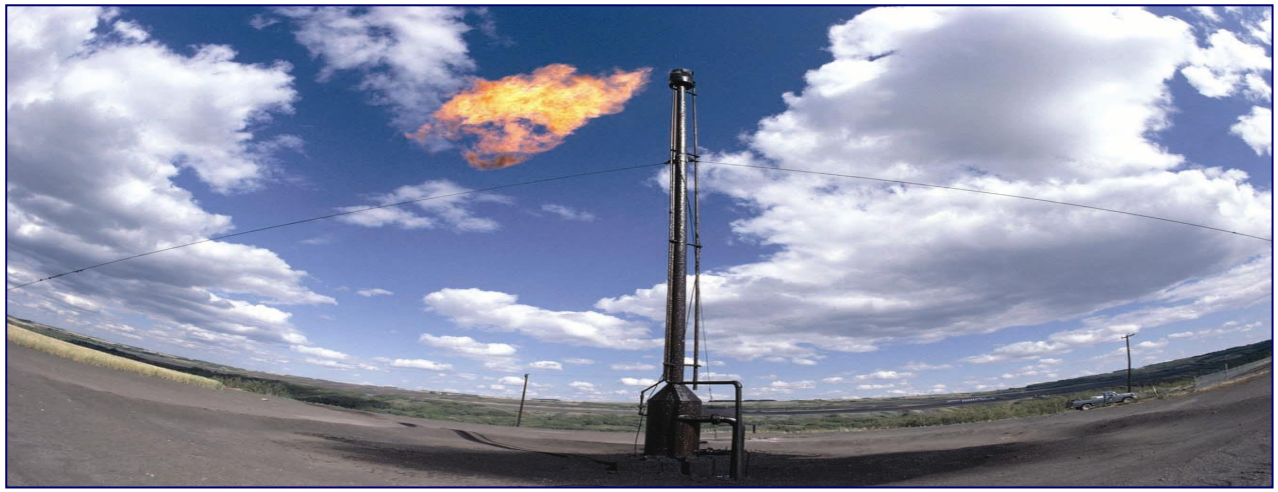
Joint OPEC / World Bank Group Workshop on Gas Flaring Reduction



Vienna, 30 June – July 1, 2005

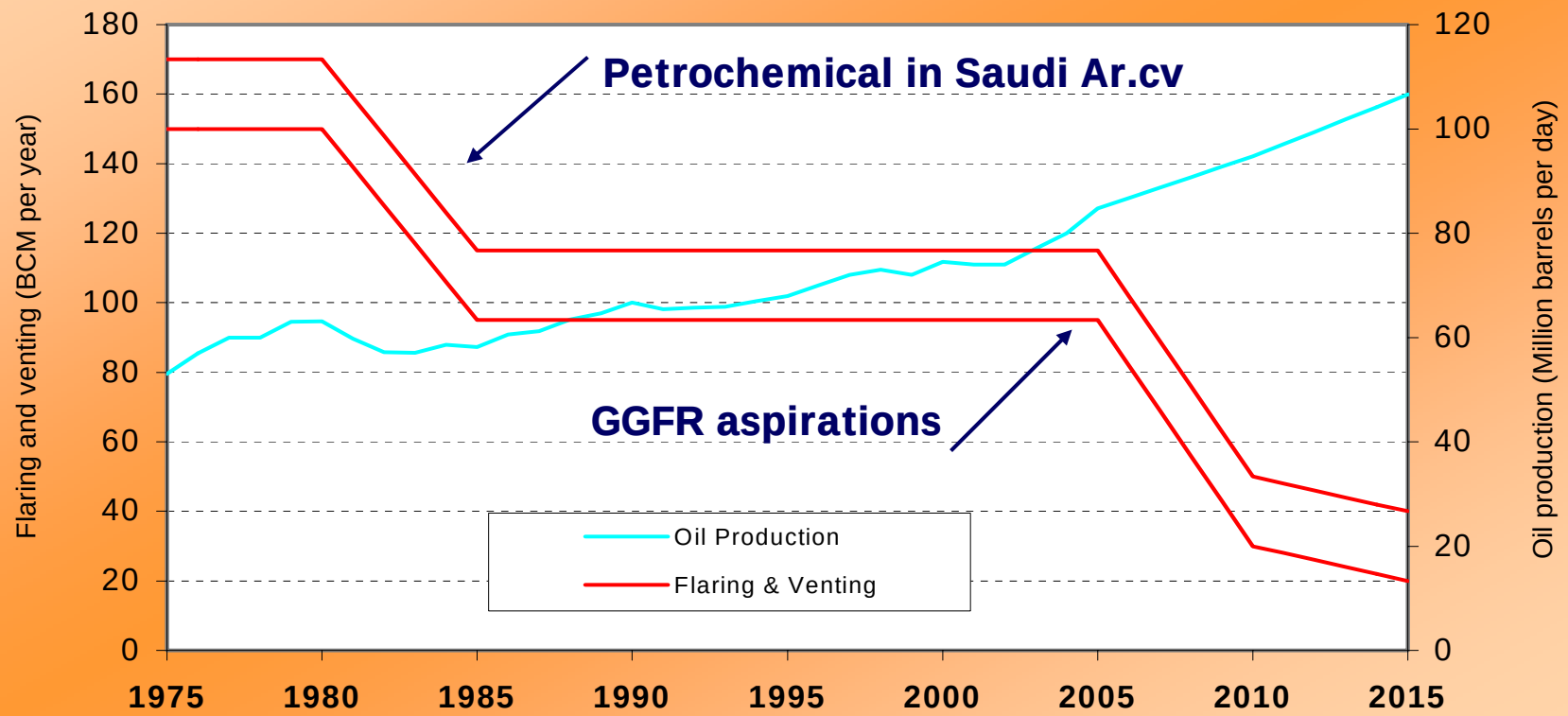
THE STANDARD

François-Régis Mouton, Adviser

Global Gas Flaring Reduction
A Public Private Partnership

Flared Gas Volume Evolution

Trends in world gas flaring and venting (1975-2015)



Why constant flaring levels, globally over 100 BCM per year ?

