



Middle East Country Climate Initiatives and the Oil and Gas Industry

Presented to
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Agenda

- Background: Global Climate Change
- International Climate Policy
- National Climate Linkages to GMI
 - Saudi Arabia
 - Qatar
 - Kuwait
 - Oman
- Conclusions

Background: Global Climate Change

- **IPCC:**
 - Global evidence that ecosystems are being affected by regional climate changes,
 - Global GHG emissions → 70% growth between 1970 - 2004 (*IPCC FAR; graph below*).
- **NOAA:** Climate change is very likely caused by human activity and poses major risks to humans and the environment (*America's Climate Choices; 2011*).
- **CH₄** contributed 14.3% of total global CO₂e emissions in 2004.
 - *Very likely* that CH₄ increase is due to agriculture and fossil fuel use.

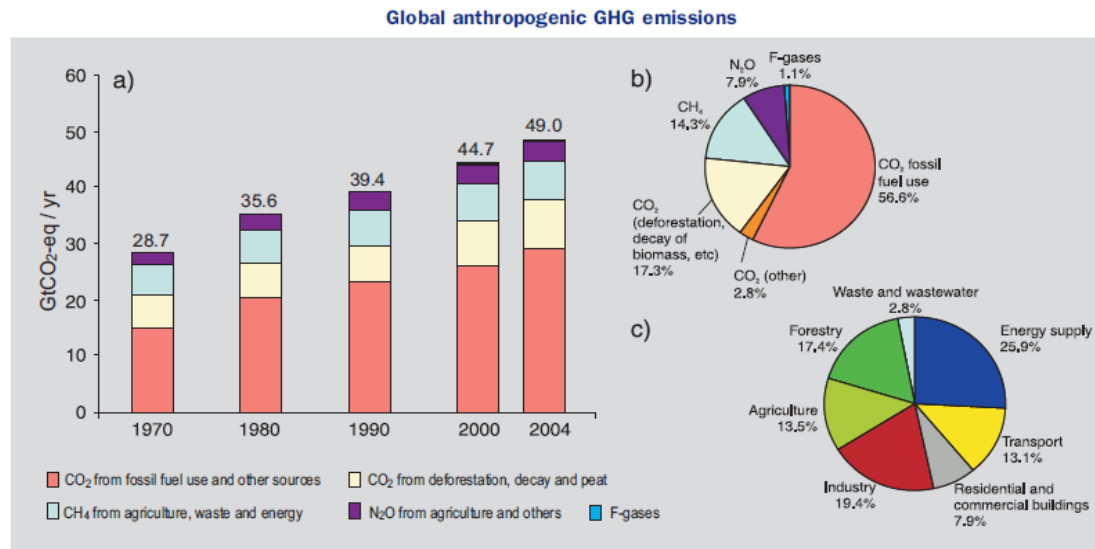


Figure SPM.3. (a) Global annual emissions of anthropogenic GHGs from 1970 to 2004.⁵ (b) Share of different anthropogenic GHGs in total emissions in 2004 in terms of carbon dioxide equivalents (CO₂-eq). (c) Share of different sectors in total anthropogenic GHG emissions in 2004 in terms of CO₂-eq. (Forestry includes deforestation.) [Figure 2.1]

International Climate Policy: Process

- **United Nations Framework Convention on Climate Change (UNFCCC)**
 - Stabilize atmospheric GHG levels to avoid “dangerous” interference with climate system
 - Next UN climate meeting (COP 18): Doha, Qatar (Nov-Dec 2012)

- **Kyoto Protocol (KP)**
 - 1997: 5% avg. cuts for developed nations from 2008 – 2012 below 1990 levels (CP1)
 - Mixed success meeting target
 - EU ETS
 - US—not ratified
 - Withdrawn or missing target—Canada, Japan
 - BASIC countries urge agreement on extension of KP at Doha
 - Developing country economic concerns over future binding target reductions

Clean Development Mechanism (CDM): KP flexibility mechanism

- Offsets in developing countries used for compliance in developed countries
- >4,600 CDM projects registered; 1 billion CERs issued; ~ 2.7 billion tCO₂e in total
- Qatar: 1 project registered; Kuwait, KSA: projects in development
- Various project sizes (large, small-scale) and formats (individual projects, PoAs)
- Methodologies: 89 large-scale, 21 consolidated, and 84 small-scale
 - Oil/gas methane: AM9, AM23, AM37, AM43, AM74, AM77
 - Re-injection methodology not yet approved
 - Guidance on quantifying upstream leakage emissions

International Climate Policy: Key issues

- **Current international issues**
 - Future treaty
 - 2nd Commitment Period for KP
 - Green Climate Fund
 - Examples of key mechanisms, topics (PMR, REDD+, LEDS, adaptation)
- **Emergence of national targets/other climate policies**
 - Australia
 - Japan
 - China
 - India
 - Brazil
 - Other major national emitters (e.g. Indonesia, Mexico, Korea, South Africa)
 - California

