



PROJECT SUMMARY

GHG Emissions Assessment and Calculation of a Carbon Footprint Natural Gas Refining Facility, UK



KEY PROJECT ELEMENTS

- **ENERGY EFFICIENCY ASSESSMENT**
- **FUGITIVE EMISSIONS ASSESSMENT**
- **CALCULATING THE ONSHORE CARBON FOOTPRINT**
- **DEVELOPING A METHOD FOR CALCULATING THE CARBON FOOTPRINT OF THE OFFSHORE INSTALLATIONS**

CRA is providing a range of consultancy services to the gas refining installations at Bacton, Norfolk, England, including Best Available Technique assessments, environmental management systems support and greenhouse gas management.

CRA has recently developed a carbon footprint for one of the natural gas refineries, making use of data generated by CRA for other regulatory reporting requirements. An energy-efficiency study of combustion processes at the facility, together with a fugitive emissions assessment, provided various useful data relating to GHG emissions. From these, CRA developed conversion protocols, incorporating UK government emission factors, to calculate carbon dioxide equivalent emissions, for sources of carbon dioxide, carbon monoxide and methane.

Point sources of emissions comprised various combustion processes, including boilers, gas turbine compressors and standby generators and pumps. Emissions of CO₂ were calculated from metered fuel consumption, with emissions monitoring data addressing CO and CH₄. Fugitive emissions were estimated by various techniques, including the American Petroleum Institute component count method, which provides emission factors for various plant components such as flanges, pumps and valves.

Following the calculation of the refinery footprint, CRA is working with the company to develop a method for extending the footprint boundary to include its headquarters office and its offshore field operations.

The project demonstrates how a single initiative can accomplish multiple objectives. The work undertaken by CRA for the combustion process energy efficiency study addressed regulatory requirements (reports suitable for submission to the Environment Agency to address the Improvement Condition and to facilitate resolution of performance issues), process efficiency (the adoption of the proposed improvements will reduce the annual CO₂ emissions reported, in terms of emissions per unit productivity, under the EU Emissions Trading Scheme) and provided much of the data for the carbon footprint.