



# Gas Flaring

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# Flaring

- Flaring of associated gas is not necessary
- Gas may be used directly for power generation
- Gas may be sold (pipelines and buyer necessary)
- Gas may be injected
- Gas **can** be flared for safety reasons



Photo:Norwegian Coasatl Administration

**Avoiding** flaring is smart for several reasons

- do not harm the environment
- is resource friendly
- will increase income

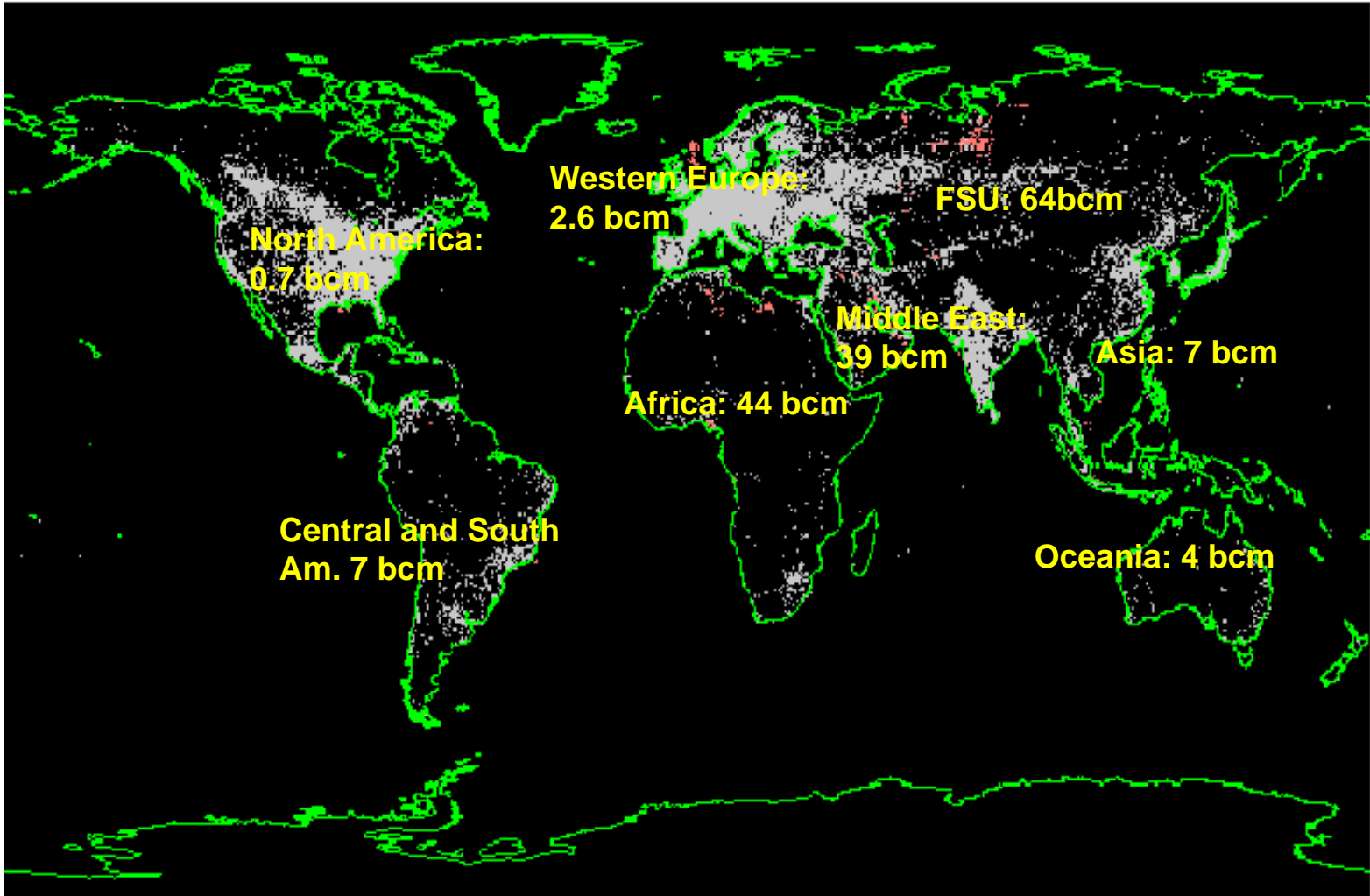
## Why it is a problem

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- A resource waste 150 bcm
  - More than gas consumption in Germany + France
  - Flaring in Africa = 200 TWh of CCGT power production
  - 200 TWh - enough power for 85 million low-income urban households
- An environmental problem 500 Mt CO<sub>2</sub> eqv.
  - At least 10% of Annex 1 countries' Kyoto commitments
  - Local effects – health and ecosystems near flaring sites

