IEA Bioenergy
Technology Collaboration Programme

To be or not to be a biobased commodity

Assessing requirements and candidates for lignocellulosic biomass based commodities

Summary Series

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Authors: Wolter Elbersen, Iris Vural Gursel, Juliën Voogt, Koen Meesters (Wageningen Food & Biobased Research, the Netherlands) and Biljana Kulisic (Energy Institute Hrvoje Pozar, Croatia)

What makes a true lignocellulosic commodity?

Lignocellulosic biomass is an underutilised renewable resource. Using this biomass for biobased applications is hampered by a lack of possibilities to efficiently link the biomass to markets which include both energy applications such as heat and electricity production, conversion to transport fuels and chemicals and materials. Siting conversion facilities near abundant biomass has the benefit of availability of low cost biomass, but the locations generally lack security of supply, availability of qualified personnel, and do not benefit from existing infrastructure and possibilities to add value to residues. Furthermore, the scale of conversion systems is limited by local cost of generally bulky and wet biomass supply.

The development of real lignocellulosic commodities can connect biomass to markets and lower the opportunity costs of the commodities. Five requirements of a real lignocellulosic biobased commodity have been defined:

1. Easy to store and transport: High energy density, dry, low ash, nutrient depleted
2. Fungible: “Exchangeable” = uniform, standard quality
3. Standardization of transport, contracting, insurance and conversion systems
4. Functioning markets: Trading systems, Financial instruments
5. Sustainability: Standard sustainability certification systems

Several candidates as real commodities exist including wood pellets, pyrolysis oil, herbaceous pellets, torrefied pellets, wood chips and bio-crude. However, they are still not real commodities as they do not fulfil the 5 requirements described above. It is argued that only a few biomass commodities have to be defined that cover all lignocellulosic biomass types (wood, grass, straw, bagasse, processing residues, etc.) and also all applications such as heat, electricity, fuels, chemicals and materials. The standards have to be as wide as possible and avoid frivolous or unnecessary demands. This will require international collaboration else the potential lignocellulosic biomass will not materialize. The development of real lignocellulosic commodities can connect biomass to markets and lower the cost of biomass supply by lowering transaction costs, as illustrated in Figure 1. Commodities can contribute to efficient and circular use of biomass by giving biomass that would not have an efficient use (stranded biomass) a market.

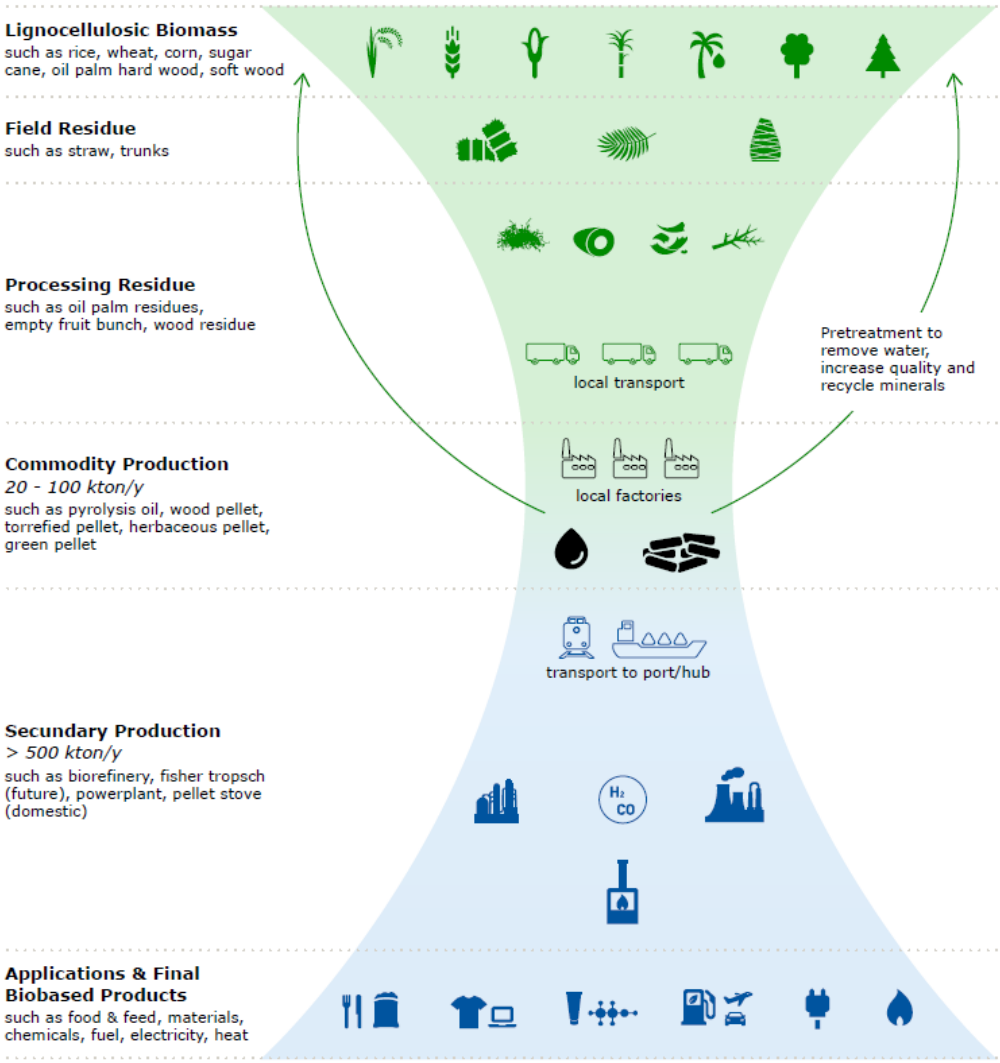

Figure 1. The role of biobased commodities to link lignocellulosic biomass sources to international markets. The arrows signify the return of minerals and water to the land or farm.

Development of biobased commodities

Trade in biomass will be greatly enhanced with the definition of a limited number of standard 'biobased commodities' that cover all lignocellulosic biomass types (wood, grass, straw, bagasse, processing residues, etc.) and also all applications such as heat, electricity, fuels, chemicals and materials. It is necessary that all parties involved in the production chain (biomass producers, machine builders, regulators, insurers, bankers, transport, final users) work towards creating these commodities that can link all the potentially available and diverse lignocellulosic biomass resources worldwide with global markets.