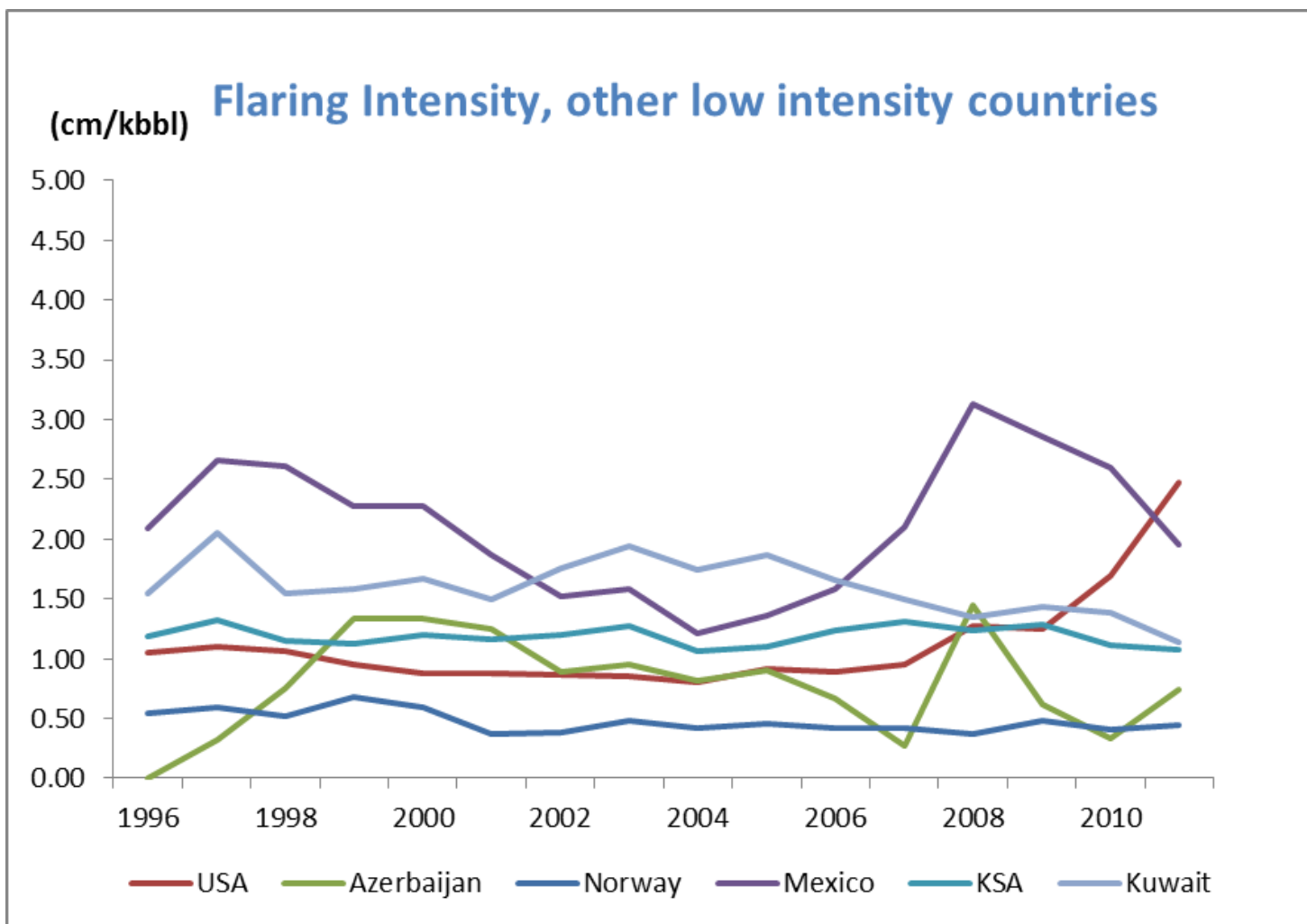
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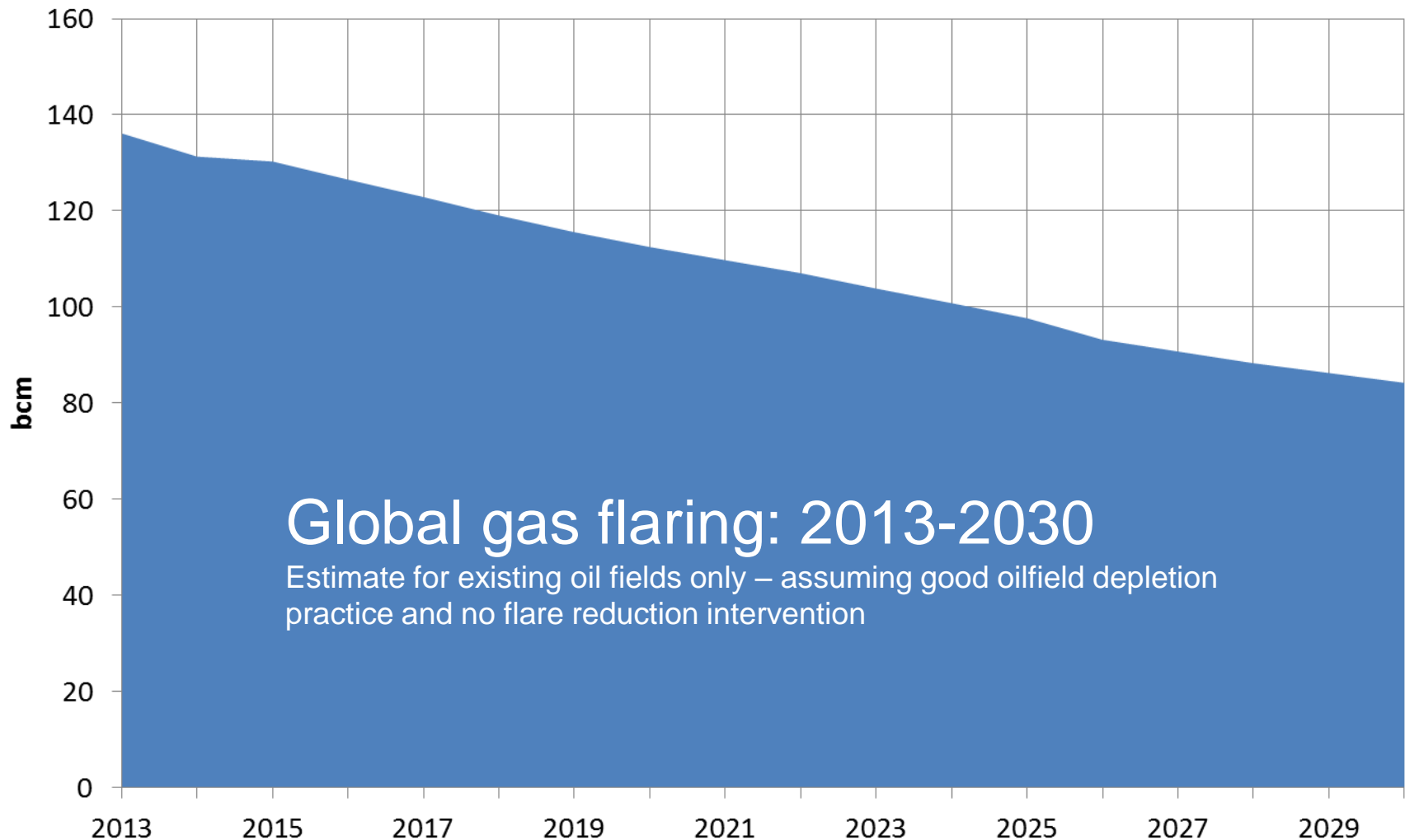
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Examples of GGFR work (completed or ongoing)

- Regulatory advisory services, including on gas pricing policy (examples Indonesia, Mexico, Iraq)
- Gas master plans (examples Congo, Gabon, Cameroon)
- Gas value chain, developing plans for infrastructure, institutions, market development (example Iraq)
- Flare gas measurement and monitoring, advisory services (examples Mexico, Azerbaijan, Algeria)
- Clusters for gas utilization projects. Identification of location and utilization solutions (example Khanty-Mansiysk, Russia)
- Screening studies and proposed pilot projects for flare elimination (example Mexico)
- Communications and outreach: Media; events and presentations (conferences and workshops, global forums); advocacy campaigns; web; gas flaring reduction examples and success stories, etc.

Will natural oil field depletion take care of the flaring problem? Not really



Future work on gas flaring – a distinction

- GGFR
 - Facilitating gas flaring reduction
- New World Bank-introduced initiative
 - Governments and oil companies making commitments and setting targets
 - Launched in April 2015

Towards a world free of flares



WORLD BANK GROUP

More information on flaring:
www.worldbank.org/ggfr

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