

ThermalNet, WP3B Economics

Deliverable 3B-2

Report on workshops held from Jan 2005 to June 2006

Economics and LCA of Renewable Transport Fuels (Lille, April 2006)

The topics discussed at the workshop covered points 1 (case studies), 2 (cost of GHG emission) and 4 (upcoming technologies) on the topic list. The workshop was jointly organized with WP2G).

Presentations were given by Harold Boerrigter, ECN: "Cost structure of a synthetic fuel plant" and by Edmund Henrich, FZK: "Process, design and economics of the Karlsruhe process". Gerfried Jungmeier, JR gave also a presentation on "What is the environmental and economic performance of biofuels".

Harold Boerrigter and Edmund Henrich reported two completely different approaches on large scale Fischer Tropsch synthetic fuel production. Both researchers presented a techno-economic assessment using different methods in order to evaluate economic viability. ECN investigated a large scale plant integrating gasification and Fischer-Tropsch synthesis at a harbour site (Rotterdam). FZK investigated decentralized pyrolysis and transport of bio-oil slurry (including the charcoal) to a centralized gasification/Fischer-Tropsch plant. The two presentations made it clear, that the reliability of assessments of future large scale applications is unsure because of uncertainties in scaling up from small applications and of uncertainties in the assessment of unknown technological solutions. Also, the assessment of some costs e.g. infrastructure used respectively needed (transport facilities etc.) was seen as uncertain. In the end it was agreed, that these kind of assessments gave the best techno-economic assessment possible at the moment, but the results should not be overestimated because of the uncertainties remaining in the assessment work. Both of the assessments estimated the cost for the FT-fuels production to be about 15 €/GJ or 55 €/t. It was very clear, that both of the approaches aimed at this specific cost and that the large capacity of the plants was the result of a scale up/scale factor calculation in order to achieve the intended cost. Both approaches did not comment on the likelihood of large-scale plants, financing problems or on environmental and structural issues that may result.

The discussion was completed by a very valuable extensive comment given by Stefan Fürnsinn (Vienna University of Technology) on the likelihood of the technologies at a large-scale. From the state of the art (technology for plants with several MW) to plants with capacities of several GW, a number of scale-up steps are needed; each producing a substantial technical and financial risk. Together with problems of project development, finding investors and of financing the huge sums needed for the technology development, this leads to a pessimistic view on the chances of implementation. Stefan Fürnsinn recommended that one should be realistic and think about small scale technologies with realistic investment sums and limited financial and technical risk, even if the costs of production are not competitive at the moment. (in the meanwhile they would be competitive anyway due to the rapid increase of fuel cost)

Gerfried Jungmeier reported on the main outcomes of the EU-VIEWLS project on the economic and environmental performance of different biofuels, and fuels derived from other methods as thermo chemical conversion (biogas, vegetable oil etc.).

Concerning the environmental performance he concentrated on the greenhouse gas (GHG) emissions of the fuels and discussed the methods and the relevance of this assessment. The assessment of the economic performance of the concepts investigated resulted in expected production cost at the filling station in the range of about 17 €/GJ (Biodiesel) and 51 €/GJ (MBTE).

As a result of this workshop it was stated, that the cost of renewable transport fuels are higher than the cost to produce conventional fuel. The costs of Greenhouse gas Emission substitution are very different. In general the costs are high but they depend strictly on fossil fuel prices (high fossil fuel prices => low cost for GHG reduction).

Conditions needed for industry to make investments and/or adopt new technologies (Lille, April 2006)

First Max Lauer discussed the intention to cover MCDA (multi-criteria-decision-analysis) as a tool for preparing decisions in industry. He reported that obviously the tool is not yet widely used in industrial practice and therefore no practical experience could be presented or discussed. So MCDA was not discussed in WP3B

In the workshop, three presentations referring to point 5 of the topic list were given by Florian Eder (Mondi paper and packaging) "View of a technology user", by Claus Greil (Lurgi) "View of a technology provider" and by Patricia Thornley (University of Manchester) "Bioenergy project risk.

Florian Eder used Mondi Industries in order to illustrate his statements. Issues presented and discussed were, that industries have to ask for a payback time as short as 2.5 years (for the overall project). Especially for equipment integrated in production processes (e.g. energy supply) an availability of 99.5 % and more is essential. For add-on technologies (e.g. black liquor gasification) availability can be lower, but pay back time must be very short then. High technological risk related to low experience with new technologies can only be accepted, if a high profitability can be expected.

Claus Greil shared the experience of Lurgi as a big technology provider on adopting new technologies. He highlighted the need for a strict risk assessment by validating and ranking potential risks and explained the innovation management (five phases from idea to product) implemented at Lurgi. The risk management method was illustrated with a number of practical examples.

Patricia Thornley stressed the importance of risk assessment and risk management especially for bioenergy projects. She presented a tool ("risk matrix") for getting a better overview on risk events to be expected, their probability and the impact of their occurrence.

The risk matrix is an excellent tool for preparing a good basis for decision making and the risk management. Not only technological risks can be integrated, but also other risk categories related to fuel supply problems, political changes etc.).

For the economic understanding of ThermalNet members the most important result of this workshop is to see the view industrial decision makers have to take. The availability of a technology is an essential part of risk assessment and risk assessment is most important for technology decisions.