NEWSLETTER

SEPTEMBER 2012

DIBANET

The new edition of the newsletter provides you with updated results and current outcomes of the DIBANET project. The consortium met last time at the University of Limerick, Ireland in June 2012 where the plans for the last six month of the project have been finalised. Many promising results have been achieved in the last few years and these will be presented on the DIBANET Networking Day on 31 October 2012. Additionally, the chemical database of feedstocks analysed in DIBANET and a report with Catalyst Evaluation Results is available at the project website.

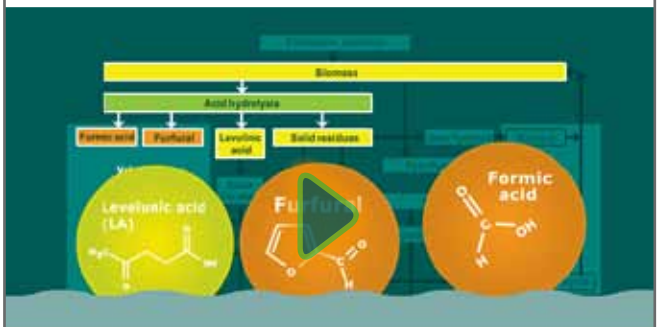
CONTENT

ABOUT DIBANET

DIBANET (www.dibanet.org), the Development of Integrated Biomass Approaches Network, is a 42 month, € 3.73m research project that is funded by the EU's Seventh Framework Program. It is coordinated by the Carbolea Research Group at the University of Limerick (www.carbolea.ul.ie) in Ireland, and builds on the key, complementary, strengths of European and Latin American researchers and industries to advance the development of second generation biofuels. It focuses on the conversion, by non-biological means, of the residues and wastes of Europe and Latin America. DIBANET offers the possibility of converting agricultural residues and wastes into sustainable biofuels and additional value added products. This work will contribute to the development of the green economy and will help to secure jobs into the future.

DIBANET VIDEO

with further details on the project ***here***



A reactor system will be created and optimised to convert key selected biomass feedstocks from organic wastes and residues to levulinic acid with acid hydrolysis.

