Towards a Sustainable Renewable Energy

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Abstract:
The merits of renewable energy have been well recognised, starting from environment gains to empowering society. As to sustain, efforts need to be focused towards environment-non-harming initiatives in order to counter numerous emerging issues in renewables. Integration and biorefinery are the possible key options to drive renewable initiatives towards sustainability. With the concept of biorefining, it opens up avenue to convert biomass, sustainably, into a spectrum of marketable bio-based products (food/feed ingredients, chemicals, materials) and bioenergy (biofuels, power and/or heat). Integration makes renewable energy to be realized in much wider scale. Number of issues need to be resolved in renewables. Solar comes with challenges in term of solar intensity, return on investment, energy conversion rate, toxic by-products from production, light intensity-dependency and energy storage. On the other hand, biofuel issues are in term of feedstock supply and cost, catalyst cost, long-term effects on engine, cold performances, storage stability, glycerol oversupply, government incentives and public perceptions; although biofuels are seen as one of the saviours of agriculture. For algal, input cost, working with the right species, products yield, validity of small scale data, carbon dioxide source and supply, life cycle impacts and algal bloom are the main issues to be tackled. As for the wind energy, fluctuation in wind quality, energy storage, threat to wildlife, deforestation and noise are the among issues. For countries where utilization of high technological energy sources is a real challenge, energy derived from locally attainable biomass sources are the possible options, in addition creating new jobs that accelerating the socio-economy of rural community. Many more research data from renewable sources with considerable sizes are needed to validate the global renewable claims and to ascertain their degree of sustainability.

Keywords : Renewable energy; Sustainability; Agriculture; Biorefinery; Climate change

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