Biorefineries at CHP Plants for Integrated Biomass Utilization

Proposal for integrated project

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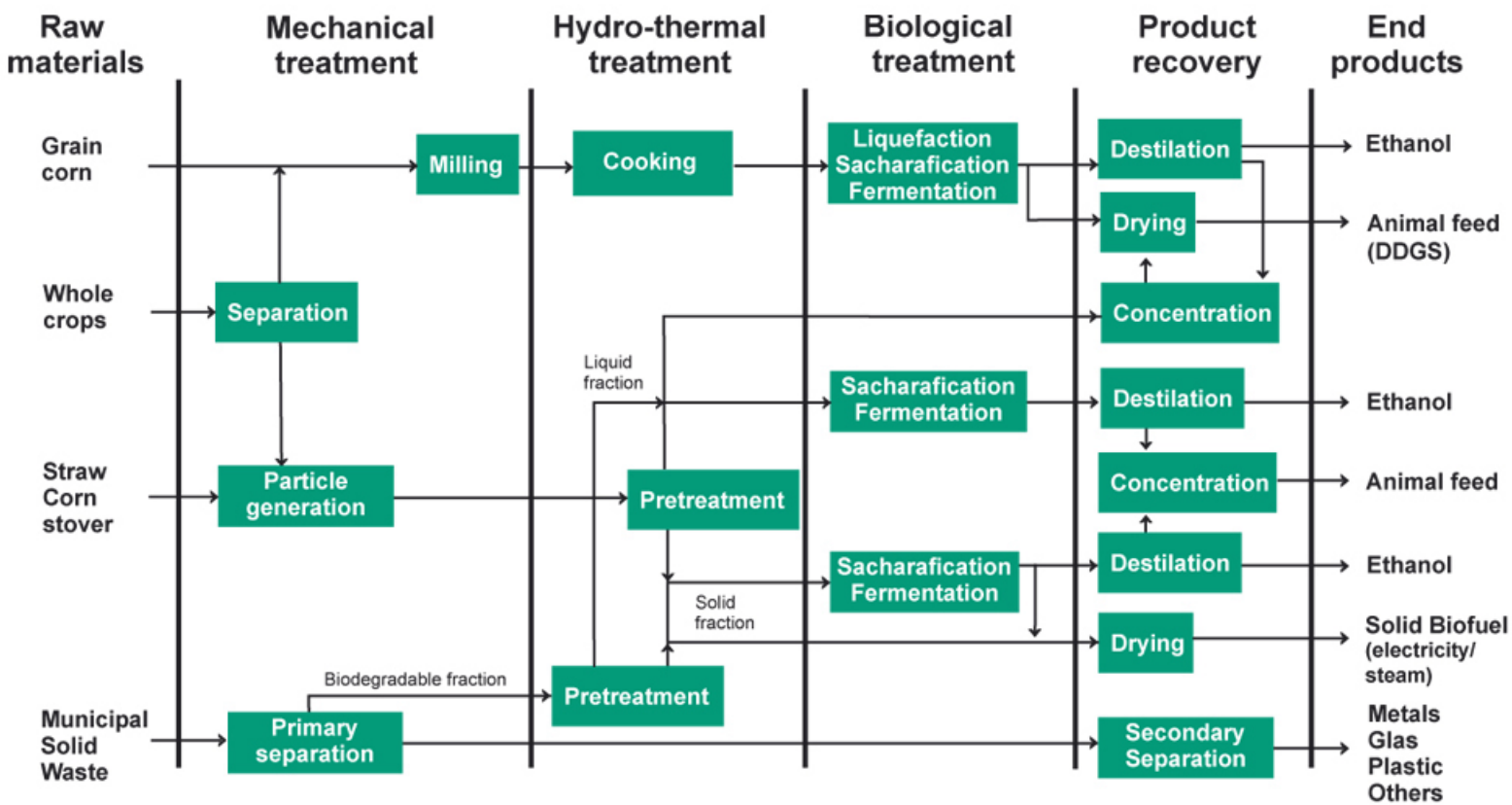
The Proposal

- Continuation and extension of the EU Project: "Co-Production biofuels" period 01.12.2002 – 01.04.2006
- Budget:13,5 mio. Euro (EU contribution 6,5 mio Euro)
- Partners:
  - Elsam A/S, Sicco K/S, Risoe National Laboratory, Royal Veterinary and Agricultural University. (DK)
  - TMO Biotec Ltd. (UK)
  - CEHN. (01.12.2002 – 01.06.2004) (E)

- www.IBUsystem.info

Objectives

- Research and development activities related to cost and energy efficient production of:
  - Bioethanol, animal feed, cellulose, sulphur free lignin, sugars, electricity and/or solid biofuel from:
  - Lignocellusosic raw materials combined with starch/sugar raw materials and
  - Integrated with existing combined heat and power (CHP) plants



Integrated Biomass Utilisation System (IBUS) for MSW, grain/corn and straw/corn stover supplied separately or combined as whole crops.

Process requirements

- Complete conversion of raw materials to saleable products
- Production of more bioenergy in the form of electricity and/or solid biofuel than the total energy consumption of the production proces
- No waste water
- Very little water consumption
- No dioxin emission

Pilot facilities

- Pilot facilities for continuous hydro thermal pretreatment of 50 – 100 kg/h of lignocellulosic rawmaterial has been established
- Pilot facilities for 500 – 1000 kg/h will be established in 2005
- Both acids and bases can be used as catalysts
- Alkaline wet oxidation trials can be conducted
- Pressures up to 30 bar, temperatures up to 230 C
- Discharge with steam explosion can be applied

These pilot facilities will be made available for the partners of the Integrated Project

Workpackages 1/4

- WP1
  R&D related to continuous basic hydro thermal pretreatment of lignocellulose for co-production of ethanol, cellulose and lignin (Risoe, RVAU, (DK))

- WP2
  Development of a central automatic wet fractionation system for MSW to produce a biodegradable municipal waste (BMW) fraction for ethanol production in combination with grain (Elsam Kraft A/S, Sicco K/S, (DK))

Workpackages 2/4

- WP3
  Development of thermofilic microorganisms for conversion of C5 and C6 sugars to ethanol, single cell protein or lactic acid (TMO Biotec (UK))

- WP4
  Development of a production process for sulphur free lignin integrated with the lignocellulose – to – ethanol process (Granit Technologies S.A. (CH))

Workpackages 3/4

- WP5
  Integrated utilisation of corn and corn stover
  (Partners from Jilin Provins, (China))

- WP6
  Integrated utilisation of molases, bargasse, cotton stalks and rice straw
  (Central Laboratory for Food and Feed, (Cairo, Egypt))

Workpackages 4/4

- WP7
  R&D related to continuous ethanol extraction of lignin from straw for co-production of cellulose, lignin and ethanol
  (Potential partners fra China and EU will be invited)

- WP8
  R&D related to production process for concentrated sugar solutions
  (Partners not yet identified)

Several other WPs are under preparation.

Ideas and partners are welcomed.


Preatretment plant