

Optimal Incentive Schemes to Reduce Natural Gas Flaring & Venting

Giacomo Benini¹ and Valerio Dotti²

¹Department of Energy Resources Engineering, Stanford University

²Department of Economics, Washington University in St. Louis

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Abstract

Crude oil wells produce associated gas. The latter is flared and vented for operational, safety, and economic reasons. National and international regulations discourage both practices. The present paper shows that the co-presence of flaring *and* venting regulation generates a flaring-venting substitution effect. Namely, a part of gas, which would otherwise be flared, is vented. Given the higher global warming potential of this second practice, the current regulatory framework could hinder rather than prevent climate change. We present two taxation schemes able to defuse the substitution effect. The first one taxes the production of gas from pure gas fields, the second one the production of electricity from coal. Both programs divert the tax revenues to subsidize the production of associated gas in oil fields to align the incentives of the producers with the ones of the regulator. Both programs are coupled with a carbon border tax to protect the competitiveness of national energy producers vis-à-vis foreign ones. We calibrate their magnitude using data from the United States energy sector. In doing so, we identify the lower bound reduction of both schemes. According to our estimates the first one would reduce the emissions of the energy sector by 7.43%, the second one by 23.86%.

Keywords: Crude Oil, Associated Petroleum Gas, Natural Gas, Flaring, Venting, Carbon Dioxide Emissions, Methane Emissions, Optimal Taxation Design, Second Best Carbon Tax, Carbon Border Tax.

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Corresponding Author: giagi.benini@gmail.com