

**CLEANTECH BRIEF: Sustainable Management of our Biomass Resources – Unlocking Total Supply Chain Value****A Draft White Paper for discussion****Written by:****Aaron W. Perry**
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The New Energy Economy is beginning to take hold in Colorado and indeed around the United States. Technological innovation is at the core of this transition to a more sustainable economy – one in which we have tangible prospects for a future of energy, agriculture, water and climate security. This future of security and sustainability will result from combined efforts in the wind, solar, hydro and bio-based industry sectors. However, the bio-based (biomass and biorefining) sector of the renewable energy industry will respond uniquely and critically to the *way in which* we manage our biomass resources (via “technique”) as much as to *what we do* with them (via “technology”).

In short, sustainability lies in intelligently designing and implementing *the way in which we do what we do* with our biomass supply chains (integrating technique *and* technology).

The future of sustainably managed bio-resources depends jointly and severally on our technique and our technology – fortunately we have in the greater biosphere and all of its robust natural systems an excellent road-map for complex bio-material handling (technique) and bio-material conversion (technology) interdependencies that should serve as our primary guide¹ to intelligent, sustainable industrial design in the bio-based renewable energy sector.

This basic principle of integrating the technique with the technology has two critical applications in the biomass and biorefining industries. One application allows us to unlock the maximum sustainable value in the resource supply chains. The other ensures the long-term productivity of those renewable resources. The long-term productivity of our renewable bio-based resources (whether woody biomass from beetle-infested forests, recycled cooking oil from commercial food facilities, lipid and cellulosic biomass from algae production systems or cellulosic biomass from switch-grass cultivated on marginal lands) is a function of the techniques by which we

¹ Janine Benyus’ [Biomimicry: Innovation Inspired by Nature](#) is one of several ground-breaking texts discussing the importance of modifying our industrial systems and products to more closely mimic nature’s efficiencies and intelligence, and the competitive advantages that result from such mimicry.

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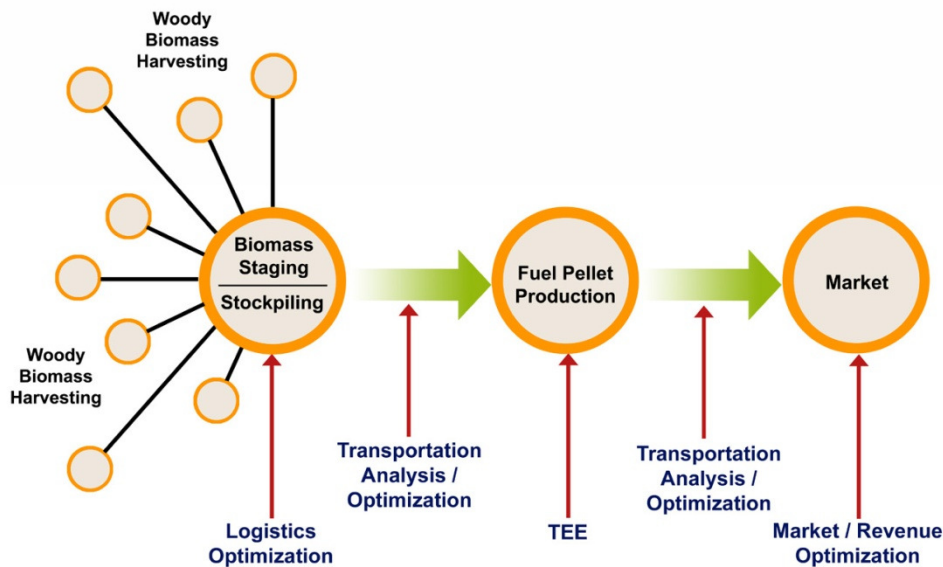
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utilize and up-cycle water, nutrient and other resources upon which these living, biomass-producing organisms and ecosystems depend.

The application of this principle – unlocking the maximum sustainable value in these resource supply chains – is equally critical to the economic development of the biorefining industry, and to all of the commercial stakeholders increasingly dependent on it. As companies and industry sectors compete for valuable biomass resources, including a variety of harvested and recycled biomass resources that have energy and nutrient value in them, the companies that can unlock the most value within each resource supply chain – both in terms of technique and technology – will deliver greatest value over time to stakeholders throughout the supply chains.

By focusing on the fundamental economics of these resource streams (including the environmental footprint performance and resulting economic costs/benefits), advanced Cleantech companies in the bio-resources sector will deliver the most optimized revenue and cost structures – therefore outcompeting other demand on these resources and delivering greater economic (and environmental) value to all of their stakeholders. Whether such value-unlocking is delivered by a company recycling used cooking oil for hundreds of restaurants and commercial facilities in a region, or by a company harvesting beetle-infested woody biomass (see diagram below), the focus on fundamental value will ensure that all stakeholders (resource producers and renewable energy product consumers alike) receive maximum economic and environmental benefit for each resource.

This is at the heart of sustainability in the bio-resources sector – *creating long-term value for all of our communities and stakeholders by unlocking maximum sustainable value through technique and technology.* (For more information, please visit www.rmse.biz).



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