



IEA Bioenergy
Technology Collaboration Programme



Project Waste2Value, Source: BEST

Country Report Austria

Update

Dr. Jitka Hrbek, Prof. Christoph Pfeifer

30.6. 2020, IEA Bioenergy Task 33 meeting

The IEA Bioenergy Technology Collaboration Programme (TCP) is organised under the auspices of the International Energy Agency (IEA) but is functionally and legally autonomous. Views, findings and publications of the IEA Bioenergy TCP do not necessarily represent the views or policies of the IEA Secretariat or its individual member countries.

Technology Collaboration Programme

by **iea**

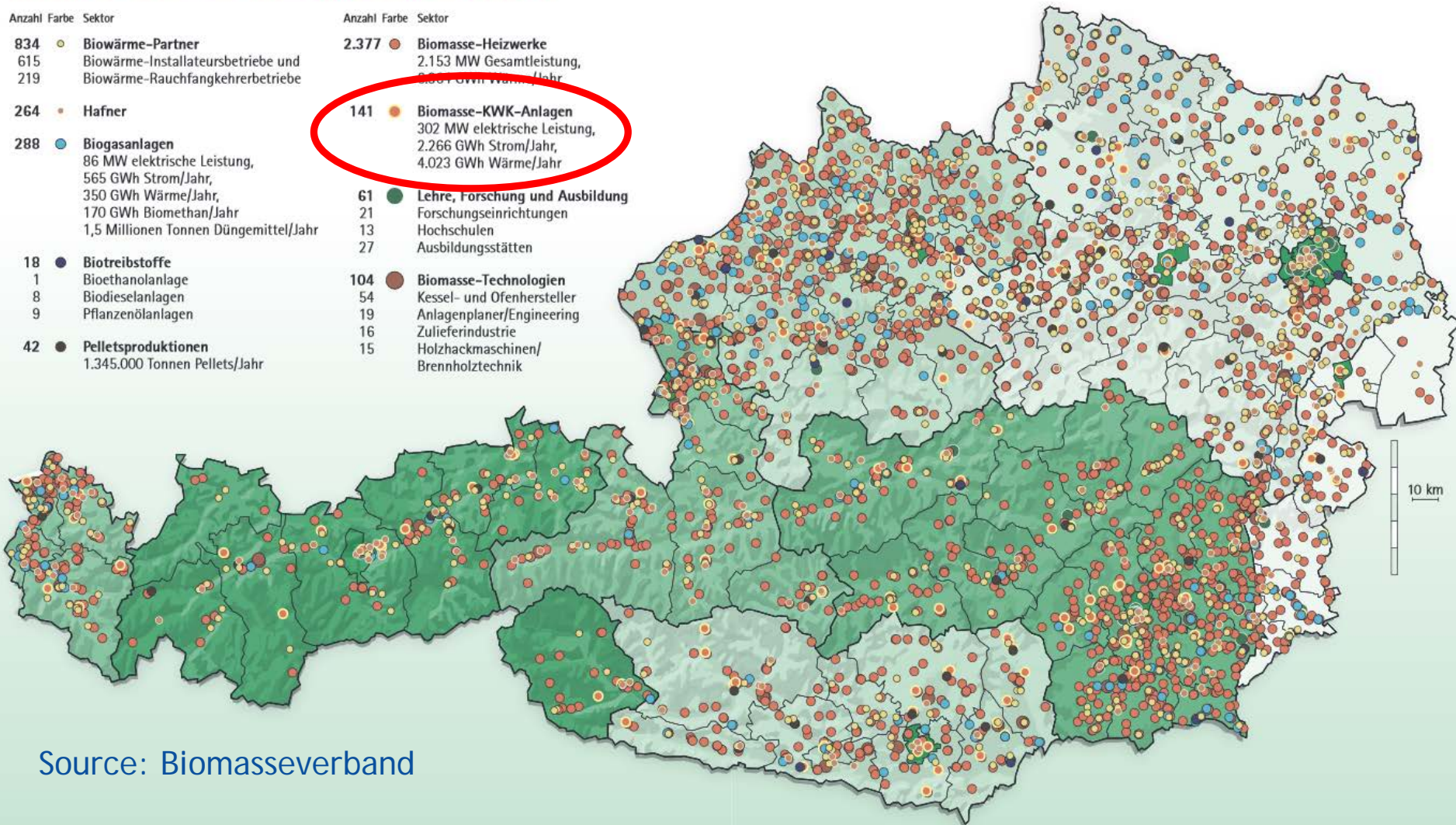
Outline

- Bioenergy in Austria
- Research on gasification
- Industry
- Implementations

Bioenergy in Austria

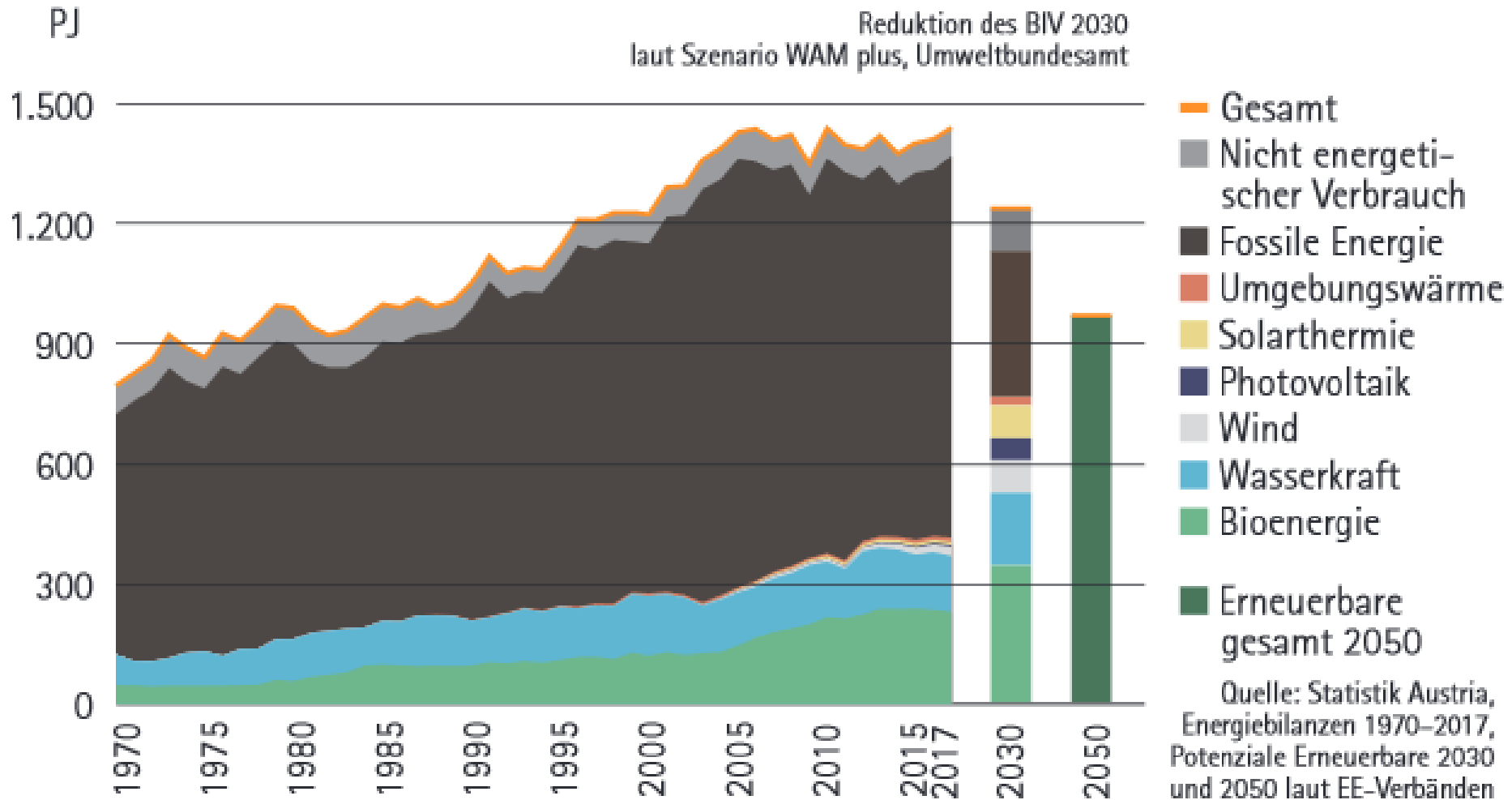
Bioenergie-Branche in Österreich, Datenbasis 2018/19

