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Gas Flaring Worldwide – Policy and Regulation

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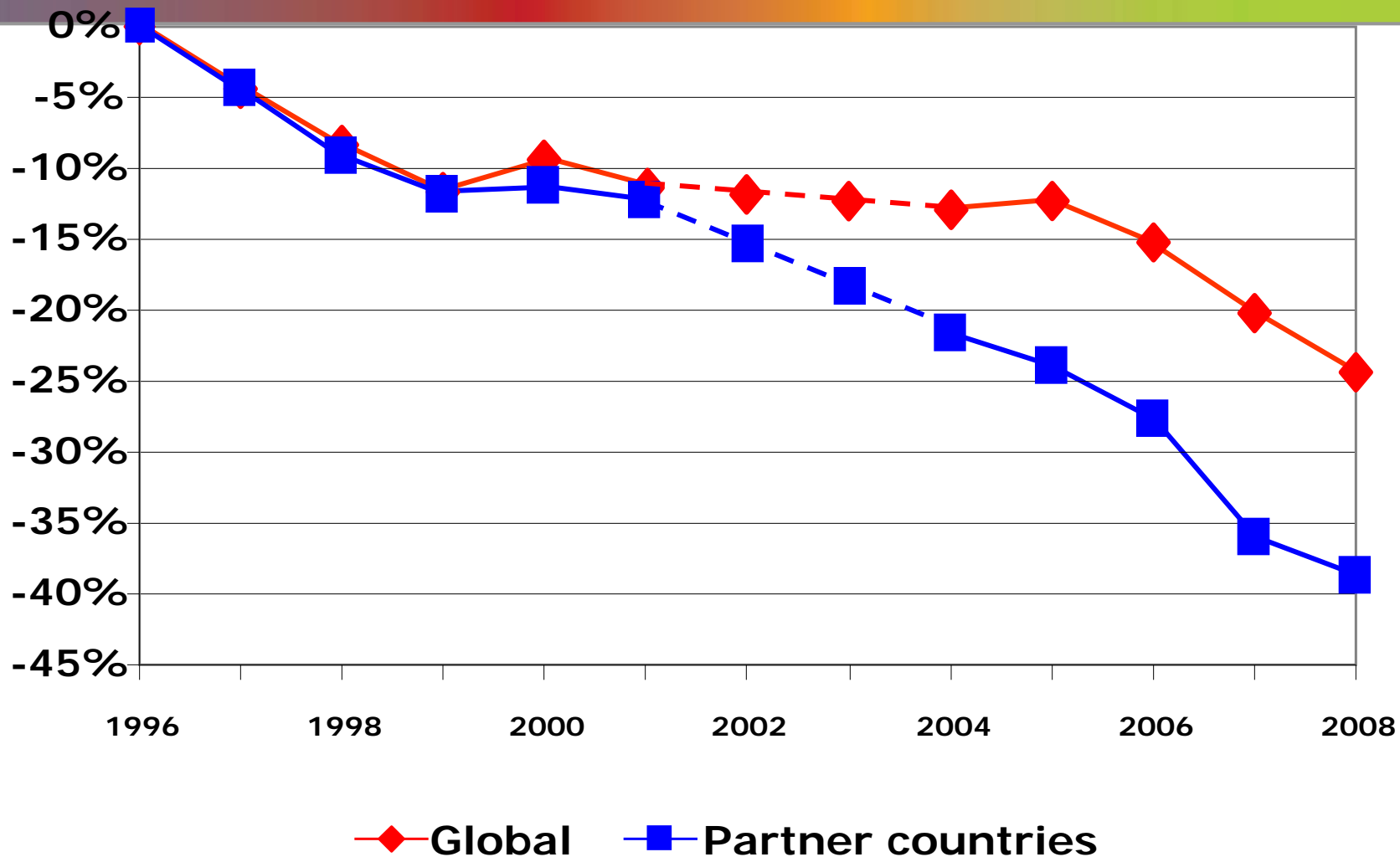
Gas Flaring – Magnitude of the Issue



- An estimated 140-150 bcm of gas is flared globally each year
- Adds around 400 million tons of carbon dioxide into the atmosphere each year
- 85% of global flaring occurs in 20 countries
- Major flaring areas are: Russia, Gulf of Guinea and the Middle East

Climate Change and Sustainable Development Imperatives no longer tolerate unnecessary flaring

