Experience with methane emission mitigation in Eurasia

Background, challenges and achievements

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Carbon Limits AS
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Carbon Limits Methane Mitigation in Eurasia

Methane Programme in Kazakhstan

Concise Summary of Results in Kazakhstan
  - Methane Mitigation Programme
  - O&G national inventories and abatement costs

Challenges Experienced
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Challenges Experienced
Carbon Limits
Who are we?

• Carbon Limits was established in 2005.

• Carbon Limits has built an extensive experience on
  ✔ Monitoring reporting and verification of GHG
  ✔ Gas flaring reduction
  ✔ Methane emission reduction
  ✔ Emission Trading Systems

• A large number of techno-economic studies of mitigation in the O&G sector

• We have projects in more than 20 countries including Norway, Russia, Kazakhstan, Ukraine, Azerbaijan, Turkey, Iran, Qatar, Egypt, Tunisia, Nigeria, Gabon, Sri Lanka, …
Why O&G methane is important in the region? Countries where CL has done some work of methane

- The 6 countries together represent 30 – 35% of world’s O&G methane emissions (Source: EPA Non-CO2 inventories for 2015)
- Russia alone represents ~19% of world’s O&G methane emissions in 2015 (EPA)
- Share of the 5 countries of Ukraine, Kazakhstan, Azerbaijan, Uzbekistan and Turkmenistan at a total of 200 MMtCO$_2$e/y is just slightly less than US magnitude of methane emissions from O&G sector (220 MMtCO$_2$e/y)

...there are considerable uncertainties though!
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Challenges Experienced
Methane Programme in Kazakhstan
Overview – Key objectives

Create awareness and commitment → Undertake measurement pilot surveys → Identify and assess emission reduction projects

- Improve inventories and abatement potential assessment
- Work with government on methane assessment and abatement

**Programme co-initiator:** Ministry of Energy (former MoE)

**Cooperating companies (so far):**
KazMunaiGas E&P (EmbaMunaiGas), KazTransGas – Intergas Central Asia, KazakhOil Aktobe, MangistauMunaiGas
Direct Detection & Measurement Campaigns
September 2015 and November 2015 – West and South Kazakhstan

What was done?

- Detection of emissions with infrared camera
- Measurement of gas losses with the sampler
- If sampling not possible – visual estimate
- Analysis of infrastructure for potential utilization
- Easily fixable leaks tagged or repaired on-spot

Campaign results are used for techno-economic analysis of potential projects…
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- Challenges Experienced
A number of case-studies developed...demonstrate real-life cost, benefit and technical applicability

Case study 1 – Vapour recovery units for storage tanks
(12,000 tonnes CO₂eq/y, payback period<5 years, CAPEX~ 1.1 mil $, …)

Case study 2 – Systematic Detection & Repair of Fugitive Emissions
(Investment ~400k$ over 15 years, ~0.5 MMm³/y gas savings, a positive NPV of 350k$,…)

Case study 3 – Vent gas capture from compressor stations
(~10,000 tonnes CO₂eq/y, payback period<3 years, CAPEX~ 0.6 mil$, …)
Main results
Split of emissions by emissions categories
Main results
Abatement potential and abatement costs estimates
A look at the big picture
Methane abatement costs for upstream oil and gas industry
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Challenges Experienced
Challenges experienced

- Building trust – creating enthusiasm!
  - Lack of awareness about sources and impacts of methane emissions
  - Accessing the data and having doors open for surveys

- Technical challenges
  - Huge uncertainties on current international estimates
  - Significant shortage of similar works done outside North America
  - Variations of current practices between countries
**Lessons learned**

- New knowledge is created through measurements and understanding of local conditions
- Measurements and mitigation should run in parallel
- Collaborative processes essential for success (no finger pointing)
- Patience is needed to bring along a strong local network; local partners are essential for success

Will continue to engage actively with others who are working on this issue, including policy makers, NGOs, international organizations.

**EXPERIENCE WITH CARBON LIMITS**

**Before start:** Companies focused only of safety, not on resource waste and the environment

**Soon after:** Expanded interest from companies. Focus grows to cover resource management and environment.

**Key benefit of this approach:** Time needed to bring along a strong local network; partners are essential for success, especially for companies where this is new territory
Thank you!