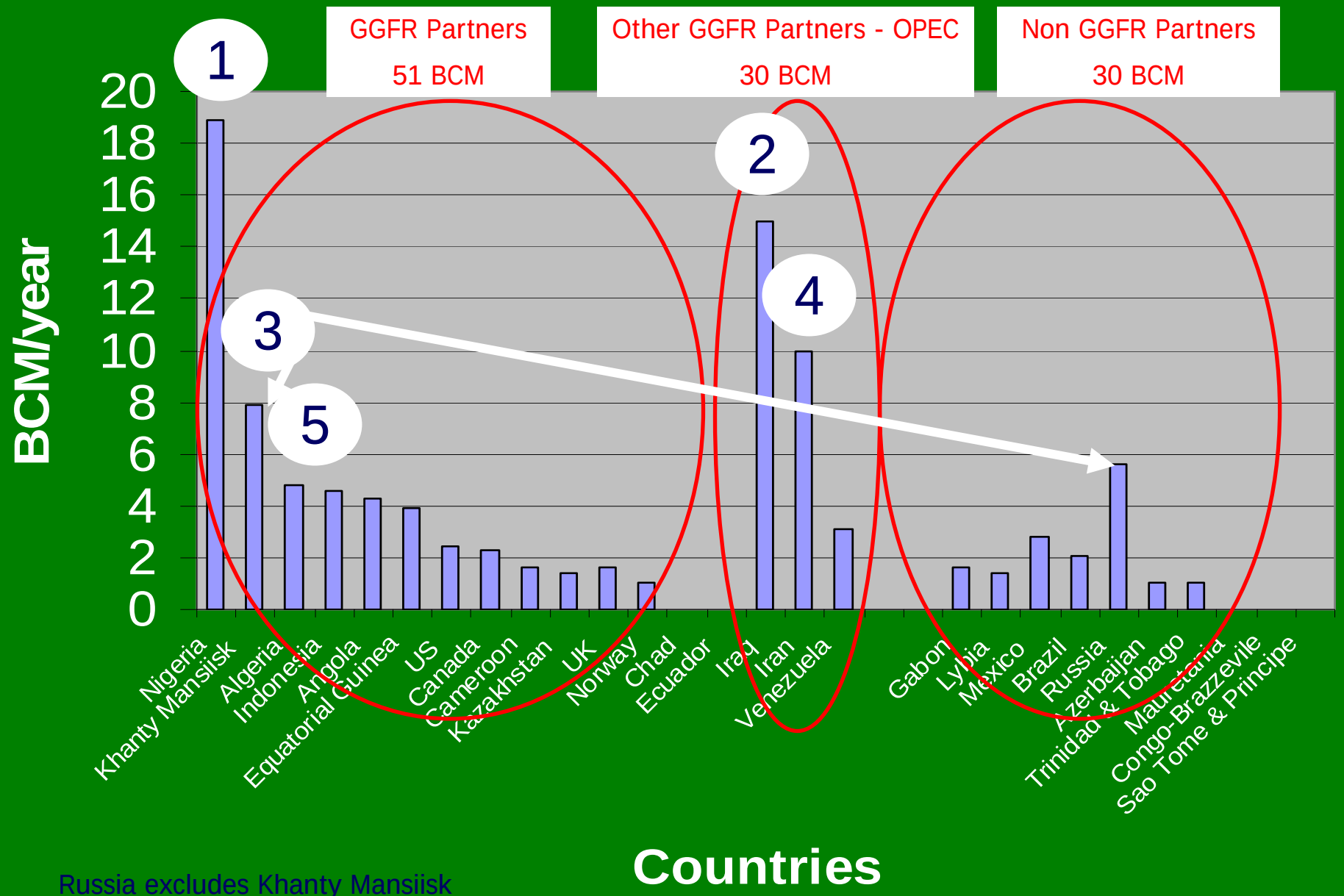
Although governments and companies have made significant investments in flared gas reduction projects

Two key factors limit the global impact of these efforts:

- **Global oil production increases :** associated gas production increases, offsetting efforts to reduce gas flaring
- **Individual actions are not enough :** in order to develop gas markets, gas infrastructure, and flaring reduction projects often **requires collaborative action**