Flaring intensity from satellite estimates: % change from 1996



Estimated flared volumes from satellite data

Volumes in bcm	2005	2006	2007	2008	2009	Change from 2008 to 2009
Russia	55.2	48.8	50.0	40.2	46.1	5.9
Nigeria	21.3	19.3	16.8	14.9	14.8	(0.1)
Iran	11.3	12.1	10.6	10.3	10.9	0.6
Iraq	7.1	7.4	7.0	7.0	8.3	1.3
Kazakhstan	5.8	6.0	5.3	5.2	5.0	(0.2)
Algeria	5.2	6.2	5.2	5.5	4.9	(0.6)
Angola	4.6	4.0	3.5	3.1	3.6	0.5
Libya	4.4	4.3	3.7	3.7	3.6	(0.1)
Saudi Arabia	3.0	3.3	3.4	3.5	3.5	0.0
Qatar	2.7	2.8	2.9	3.0	2.9	(0.1)
Venezuela	2.1	2.0	2.1	2.6	2.8	0.2
Indonesia	2.7	3.0	2.4	2.3	2.7	0.4
China	2.8	2.8	2.5	2.3	2.4	0.1
USA	2.0	1.9	1.9	2.3	2.0	(0.3)
Mexico	0.9	1.2	1.7	2.6	2.0	(0.6)
Oman	2.5	2.2	1.9	1.9	1.9	0.0
Kuwait	2.5	2.5	2.1	1.8	1.8	0.0
Canada	1.2	1.6	1.8	1.8	1.8	0.0
Uzbekistan	2.5	2.8	2.0	2.7	1.7	(1.0)
Egypt	1.7	1.7	1.5	1.5	1.7	0.2
Total top 20	142	136	128	118	124	6.1
Rest of the world	29	24	25	20	21	1.4
Global flaring level	171	160	153	138	146	7.5
Partner countries in top 20	56.0	56.2	50.5	50.4	49.6	(0.8)