*Major uncertainty about the scale of flaring and venting*

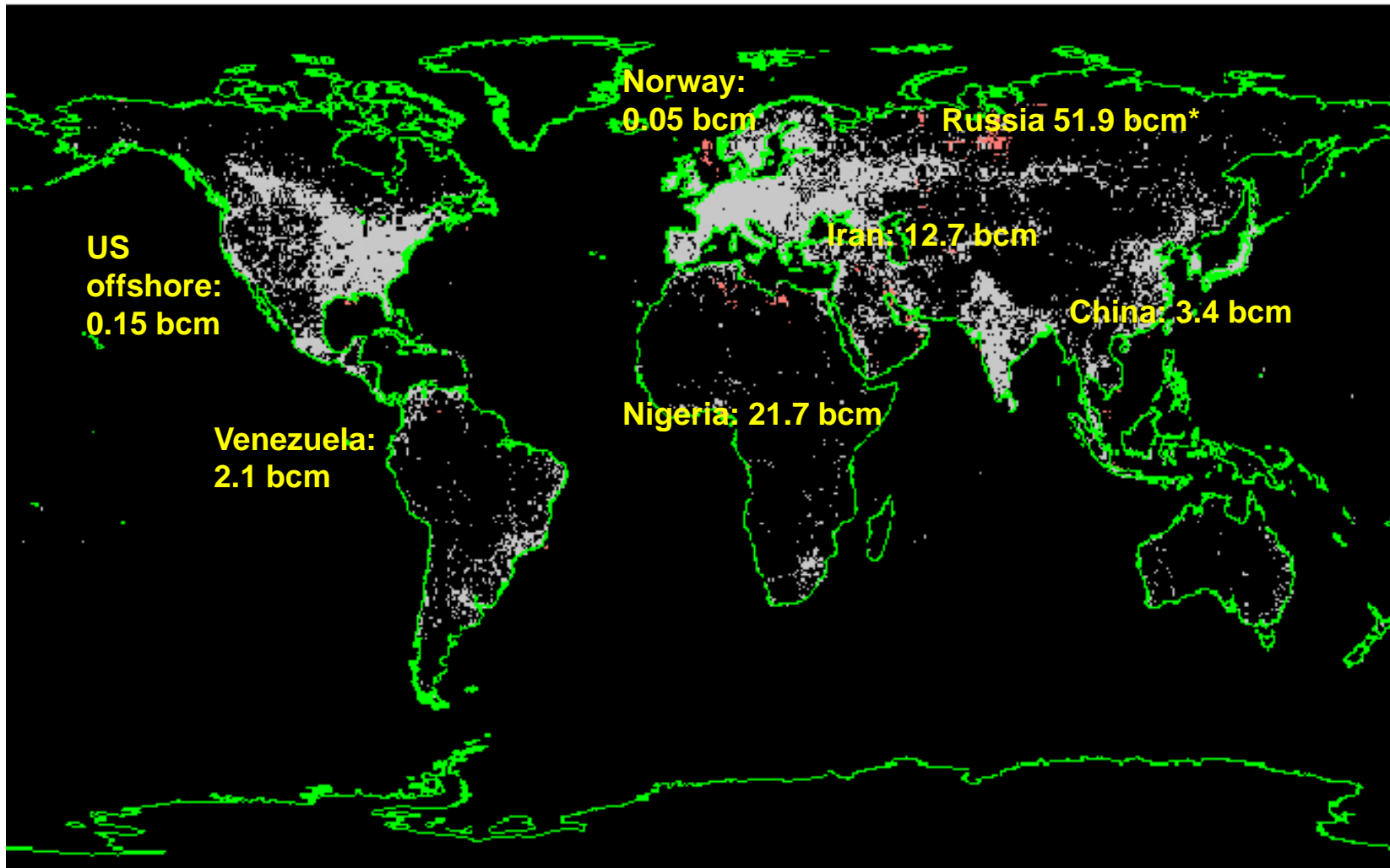
# Flaring by region (2006)