DIBANET CONSORTIUM

PROJECT PARTNERS

University of Limerick, Ireland, (coordinator)
www.carbolea.ul.ie

Aston University, the United Kingdom
www.aston-berg.co.uk

CERTH, Greece
www.certh.gr

FOSS Analytical, Denmark
www.foss.dk

Geonardo, Hungary
www.geonardo.com

CTC, Brazil
www.ctcanavieira.com.br

Federal University of Rio de Janeiro, Brazil
www.ufrj.br

University of Buenos Aires, Argentina
www.di.fcen.uba.ar/diq/lpc

YPF, Argentina
www.ypf.com

EMBRAPA Soils, Brazil
www.cnps.embrapa.br

Fundacion Chile, Chile
www.fundacionchile.cl

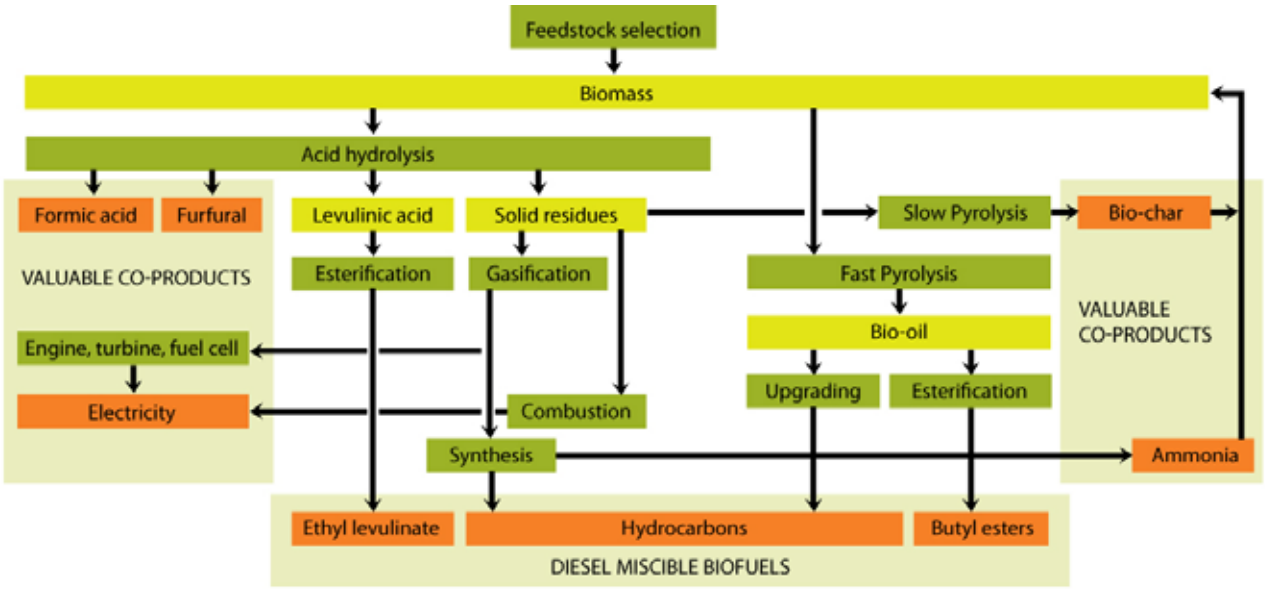
UNICAMP, Brazil
www.unicamp.br/unicamp

MEETING IN IRELAND

The last project meeting was held at the Carbolea Research Group, University of Limerick, Ireland on 25-26 June 2012. The partners of the DIBANET consortium presented their recent progress and discussed the plans for the remaining six month of the project, with special focus on the commercial exploitation opportunities. The meeting also involved an excursion to the operational DIBANET pilot reactor system.

DIBANET PROCESSES

Dibanet aimes to advance the art in several key areas in diesel miscible diesel production:



- *First of all, rapid analytical methods using Near Infrared Spectroscopy will be developed to analyse wet samples of lignocellulosic biomass and predict important properties (e.g. cellulose content).*
- *A reactor system will be created and optimised to convert key selected biomass feedstocks to levulinic acid using acid hydrolysis while minimising chemical and energy requirements.*
- *Levulinic acid will be esterified with ethanol to produce ethyl levulinate, a diesel miscible biofuel that can be used in regular diesel car engines.*
- *The energy balance and costs of the production of levulinic acid will be improved since the solid residue that remains after the acid-treatment can be gasified to produce a fuel gas for heat and power production, so allowing an energetically self-sustaining process.*
- *Alternatively, the syngas from oxygen gasification can be used to synthesise diesel or ammonia. Biochars produced from the slow pyrolysis of the acid hydrolysis residues will be examined for use as soil amenders in order to enhance biomass yields and sequester carbon.*
- *Another process is utilising the bio-oil from fast pyrolysis of biomass for the production of diesel miscible butyl esters, and upgrading the bio-oil to hydrocarbons.*
- *The DMBs developed will be tested for their compliance with the required properties of transport fuels.*

E-LEARNING on the DIBANET PROCESSES

is available at the project website
www.dibanet.org/elearning.php

PROJECT ACTIVITIES

DIBANET & SMARt CHP Networking event in 2012

Thessaloniki, Greece
31 October 2012, 13:30 – 18:00

Venue: Centre for Research & Technology Hellas (CERTH/CPERI)

6th km. Charilaou-Thermi road,
Thessaloniki, 57001 Greece

The DIBANET research consortium presents "Diesel miscible fuels from wastes, residues and non-food crops of Latin America & Europe" Networking event held on 31 October 2012 at CERTH, in Thessaloniki, Greece. The Networking event will bring together key players in scientific communities and industry to discuss how Europe and Latin America can work together to produce diesel fuels sustainably and cheaply.

