

# case study

## Biofuels for Heating

### Evaluating optimum biofuel blend to power domestic and commercial heating

#### Project Summary

**Problem:** UK home heating produces almost 20% of national carbon emissions. Despite extensive use in transport, biofuels such as biodiesel and bioethanol have not, until recently, been considered for heating application. The rapid development of a renewable home heating fuel is now a key objective for the UK oil heating industry.

**Solution:** Develop and trial biofuels for use in home and commercial oil heating systems.

#### Partnership

Carbon Connections supported a partnership between the University of East Anglia (UEA), Clean Energy Consultancy (CEC), Riello Ltd and Norfolk County Council to demonstrate the feasibility of using biofuel blends as a direct replacement for kerosene and oil heating fuel in existing heating systems.

Now, the oil heating industry, represented by OFTEC (The Oil Firing Technical Association) and ICOM Energy Association, has backed a project that will ensure a seamless transition to the marketplace for renewable fuel. In addition, the project is working with Argent Energy Ltd. in Scotland (supplying biodiesel manufactured from used cooking oil) and with Pace Petroleum Ltd. (supplying biodiesel and biodiesel blends for the trials).

#### Inspiration

The UK's one million plus domestic oil-fired burners emit around 8m tonnes of CO<sub>2</sub> per year. The UK also generates several million more tonnes of CO<sub>2</sub> every year from commercial heating oil, LPG and coal-fired domestic heating. The significance of these trials is immense: if renewable biofuels could be used in the UK, the savings could equate to taking two million cars off the road.

The project will demonstrate that renewable fuel options are available to customers without the expense of upgrading or replacing equipment as is currently necessary. Renewable heating fuel will be available to both new build and existing installations.

#### Innovation

Earlier tests indicated that biofuel and unrefined vegetable oil could provide satisfactory combustion in oil-fired boilers but also revealed some technical problems such as build-up of unburned fuel on the combustion head and poor low-temperature fuel properties. This project will identify and evaluate a blend of biodiesel which has the appropriate properties for year-long storage as well as for efficient combustion and long-term maintenance-free use in domestic heating.

#### Development

Riello Ltd. hosted the initial trials at their Huntingdon laboratories while UEA evaluated key properties of biofuel blends. Pace Petroleum are investing in their King's Lynn depot to create biodiesel supply capability. The participation of OFTEC and ICOM will bring many more companies into the trials and provide the widest possible basis for comprehensive evaluation. Carbon Connections has invested £191,382 into the trials, which will identify the most appropriate blend to produce significant carbon savings, possibly of a similar magnitude to the savings anticipated from the use of renewable fuels in transport by 2010.



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**Carbon Connections** is HEIF-funded investment project utilising £3 million for carbon reduction activities. Based at the UEA, Carbon Connections supports innovative projects in carbon reduction using a partnership model. The aim is to facilitate knowledge transfer between universities and research laboratories and the business community to speed commercial development of carbon-saving projects, whether technological or behavioural in focus.