Key Policy Issues (continued)

- Indirect pressure from global policies on GHG reductions for fuels
 - EU Fuel Directive
 - California's Low Carbon Fuel Standard

International Climate Policy: New market mechanisms

- **Key future challenge: Next Steps?**
 - Limiting future temperature increase to < 2 degrees C (*Copenhagen Accord*)
 - Emissions reductions, considering common and differentiated responsibilities
 - Need for full suite of market mechanisms

- **Importance of CDM is uncertain**
 - Expiration of CP1
 - Large oversupply of CERs
 - Low market prices
 - Restrictions on types of CERs from EU, NZ

New International Mechanisms (continued)

- **New market** mechanisms proposed in recent years
 - Green investment schemes
 - Baseline and credit permit trading
 - Sectoral crediting schemes
 - Program of Activities (already under implementation through CDM)
 - NAMAs (see next page)

International Climate Policy: NAMAs

- **Nationally appropriate mitigation actions (NAMAs):**
 - Up to each country to select relevant sector for which NAMA can be developed.
 - Development, financing and compatibility with international climate regimes
 - Could be possible way forward to link mitigation actions with climate policies

- **60+ countries** have developed NAMAs
 - Most at design/financing stage, some at implementation stage
 - Wide range of sectors (industry, cement, energy, etc.)

NAMAs (continued)

- **Flexible financing**
 - Unilateral, bilateral, or multilateral.
- **Strategic opportunity** to develop and package mitigation actions
 - **Possible result** → continue core oil/gas operations while minimizing secondary methane emissions (flaring, venting, fugitive leaks, etc.).

National climate linkages to GMI: Overall

- **All four countries acknowledge importance of reduction opportunities**
 - Climate linkage: potential low-hanging fruit for GHG abatement
 - Environmental policies: Links to air pollution laws, EIAs, gas flaring reduction goals
- **Examples of initiatives to reduce emissions**
 - Saudi Arabia: Aramco - Master Gas Collection System
 - Qatar: QP and Ras Gas - Flare Minimization
 - Kuwait : KOC – Flare Reduction and powering of 40,000+ homes
 - Oman: PDO – Reduction of Flaring and Venting of Associated Gas

National Linkages (continued)

- **World Bank's Global Gas Flaring Reduction (GGFR)**
 - Started in 1992 at WSSD
 - Public-private partnership (country governments and companies)
 - Remove market barriers and promote regulatory frameworks to reduce gas flaring
 - Includes Kuwait and Qatar

National climate linkages to GMI: Challenges

- **Challenges**

- Limited scope of existing national climate policy
- Low prioritization of methane reduction in relation to sustainable development objectives
- Lack of pre-existing gas collection and distribution infrastructure
- Partial scoping assessment
- Lack of enforcement
- Challenging project economics
- Relatively low gas prices

- **Need to consider full suite of approaches**

- New mechanisms (NAMAs, sectoral approaches) in addition to current approaches with CDM and carbon market mechanisms

National climate linkages to GMI: Saudi Arabia

- **Ninth Development Plan**
 - Economic diversification and local development
- **PME: General Environmental Laws and Rules for Implementation (2001)**
 - *Environmental Protection Standards: Air pollution concerns including guidance for industrial emissions*
 - EIA regulations

GMI Linkages: Saudi Arabia (continued)

- **2nd National Communications (2011)**
 - Total CH₄ emissions: 24% from oil/gas activities including flaring/venting/leaks
 - CH₄ emissions from oil/gas : ~ 7.2 MMTCO₂e (~2% of total emissions)
 - Fugitive emissions from oil/gas: 95% of CH₄ emissions in the energy sector

GMI Linkages: Saudi Arabia (continued)

- **Examples of relevant mitigation actions noted in 2nd Nat. Comm.:**
 - Assessing the methane emission sources in Saudi Arabia and related control and utilization technologies
 - Carbon capture and storage research and demonstration projects

GMI Linkages: Saudi Arabia (continued)

- **CDM**

- Establishment of DNA
- Approval guidelines, SD criteria, promotion/marketing
- 10+ projects on gas flare reduction from Aramco, SABIC under *Prior Consideration*

GMI Linkages: Saudi Arabia (continued)

- **Saudi Aramco**

- **Master Gas Collection System**

- Reduced flaring ~ 99% since 1997
- ~ ½ of gas supply comes from associated gas previously flared

- **Flare Minimization Roadmap**

- Economic incentive by recovering the flare gas valued at more than \$2 / MMBtu.
- Guidelines to minimize daily flaring, using flow meters on flare headers
- Install FGR units on elevated flares with daily flaring rates, after implementation of flaring minimization, >1 MMSCFD
- Convert conventional flares with demonstrated low flaring rates <1 MMSCFD to smokeless to meet current environmental regulations

National climate linkages to GMI: Qatar

- **Qatar National Vision 2030**
 - Four pillars including Environmental Development
 - Balance needed between environmental protection and economic development

- **Qatar National Development Strategy (2011 – 2016)**
 - Pursuit of cleaner air and climate change responses
 - Goal: Halve gas flaring to 0.0115 bcm per million tons of energy produced by 2016 from the 2008 level of 0.0230 bcm per million tons of energy produced.

