FEBRUARI

19

COMMODITIES

THEORIE IN DE PRAKTIJK

Utrecht University
Utrecht | 13:00 - 17:00 uur

IEA Bioenergy
Technology Collaboration Programme

Rijksdienst voor Ondernemend Nederland

Ministerie van Klimaat en Groene Groei

PLATFORM BIO ECONOMIE

Task 43

IEA Bioenergy
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PLATFORM BIO ECONOMIE

IEA Task 43 Biomass

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Wageningen University & Research

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To be or not to be a biobased commodity – How to bring real lignocellulosic commodities about?

Wolter Elbersen

Utrecht. IEA Commodities: Theorie in de praktijk 19 februari 2025

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Where should a lignocellulose conversion plant / biorefinery be located?

In a biomass rich area?

or

At a large hub / harbour?

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Message:

- Lignocellulosic biomass can be made available at very large scales. The issue is: How to linking biomass to demand in an efficient way?
- Supply and demand scales do not match especially not for advanced biofuel and chemical production
- We need to define and develop a limited number of lignocellulosic intermediate commodities to link the biomass sources worldwide to markets

- What are real lignocellulosic commodities?
- Real lignocellulosic commodities are needed to:
  - Ensure security of supply
  - Make efficient and circular use of the available biomass
  - Lower the cost of biomass supply

Much (herbaceous) biomass is underutilized – Often causing pollution problems – how much can be used for biobased applications?

Largest 10 crops in the world		Total field	Total mill
	Million hectares	Million ton DM crop residue per year	
Maize	185	1,038	
Rice, paddy	163	816	
Wheat	220	729	
Sugar cane	27	264	264
Oil Palm	19	192	52
Barley	49	173	
Sorghum	45	103	
Sunflower seed	25	66	8
Millet	31	43	
Seed cotton	35	35	
Total	**800**	**3,459**	**316**
All crops worldwide:	1,414		

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Based on FAOSTAT (2018) and own estimates

Where should a lignocellulose conversion plant / biorefinery be located?

Location: / Factor	Near the biomass	At a large logistical center (i.e. harbour)
Cost of biomass	+	
Security of supply		+
Availability of infrastructure		+
Economy of scale		+
Availability of personnel / expertise		+
Value of residues		+
Sum	1	5