Source: NOAA

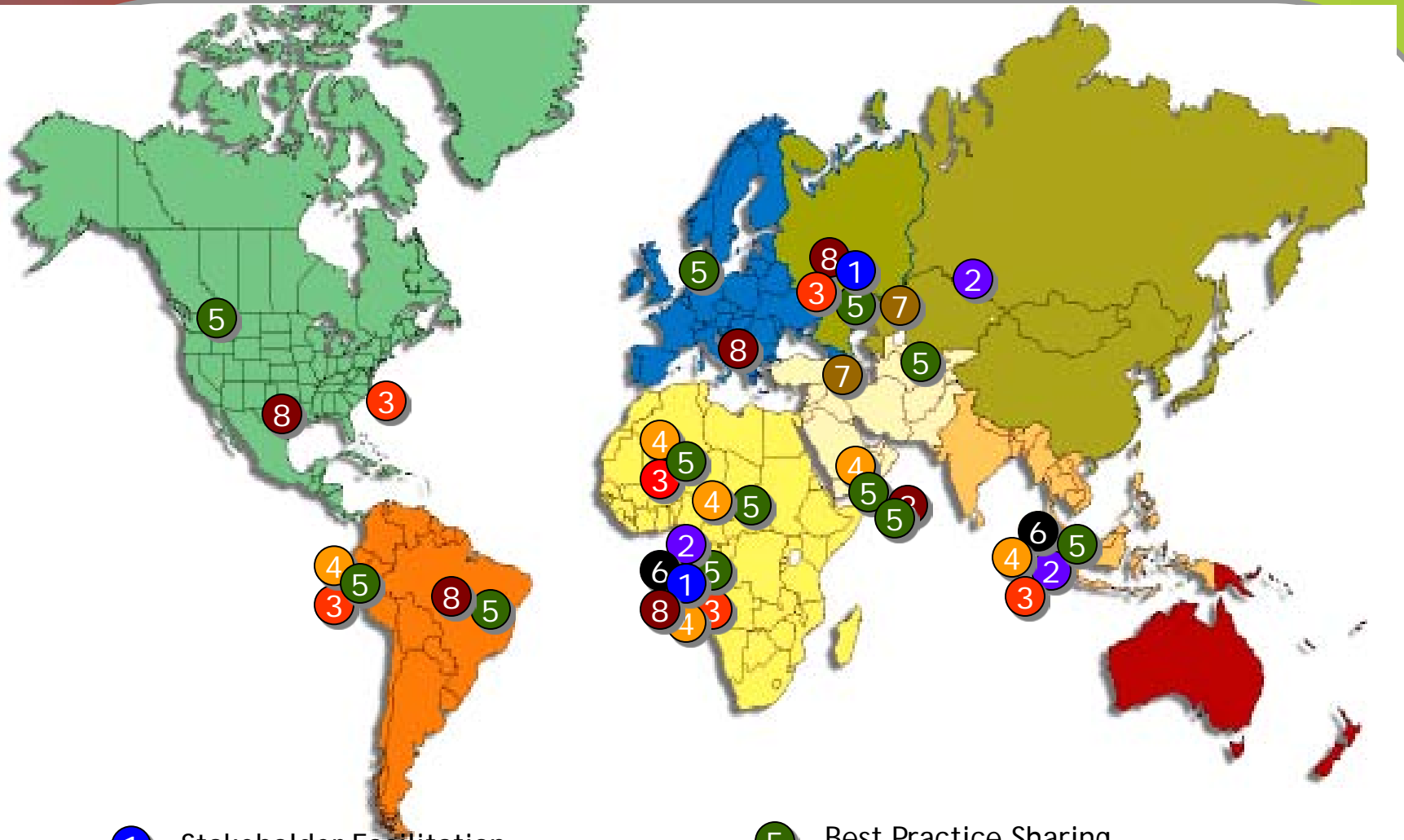
Barriers to Flare Reduction

- Underdeveloped domestic market for gas, remote from export markets
- Insufficient market access (infrastructure and commercial)
- Reliability of supply from associated gas
- Limited institutional, legal and regulatory framework for gas, including associated gas
- Insufficient gas terms in existing oil development agreements
- Unsupportive fiscal system
- Poor economics and/or funding constraints

Industry Practices – Global Standard



- GGFR Partners have endorsed the Global Standard for gas flaring reduction
- Global Standard (Stakeholder Engagement Process) provides framework for governments, companies, and other key stakeholders to consult each other and take collaborative actions, expand project boundaries and reduce barriers to associated gas utilization
 - No venting
 - No Flaring in New projects
 - Eliminate continuous flaring from existing production
 - Unless there are no feasible alternatives
- GGFR is assisting Nigeria, Equatorial Guinea, Cameroon, Algeria, Kazakhstan to meet identified dates for zero flaring.