DMSP Estimated flaring (2006)

Source: DMSP Final Report to the World Bank - May 30, 2007

## Flaring in selected countries (2006)



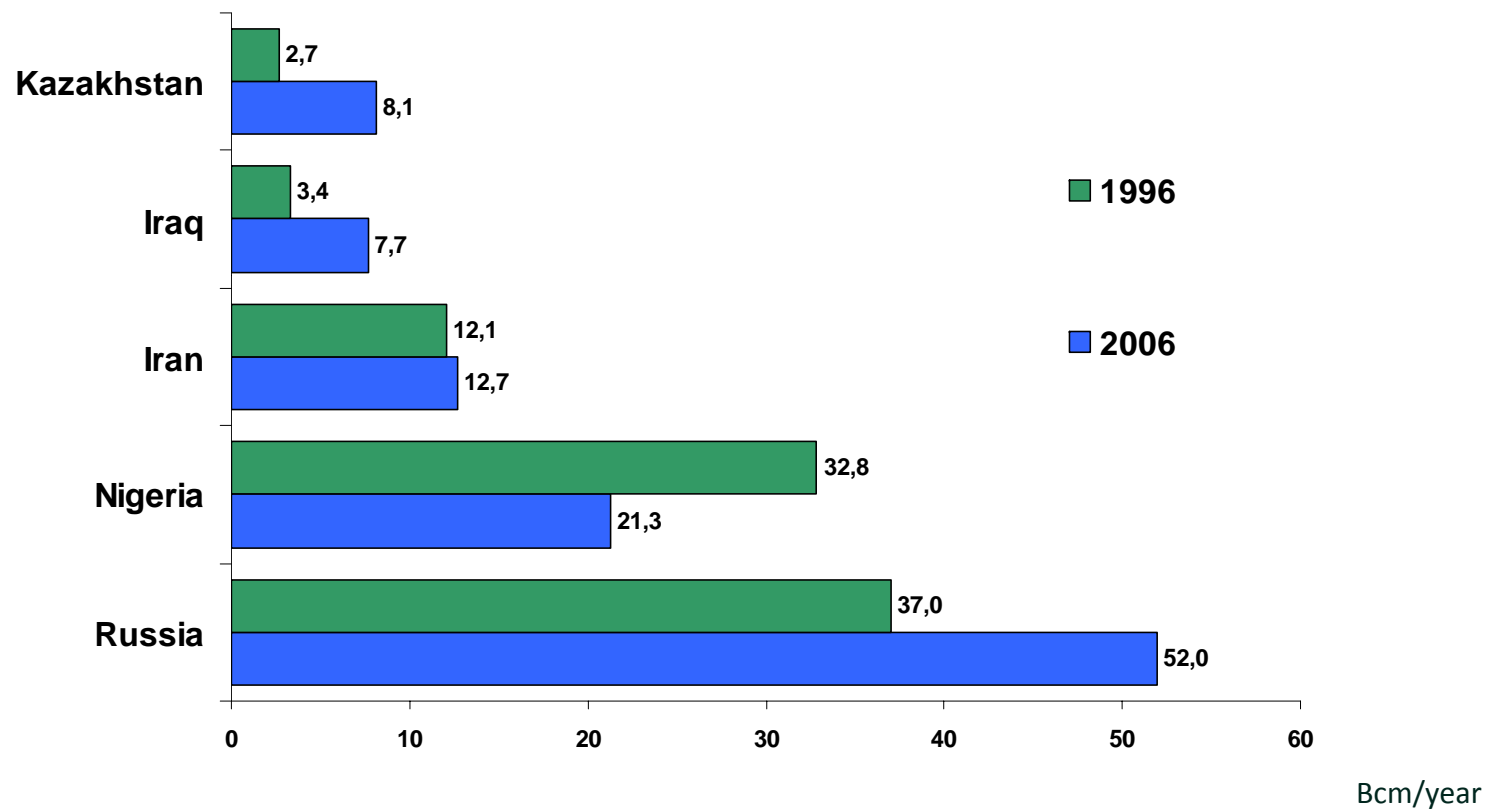
\*Khanty-Mansiysk: 24 bcm  
Russia excl. K-M: 27.9 bcm

DMSP Estimated flaring (2006)