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A real commodity is

1. Easy to store and transport = high energy density, dry, low volume, low ash, nutrient depleted

2. Fungible = is "exchangeable", standard quality

3. Standardization of transport, contracting, insurance, conversion systems

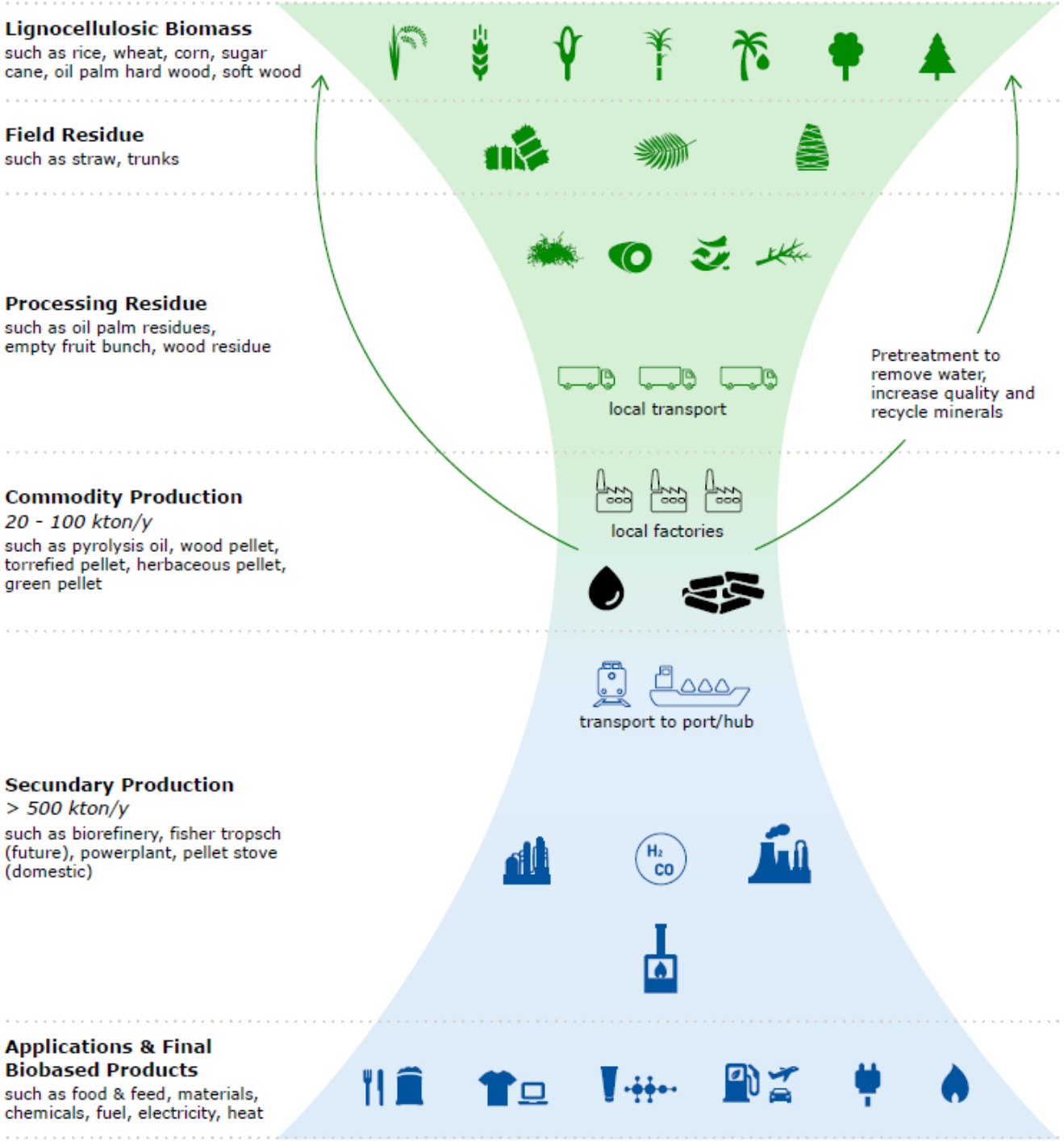
4. Functioning markets = trade systems, financial instruments (futures, etc.), high tradability

5. Sustainability standardized = sustainability certification systems

Commodities

- Maximize circular use of biomass: use stranded biomass + use total potential
- Give small producers a market → mobilizes more biomass
- Avoid risky one-on-one relationships
- Many applications per commodity
- Solve issue of scale differences between supply and demand

- Wood chips
- Wood pellets
- Torrefied pellets
- Pyrolysis oil
- Herbaceous pellets
- Bio-crude
- ?


Lignocellulosic Biomass
such as rice, wheat, corn, sugar cane, oil palm hard wood, soft wood
Field Residue
such as straw, trunks
Processing Residue
such as oil palm residues, empty fruit bunch, wood residue
local transport
Pretreatment to remove water, increase quality and recycle minerals
Commodity Production
20 - 100 kton/y
such as pyrolysis oil, wood pellet, torrefied pellet, herbaceous pellet, green pellet
local factories
transport to port/hub
Secundary Production
> 500 kton/y
such as biorefinery, fisher tropsch (future), powerplant, pellet stove (domestic)
H2
CO
Applications & Final Biobased Products
such as food & feed, materials, chemicals, fuel, electricity, heat

How to get there?

Local hubs produce lignocellulosic commodity at rel. small scale (25.000 ton per year?) = remove nutrients, water, uniform/fungible

Define only a few biomass commodities that cover:

- All lignocellulosic biomass types: wood, grass, straw, bagasse, etc.
- All applications: heat, electricity and chemicals, transport fuels, jetfuel, etc.
- Set wide standards and avoid frivolous demands

- Involve all players in the production chain (biomass producers, machine builders, regulators, insurers, financing, transport, final users)
- Allow markets to agree on limited number of commodities
- At what volume a commodity is a commodity?
- Implement worldwide?
- ?
- ?

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Thank you!

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To be or not to be a biobased commodity

Assessing requirements and candidates for lignocellulosic based commodities

IEA Bioenergy: Task 43

March 2022

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To be or not to be a biobased commodity

Assessing requirements and candidates for lignocellulosic based commodities

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