

# **Task 34: Pyrolysis of Biomass**

**2013-2015 Triennium**

Operating Agent--United States of America

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# Task 34 -- Pyrolysis

## ▶ Objective:

To facilitate commercialization of biomass fast pyrolysis,  
-- maximizes liquid product yield and quality  
-- produces renewable fuel oil and transportation fuels

## ▶ Priority Topics

- Review of Bio-oil Applications
- Bio-oil Standardization Support
- Round Robin for Analytical Method Validation
- TEAs of Biomass Pyrolysis Application Technologies

# Expected Participants 2013-2015

- ▶ US—Operating Agent
- ▶ Sweden
- ▶ Germany
- ▶ Netherlands
- ▶ Potential participants-
  - UK
  - Finland
  - Belgium?

# Task 34 Activities

- ▶ Semi-annual task meetings in participating countries
  - Recently met in Karlsruhe, Germany, April 16-18
- ▶ Twice annual newsletter prepared
  - Electronically published
  - >1000 distribution
  - Available on the website
  - May 17<sup>th</sup> input deadline—published in June
- ▶ Maintenance of Task 34 website
  - Aston University
  - <http://www.pyne.co.uk/>
- ▶ Preparation of reports to ExCo

# Project Plan

## ▶ Review of Bio-oil Applications

- Near term emphasis
- Market size, resource size, property impacts
- Deliverable—journal article

## ▶ Bio-oil Standardization

- Support implementation of standard methods
  - CEN
  - ASTM
  - REACH
- Deliverable—Improved MSDS

## ▶ Round Robin

- Bio-oil analysis
  - Sulfur, Chlorine, trace metals
  - Improved aging test
- Deliverable—journal article publication of evaluation of results

# Project Plan, cont.

## ▶ **Technoeconomic assessments**

- Evaluate various biomass pyrolysis application routes
- Deliverable--TEA to be published

## ▶ **Proposed Inter-task collaborations**

- Comparison of bio-oil combustion to solid biomass combustion (Task 32)
- Comparison of bio-oil gasification to solid biomass gasification (Task 33)
- Use technical assessments to develop LCAs (Task 38)
- Development of operations database (Task 39)
- Evaluation of a pyrolysis-based biorefinery (Task 42)

# Bio-oil Gasification

## ▶ KIT – bioliq process

- Twin-screw pyrolysis of straw, 2 MW (500 kg/h)
- Blending of bio-oil with char byproduct
- Entrained flow, slagging, high-pressure, oxygen-blown gasifier, 5 MW (1 t/h)
- Catalytic synthesis of DME (150 kg/h) and gasoline (100 l/h)

## ▶ BTG-ETC collaboration

- Rotating cone pyrolysis for bio-oil and feeding skid by BTG
- Gasification in entrained flow, pressurized, oxygen-blown gasifier in Pitea, Sweden.

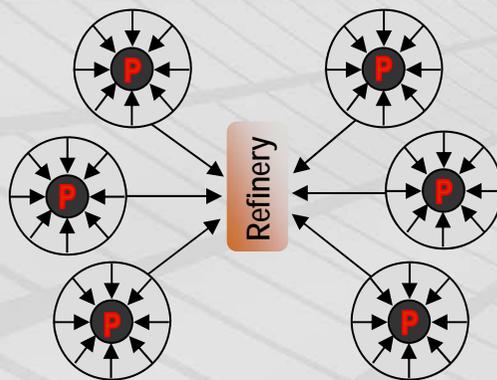
<http://www.pyne.co.uk/Resources/user/PyNe%20Issue%2032%20%20-%20December%202012%20-%20website.pdf>

# Discussion of potential collaborative activities

- ▶ KIT-Germany: gasification of both biomass and bio-oil
- ▶ ETC-Sweden/BTG-Netherlands: gasification of both biomass and bio-oil
- ▶ Others?

**additional slides**

# Fast Pyrolysis to PetroRefinery Feedstock



Biomass

Pyrolysis

Stabilization

Biocrude

Deoxygenate

Other Refinery Processes

- Gasoline
- Diesel
- Jet
- Chemicals

