

See discussions, stats, and author profiles for this publication at: <http://www.researchgate.net/publication/49587891>

Systemic analysis of production scenarios for bioethanol produced from ligno-cellulosic biomass [abstract]

ARTICLE in BIOTECHNOLOGY, AGRONOMY, SOCIETY AND ENVIRONMENT · JANUARY 2010

Impact Factor: 0.51 · Source: DOAJ

DOWNLOADS

149

VIEWS

112

6 AUTHORS, INCLUDING:



Philippe Baret

Catholic University of Louvain

79 PUBLICATIONS 1,269 CITATIONS

SEE PROFILE



Pierre M Stassart

University of Liège

22 PUBLICATIONS 160 CITATIONS

SEE PROFILE



Bruno Godin

Walloon Agricultural Research Centre CRA-W

31 PUBLICATIONS 103 CITATIONS

SEE PROFILE



Didier Stilmant

Walloon Agricultural Research Centre CRA-W

56 PUBLICATIONS 164 CITATIONS

SEE PROFILE

Systemic analysis of production scenarios for bioethanol produced from ligno-cellulosic biomass

François Ghysel ⁽¹⁾, Philippe Baret ⁽²⁾, Pierre Stassart ⁽³⁾, Bruno Godin ⁽¹⁾, Jérôme Delcarte ⁽¹⁾, Didier Stilmant ⁽¹⁾

⁽¹⁾ Centre wallon de Recherches agronomiques (CRA-W). Section Systèmes agricoles. Rue de Serpont, 100. B-6800 Libramont (Belgium). E-mail: f.ghysel@cra.wallonie.be

⁽²⁾ Université catholique de Louvain (UCL). Département de Biologie appliquée et des Productions agricoles. Unité de Génétique, Populations et Reproduction. Bâtiment de Serres, local b343. Place Croix du Sud, 2/14. B-1348 Louvain-la-Neuve (Belgium).

⁽³⁾ Univ. Liege (ULg). Département des Sciences et Gestion de l'Environnement. Unité Socio-économie, Environnement et Développement. Avenue de Longwy, 185. B-6700 Arlon (Belgium).

Defining alternatives for non-renewable energy sources constitutes a priority to the development of our societies. One of these alternatives is biofuels production starting from energy crops, agricultural wastes, forest products or wastes. In this context, a “second generation” biofuels production, aiming at utilizing the whole plant, including ligno-cellulosic (hemicelluloses, cellulose, lignin) fractions (Ogier et al., 1999) that are not used for human food, would allow the reduction of the drawbacks of bioethanol production (Schoeling, 2007). However, numerous technical, economical, ethical and environmental questions are still pending. One of the aims of the BioEtha2 project, directed by the Walloon Agricultural Research Centre, is to define the position of bioethanol produced from ligno-cellulosic biomass among the different renewable energy alternatives that could be developed in Wallonia towards 2020. With this aim, and in order to answer the numerous questions in this field, the project aims at using tools and methods coming from the concept of “forecasting scenarios” (Sebillotte, 2002; Slegten et al., 2007; For-learn, 2008). This concept, based on a contemporary reality, aims to explore different possible scenarios for the future development of alternative sources of energy production. The principle is to evaluate, explore, possible futures of the studied problematic, through the establishment of possible evolution trajectories. We contribute to this prospective through a systemic approach (Vanloqueren, 2007) that allows lightening the existing interactions within the system “ligno-cellulosic biomass chain” without isolating it from its environment. We explain and sketch the two contexts needed to identify primary stakes. The global context includes inter-dependant and auto-regulating fields such as society, politics, technology and economy. These four fields influence each part of the “chain” with specific tools. However, the interest and possible action fields lay within the intermediary context representing the “resources” such as agriculture, forestry, “driving” elements such as mobility, mediation elements such as territories and environment and concurrent elements such as non-cellulosic biomass, the energy mix and the non-energy valorization.

Keywords. Bioethanol, ligno-cellulosic biomass, prospective, systemic, scenario.

References

- For-learn, 2008. <http://forlearn.jrc.ec.europa.eu/index.htm>, (2008), (20/10/08).
- Ogier J.C. et al., 1999. Production d'éthanol à partir de biomasse lignocellulosique. *Oil Gas Sci. Technol.*, **54**(1), 67-94
- Schoeling O., 2007. *Les biocarburants non conventionnels en Belgique : pour aller au-delà de 5,75 % à l'horizon 2010 ?* Louvain-la-Neuve, Belgium : Valbiom.
- Sebillotte C., 2002. Les microscénarios et leur construction. *OCL*, **9**(5), 352-361.
- Slegten R. & Stassart P., 2007. Quel territoire pour quelle agriculture en 2022 ? In : Stassart P., Louviaux M. & Slegten R. *Prospective participative locale. Quatre scénarios pour le territoire et l'agriculture en 2022. Résultats, évaluation, méthodes*. Université de Liège : Faculté des Sciences, Département des Sciences et Gestion de l'Environnement, 1-60.
- Vanloqueren G., 2007. *Penser et gérer l'innovation en agriculture à l'heure du génie génétique*. Thèse de doctorat : Université de Louvain-la-Neuve (Belgique).