University Alliance for Sustainability

Final Report: UAS Senior Research Stay at University of British Columbia

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"Rebalancing the methane cycle by abating methane emissions of upstream oil and gas sector – the case of Canada"

November 27th to December 19th, 2018.

During my three week UAS Senior Research Stay in Vancouver at the University of British Columbia (November 27 to December 19, 2018) I was hosted by Prof. Dr. Kurt Hübner, Jean Monnet Chair for European Integration and Global Political Economy and colleagues. The goal was the preparation of a joint project on the topic „Rebalancing the methane cycle by abating methane emissions of upstream oil and gas sector – the case of Canada". During my stay, I further established new contacts with colleagues at UBC (e.g. Prof. Ramana, Director of the Liu Institute for Global Studies) and with colleagues for the public policy sector, but also with Canadian experts at non-university institutions (e.g. Maximilian Kniewasser & Jan. Gorski of the Pembina Institute). I was provided office space at the Institute for European Studies (IES).

Emissions from the oil and gas industry represent a large proportion of total global greenhouse gas emissions. Additionally, a significant share of methane emissions via venting, leakage and flaring stems from this industry. Methane is a powerful greenhouse gas, and the 2.5 time increase in atmospheric concentrations since pre-industrial times is causing 20% of global warming and 60% of climate forcing.

Today the global methane cycle is over balanced by 10 million tons/a due to human activity, which releases about 300 million tons of methane per year. Annually 6 Gt CO_{2e} (CO_2 equivalent) emissions are lost in vents, leaks and flares. Methane losses present also an existential threat to natural gas as clean and affordable bridging fuel. If only 3.2% of gas is lost from the supply chain, gas is no longer (on a well to wire basis) cleaner than coal.

Rebalancing the methane cycle by abating 10 million tons of methane is achievable and can be done economically. The projects should focus on flared, vented and leaked methane from oil and gas operations. Projects that capture and use this methane are worth per current gas prices $60 billion per year.

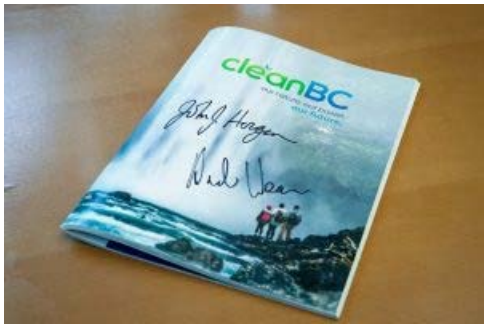
Among the worldwide 61 countries emitting methane by vents, flares and major leaks are only regarded by four Western industrialized countries: the USA, Canada, United Kingdom and Australia.

Responsible for actual five per cent of global oil production and nearly five per cent of global natural gas production, Canada is placed among the six largest producers of oil and gas of the world. Canada ranks as no. 2 after the USA; the country has tried to make a mark as international leader in abating climate change and the reduction of greenhouse gas emissions, and of methane in particular, is at the forefront of the Canadian climate policy agenda, both on the federal level and in the provinces Alberta, British Columbia and Saskatchewan, where the Canadian oil and gas sector is located.

As part of the Pan-Canadian Framework on Clean Growth and Climate Change, the Government of Canada strives to reduce methane emissions from the oil and gas sector by 40 to 45 per cent from 2012 levels by 2025. According to government estimates, methane emissions make up about 15 percent of Canada's total GHG emissions. However, according to actual studies methane emissions are regarded far worse than feared. The comparison of airborne measurements and inventory estimates of methane emissions in the Alberta upstream oil and gas sector shows that total methane emissions are likely at least 25-50% greater than current government estimates and over five times higher than what oil and gas companies are currently reporting. Such findings are alarming, because uncertainty in true methane emissions -e.g. unreported and fugitive sources - complicate the identification and implementation of effective methane mitigation options.

The three largest sources of methane emissions — fugitive emissions (leaks), pneumatic devices, and general venting — each have different challenges and require different regulatory solutions. Suggested policy approaches addressing methane are regulations for improving measurements and reporting, design standards, leak detection and repair requirements, but also carbon pricing and subsidies.

On Federal level, Canada finalized their methane regulations in 2018, and Alberta and British Columbia released draft regulations. Saskatchewan's regulations only target venting from oil facilities and ignore all other sources of methane emissions. In December 2018, British Columbia published the Clean BC program, which aims, among other things, to reduce the province's methane emissions by 40% by 2025, and GHG emissions related to 2007 emissions by 40% until 2030.



According to the media release of Prof. Andrew Weaver, CleanBC repositions British Columbia as a leader in the 21st century low carbon economy.

The joint project will use regional country flaring surveys and economic evaluations of effective flaring and venting reduction practices to show, whether it will be possible to generalize the improvements from Alberta to other Canadian oil and gas fields. Further, the factors for the increase of emissions until 2004 and the decreasing trend will be curved out. Finally, the project will try to give an answer how successful Canada has been as international leader in abating climate change. During my stay, I had the chance to continue working on a future application for a long-time study.