→**Need for a forum enabling discussions between stakeholders**

Flared Gas



Russia excludes Khanty Mansiisk

Typical barriers to gas sector development

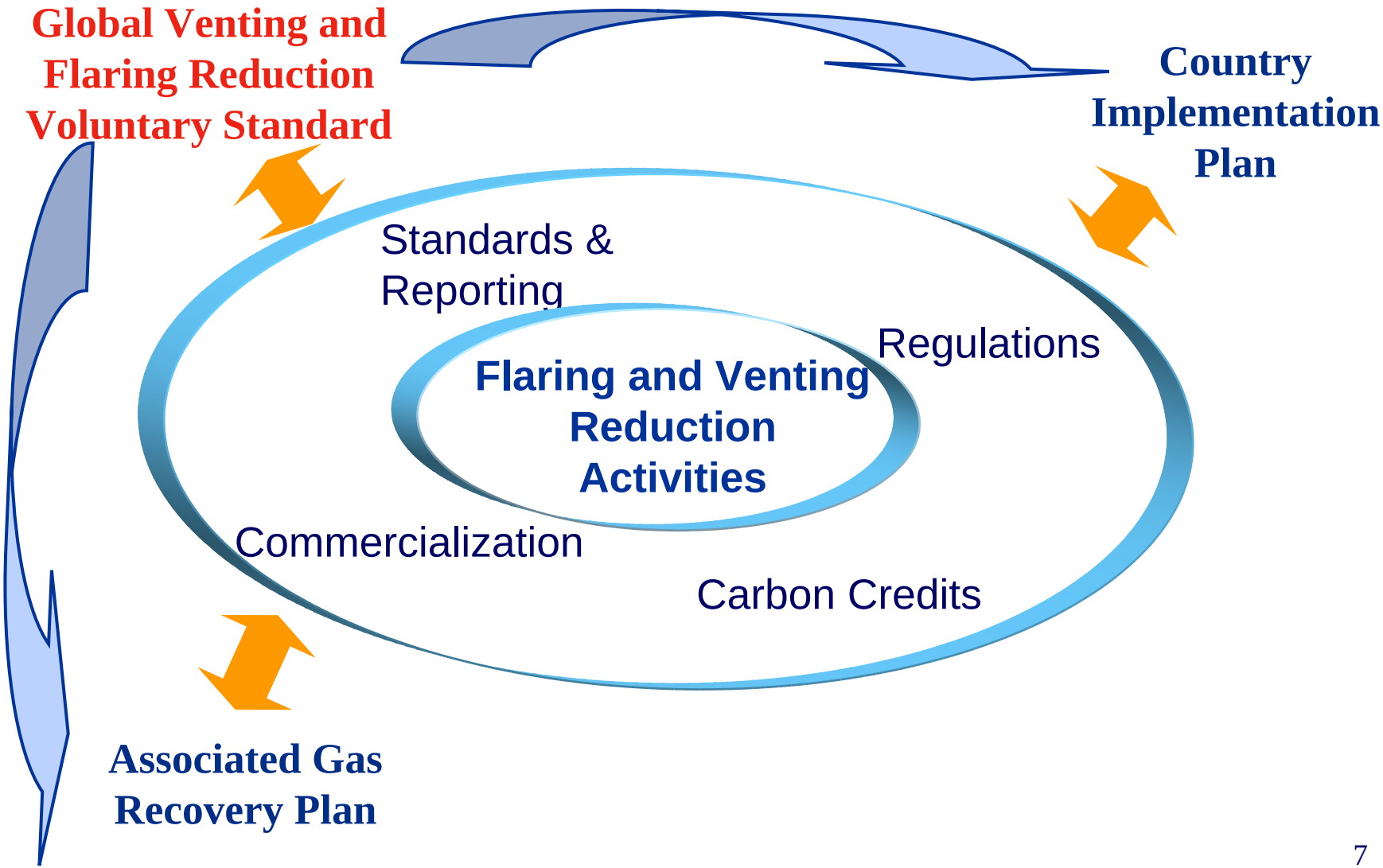
- Underdeveloped domestic market for gas and gas products (LPG, CNG, fuel methanol, power etc)
- Infrastructure constraints and access
- Limited institutional, legal and regulatory framework for gas, including associated gas
- Gas terms (or absence thereof) in existing oil development agreements
- Fiscal system
- Domestic gas and gas product pricing
- Funding constraints

Collaborative Action: GGFR

- **August 2002** : GGFR Partnership was formed at the World Summit on Sustainable Development in Johannesburg
- **GGFR Objective** : to support governments and the petroleum industry in their efforts to reduce flaring and venting
- A **growing partnership** including governments, state-owned and IOCs, OPEC, and the WBG

→**Access to 80 % of the sources of global flaring**

Integrated Approach to Flare Reduction



The Standard

→ **In May 2004,** 2nd International GGFR Conference in Algiers : GGFR announced the

"Global Gas Venting and Flaring Reduction Voluntary Standard"

- To provide framework for governments, companies, and other key stakeholders to consult each other and take collaborative/complementary actions
  → **Expand project boundaries and reduce barriers to associated gas utilization**

- To encourage **integrated approach** including market and infrastructure development, commercialization, legal and fiscal regulations, carbon credits;

- To achieve global applicability and impact by allowing for **flexibility to local conditions**, balancing ambitious timescale with realistic constraints.

Key Concepts of the Standard (1)

Initial Goal (focuses on large sources) :
"no more continuous venting or flaring"
unless no feasible alternative

- **Voluntary** and based on financial performance rather than prescriptive
- **Collaborative action**
- Options to enhance feasibility of associated gas utilization ("tool box")
- **Public reporting-** self sustaining

Toolbox for Stakeholder Discussions

Gas Producers

- **Integrate economic, environmental, social benefits and/or costs into incremental econs**
- **Expand project boundaries**
- Trade gas between fields and producers
- **Source gas for deficient fields**
- Transfer best practices and technology
- Carbon credits

Governments

- **Contractual rights to associated gas**
- Profit sharing mechanisms
- **Third party access to infrastructure**
- Infrastructure cost recovery
- **Tax and royalty incentives**
- **Gas pricing to reflect value to economy**
- **National gas market strategy and gas market development**

Consumers

- **Reliable gas sourcing**
- **Flexible long-term contracts**
- **Associated gas pricing based on competitive fuels**
- **Payment guarantee for gas delivery**