Source: DMSP Final Report to the World Bank - May 30, 2007

# Change in Gas flaring 1996-2006

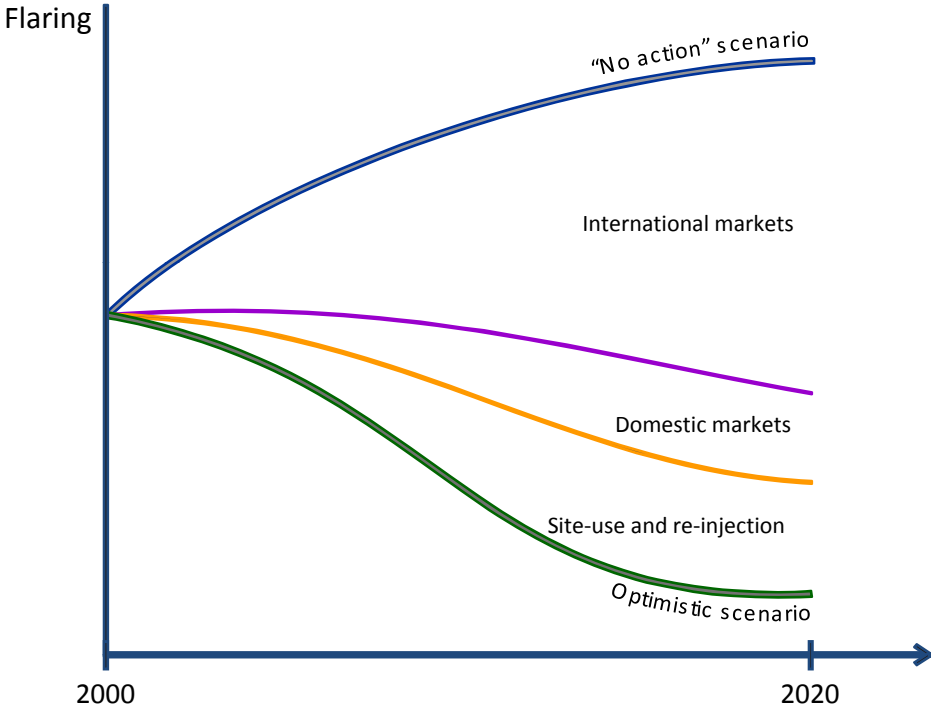
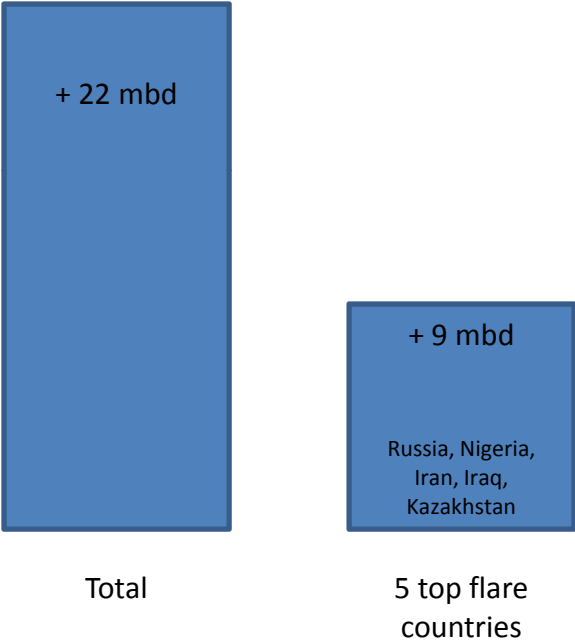
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Source: NOAA

# Future flaring trends

Incremental oil production 2007-2030



# Barriers to flaring reduction investments

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- **Attitudes and perceptions**
  - The value is in crude oil, gas considered waste product
    - Not anymore: gas has a market value and is increasingly in short supply
- **Access to international markets**
  - Manage risks: building and financing infrastructure across national borders
  - Stakeholder opposition: location of infrastructure
- **Access to national markets**
  - Non-discriminatory access to infrastructure
  - Fair and market based prices
  - Sound and stable investment environment
- **Financing**
  - Political and market risks makes financing expensive
  - Basic financial viability may be weak: small fields far from markets