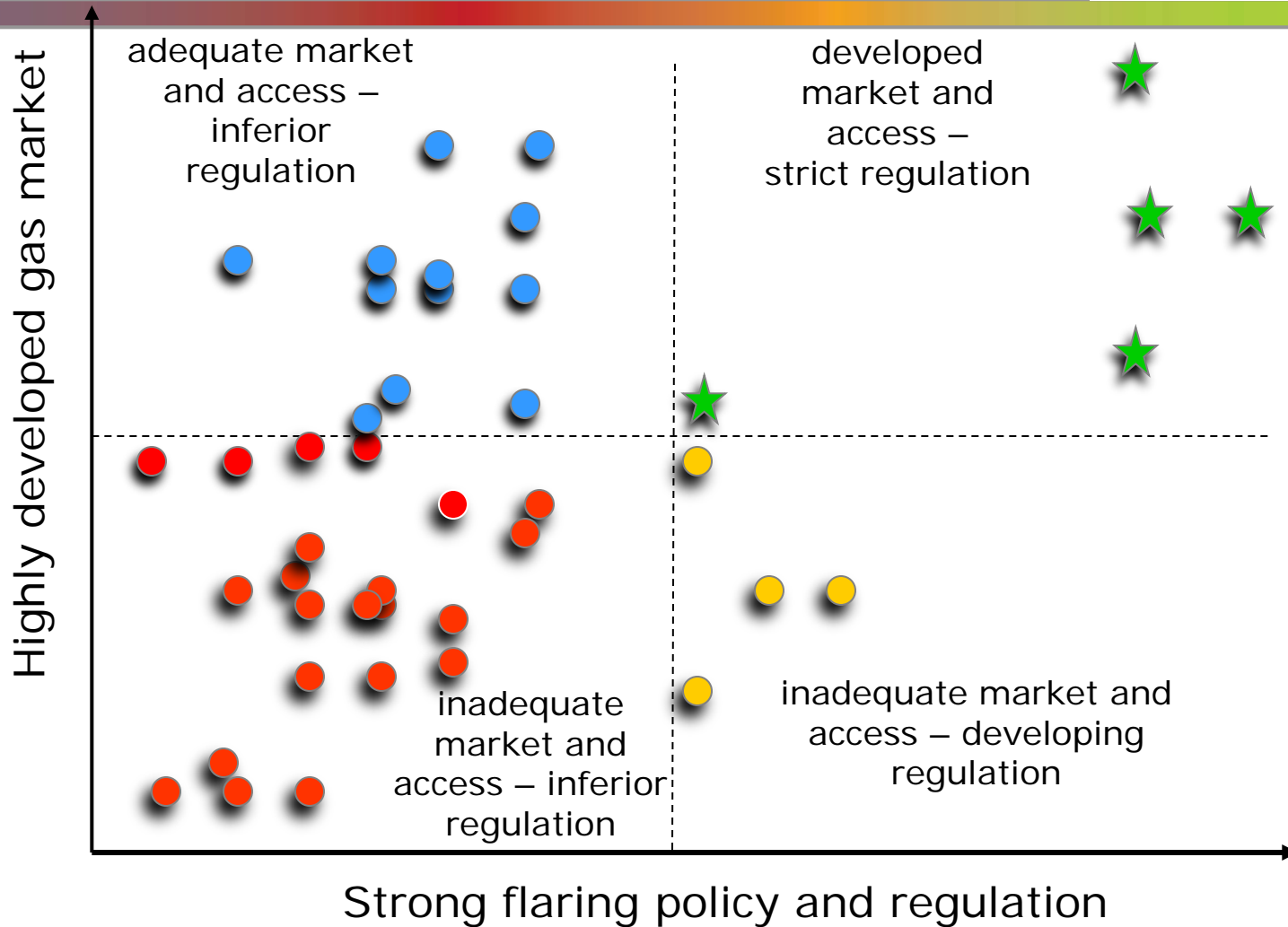
- 1 Stakeholder Facilitation
- 2 Project Facilitation
- 3 Carbon Finance
- 4 Gas Utilization & Feasibility Study

- 5 Best Practice Sharing
- 6 Gas Flare Data Collection
- 7 Measurement
- 8 Communications and Outreach

