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Growing trade of bioenergy in the EU: Public acceptability, policy harmonization, European standards and certification needs

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ARTICLE INFO

Article history:
Received 29 September 2009
Received in revised form
9 September 2010
Accepted 18 October 2010
Available online 4 February 2011

Keywords:
Biomass trade
European Union (EU)
Standards
Harmonization
Certification
Sustainability

ABSTRACT

Since 2000, the consumption of bioenergy in the European Union has grown, along with a concurrent growth in the trade of biomass for energy purposes (though traded volumes still remain small). Bioenergy production and trade will likely continue to increase into the future, driven by climate change concerns, emissions reduction targets, increasing concerns about domestic energy security and favourable policies. The harmonization of European standards and the development of certification systems are key issues to resolving potential negative effects of increased biomass trade. Certification systems not only address the issue of environmental sustainability from production to end-use, but also allow for product differentiation while adding value to sustainably produced products, which can ultimately enhance a competitive and sustainable bioenergy market. In addition to analyzing bioenergy trade growth in the European Union, a questionnaire survey of 92 bioenergy experts from eight member states within the European Union was conducted. Survey results show that bioenergy is highly accepted in the European Union but that there is a lack of European standards and policy harmonization, along with the absence of a competitive market or a certification system, all of which are necessary for sustainable production and trade of bioenergy. A large majority (63 percent) of the total respondents agreed that the certification of bioenergy is necessary to promote the sustainable use of biomass.

1. Introduction

Over the past decades, the use of bioenergy has increased rapidly in many parts of the world [1]. In order to comply with Kyoto greenhouse gas reduction targets, many countries have set goals for the utilization of biomass [2], intensifying its production and consumption for energy purposes. The fuel shocks from the early 1970s to the late 1980s were also responsible for increasing the use of bioenergy [3] and it is increasingly being seen as a substitute for fossil fuels [4]. The recent cost of oil has driven fuel prices to historical heights, making bioenergy a more cost-competitive and interesting choice [5]. Bioenergy has also been introduced as an alternative to fossil fuels to reduce negative impacts on climate [6]. It is recognized as being carbon-neutral [7], significantly reducing the amount of carbon dioxide (CO_2) in the

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doi:10.1016/j.biombioe.2010.10.012

atmosphere compared with burning fossil fuels. Considering such environmental benefits, the consumption of bioenergy was found to be a cost effective climate change mitigation option [8,9].

While the potential for biomass production from the global terrestrial ecosystem is significant [10], biomass energy accounts for only 10–15 percent of the total primary energy consumption of the world [11–13]. Because of favourable policies and other commercial driving factors, the demand for bioenergy is continuously increasing, with a resultant expansion in biomass and bioenergy markets. Because an international commodity market is developing for biomass resources (e.g. wood pellets, ethanol) [15], and these resources are unevenly available throughout different parts of the world, trade in biomass is growing among European, Southeast Asian, South American and North American countries [14].

The European Union (EU) is promoting the use of bioenergy to reduce greenhouse gas (GHG) emissions, increase decarbonization, diversify fuel supply sources, develop long-term replacements for fossil fuels and offer new opportunities for rural income [16]. Introduced in 2007, a new energy policy for Europe sets a target of achieving at least a 20 percent reduction in GHGs and a 20 percent increase in renewable energy by 2020 [17]. Domestic energy security is also a driving factor; presently, 54 percent of the total energy consumed by the EU-27 [18] is imported, and the European Commission predicts that this dependency rate could increase to 70 percent if measures are not taken to increase domestic energy supplies [19]. Although bioenergy cannot replace all fossil fuels, it can contribute significantly to the diversification of the EU fuel mix, consequently increasing domestic energy supplies and reducing GHG emissions. This paper begins by describing the rate of growth in the trade of biomass and liquid biofuels in the EU-27, analyzing the results of a survey carried out among bioenergy experts within EU member states to investigate issues in bioenergy trade.

1.1. *Overview of bioenergy trade in the EU*

While there is sufficient biomass potential in the EU (12.6 EJ in 2030) to support ambitious renewable energy targets without harming the environment [20], this amount is not yet available for trade. Biomass represents two-thirds of total renewables, with a large potential still available for exploitation in the EU [21]. As the trade offers exchange opportunities of goods and/or services between the countries and increase the utility of products [22], the development of a truly international bioenergy trade in the EU is essential to fully utilize available biomass that is currently underutilized [23,24].

Demand and supply of bioenergy do not coincide geographically around the world as well as in the EU, necessitating international trade to distribute resources effectively [25,26]. Some countries are net suppliers of bioenergy to nations that lack such resources [27]. Exporting countries gain an additional source of income and increased employment and, because imports can provide bioenergy at lower prices, larger quantities, and better quality than domestic supplies [28], importing countries gain an economical way to fulfill their emissions reduction targets and diversify their fuel mix [29]. Wood and agricultural biomass have a crucial role to play in enhancing trade in renewable energy [30]. Due to the potential growth of a sustainable bioenergy trade and the resulting reduction in GHG emissions, bioenergy has very promising prospects in the EU and could, in fact, be a key component of future energy systems [31].

The EU can increase bioenergy use by utilizing more domestic sources or increasing imports [26]. Several EU countries have large potentials for expanding the use of biomass from forestry or agriculture [32] to meet the EU target of 20 percent renewable energy by 2020. Other countries with a lack of domestic resources can help meet targets through biomass imports [33].

In spite of bioenergy trade growth, there is a lack of strong data to describe this sector [15]. There are a number of studies that deal with it, either focusing on individual countries [26,32,34–36] or taking a more global approach [14,37]. These studies showed that many types of solid woodfuels (i.e. fuel wood, wood chips, wood charcoal, pellets and wood residues) and liquid biofuels (i.e. biodiesel, ethanol, methanol and other vegetable oils) are being traded within the EU. Available statistics estimate that of about 429 million m^3 of roundwood harvests annually across the EU-27, about 21 percent is directly used as fuel wood (Table 1). A large share of industrial roundwood residues is also used for energy purposes. EUROSTAT database, under the theme of environment and energy,

Table 1 – Production and trade of forest based biomass for energy and industrial purposes in the EU-27 (2006) [48].

Commodities	Production	Trade		Unit
		Imports	Exports	
Forest biomass for industrial use				
Total roundwood	427.8	61.1	34.7	Million m^3
Industrial roundwood	338.5	57.9	32.0	Million m^3
Sawnwood	112.7	45.0	52.6	Million m^3
Fibreboard	16.8	8.4	10.6	Million m^3
Wood-Based Panels	64.7	27.8	31.1	Million m^3
Wood Pulp	41.1	18.0	11.9	Million tons
Forest biomass for energy				
Wood fuel	89.3	3.2	2.7	Million m^3
Wood charcoal	0.4	0.7	0.3	Million tons