Gas Infrastructure Owners

- **CAPEX and OPEX requirements and Infrastructure expansion projects**
- **Third party ownership of infrastructure**
- **Third party access to infrastructure**
- Tariffs to recover costs and fee for 3rd party access

⇒active engagement and cooperativeness of all key stakeholders

Key Concepts of the Standard (2)

- **New projects** flaring and venting reduction**: 1/2005**
- **Existing facilities** venting reduction**: 1/2006-8**

Associated Gas Recovery Plans for Producers

- Within project boundaries : **1/2006**
- With expanded project boundaries **1/2007**

Country Implementation Plan for Govts : **1/2006-7**

Existing facilities flaring reduction

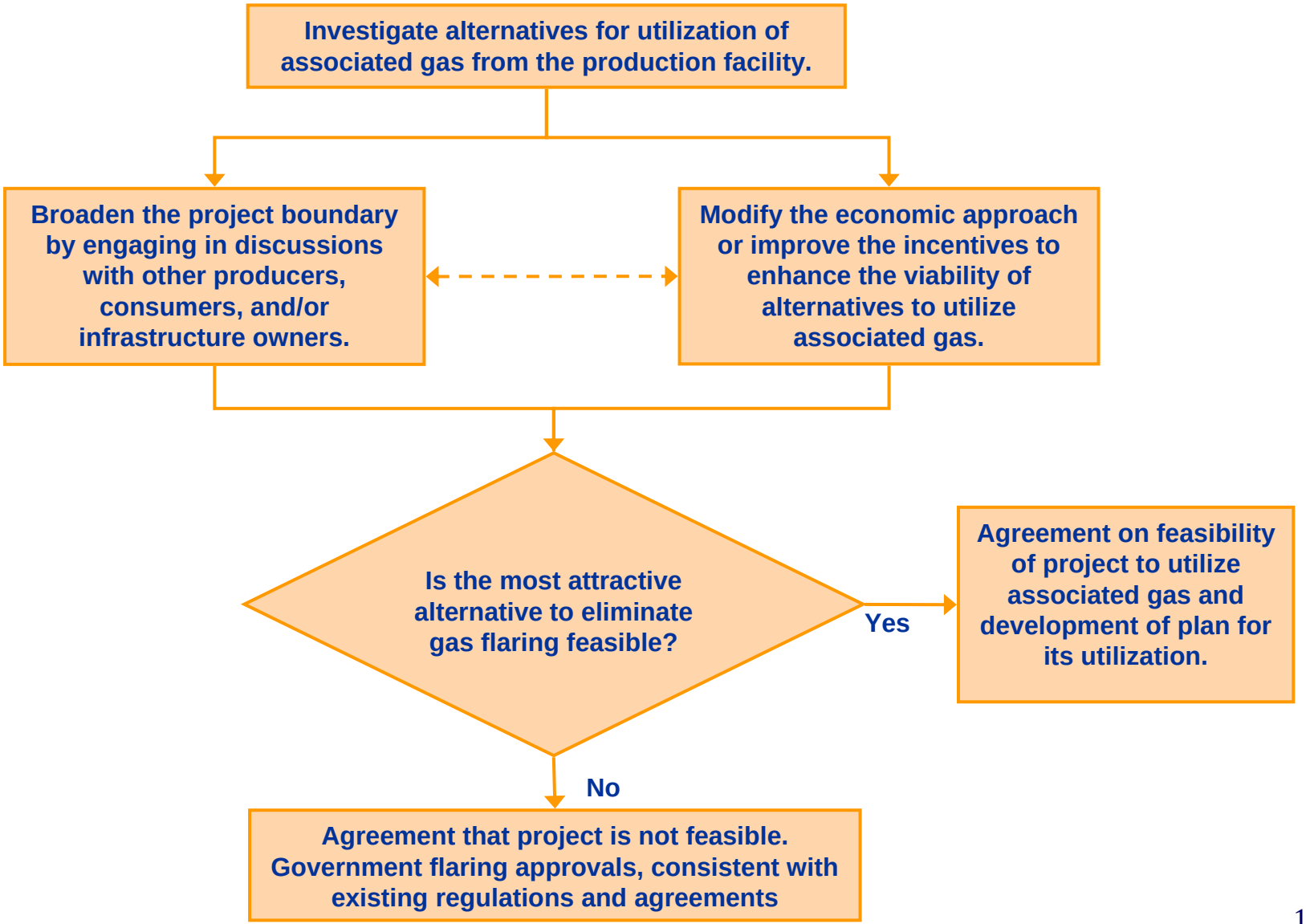
- Within operational project boundaries : **1/2010**
- With expanded project boundaries : **1/2011**

Key Concepts of the Standard (3)

Ultimate Goal :
longer term continuous improvement

- Minimize continuous and non continuous flaring
- Regular review of remaining flaring and venting
- Public reporting

Process to Determine Feasibility of Flaring Alternatives



Examples of Standard Implementation
Equatorial Guinea

Challenge:

Relatively few fields, few markets EG NLG and local (Bata)

- → Collaborative effort needed between IOC's and Government
- → Finding common ground among IOC's

Resolution:

- → EG GGFR meetings between stakeholders organized in Oct 2004, Feb and June 2005
- → Gas flaring reduction options identified based on expanded project boundaries. A joint study between operators agreed and kicked off

Target Outcomes:

- Reduce by 1 to 2 BCM currently flared gas in 2007 ?
- Increase the EG LNG project size by bringing more gas into it

Examples of Standard Implementation

Cameroon

Challenge :

- Very disperse sources and few markets (38 fields – 1.6 BCM flaring)

Resolution:

- A study has been carried out identifying attractive option for Domestic: Conversion to gas (power plant and refinery) plus additional Power
- Workshops organized in 2004 and 2005 including operators, power sector, government, other stakeholders
- Stakeholder discussions on associated and non associated gas use options (both domestic and export) on-going

Target Outcomes:

- Reduce 1 BCM currently flared gas in 2007 ?
- Build another liquefaction train for EG LNG
- Enhancing regional collaboration on gas and transport

Examples of Standard Implementation
Algeria/Sonatrach

Challenge:

→ Remote fields vs. markets
  → Identifying projects where associated gas monetization was feasible

Resolution

→ Significant efforts have been made since the 70's:
  – Flared gas reduced from 80% to 11% (4.7 BCM today)
  – Flaring prohibited for all new projects, since 1994
  – However, still some flaring from existing fields

→ GGFR/Sonatrach study completed
  → Viable options for Ohanet, TFT and In Amenas (1.3 BCM in 2003)
  → Expansion on project boundaries (Incl. Govt Take…)
  → Potential revenue increase due to CDM on Ohanet

→ **Outcomes :**
  →Ohanet decided (0.3 BCM) as part of larger project
  →TFT and In Amenas (1 BCM) in discussion between Ministry and Sonatrach

Adoption of the Standard

Adoption of the Global Gas Venting and Flaring Reduction Voluntary Standard means that the stakeholders:

- **Endorse the principles** set forth in the Standard as outlined in this presentation
- **Support collaboration with other stakeholders** toward the utilization of associated gas and the reduction of flaring and venting
- **Agree to publish flaring data** through the government for transparency

Public Reporting is Part of Standard Roll-Out

There is a need to

- better understand vented and flared gas volumes on both country and company specific basis,
- track flaring reduction versus projected forecasts
- gather consistent data

Publishing Flaring Data
North America

From Government Accountability Office Report
(July 2004)

- "…22,000 oil and gas producers in the US in 32 states,
- Only one fourth provide consistent data !
- The states that do report, do not distinguish between venting and flaring"

7.7 Gm^3 flared in 2000 and … 3 Gm^3 today ?

Publishing Flaring Data

Flaring Data Reporting Tool

Objective :

It is important that the data ownership remains with the respective governments as GGFR is not flare police

⇒To provide a standardized approach for data gathering, storage and reporting of associated gas that is flared or vented

Publishing Flaring Data
Flaring Data Reporting Tool

Description: The web-based tool is designed to be simple to use, administer and maintain. (Web tool being tested in 2/3 Partner countries).

Availability: End 2005

Next step: Launch the tool in GGFR partner countries – Q1/Q2 2006 for reporting 2005 venting and flaring activities

GGFR - Microsoft Internet Explorer

File Edit View Favorites Tools Help Address http://www.stopflaring.org Go

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GGFR

This data collection website has been developed by Global Gas Flaring Reduction Public-Private Partnership (GGFR) to help oil producing companies and governments gather and publish mflaring data. This website provides a unique platform for companies and governments around the world to voluntarily share data and track the amount of associated gas that is currently flared due to the existence of a number of barriers that prevent it from being used more productively.

Founded at the 2002 World Summit on Sustainable Development in Johannesburg, GGFR is a forum of governments of oil producing countries, state owned oil companies, International oil companies, as well as other key stakeholders, coordinated by the World Bank Group, whose objective is to support the efforts of the petroleum sector worldwide to reduce flaring and venting of gas associated with the extraction of crude oil. The GGFR currently has access to over 70% of the sources of global flaring. GGFR remains open to new partners.

bp Chevron ExxonMobil

IFC

- What is flaring?
- What is GGFR?
- Members
- Contact us
- View the flaring reports
- Copyright Information

Private member area

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GGFR

Satellite picture of the world showing gas flares (shown as red dots) for the year 2003, courtesy U.S. National Oceanic and Atmospheric Administration (NOAA). Areas of the world with significant flare levels have been highlighted in boxes. Additional flaring not highlighted on the map: Asia 7.5%, Europe 3% of the world gas flaring. Click on the regions to have a large view of the map.

When crude oil is brought to the surface from several kilometers below, gas associated with such oil extraction usually comes to the surface as well. This associated gas is often released into the atmosphere, ignited (flared) or un-ignited (vented).

Over 100 billion cubic meters of natural gas is flared globally every year, equaling:
- total world gas consumption for half a month
- the combined annual gas consumption of Italy and France
- the combined annual gas production of Latin America and Caribbean
- the combined annual gas imports of Asia, Middle East and Oceania
- half of Russian gas exports

The annual volume of natural gas being flared and vented is also equivalent to more than 10 percent of committed emission reductions by developed countries under the Kyoto Protocol for the period 2008-2012

