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Michael Boot, J Fundam Renewable Energy Appl 2018, Volume 8
DOI: 10.4172/2090-4541-C1-053

What can the bio-economy learn from other commodity markets?

Michael Boot
Eindhoven University of Technology, Netherlands

Onsite upgrading of raw materials towards high value products is quite uncommon in commodity markets. You will not be surprised to learn that gold rings are not manufactured at the gold mines of South Africa, nor will you be impressed to find out that most lithium batteries are not produced in Chile. The same holds true in the petrochemical industry. Here too, high value products, including fuels, chemicals and Pharma are scarcely produced near oil wells, tar fields or oil shale sites. The goal of this work is to ascertain how far a raw material should be processed onsite, based on a review of several commodity market value chains. This insight will then be applied to the bio-based economy, so as to provide clues on how the biomass value chain might be improved. There appears to be an implicit, but nevertheless apparent guiding principle with respect to onsite processing in commodity markets. Herein, the money density of raw materials tends to be increased onsite only to the point whereby processing further still would result in a loss of so-called end-product agnosticity or total addressable market. In other words, gold proper is both worth considerably more than its associated ore and can serve as a feedstock for an equally large market. By contrast, gold rings, though arguably more valuable per unit of mass or volumes represent a far smaller market than the market for gold as a whole. The commonly held view of the biomass value chain holds that biomass ought to be converted in biorefineries directly into a multitude of higher value products. Application of aforementioned guiding principle, however, would suggest that onsite production of a common ancestor for all foreseen end products would be the more logical approach. A likely candidate for this role, and one that is pivotal to the petrochemical value chain the biobased economy one day hopes to replace could be crude bio oil.

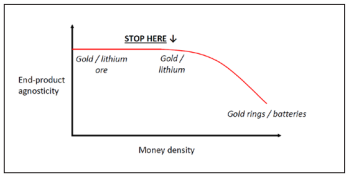

Figure-1: Apparent trend in commodity markets w.r.t. onsite processing.

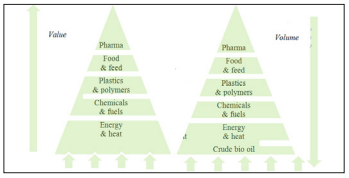

Figure-2: Popular (left) and proposed (right) biomass value pyramid.

Biography

Michael Boot has received his MSc and PhD degree in Combustion Technology from the Department of Mechanical Engineering of Eindhoven University of Technology in 2005 and 2010, respectively. In 2009, he has Co-Founded Progression-Industry BV to commercialize various automotive technologies in the domains of waste energy recovery and biofuels. Parallel to these entrepreneurial activities, he started a scientific career, first as a Part-Time Assistant Professor/Innovation Manager in 2010 and later as Fellow in 2016 (to date) at the same university. In 2016, he obtained an Executive MBA from TIAS Business School, with a final thesis on blue ocean product-market strategy. In May 2017, he has founded Vertoro BV, a startup that has the ambition to become this century's oil baron.

m.d.boot@tue.nl

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