| Anzahl | Farbe | Sektor | Anzahl | Farbe | Sektor |
|--------|-------|---------------------------------------|--------|-------|--|
| 834 | ○ | Biowärme-Partner | 2.377 | ● | Biomasse-Heizwerke |
| 615 | | Biowärme-Installateursbetriebe und | | | 2.153 MW Gesamtleistung, |
| 219 | | Biowärme-Rauchfangkehrerbetriebe | | | 3.831 GWh Wärme/Jahr |
| 264 | ● | Hafner | 141 | ● | Biomasse-KWK-Anlagen |
| 288 | ● | Biogasanlagen | | | 302 MW elektrische Leistung, |
| | | 86 MW elektrische Leistung, | | | 2.266 GWh Strom/Jahr, |
| | | 565 GWh Strom/Jahr, | | | 4.023 GWh Wärme/Jahr |
| | | 350 GWh Wärme/Jahr, | | | |
| | | 170 GWh Biomethan/Jahr | | | |
| | | 1,5 Millionen Tonnen Düngemittel/Jahr | | | |
| 18 | ● | Biotreibstoffe | 61 | ● | Lehre, Forschung und Ausbildung |
| 1 | | Bioethanolanlage | 21 | | Forschungseinrichtungen |
| 8 | | Biodieselanlagen | 13 | | Hochschulen |
| 9 | | Pflanzenölanlagen | 27 | | Ausbildungsstätten |
| 42 | ● | Pelletsproduktionen | 104 | ● | Biomasse-Technologien |
| | | 1.345.000 Tonnen Pellets/Jahr | | | Kessel- und Ofenhersteller |
| | | | | | 54 |
| | | | | | 19 |
| | | | | | 16 |
| | | | | | 15 |
| | | | | | Zulieferindustrie |
| | | | | | Holzhackmaschinen/ |
| | | | | | Brennholztechnik |



Source: Biomasseverband

Energy consumption and potentials in 2050



Research in Austria

University of Natural Resources and Life Sciences (BOKU Wien)

- Installation of a 20kW bubbling fluidized bed combustor/gasifier
- BioAdd - Influence of additives on combustion/gasification (Austria, national funding)
- Flash - Predicting flow behaviour of ash for gasification (Norwegian Research Fund)
- Cooperation with University of Seville (Prof. Alberto Gomez-Barea) on solar assisted dual fluidized bed gasification: Gomez-Barea, A., Suarez-Almeida, M., Silva, M., Pfeifer, C., Karl, J., Ghoniem, A., 2019, "Hybridization of biomass steam gasification in dual fluidized bed reactor with concentrated solar energy", at International Conference on Polygeneration Strategies, Nov 18-20, 2019, Vienna, Austria



Research in Austria

Vienna University of Technology (TU Wien)