- **Flaring reporting guidelines**

GMI Linkages: Qatar (continued)

- **Initial National Communication (2011)**
 - Oil and gas sector emits half of total GHG emissions in 2007
 - Wasted “non productive” combustion emissions (e.g. flaring): 13% of the national energy use and 26% of the total energy consumed by the oil and gas operations
 - GHG emissions from flaring: 8.66 million tons CO₂e (12% of total GHG emissions)
 - 98% from upstream oil and gas operations and the rest from the petroleum refinery and petrochemical industries.
 - Possible mitigation pathway: Flare mitigation from oil and gas operations will lead to significant reductions in not only CH₄ and CO₂ but also SO₂ and NMVOC

GMI Linkages: Qatar (continued)

- **CDM**
 - DNA established and promoting projects
 - 1 project from Qatar Petroleum (use of previously flared associated gas from Al-Shaheen Oil Field) registered
- **Selected methane reduction examples:**
 - Qatar Petroleum
 - Flare minimization: Analyze opportunities: estimate lost revenue
 - Carbon accounting and reporting standards and carbon capture (feasibility assessment for CO₂ captured during gas purification)
 - CCS
 - Ras Gas
 - In 2011 completed a five-year flare minimization program
 - In 2005, flaring 1.37% of its intake gas but in 2010, flaring 0.47% of gas.
 - Developed a GHG policy and management strategy and independent third party verification of its GHG inventory.

National climate linkages to GMI: Kuwait

- **Kuwait Environmental Protection Agency**
 - Environmental regulations on air pollution
 - Development of national climate policy
 - Collaboration with UNDP on environmental framework and possible design of NAMAs

- **National reduction in flaring**
 - Drop from 17% (2005-06) to 1.75% (2010-11) on energy basis
 - Led to increased revenues by \$2.7 billion

GMI Linkages: Kuwait

- **GGFR**
 - Joined in March 2012

- **Initial National Communication**
 - Underway through support of UNEP and GEF
 - National inventory, mitigation pathways, adaptation and other topics

- **CDM**
 - None registered; 6 projects listed under *Prior Consideration* incl. 3 on flare reduction

GMI Linkages: Kuwait (continued)

- **KPC**
 - Goal of reducing flaring down to 1% and ultimately zero flaring

- **KOC**
 - 40,392 houses powered over 6 years since the start of flaring reduction program
 - Flaring and reduction in KOC is tracked on a daily basis by management at all levels
 - Corporate flare reduction campaigns organized
 - Frequent coordination meetings with companies and consumers

National climate linkages to GMI: Oman

- **Regulation on Controlling Air Pollutants (2004)**
 - Issued by Ministry of Regional Municipalities, Environment & Water
 - Environmental regulations and guidelines
 - Outlined emissions standards for flaring (CO₂ and other gases)
- **Ministry of Environment and Climate Change**
 - Environmental permits and impact assessments
 - Climate change policy developments
- **Initial National Communication**
 - Underway through support of UNEP and GEF
 - Collaboration with Ministry of Environment and Climate Change, Sultan Qaboos Univ.

GMI Linkages: Oman (continued)

- **CDM**

- None registered; 8 projects listed under *Prior Consideration* (none on oil/gas methane)
- CDM feasibility study for gas flare reduction at Safah field

- **PDO**

- Strong efforts since 1980 to capture associated gas
- Official policy of reducing flaring/venting of gas to residual levels (near zero)

Conclusions

- International climate policy post 2012 is uncertain but evolving
- Key future global climate policy issues:
 - Groundwork for new climate treaty, CP2 for KP, financing for GCF, new mechanisms
- Use of CDM
 - Limited success as a mechanism for obtaining carbon credits and revenue in methane reduction in the oil/gas sector
 - Future use and uptake remains uncertain.
- NAMAs may present a useful opportunity to develop and package sector-wide methane reduction activities across the oil/gas sector.

Conclusions (continued)

- All four countries—recognized and successfully reduced methane emissions
- National policies outline commitment to environmental protection—Environmental laws, development plans, and national communications
- Challenges exist
 - Policy, market, enforcement, economics, infrastructure, awareness
- Innovative use of climate mechanisms
 - Optimize methane reduction programs in the oil/gas sector
 - Leave the core business operations untouched
 - Yield other economic and environmental co-benefits