## Regulatory framework –summary

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- **Countries with specific flare targets have not met the targets**
- **Most countries explicitly deal with gas use and flaring in primary legislation (eg hydrocarbon law)**
- **Secondary legislation (regulations, codes, licences, guidelines) vary greatly**
- **Ministries responsible for hydrocarbons often has the principal regulatory responsibility**
- **State-owned petroleum companies still carry out regulatory functions in many developing countries**
- **Regulatory approaches: prescriptive or performance based**
- **Application and approval to flare**
  - Part of licence requirements
  - Explicit permissions to flare, increasingly based on economic evaluation
- **Monitoring requirements and practises vary greatly**
- **Enforcement**
  - Often hindered by poor or lacking monitoring
  - Few countries have (and collect) taxes and fines
  - Penalties, eg production restrictions, more common

# Overview of policies and regulations in selected countries

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## **Kazakhstan**

- Law on Oil (2005) prohibits flaring unless there is a case of emergency
- Amendment (2007) allow permission to flare if utilization is uneconomical
- The Policy aim is to stop flaring of associated gas by 2011

## **Iran**

- No clear policy on flaring, but effort is put on increasing gas utilization by reinjection and LNG production.

## **Nigeria**

- The Nigerian government has announced a target to end all non- operational gas flaring by 2008.
- Regulatory framework that taxes flaring and encourage alternative usage

## **Azerbaijan**

- From 1999 each oil and natural gas production project should include a plan to develop its natural gas potential
- natural gas production have increased largely by reducing flaring.

## **Algeria**

- Prohibition of flaring since 1966
- Law was reinforced in 2005 with stricter requirements on permission and with a 0,11 US\$/m<sup>3</sup> tax on flared gas. and venting

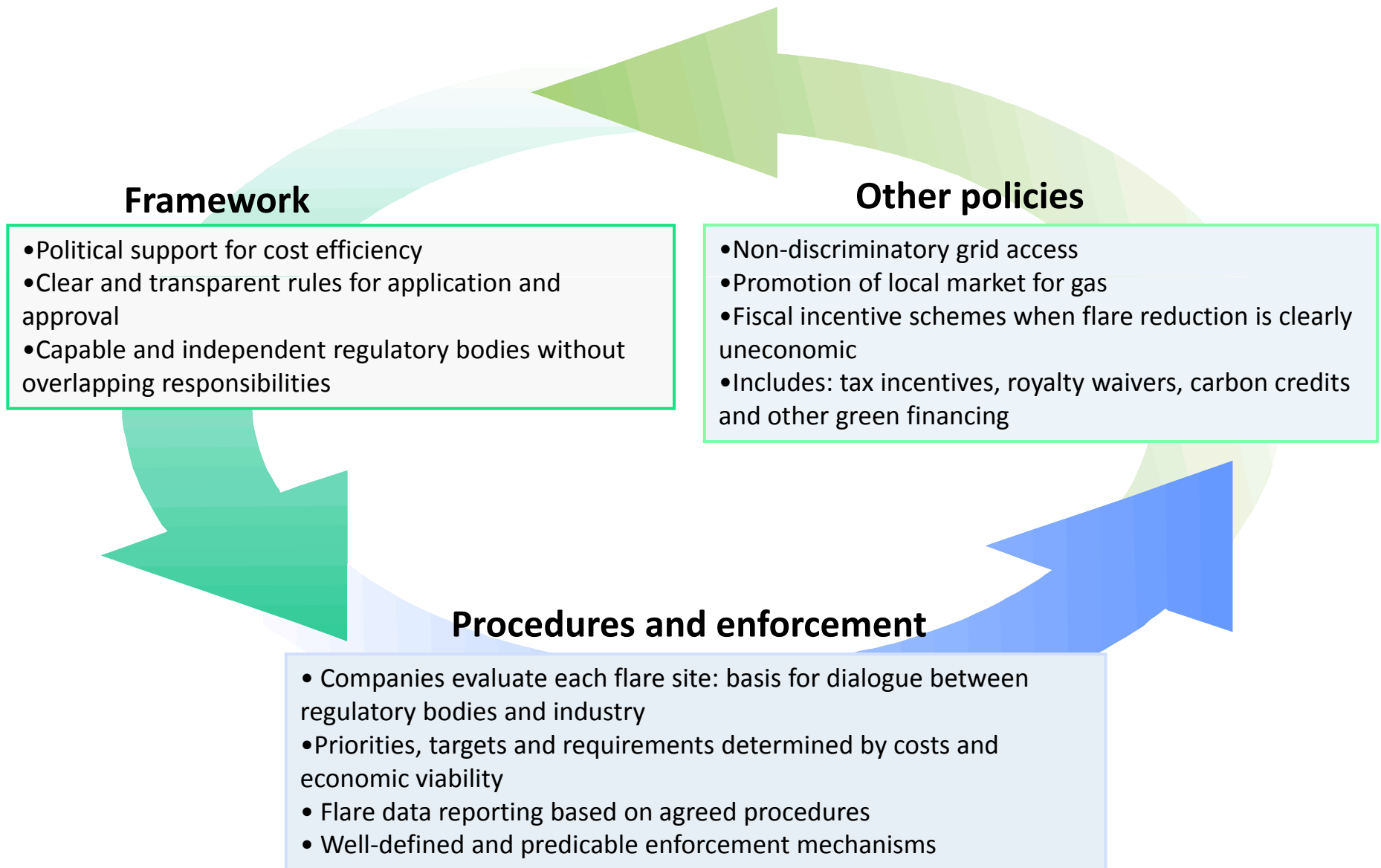
# “Best practice” policies and regulations -1