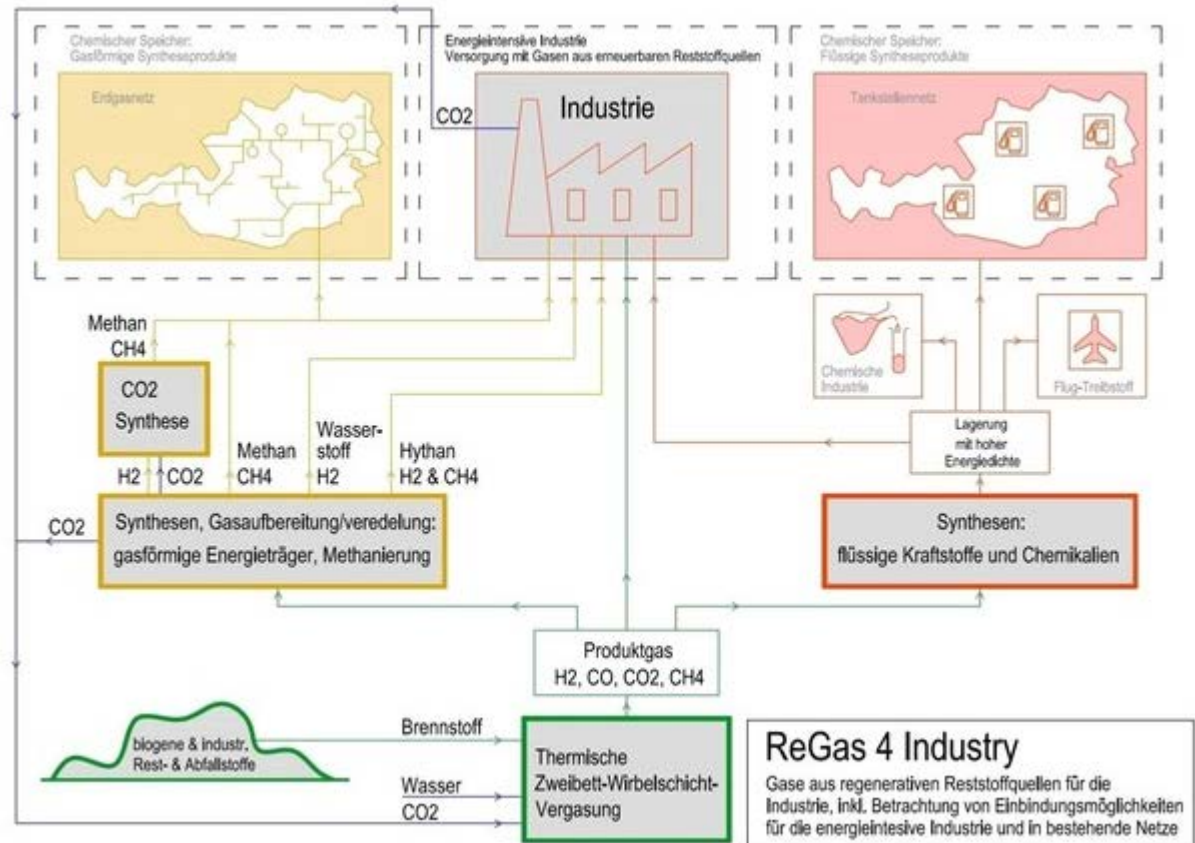
Institute of Chemical Engineering



ReGas 4 Industry

Utilization of low cost feedstock e.g. agricultural or industrial waste, for the production of synthetic biofuels

Project partners



More information:

https://www.vt.tuwien.ac.at/chemical_process_engineering_and_energy_technology/future_energy_technology/gasification_and_gas_cleaning/projects/EN/

Research in Austria

Graz University of Technology

Institute of Thermal Engineering



Projects areas:

- Combustion and gasification
- CFD-simulations
 - reactive fluid flows
 - solar thermal processes
 - extrusion and injection molding (polymers)
 - thermal Management
- Thermo-dynamical process simulation
- Fluidized bed combustion
- Second Generation Fuels and fuel cells
- CO₂-free gas- and coal-burning power plant

Research in Austria

MCI

University of Applied Sciences for Environmental-,
Process- and Biotechnology, Innsbruck

Projects areas:

- Multi-staged fixed bed gasification systems
- Valorization of biomass
- Biomass to power and heat
- Engine & emissions
- Energy distribution and storage

Research in Austria



Competence area - gasification:

- Product gas production/treatment/utilization
- Process development and optimization
- Measuring and analysis technology
- Fundamental R&D on ashes and bed materials
- 1st and 2nd generation biofuels
- Representative of Austria in IEA Bioenergy Task 39 liquid biofuels
- Secretary of IEA Advanced Motor Fuels

Austrian companies



Die Leistungsdaten TYP 300:

| | |
|----------------------------------|------------------------------------|
| Elektrische Leistung | 300 kWel |
| Thermische Leistung | 500 kWth |
| Brennstoffverbrauch | 180 kg/Std |
| Spezifischer Brennstoffverbrauch | 0,56 kg (atro)/kW _{th} el |
| Restfeuchte | 10 % |
| Holzgasproduktion | 600 Nm ³ /Std |
| Gesamtwirkungsgrad | 84,0 % |
| Ascheproduktion | 5 kg/Std |
| Strombedarf der Anlage | 6 % der Nennleistung |