IFC

- What is flaring?
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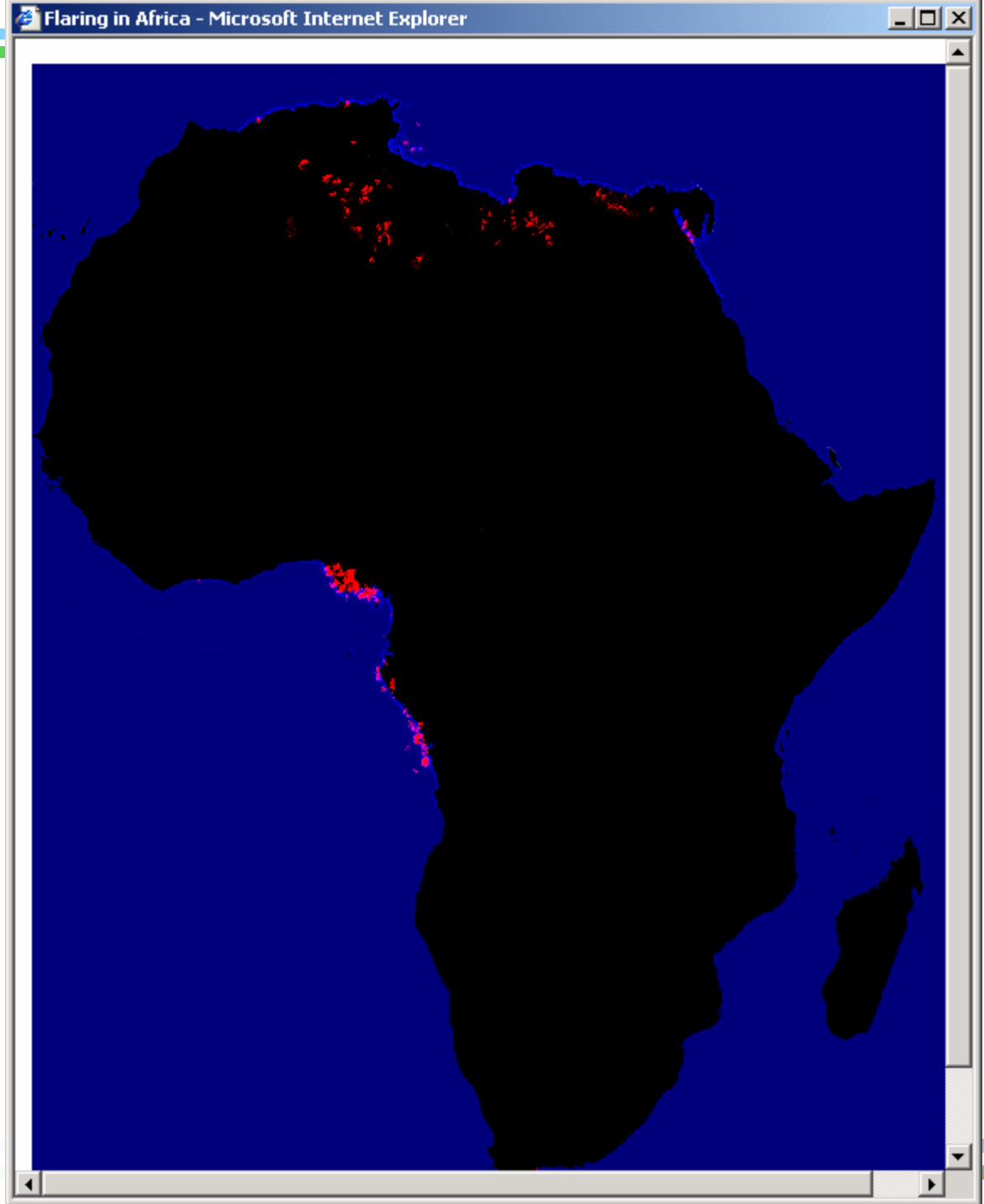
- Home

Private members area


Flaring in Africa - Microsoft Internet Explorer

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Back Search Favorites Media

The aim of the Partnership is to support national governments, development agencies and the petroleum industry in their efforts to reduce routine flaring and venting of gas associated with the extraction of crude oil. It is set to operate until June 2007.

The country/NOCs members are:

- Algeria (Sonatrach)
- Angola
- Chad
- Cameroon (SNH)
- Ecuador
- Equatorial Guinea
- Indonesia
- Kazakstan
- Khanty Mansiik (Russia)
- Nigeria

The International Oil Companies (IOCs) are:

- BP
- ChevronTexaco
- ENI
- ExxonMobil
- NorskHydro
- Shell
- Statoil
- Total
- Marathon Oil