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- **Policy objective and regulatory framework**
  - Flexible and transparent secondary regulations rather than strict and specific primary legislation
    - Specific and unachievable flare phase out targets are counterproductive (e.g. Nigeria)
  - Regulatory bodies with clearly defined and not overlapping functions and adequate staffing
- **Regulatory procedures:**
  - Regulatory requirements must recognize differences in abatement costs
  - Dialogue between regulatory bodies and industry based on technical and economic data
  - Guidelines and criteria for assessment of economic feasibility must be clear and transparent
- **Measurements, reporting, monitoring and enforcement**
  - Regular reporting of venting/flaring based on agreed methodologies
  - Define enforcement mechanisms: predictable, clear and transparent set of actions and penalties with non-compliance (“enforcement ladder”)
- **Role of other policies (incl. fiscal and market reform)**
  - Grid access at reasonable and non-discriminatory terms
  - Promote local markets for gas, including market based prices
  - Fiscal incentive for uneconomic flare reduction investments
    - Royalty waivers, tax incentives
    - Revenues from carbon credits or other green financing

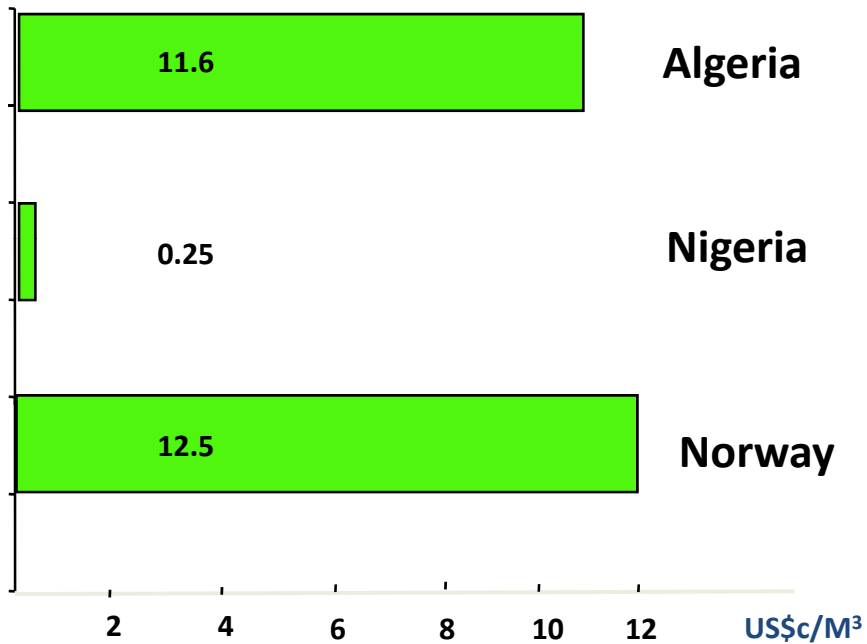
## “Best practice” policies and regulations -2

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# Only three countries have flaring taxes