Die Leistungsdaten TYP 500:

| | |
|----------------------------------|------------------------------------|
| Elektrische Leistung | 500 kWel |
| Thermische Leistung | 800 kWth |
| Brennstoffverbrauch | 300 kg/Std |
| Spezifischer Brennstoffverbrauch | 0,56 kg (atro)/kW _{th} el |
| Restfeuchte | 10 % |
| Holzgasproduktion | 1 000 Nm ³ /Std |
| Gesamtwirkungsgrad | 84,0 % |
| Ascheproduktion | 8 kg/Std |
| Strombedarf der Anlage | 6 % der Nennleistung |

Austrian companies

Aichernig Engineering GmbH (former REPOTEC)

(<http://www.repotec.at>)

Engineering of FICFB gasifiers for CHP, BioSNG and other synthesis (Güssing, Ulm, Göteborg)

GET- Güssing Energy Technologies

(get.ac.at)

Research, consulting and engineering, education centre

Güssing Renewable Energy

(<http://www.gussingrenewable.com>)

GE Jenbacher Energiesysteme AG

(<https://information.jenbacher.com/index.php>)

Austrian companies

Small scale gasification - overview



| Output kWel | Output kWth |
|-------------|-------------|
| 18/55 | 44/120 |
| 20 | 60 |
| 50 | 107 |

Austrian companies

Small scale gasification - overview



| Output kWel | Output kWth |
|-------------|-------------|
| 200-500 | 320-770 |
| 300/500 | 500/800 |
| 120-550 | 280-880 |

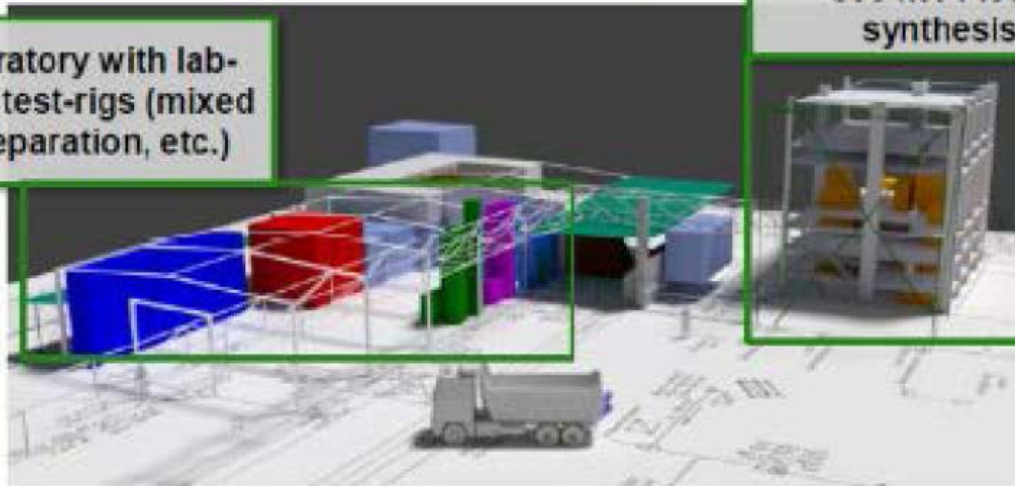
Project Waste2Value

1 MW DFB gasification + synthesis: Waste2Value

New research location at industrial site *Simmeringer Halde*

1 MW DFB gasification demonstration plant (improved reactor design) + 300 kW Fischer-Tropsch synthesis pilot plant

Research laboratory with lab-scale synthesis test-rigs (mixed alcohols, H₂ separation, etc.)



COMET
Competence Centers for
Excellent Technologies

Project Waste2Value

RDF gasification, FT synthesis, SNG production, etc.



