

Power Engineering 2017- Bioenergy in Germany: Technologies, perspectives and challenges- Rafal Strzalka - Stuttgart Technology University of Applied Sciences

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Abstract

Bioenergy is so far the most important renewable energy source in Germany. This can be explained above all by the availability of numerous proven technologies and processes developed for energy generation from biomass. Furthermore the advantage of biomass lies in the possibility of direct substitution of fossil fuels which creates numerous perspectives for the implementation of new bioenergy project within the existing energy infrastructure. Above all biomass also represents a form of stored solar energy, which can be used efficiently according to the current energy demand. The results summarized in the proposed study provide an overview of the role of biomass in the German energy mix, with a particular focus on the renewable energy sector. Furthermore, the technologies for energy generation from biomass, their main indicators and properties are presented. The main focus is placed on the technologies for decentralized generation of power and heat, since these technologies achieve relatively high conversion efficiency, can be characterized by low transport losses and fulfill the criteria of economically feasible operation. In addition, the perspectives and barriers for the successful implementation of new bioenergy projects will also be described and presented in the paper. These analyses will provide particularly important results in view of the changed energy policy system conditions within the framework of the last EEG amendment. In particular the influence of the energy policy issues and their influence on the bioenergy sector will be discussed on the basis of the two most important technologies: Biogas plants and combustion-based CHP plants. The publication also analyses and describes the success factors which determine the increasing application of bioenergy technologies. Subsequently, the aspects of the integration of biomass into energy systems and its various facets will be discussed. Concerning this matter, the main challenge is the achievement of the energy policy objectives and the maintenance of the positive sector growth despite the worsening of the general economic conditions and system-technical requirements. Finally, as a result of these considerations the final part of the study is devoted to questions of efficiency enhancement, system optimization and infrastructure adaptation, which are crucial for the efficient implementation of bioenergy within innovative energy supply systems.

Bioenergy is the most established sustainable power source asset and has a long convention in heat arrangement. Be that as it may, with the foundation of the substance business and building the application field as reached out to the force and the vehicle area. This article traces the advancement of intensity

and fuel creation from biomass over a time of hundred years until today, just as future possibilities. The critical specialized advancements of bioenergy as to political and chronicled occasions are reflected. Notwithstanding of enhancements in the most recent decades, basically connected with issues like asset accessibility, specialized productivity or outflow moderation, the future vitality flexibly by biomass must be significantly increasingly proficient, demand-oriented and incorporated step-by-step in a progressively sustainable power source framework.

Bioenergy is nearly as old as mankind. Be that as it may, from the revelation of fire, at some point somewhere in the range of 500 000 and 1 500 000 years prior there was far to innovation improvement of bioenergy. This improvement was joined by social desires for bioenergy's capacities. The old style arrangement of vitality progress in the major conserved states had followed continuous movements from absolute dependence on fuelwood and charcoal to expanding employments of coal, in both residential and mechanical settings (Fig. 1). Particularly with the start of the industrialization and the monetary and social rise, plants as vitality source turned out to be less significant, as fossil vitality assets with an a lot higher vitality thickness were progressively utilized. By the by, in the midst of vitality emergencies or in periods of horticultural overproduction, innovation advancement of bioenergy has gotten a push. Consequently, from one perspective a persistent utilization of wood in little warming and cooking gadgets can be expressed, however then again, new bioenergy transporters had been produced for a more extensive application inside the fossil gracefully framework. Consequently, the arrangement and use of bioenergy from vaporous and fluid biofuels has significantly changed since the principal volume of Chemie Ingenieur Technik has been distributed in 1928. Adjacent to the utilization for warming purposes, in the start of the twentieth century biomass was likewise used to create power and fluid biofuels.

In this paper, a diagram of the advancement of bioenergy with an uncommon spotlight on fluid and vaporous bioenergy bearers in Germany for the course of events somewhere in the range of 1928 and 2028 is given. Significant casing conditions and key innovation improvements are made sense of, which have driven the bioenergy use over various periods. Moreover, the real use is imagined and, at last, the significant key strides for bioenergy expected for the following decade is talked about. With this narrative, we take the risk to salute the diary and expectation that we can examine in the 100th volume of CIT in 2028 about the real-world encounters of the present estimation.