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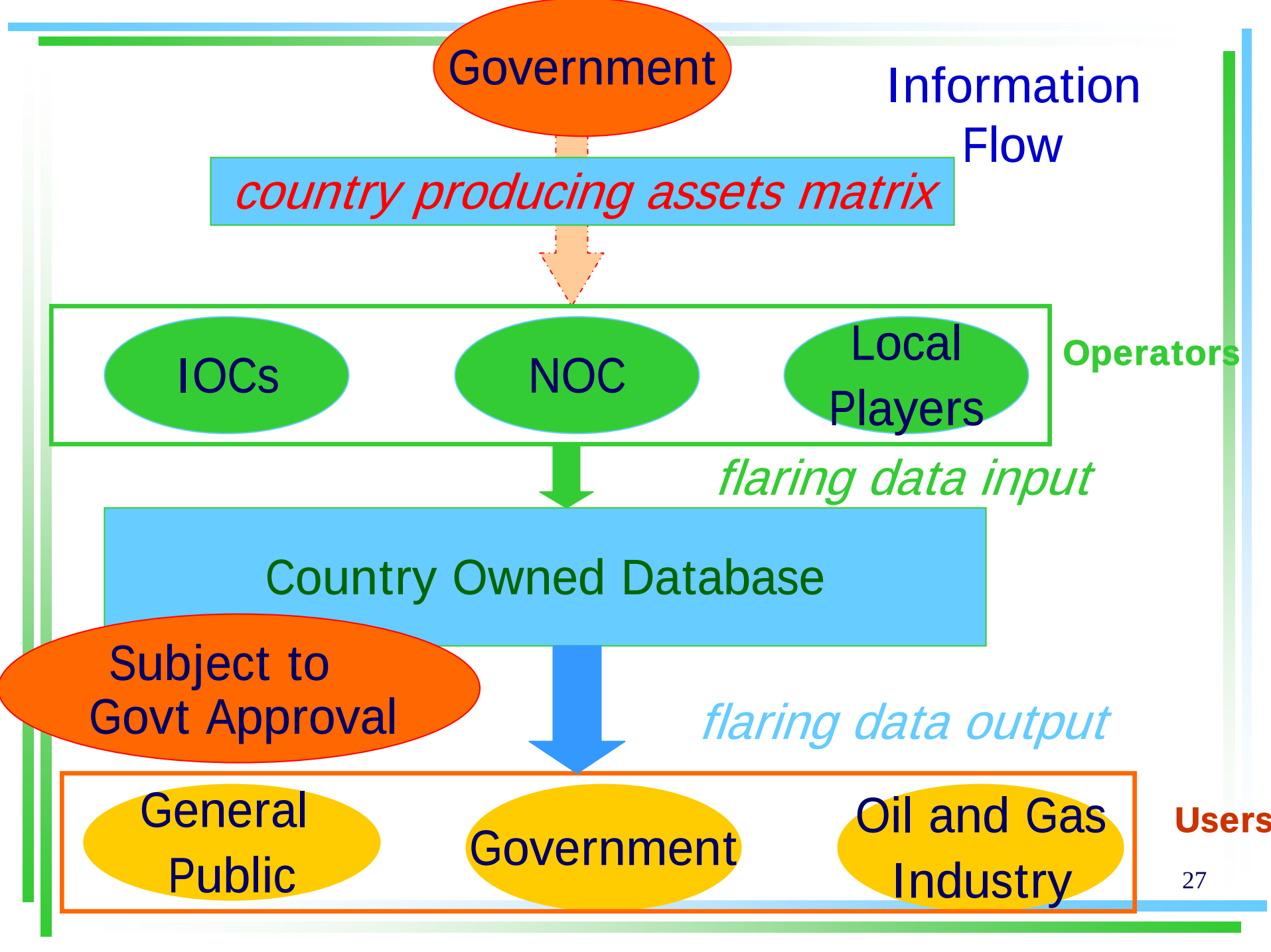
Private members area

Publishing Flaring Data

Flaring Data Reporting Tool

- **Website Ownership**: Data Base Administrator
- **Country Ownership**: Country Administrator (usually NOC) – to control, access and publish relevant data
- **Data Input:** Asset operators (Input coordinator and approver)
- **Reporting:** Web users (NGOs, Multilateral organizations, universities, press…)

