

**Canadian Fuels Association on the use of Differential Absorption Lidar (DIAL)  
technology in pilot projects dealing with emission quantification  
at Canadian refineries**

Canadian Fuels and its members have been working, learning and improving the quantification of emissions from their facilities since the early 1970s. Emissions from petroleum refineries are of interest to regulators, the communities in which refineries operate, and the companies that operate refineries. Canadian Fuels Principles commit members to consider safety, health and environment in business planning, facilities and product design, operating practices, and training programs. Refineries must operate in a manner that protects the environment, and the safety and health of employees, neighbours, customers and the public (see Canadian Fuels Principles at [www.canadianfuels.ca](http://www.canadianfuels.ca)).

In that spirit, Canadian Fuels began working with Environment Canada and other stakeholders to produce credible emissions inventory in 1973, has had a Code of Practice to guide the quantification of refinery emissions since 1994 ([http://canadianfuels.ca/userfiles/file/CPPI\\_CoP\\_Rev13\\_Revised\\_for\\_Selenium\(1\).pdf](http://canadianfuels.ca/userfiles/file/CPPI_CoP_Rev13_Revised_for_Selenium(1).pdf)); and has participated with other stakeholders in supporting the design of an efficient and useful Canadian National Pollutant Release Inventory (NPRI) since its inception.

The tools continue to improve. The Code of Practice is regularly updated to reflect new developments, and is currently Revision 13. Operating tools such as LDAR (Leak Detection and Repair) programs, CEMS (Continuous Emissions' Monitors), and ambient air monitors help improve quantification and reduce emissions.

Another new tool that is being used or evaluated by companies is handheld optical imaging. This provides additional capability to broadly and proactively monitor the equipment in operations to support further improving current fugitive emissions management programs. Optical imaging surveys, in specific situations, supports achieving emission reductions, through confirming the completeness of emission inventories and further contributing to the safety of our operations.

Alberta, Ontario and other jurisdictions are testing the use of Differential Absorption Lidar (DIAL) technology. Canadian Fuels understands and supports the goal to seek better approaches toward emissions' monitoring and ultimately emissions management.

There is substantial work being done in the USA that can efficiently improve understanding of the utility of DIAL and other technologies in refinery applications, lead to improvements in the quantification of emissions, and result in internationally recognized protocols for using optical technology for identification and quantification of emissions. Concawe\* has assessed that "complex remote sensing techniques such as DIAL can only provide short-term emission measurements. Extrapolation of these can lead to very large errors in the projected annual inventory values due to the temporal variability of refinery emissions".

Studies have been completed using DIAL at the BP refinery in Texas City and at the Shell, Deer Park, Texas facility. Canadian Fuels has tracked and discussed these developments with Environment Canada, and the provinces of Alberta and Ontario as part of our continuous improvement process.

\* European association for environment, health and safety in refining and distribution

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