Presentations will be made and discussions will take place on new methods for the sustainable production of diesel fuels from wastes and residues.

The participation is free of charge, however, registration is required.

The Networking event will be co-organised with the LIFE project „**SMARt - CHP** Demonstration of a Small scale Mobile Agricultural Residue gasification unit for decentralized Combined Heat and Power production".

DIBANET

SMARt CHP

PRELIMINARY AGENDA

13:00 - 13:30 **REGISTRATION**

13:30 - 14:00 **OPENING AND WELCOME**
CERTH, University of Limerick, Aristotle University

14:00 - 16:30 **DIBANET SCIENTIFIC INTRODUCTION**

Feedstock evaluation and development of rapid analytical methods
Dr. Daniel Hayes, University of Limerick, Ireland

Levulinic Acid Reactor and Process Development
Dr. J. J. Leahy, University of Limerick, Ireland

Solid acid catalysts
Prof. Victor Teixeira da Silva, Federal University of Rio de Janeiro, Brazil

Pyrolysis and Gasification of Biomass and Wastes
Prof. A.V. Bridgwater, Aston University, the United Kingdom

16:30 - 17:00 **COFFEE BREAK & POSTER SESSION PARALLELLY**

17:00 - 18:00 **SMART CHP SCIENTIFIC INTRODUCTION**

Sub-Biorefinery: Gasification of Biomass
Anastasia Zabaniotou, Ass. Prof. Auth and CERTH collaborator

Greek Biomass Resources and Biofuels
Spyros Kyritsis, Emeritus Prof., Agricultural University of Athens

Biomass Gasification activities in Thessaly Region
Bellis Vasileios, Chemical Engineer, ANKA

18:00 - **POSTER SESSION WITH RECEPTION**

On 1 November 2012 the DIBANET and SMARt CHP Poster sessions continues to be exhibited under the COST meeting and workshop.

Further information and registration:
www.dibanet.org/networking_day_greece.php

We are looking forward to meeting you at our Networking event!

DIBANET SCIENTIFIC PUBLICATIONS

Papers resulting fully or partly from the project:

- Development of near infrared spectroscopy models for the quantitative prediction of the lignocellulosic components of wet Miscanthus samples, Hayes, DJ Bioresource Technology, 119 (2012) 393-405.
- Autothermal, single-stage, performic acid pretreatment of Miscanthus x giganteus for the rapid fractionation of its biomass components into a lignin/hemicellulose-rich liquor and a cellulase-digestible pulp, Haverty, D; Dussan, K; Piterina, AV; Leahy, JJ; Hayes, MHB; Bioresource Technology 109 (2012) 173–177.
- Pressurised Pyrolysis of Miscanthus using a Fixed Bed Reactor. Melligan, F; Auccaise, R; Novotny, EH; Leahy, JJ; Hayes, MHB; Kwapinski, W; Bioresource Technology 102 (2011) 3466-3470.
- Characterisation of the products from pyrolysis of residues after acid hydrolysis of Miscanthus. Melligan, F; Dussan, K; Auccaise, R; Novotny, EH; Leahy, JJ; Hayes, MHB; Kwapinski, W. Bioresource Technology, 108 (2012) 258–263.
- Biochar and soil nitrous oxide emissions, Alho, CFBV; Cardoso, AS; Alves, Bruno JR; Novotny, EH. Pesquisa Agropecuária Brasileira, 47 (2012) 722-725.
- Reproducing the organic matter model of anthropogenic dark earth of Amazonia and testing the ecotoxicity of functionalized charcoal compounds, Linhares, CR; Lemke, J; Auccaise, R; Duó, DA; Ziolli, RL; Kwapinski, W; Novotny, EH. Pesquisa Agropecuária Brasileira. 47 (2012) 693-698.
- Context and importance of biochar research, Madari, BE; Maia, CMBF; Novotny, EH. Pesquisa Agropecuária Brasileira. 47 (2012) i-ii.
- Catalytic upgrading of levulinicacid to ethyl levulinate using reusable silica-included Wells-Dawson heteropolyacid as catalyst, Pasquale, G; Vazquez, P; Romanelli, G; Baronetti, G, Catalysis Communications 18 (2012) 115–120.
- Levulinicacid esterification with ethanol to ethyl levulinate production over solidacid catalysts, Fernandesa, DR; Rochaa, AS; Maia, EF; Motab, CJA; da Silva, VT, Applied Catalysis A: General 425– 426 (2012) 199– 204.
- Advances in Biochar Research in Brazil, Maia, CMBF; Madari, BE; Novotny, EH. (2011) Dynamic Soil, Dynamic Plant, 5 (Special Issue 1). 53-58.