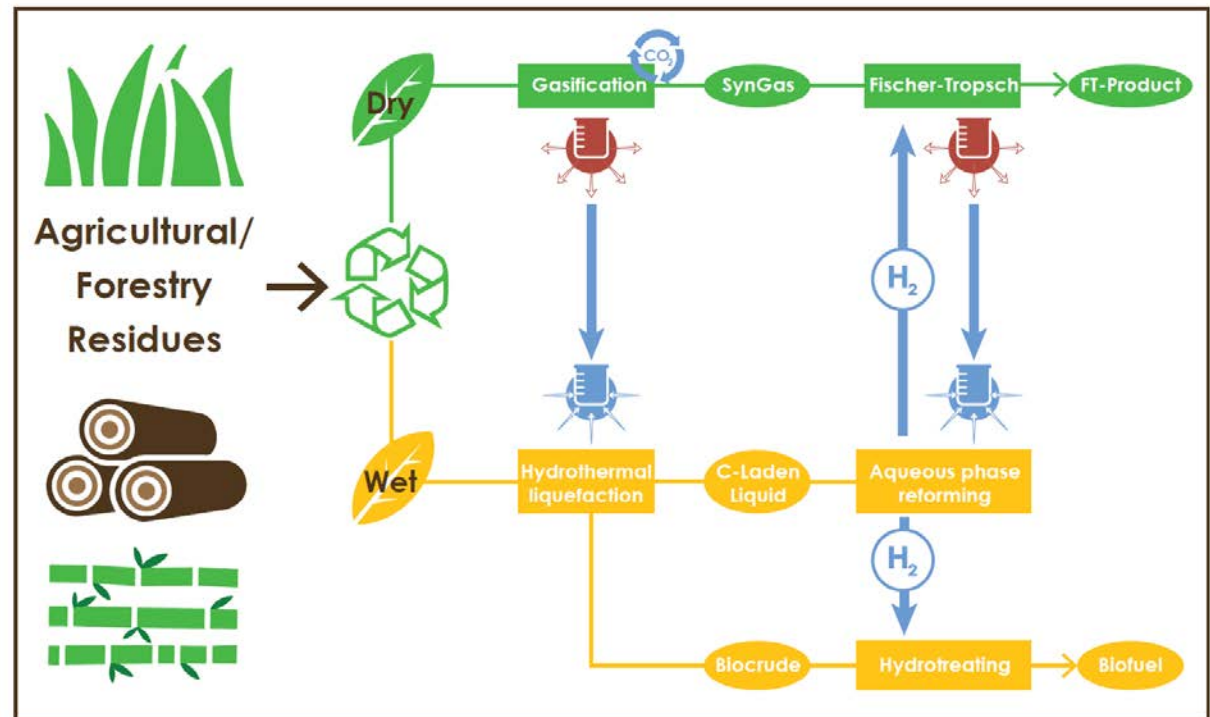
Project Heat-to-Fuel

The Consortium of the Horizon 2020 project Heat-to-Fuel is organizing a comprehensive **workshop on E-Fuels taking place in March 2021 in Vienna**. This workshop includes results from the Heat-to-Fuel project and other inputs on advanced power-to-gas and power-to-liquids technologies.

Main topics:

- Electrolysis
- CO₂ Capture
- Conversion of syngas
- Demo projects

workshop is open to any interested participants, free of charge



Special Issue on Engineering Thermochemistry: Fundamentals and Technologies

<http://www.keaipublishing.com/en/journals/carbon-resources-conversion/call-for-papers/engineering-thermochemistry-fundamentals-and-technologies/>

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Special Issue on Engineering Thermochemistry: Fundamentals and Technologies

The special issue considers original research and review articles on chemistry about element transfer, product formation, morphology variation and their related application and emission controlling technologies in various kinds of thermal processes including fuel conversion by torrefaction, pyrolysis / carbonization, gasification and combustion, resources processing through reduction, oxidation, calcination and roasting, material synthesis and treatment, wastes thermal conversion such as incineration, solvothermal reactions such as hydrothermal carbonisation, high-temperature molten salt, and others. The catalysis and numerical modeling involving in such thermal processing are also highly welcome.

Submission deadline

- 30 September 2020

Managing Guest Editor and Guest Editors

- Christoph Pfeifer
- Guoqing Guan
- Guangwen Xu

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Questions?

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www.ieabioenergy.com