

# FROM COSTS TO BENEFITS: HOW REGULATION CAN CHANGE THE OUTLOOK FOR NATURAL GAS FLARING IN BRAZIL

## Overview

Although associated natural gas flaring is observed in the whole world, this problem receives special attention in less developed nations, for it is more common in those countries.

150 billion cubic meters of natural gas are flared per year in the world, which is equivalent to 5% of the world production of natural gas. This represents annual losses of US\$ 10 billion (pricing the million BTU at US\$ 2.00). Such flaring involves CO<sub>2</sub> emissions reckoned at around 400 million tonnes. Additionally, where such emissions might be completely reversed, this could generate carbon credits estimates at US\$ 6 billion (Farina, 2010).

The Brazilian reality, however, is somewhat different. Flaring and loss of associated natural gas are still reported. During the month of April 2014, the Brazilian fields sent a daily average of 3.8 million cubic meters of natural gas to the atmosphere through flaring, which corresponds to 4.8% of the Brazilian production of natural gas. Considering just the production of associated gas, flaring reached the level of 7.25% of it. Besides, it should be observed that in the last 12 months, the rate of gas utilization has reached a minimum of 93.6% and a maximum of 95.2% (ANP, 2014, p. 10:24). Nevertheless, the most important point in this discussion is that the “(...) lack of technology solutions is not the problem; gas flaring can be dealt with today through a variety of existing technologies at reasonable cost.” (Farina, 2010, p. 8). Mitigating the natural gas flaring is important since it generates gas emissions, enhancing the greenhouse<sup>1</sup> effect. Flaring is a result of an externality in the production of oil, once companies prefer just producing the oil and flaring the gas as a solution to maximize their profits. Thus, it is a consensus in the literature that such flaring should be avoided and mitigated. (OCDE, 1997; World Bank, 2004).

The studies conducted on the subject agree that flaring is the result of a legal and institutional framework, most times associated with low levels of transparency and relatively weak regulations.

In this context, this paper proposes to present to the reader a history of associated natural gas flaring held in Brazil as well as the actions that the national regulator has applied to reduce this practice. Another contribution of this work concerns the new contractual clauses adopted in the concession contracts for the exploration and production of hydrocarbons in Brazil, which clarified the contract terms for the market.

## Methods

Review of the relevant literature on the subject will be held, consolidating the contributions already made to the subject. Comparison between Brazil's flaring regulations and the international one, observing if this kind of regulation is supportive of minimizing flaring.

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<sup>1</sup> “Flaring natural gas creates particulate emissions (soot), fugitive methane emissions, nitrogen oxides, sulfur dioxide, and a number of other harmful emissions. Assessments show larger concentrations of nitrogen oxide (NO<sub>x</sub>) are found within one to three km of flaring sites. Sulfur Dioxide (SO<sub>2</sub>), Carbon Monoxide (CO) and various unburned hydrocarbon emissions can be present within five to 15 km from flare sites.” (Farina, 2010, p. 22)

## **Results**

The solution to the problem necessarily involves the adoption of government policies, if possible, in partnership with the field operators responsible for the flaring of natural gas associated. This is the standard behaviour adopted in Brazil, changing the regulations for the new oil fields, and seeking to solve the flaring in existing fields celebrating a conduct's term with the companies.

## **Conclusions**

This paper concludes by drawing attention to the fact that the Brazilian regulation is converging with the international practices, seeking minimization and mitigation of associated gas flaring, and finally, catching-up with the leaders in the zero flaring target.

## **References**

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