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# A new competitive liquid biofuel for heating (COMBIO)

### **Results**

**Project Information** 

COMBIO

Grant agreement ID: ENK5-CT-2002-00690

**Project closed** 

Start date 30 June 2006 1 January 2003

**Funded under** Programme for research, technological development and demonstration on "Energy, environment and sustainable development, 1998-2002"

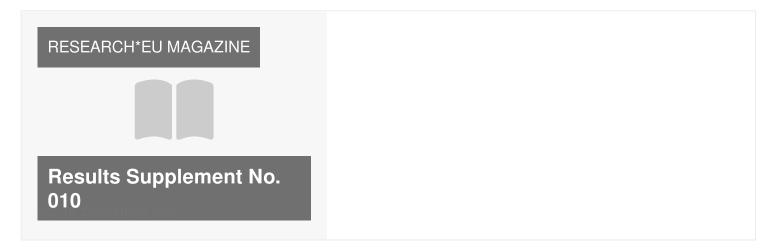
**Total cost** € 2 348 572,00

End date

**EU** contribution € 1 295 023,00

Coordinated by FORTUM OIL AND GAS OY Finland

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## Deliverables

#### Preliminary specifications for pyrolysis liquids

CEN's Technical Board created the working group CEN/BT/WG 149 Liquid and Gaseous Alternative fuels in December 2002. The Swedish Standards Institute SIS assumed the responsibility for the secretariat of this WG, and VTT contributed initially in the work. In the longer term, CEN was recommended to prepare to start working also on the pyrolysis oil standards as alternative fuels for stationary applications. At the plenary meeting of CEN/TC 19 in June 2005 on standardization of liquid and gaseous alternative fuels the CEN/BT/WG 149 recommendations were included to the workplan.

Fuel oil specifications are proposed based on feedback from pyrolysis liquid end-users. Preliminary specifications for boiler use in three size classes were proposed in the proejct. A paper on specifications has been published in Energy & Fuels and reported in the project.

Oasmaa, A, Peacocke, C., Gust, S., Meier, D., McLellan, R. Norms and Standards for Pyrolysis Liquids. End-User Requirements and Specifications. Energy & Fuels., vol. 19 (2005) 5, s. 2155-2163. doi:10.1021/ef040094.

#### Economic assessment

Integrated production of PO and CHP was assessed in Fnland. Pyrolysis plant is integrated to an existing CHP power plant. The power plant is based on fluidized-bed boiler. Consumer prices for light

(LFO) and heavy fuel oil (HFO) in Finland are used as reference prices. Consumer price for the LFO has varied between 30 and 40 euro/MWh during the time of the project.

Two economic estimates are shown for pyrolysis oil:

- Production cost is estimated using the annuity method for valuating capital costs.

- Internal rate of return (IRR) is calculated assuming a lower price for pyrolysis liquid fuel to take into account higher transportation and increased utilisation costs compared to LFO.

Using 8.3 /GJ (30 /MWh) as a value for the liquid biofuel an internal rate of return of 10 % is calculated (pre-tax). IRR is especially sensitive for sales price and yield and to a lesser extent to investment cost.

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