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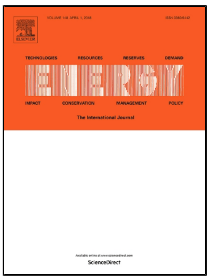

On Methane Emissions from Shale Gas Development

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On Methane Emissions from Shale Gas Development

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Abstract

Environmental and economic impacts of methane escaping from the natural gas supply chain remain uncertain. Flowback emissions from hydraulically fractured natural gas wells are a key component of emissions from unconventional gas wells. While reduced emission completions in the United States are required by regulation, Canada's proposed regulation will only be implemented in 2020 with the two highest producing provinces under exemption. To understand potential benefits of regulations, we use predictive modelling of well-level production data of 1633 hydraulically fractured shale gas wells in five plays to estimate pre-production emissions. The mean estimate for flowback emissions (2,346±95% confidence interval of 91 Mg CO_2e/completion) fall within the 95% confidence limits of measured potential emissions (2,566±777 Mg CO_2e/completion). Our results indicate that in 2015, the average emissions per shale gas well undergoing flowback was 2,347 Mg CO_2e/completion in the U.S. and 1,859 Mg CO_2e/completion in Canada. Mean potential profits from controlling methane emissions using reduced emission completions were US$17,200/well in the U.S. and US$11,200/well in Canada.

Keywords: Shale gas; Methane emissions; Flowback Emissions; Measurement; Modelling; Economics

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