Methane Emissions Resulting from Upstream Petroleum Activities in Turkey

Emre Ö zgür, Ph.D.

Global Methane Initiative
Member of Turkish Oil & Gas Subcommittee

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Outline

- General Information about Turkey
- Upstream Petroleum Sector in Turkey
- Characteristics of Turkish Crude Oils
- Methodology for the Estimation of Methane Emission
- Methane Emission
- Actions for Greenhouse Gas Emission Reduction
- Evaluations
General Information about Turkey

Capital City: Ankara
Area: 814,578 km²
Population: 80 millions
Annual Energy Consumption: 125 million toe
18 million barrel crude oil production (annual)
0.4 billion m³ (1,400 million scf) natural gas production (annual)
Characteristics of Turkish Crude Oils

- Black Oil Type
- Relatively higher sulphur content
- Low gas content
- Weighted Average Gas/Oil Ratio (GOR): 70 scf/bbl
Methodology for the Estimation of Methane Emission

- Production data of all crude oil fields were collected (120 no.)
- GOR data of all crude oil fields were collected
- The Multiplication of Production value by the GOR data of each field were summed up for Final Estimation

\[
\text{Amount of Methane Emission} = \sum_{n=1}^{120} \text{Annual crude oil production of field}_n \times \text{Gas Oil Ratio (GOR) of field}_n
\]
Methane Emission

- Emitted Methane Amount of Turkey ≈ 36 million m³ (1.270 billion scf) annually coming from the “associated gas” (As the Result of the Previous Equation)

- Associated gas is processed through venting in most of the fields at storage tanks (half of the total methane emission) and is flared at few fields with high gas content (other half of the total methane emission)
Actions for Greenhouse Gas Emission Reduction

- CO₂ Gas recycling unit at the largest oil field of Turkey, “Batı Raman” where “immiscible CO₂ injection” Project (Enhanced Oil Recovery) is active.

- 13 billion scf CO₂ is injected annually.

- 95% of CO₂ recycled at surface equipment and reinjected to reservoir.
Evaluations

- Relatively low greenhouse gas emission is observed in the oil & gas sector (upstream) activities in Turkey due to the production level and gas ratio of crude oils.

- New petroleum law introduced in 2013 includes environmental issues:
  - Submission of the evaluation form on the environmental effects of exploration and production operations by oil companies is compulsory.
  - Form should also include the effects of gas leakages and flare gases and etc.
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Thank you

Emre Ö zgür, Ph.D.
Petroleum & Natural Gas Engineer

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emreozgur@gmail.com
www.linkedin.com/in/dremreozgur