A Black Carbon Inventory for Gas Flaring in Alberta's Upstream Oil and Gas Sector

David R. Tyner, Bradley M. Conrad, Matthew R. Johnson
Energy and Emissions Research Laboratory, Carleton University

Abstract

The Government of Canada ratified the amended Gothenburg Protocol on November 28, 2017, Canada's sixth protocol under the Convention on Long-range Transboundary Air Pollution (CLRTAP). This amended protocol specifically recognizes the adverse health and environmental impacts of black carbon (BC) as a fine particulate pollutant, and notably, it is the first legally binding instrument to mandate reductions from significant BC sources.

Canada's fine particulate reporting commitments under the Gothenburg Protocol will require estimates of BC emissions from the upstream oil and gas sector. These data will be prepared by Enviornment and Climate Change Canada (ECCC) based on National Inventory estimates derived from 2011 data and extrapolated forward using provincial-level activity data. However, ongoing FlareNet research and the recent work of Conrad and Johnson (2017) suggests the current BC emission factors for flares used in federal reporting likely overestimate particulate emission from typical flares in Alberta. Using BC yield data from direct field measurements of flares in Alberta combined with controlled laboratory studies, this work presents a preliminary BC inventory from natural gas flaring at upstream sites in Alberta in 2017. A key objective of FlareNet will be to further refine this initial BC inventory through continued field measurements to ensure that BC emissions estimates are reflective of current flaring practices. Once sufficient field data are available, preliminary results shown in this poster will be extendend and submitted for peer-review publication such that they may be directly cited in future national and international BC reporting.