INTERNATIONAL WORKSHOP

System and Integration Aspects of Biomass-based Gasification

iets
Industrial Energy-Related Technologies and Systems
An Implementing Agreement established under the auspices of the International Energy Agency

Industry-based Biorefineries

ANNEX XI

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Gothemburg, Sweden
2013, November 19/20th
The biorefinery industrial concept - an integrated process converting biomass available, related to the industrial complex, into valuable products.
Focus towards an Ideal Concept?

- Wide range of valuable products
  - Competitiveness
  - Market

- Ability to process different biomass feedstocks
  - Resources
  - Flexibility
  - Economics

- Efficient integration with minimum impacts
  - Energy
  - Waste
  - Emissions
  - Sustainability

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The general objective is to provide a sound basis for the integration of biorefinery concept in different industrial sectors, where biomass is used as resource or biomass based waste is available, which could be used for fuel/energy production but also considering opportunities for added value bio-products generation.

- optimization of energy efficiency in existing and/or new integrated industrial plants, to convert internal biomass and wastes to energy and bio-products
- implementation of joint projects leading to engine fuels production
- biofuels production by integration of CO₂ capture and sequestration in the conversion process

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Annex Structure

TASK I
Bioenergy and Biofuels
Task I Manager
Isabel Cabrita

TASK II
Biochemicals
and New Fiber Materials
Task II Manager
Alexandre Gaspar

TASK III
Sustainability
Studies
Task III Manager
Henrique Matos

TASK IV
Process
Integration
Task IV Manager
Thore Berntsson

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Status & Implemented Actions

• Programme of Work 2010-2013
  » Visibility
  » R&D needs identification
  » Project definition
  » Projets’ Implementation
  » Dissemination and Workshops

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Implemented Projects & Cooperation Areas

– **Project XI/1 ** **BUGWORKERS** - New tailor-made PHB-based nano-composites for high performance applications produced from environmentally friendly production routes – EU funded project R&D based – Dissemination activities (Portugal and Netherlands)

– **ProjectXI/2  ALGAECASCAD** - The biorefinery of Algae, a CASCADE approach – Information Exchange and projects’ definitions for R&D implementation (Portugal, Belgium)

– **ProjectXI/4** - Integrated Biofuel Production Processes, based on Systematic Optimization Methodologies (Proposal of Portugal)

– **Project XI/5** - Process Integration of Gasification-based Biorefineries (Proposal of Sweden)

– **Cooperation in the European “BioConSept” Project**, through the participation in the Advisory Group by the Annex Manager.

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Other Proposals for Projects & Cooperation Areas

- BioBlocks
  - Bio-based products from ligno-cellulosic resources (glucose, xylose and lignin)

- NMC
  - New added-value products from bleached *Eucalyptus globulus* kraft pulp (nanocelluloses and xylanes)
Expected Results

- Evaluation of technological and economical options focusing on industry integrated biorefineries

- R&D projects on technology specific areas
  - Process Eng towards Biofuels and Biomaterials, including at nano scale
  - Process Integration

- Biorefinery concept with the integration of the capture of CO$_2$ for enhancing the growth of microalgae and/or other biomass species through process integration

- Sustainability and life cycle analysis

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Opportunity

Energy & Fuels

Bioproducts and biomaterials

PRODUCTION

Motivation of industry
R&D needs
Multi-disciplinary collaboration
Financing

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Work Plan & Orientation

• Execution of ongoing projects
• Joint initiatives with other Platforms
• Information Exchange
• RD&T joint implementation within the scope of Tasks

The real challenge and the driver of the R&D work implemented so far and foreseen in the future, is related to the integration of different processes, leading to fuels and high-added value bio-products using cheap resources, guarantying the feedstock availability for energy efficient decentralized applications.

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Collaboration

• International Cooperation with other Implementing Agreements, combining the knowledge of industrial technologies with energy efficiency, and the biomass conversion processes...

• Providing a global forum to exchange information, disseminate knowledge gained and lessons learned, in an atmosphere that promotes interaction and collaboration

• Encouraging participants to engage in truly collaborative, value-adding research and development activities and to promote demonstrations

• Focusing the research efforts by regularly updating a prioritized list of research needs and knowledge gaps

• Involving industry and communicating progress

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Conclusions

- Fully integrated biorefineries in industry needs, a strong collaboration between groups of different disciplines and industrial companies.

- International cooperation will provide expertise in different fields in a cost effective manner and could also provide different challenges for development.
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Thank you for your attention...

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