Bioenergy: Current Status, Future Directions & International Collaboration

Dr Stephen Schuck  
Bioenergy Australia Manager  
7 Grassmere Road, Killara NSW 2071  
Email: ceo@bioenergyaustralia.org

Abstract

This presentation profiles biomass as a source of sustainable, renewable energy for electricity, cogeneration, heat and liquid transportation fuels. The presentation focuses on the status of bioenergy both globally and in Australia, and considers some of its future pathways.

The presentation covers the variety of biomass sources and their overall contribution to global energy supplies. It is noted that bioenergy extends beyond being merely a source of renewable energy, as it also provides several co-products and co-values. Biomass currently provides 4 percent of Australia’s total primary energy needs. It contributes 0.9 percent of the nation’s electricity. The presentation shows how bioenergy in Australia compares to that in several other countries.

The primary energy conversion technologies for heat and power covered are: combustion, gasification and anaerobic digestion. Plant examples at various scales are shown from small Organic Rankine Cycles through to an Ultra Super Critical combined heat and power unit which uses five fuels including wood pellets and straw bales for fuel. Solid biomass is ideally suited to pure thermal applications, even in the absence of specific government incentives. Various bioheat projects have gone ahead in several industries.

Biomass gasification is a relatively new technology. Gasification involves converting the biomass to a combustible gas, which can then be used for powering engines, turbines and in the future fuel cells. Gasified biomass can also provide a renewable feedstock for fuels and chemical production. Examples of biomass gasification developments in Australia and overseas are presented.

Anaerobic digestion produces a combustible gas using microbes. The biogas may be used for several energy related applications.

Liquid biofuels are covered, with the emphasis on advanced biofuels. The two main biofuel production routes are biochemical and thermochemical conversion. Their development and recent milestones are presented.

Concluding remarks related to some of the myths and issues surrounding bioenergy and the various barriers to its widespread deployment in Australia are presented.

Australia’s participation in the International Energy Agency’s Bioenergy program is summarized, profiling the program’s objectives and activities plus Australia’s involvement in five Tasks. These cover feedstocks, greenhouse gas balances, biogas, liquid fuels and biorefining. ARENA (www.arena.gov.au) is financially supporting Australia’s engagement in this international collaboration through its Emerging Renewables Program.
**Dr Stephen Schuck**

Stephen Schuck, through his company Stephen Schuck and Associates manages Bioenergy Australia, a government-industry-research alliance of some 50+ organisations, fostering the development of biomass for heat, power, transportation fuels and other value added bio-based products.

Steve is Australia’s representative on the Executive Committee of the International Energy Agency’s Bioenergy program (www.ieabioenergy.com). He has been involved in numerous bioenergy consultancies and projects, including market entry and biofuels and bioelectricity studies. He co-authored the major report ‘Bioenergy in Australia – Status and Opportunities’. He also produced the inaugural Bioenergy Industry Report for the Clean Energy Council (CEC) and was also one of the contributors to the CEC Bioenergy Roadmap.

Steve has been the convener of all 15 annual Bioenergy Australia conferences; Australia’s major bioenergy event.

Stephen’s academic qualifications include a PhD, an MSc (Engineering) and an MBA (Technology Management).