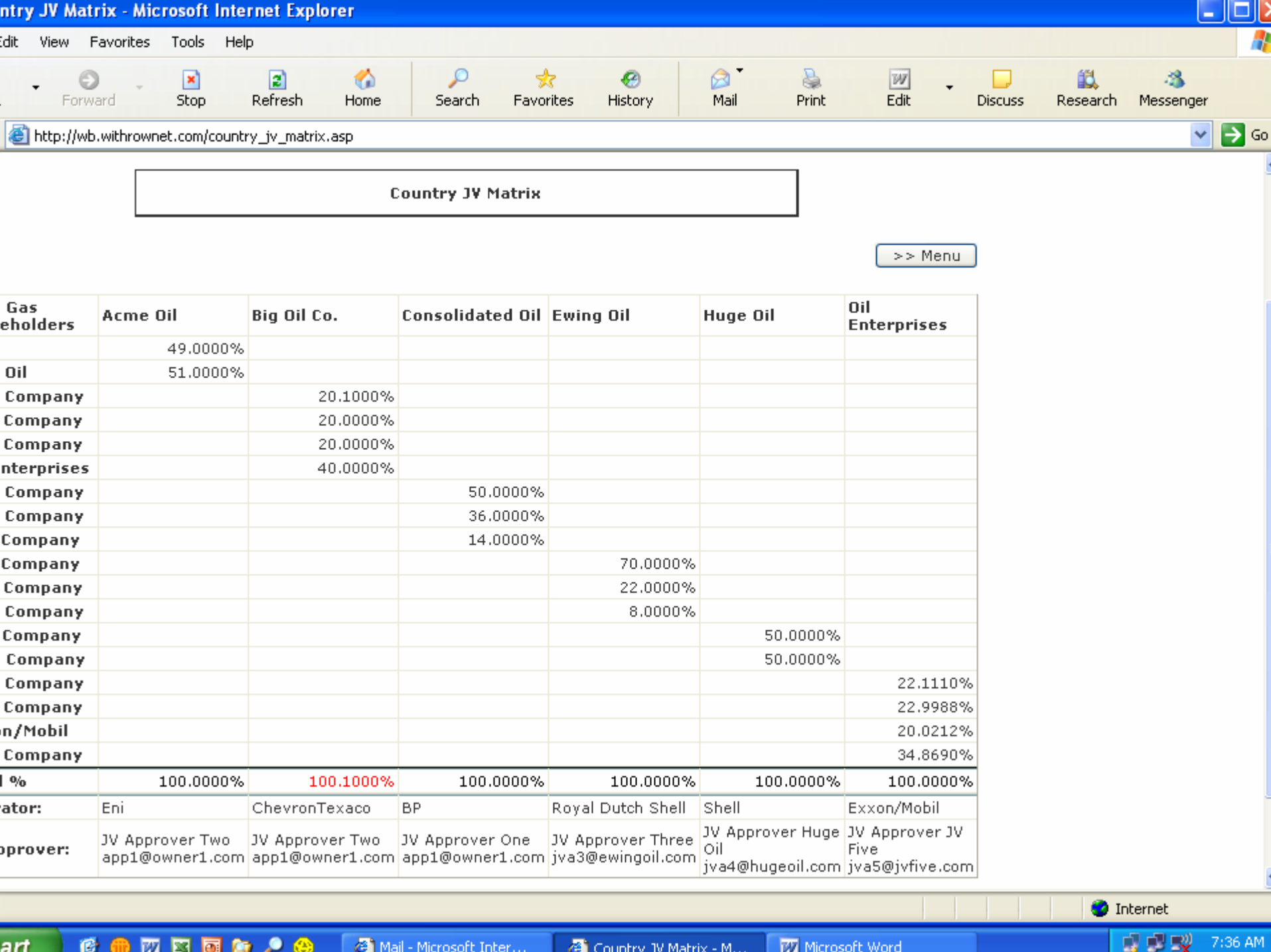

Government
Information Flow
country producing assets matrix
IOCs
NOC
Local Players
Operators
flaring data input
Country Owned Database
Subject to Govt Approval
flaring data output
General Public
Government
Oil and Gas Industry
Users

Standard Implementation
Flaring Data Reporting Tool

Ministries or NOC to identify :

- Asset list and operators,
- % ownership,
- Asset input coordinator and Asset approver coordinator

➢ To define all producing Assets in the country



Country JV Matrix

>> Menu

Gas eholders	Acme Oil	Big Oil Co.	Consolidated Oil	Ewing Oil	Huge Oil	Oil Enterprises
	49.0000%					
Oil	51.0000%					
Company		20.1000%				
Company		20.0000%				
Company		20.0000%				
nterprises		40.0000%				
Company			50.0000%			
Company			36.0000%			
Company			14.0000%			
Company				70.0000%		
Company				22.0000%		
Company				8.0000%		
Company					50.0000%	
Company					50.0000%	
Company						22.1110%
Company						22.9988%
n/Mobil						20.0212%
Company						34.8690%
l %	100.0000%	100.1000%	100.0000%	100.0000%	100.0000%	100.0000%
rator:	Eni	ChevronTexaco	BP	Royal Dutch Shell	Shell	Exxon/Mobil
pprover:	JV Approver Two app1@owner1.com	JV Approver Two app1@owner1.com	JV Approver One app1@owner1.com	JV Approver Three jva3@ewingoil.com	JV Approver Huge Oil jva4@hugeoil.com	JV Approver JV Five jva5@jvfive.com

Standard Implementation

Flaring Data Reporting Tool

Operators to report :

- Annual flaring and venting volumes per country per field per Asset operator
- Gas oil ratio
- Annual emissions volume per country per field per Asset operator
- Annual oil production per country (“nice to have” at company level)

$\Rightarrow$ Current Period and 2 year forecasts for the above (or $\neq$)

Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites History Mail Print Edit Discuss Research Messenger
Address http://wb.withrownet.com/flareventreport.asp?EID=3

Current Period and Units of Measure (UOM)

- Select -	Start	End
Current Period	1/1/2005	12/31/2005
Average Gas Volume UOM	million cubic meter per day	
Emissions UOM	Metric Tonnes CO2 eq	
Average Oil Production UOM	barrels per day	

Actual Data Input

Average Daily Oil Production in UOM	0	bbl/d

Flaring Data Input

Average Daily Gas Flare in UOM	0	mmcm/d
Emissions in UOM	0	$MtCO_2e$

Venting Data Input

Average Daily Gas Venting in UOM	0	mmcm/d
Emissions in UOM	0	$MtCO_2e$

Forecast Data Input — (2006)

Clear 2006 Forecast Data

Average Daily Oil Production in UOM		bbl/d

Flaring Data Input

Done Internet
start Mail - Microsoft Inter... Flare/Vent Reporting ... Microsoft Word 7:43 A

GGFR Report - Flaring by Country

>> Print >> Reports Menu >> Menu

Country	2005		Forecast 2006		Forecast 2007	
	Oil Prod (bbl)	Flare Volume (bcm/y)	Oil Prod (bbl)	Flare Volume (bcm/y)	Oil Prod (bbl)	Flare Volume (bcm/y)
Cameroon	73,000	73	73,365	73	37,960	75
Angola	1,030,001*	2,060,073	1,066,905	2,060,113	1,067,310	2,060,154
* Oil Production not reported for: Consolidated Oil Field 1 of Consolidated						

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Done

GGFR Report - Flaring by Company

>> Print >> Reports Menu >> Menu

Company	2005		Forecast 2006		Forecast 2007	
	Oil Prod (bbl)	Flare Volume (bcm/y)	Oil Prod (bbl)	Flare Volume (bcm/y)	Oil Prod (bbl)	Flare Volume (bcm/y)
D Oil Company	8,071	0	8,071	0	161	0
E Oil Company	8,395	0	8,395	0	168	0
Exxon/Mobil	7,308	0	7,308	0	146	0
F Oil Company	12,727	0	12,727	0	255	0
G Oil Company	0*	37	18,433	37	18,615	37
H Oil Company	0*	26	13,271	26	13,403	27
I Oil Company	0*	10	5,161	10	5,212	10
* Oil Production not reported for: Consolidated Oil Field 1 of Consolidated						

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Adopting the Standard
Cooperation with OPEC

- **Stakeholder Collaboration** through regional or country specific workshops to find ways of monetizing associated gas
- **GGFR-OPEC Work Program** to agree priorities to achieve mutual goal of flare reduction
- **Enhanced Data Collection** through the use of the GGFR data tool across OPEC membership

GGFR Flare Reduction Website

World Bank web site

Information on workshops, publications

Standards, regulations, carbon credits

www.worldbank.org/ggfr

fmouton@worldbank.org

Thank you