University of ASTON, together with University of Buenos Aires presented some results from bio-oil esterification experiments during the 19th International Symposium on Analytical and Applied Pyrolysis Linz, Austria 21-25th May 2012. The title of the poster was: **Esterification of fast pyrolysis bio-oil using heteropoly acid catalyst with Wells–Dawson structure**

Authors: D. J. Nowakowski (presenting author), G. T. Baronetti, A. V. Bridgwater, G. Romanelli and P. Vazquez

DIBANET ACTIVITIES

RECENT RESULTS AVAILABLE ON THE PROJECT WEBSITE

Report with Catalyst Evaluation Results

In the report catalysts screening studies were carried targeting to the selection of the best catalyst for the catalytic pyrolysis process of acid hydrolysis residues (AHR). This process focuses on the production of an upgraded biooil that could be used as diesel or diesel miscible biofuel and it is an upgrading process of AHR.

Chemical Database on feedstocks analysed in DIBANET

The DIBANET Chemical Database provides information on the lignocellulosic, elemental and moisture contents of selected energy crops (e.g. Miscanthus), agricultural residues (e.g. from sugarcane, coffee, banana and coconut) and wastes of Europe and Latin America as well as on their predicted yields from biorefining technologies.

RELEVANT ENERGY EVENTS in September – December 2012

ISCRE 22 — 22nd International Symposium on Chemical Reaction Engineering
2-5 September 2012, Maastricht, The Netherlands
www.iscre22.com

WasteEng 2012 4th International Conference on Engineering for Waste and Biomass Valorisation
10-13 September 2012, Porto, Portugal
www.wasteeng2012.org

Science for Biomass Feedstock Production and Utilization
2-5 October 2012, New Orleans, USA
sungrant.tennessee.edu/NatConference

ebec: European Bioenergy Expo and Conference
10-11 October 2012, Stoneleigh Park, Warwickshire, UK
ebec.nextgenexpo.co.uk

European Future Energy Forum 2011
10-12 October 2012, Geneva, Switzerland
www.europeanfutureenergyforum.com

4th Nordic Wood Biorefinery Conference
23-25 October 2012, Helsinki, Finland
www.vtt.fi/sites/nwbc2012/index.jsp?lang=en

I–CIAB: The 1st Iberoamerican Congress on Biorefineries
24-26 October 2012, Los Cabos, Baja California, Mexico
ciab2012.org

Venice 2012 - 4th International Symposium on Energy from Biomass and Waste
12-15 November 2012, Venice, Italy
http://venicesymposium.it/

Biofuels for Sustainable Development of Southern Europe (Bio4SuD)
19-20 November 2012, Thessaloniki, Greece
http://dasta.teiath.gr/Career/Default.aspx

III. Latin American Congress Biorefineries
Ideas for a sustainable world
19-21 November 2012, Pucon, Chile
http://biorefineries.blogspot.com/

Renexpo South-East Europe
21-23 November 2012, Bucharest, Romania
http://www.renexpo-bucharest.com

International Biorefining Conference and Trade Show
27-29 November 2012, Houston, Texas, USA
http://advancedbiofuelsconference.com/ema/DisplayPage.aspx?pageId=Home