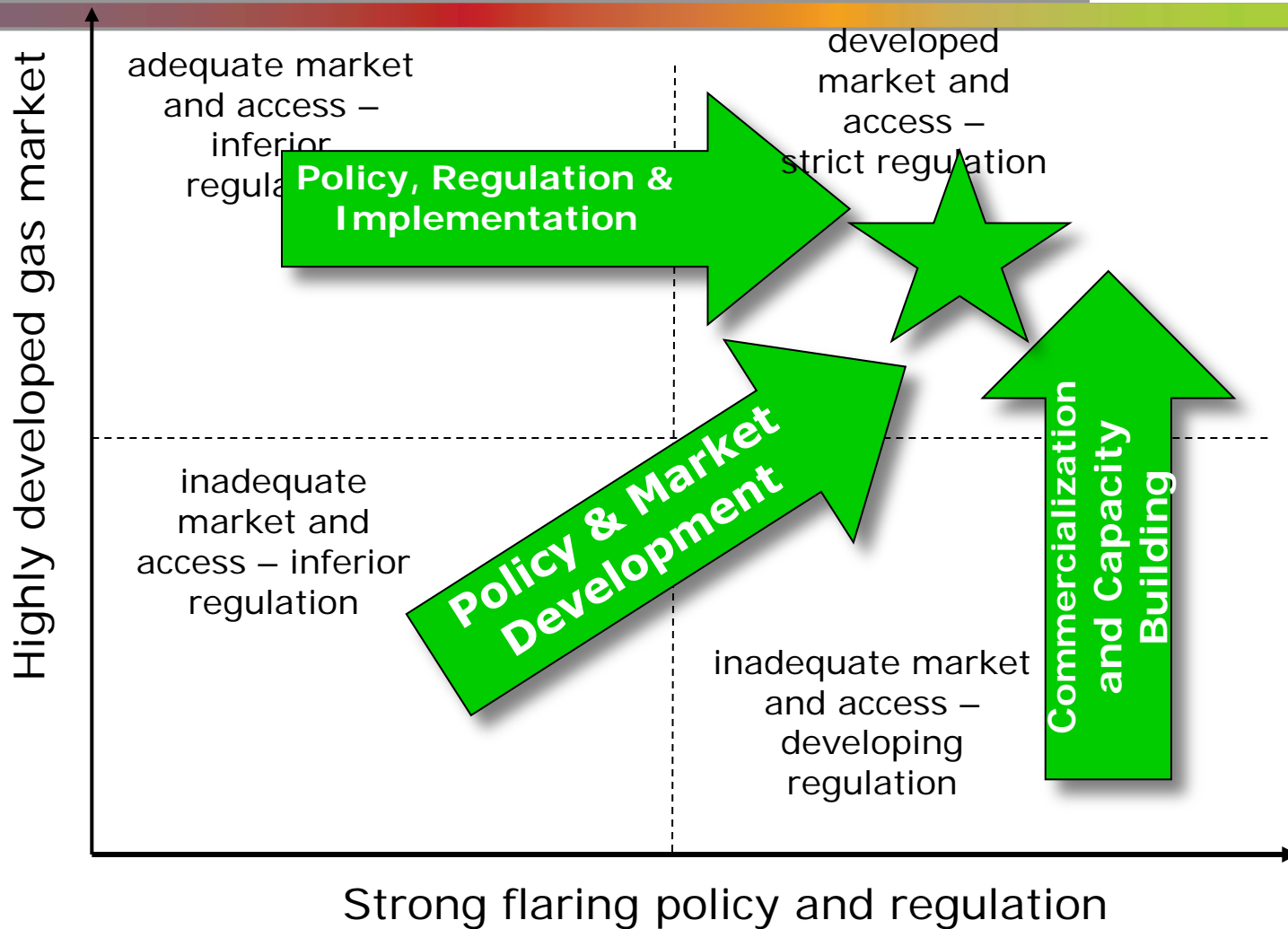
Regulation Around the World

- GGFR carried out study of 44 oil producing countries
- Objective: regulations and other factors that effected the flare and venting volume
- Findings: countries that managed to reduce flaring and venting volumes adopted a combination of
 - Efficient regulation
 - Other incentives (fiscal policies & reform of energy markets)

Country Regulatory Profiles



GGFR Focus



Relevance of GGFR action in Middle East



- The current estimate of gas flared in Middle East is 27 bcmy. Enough to feed a 18 MT LNG plant, or 5 medium size LNG trains
- In the 1980s, Saudi Arabia reduced gas flaring from 38 bcmy to less than 1 bcmy in the development of their petrochemical industry
- Unbalance of reserves / supply / demand in the region
- Qatar, as gas industry world leader, has the potential to monetize their currently flared associated gas
- Some countries use HFO for power generation while still flaring associated gas (Kuwait)
- Some countries import gas while flaring substantial amounts of gas, and LNG projects do not work at full capacity (Oman)
- Flared gas could be utilized in power generation projects (Yemen)

GGFR WORK PROGRAMS IN THE REGION

- Qatar
 - QP Workshop with operators led to Technical Working Group to reduce gas flaring
 - Carbon Finance
- Iraq
 - Gas Pricing
 - Carbon Finance
 - Assoc. Gas Recovery Plan
- Algeria:
 - Assoc. Gas Recovery Plan

Financing and contractual Issues

- Raising funds or equity financing flaring reduction projects is not an issue in most MENA countries
- Gas flaring reduction projects compete in the countries priority list with more sought after and lucrative oil projects
- Carbon finance could add value to the economics of the project
- Legal and Regulatory frameworks for gas flare reduction are sometimes non-existing
- Adequate consideration of natural gas development and production is only recently introduced in PSCs
- GGFR can help Partners developing policies and regulation to meet their gas flaring objectives

Lessons Learned & Critical Success Factors



- Fiscal and regulatory
 - Effective regulations, strong gas flaring policies
 - Fiscal terms should encourage gas utilization
 - Right balance between incentives and penalties
- Leadership and commitment
 - Governments also need clear policies with the right incentives for flare reduction
 - Country buy-in, high-level support
 - Effective partnership: Government - Industry

GGFR's Vision is...



Thank you!

Further information:

www.worldbank.org/ggfr