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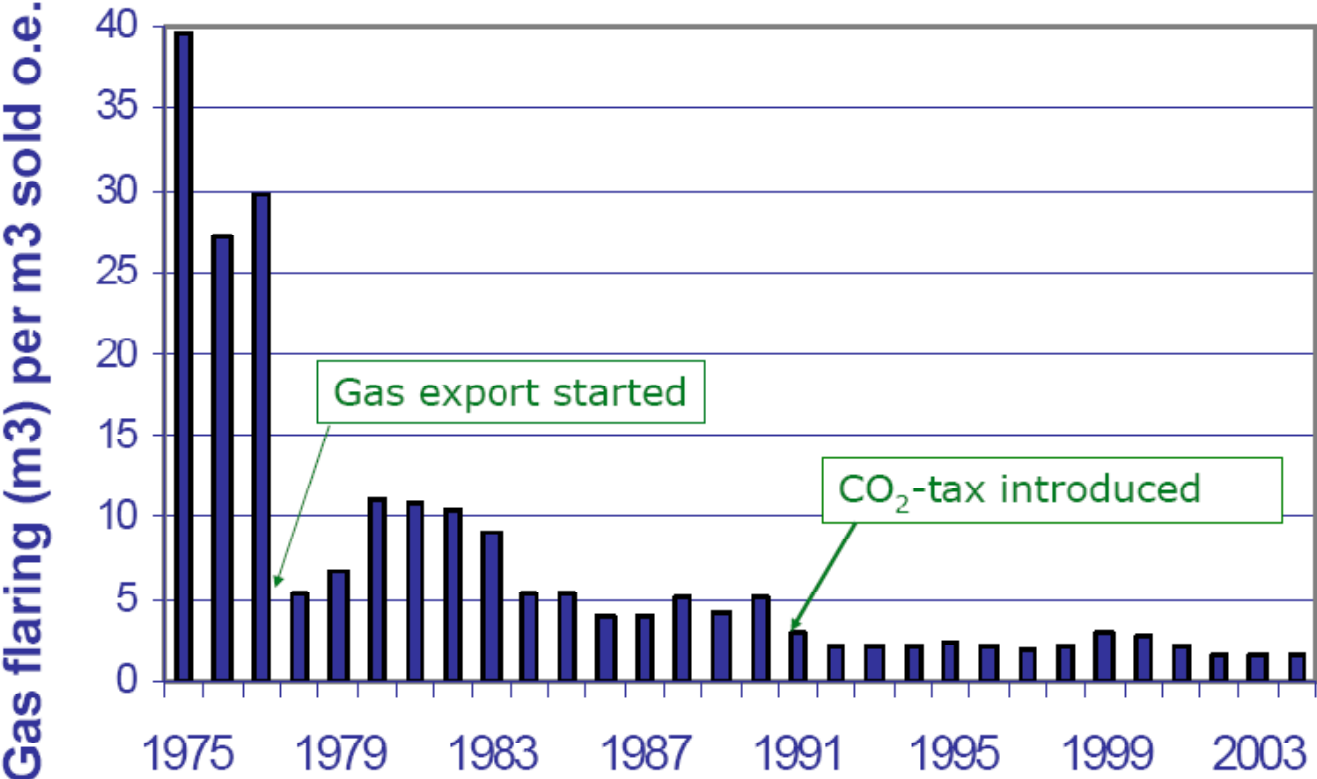


Hydrocarbon law of 2005: Fine for noncompliance with flare prohibition, currently not being collected .

Introduced in 1978, increased in 1998. Has no impact on flare reduction investments.

From 1991. Has had some impact, but most flare reduction happened prior to the fine

# Flaring reductions - Norway



Source: NPD

# Overview of policies and regulations – Norway

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- **Petroleum Act requires licensees to address associated gas utilization (Plan for Development and Operation (PDO) and Plan for Installation and Operation (PIO))**
  - EIA is part of the PDO/PIO approval process
  - Often PDO/PIOs only approved after significant investments to avoid flaring (eg. temporary re-injection)
- **Regulatory authority: Norwegian Petroleum Directorate (NPD)**
- **Measurements, reporting and monitoring**
  - Metering systems with accuracy of +/- 5%
  - Audited by NPD and reported volumes basis for taxation
- **Assessment of policies and regulations**
  - **Building of gas infrastructure of vital importance**
  - **Regulation of grid access**
    - State owns infrastructure through Gassled, non-discriminatory access with Ministry of Petroleum and energy setting transport tariffs
  - **Tax on flaring is part of a general CO<sub>2</sub> tax on energy combustion**
    - Little/no impact on routine flaring but has help improve technologies and operational procedures for non-routine flaring
    - CO<sub>2</sub> tax of importance for continued compliance