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Discursive shifts in energy from biomass: A 30 year European overview

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ABSTRACT

This study aims to provide a long term overview of developments in energy from biomass in Western Europe by analyzing the discourse in RD&D and related policy. To this end, the discourse in Western Europe between 1980 and 2010 has been studied by the literature study of open literature and articles of the European Biomass Conference. In addition, a quantitative content analysis of titles of the conference has been performed. This shows the dynamics with respect to considered feedstock, conversion technology, application as well as supporting arguments for this – a dynamics that will not show in a technology or country oriented study. We distinguish four different discourses based on differentiation to scale and knowledge intensity – but that also relates to feedstock and conversion technology. This way, the complex developments can be structured and understood as shift between and within discourses. This is especially relevant as each discourse involves a different policy arena and different actors. With a still growing interest in energy from biomass, the multiple discourses seem to keep co-existing. Emphasis continues to be given to large scale and knowledge intensive processes, which will further increase the importance of the supra-national level for future developments.

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1. Introduction

Over the past decades energy from biomass has been on the forefront of promises and developments in renewable energy. Its large potential and flexibility regarding feedstock, conversion technologies and end-products certainly contributed to that. As such, it has been widely reported upon. But, surprisingly, this strand of the literature has been mainly focusing on either specific technologies or national developments (e.g. [1,2]). One might argue that this reflects the strong role of national policies and developments that have proven to be of major importance [3]. However, this neglects the international effort, e.g. the EU efforts on biomass Integrated Gasification Combined Cycles in the 1990s, and more recently the EU directive on biofuels.

This focus is especially surprising as the general promises on energy from biomass are truly international ones: fuels from biomass as response to the international oil crises of the 1970s; energy from biomass to reduce greenhouse gas emissions since the 1990s; and more recently the promise of a bio-based economy. To life up to each of these promises requires international and large

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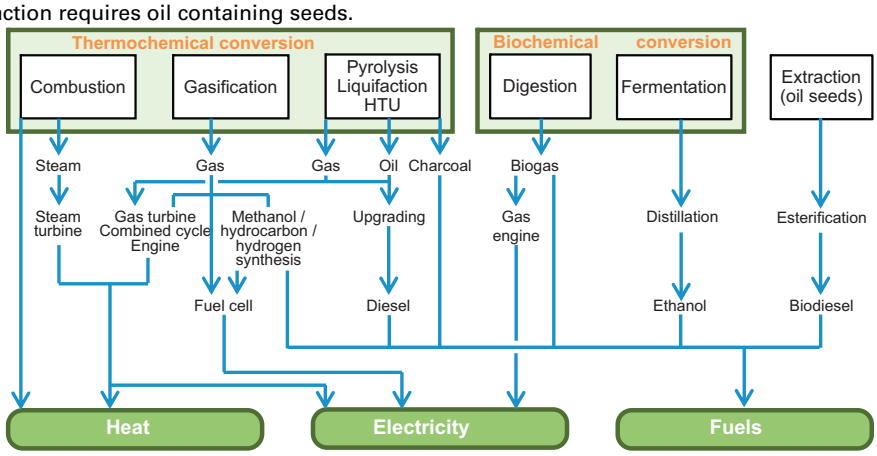
Box 1

Conversion routes energy from biomass (taken from [133]) Thermochemical routes operate under high temperature (and pressure) and often prefer dry lingo-cellulosic feedstock (wood, straw, etc.). Biochemical conversion processes are depending on the use of enzymes and bacteria that require modest temperatures and wet conditions. In general, manure and agricultural crops are the preferred feedstock. Extraction requires oil containing seeds.



scale application, as the burden of oil dependency is not levitated by a small local project, and the same hold with respect to reducing greenhouse gasses. The involved technologies ultimately serve a global market.

Our argument is not that local or national developments are not relevant; our argument is that the supranational level does matter. Our focus is on Western Europe, a region in which there has been a broad and intensive continuous RD&D effort on energy from biomass over a long period. This focus is given in by practical reasons: availability of the literature and the need to reconstruct a comprehensive story line. However, we are aware of the importance of other regions: the USA and Canada that played a leading role in the 1970s and early 80s (see, e.g. [4–6]); and more recently the developments in the USA and Asia and more specific China (e.g. [7,8]).

Although limited, several scholars did take on the international perspective on developments in Western Europe (see, e.g. [3,9,10,11]). Hall [9] is an editorial that describes to upcoming of interest in Europe in energy from biomass. His later papers [10,11] both describe the status at that time and ongoing developments in order to assess future potential of energy from biomass in Western Europe. In his well known paper, Faaij [3] follows a somewhat similar approach covering the 1995–2005 period.

We will take a somewhat different perspective, by performing a discourse analysis over a longer time horizon, 1980–2010. Our main interests and contributions are (a) how attention for specific promises and practices have developed over time and (b) the structure of the debate. As such it shows how the scenery in the energy from biomass community shifts with respect to applications and socio-economic and political context, but also with respect to feedstock and conversion technologies considered – see Box 1 . This can lead to deepening of the understanding of the ongoing developments, which is of support for policy in this field. 1980 is chosen as starting point, as it is still well covered by the literature and reflects the period in which the concerns on oil supply resulted in a renewed interest in energy from biomass that has been continued ever since.

After discussing the followed methodology, we will introduce the European Biomass Conference, the main source that we will be relying on. After that we will represent the discourses as reconstructed by two different approaches. Finally we will discuss the results and draw conclusions.

2. Methodology

2.1. Discourse analysis

Discourse analysis finds wide application in the social sciences. Object of analysis is the discussion and the argumentative structure of the discussion. This is based on the ideas of Foucault. By discourse Foucault meant "*a group of statements which provide a language for talking about – a way of representing the knowledge about – a particular topic at a particular historical moment*" [12, p. 72]. This implies a degree of repetition, in the sense that the discourse – or discourses for that matter – are shared by groups of people and show some stability over time. Several scholars emphasize that it is not a pure 'linguistic' concept, but that it is about 'language and practice', what you say and do, 'identifiable set of practices' [12,13]. But as Fairclough [14, p. 124] arguments, "*discourses not only represent the world as it is (or rather is seen to be), they are also projective, imaginaries, representing possible worlds which are different from the actual world, and tied in to projects to change the world in particular directions*". This only adds to the importance of understanding the discourse.

Discourse analysis in the field of energy from biomass seems to have drawn significant attention recently: Zschach et al. [15] have been studying the mass media discourses in leading German newspapers; Sengers et al. [16] followed a similar strategy, but focused on the biofuels debate in the Netherlands; Lehrer [17] also studied biofuels, but she focused on the US and takes a policy perspective; Huttunen [18] studied the discourses in rural non-wood bioenergy production in Finland; and finally Asveld et al. [19] focused on the debate on a bio-economy in the Netherlands. Two underlying characteristics that fueled this attention seem to be that bioenergy production has recently been widely debated worldwide and that the issue is '*multilayered and characterized by a great variety of competing interests, opinions and perceptions*', as [15] phrases it.

Most of the discourse analysis above focus on the structure of the public or policy debate and as such involve the identification of actors and advocacy coalitions involved and their position in the debate. We will take a route less travelled by, studying the discourse in the RD&D community and its involved policy. This way we hope to highlight shifts in arguments and policy and how they relate to preferences for specific feedstock, conversion technology and application – a mix of policy and technology discourse. As such, the