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Bioenergy: An Underestimated Pillar of the Energy Transition

Challenges and Opportunities for Bioenergy

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Against the backdrop of Russia's war of aggression against Ukraine, energy supply security has become a new priority, as a result of which bioenergy is also attracting greater attention again as a domestic energy source. Key framework conditions for bioenergy are changing this year due to a series of changes in legislation, such as the amendment of the German Building Energy Act (Gebäudeenergiegesetz), the German Renewable Energy Act (Erneuerbare-Energien-Gesetz) and the European Renewable Energy Directive.

Germany has some 9,900 biogas facilities, and bioenergy accounts for around eight per cent of the country's gross electricity generation. It also makes a crucial contribution to heat and fuel production. In contrast to wind and photovoltaic energy, both volatile energy sources widely reported on in the media, biogas facilities can generate base load renewable electricity and heat, thereby stabilising the grid during periods of low sunlight and wind in particular. Due to its many different applications in the heat, transport and electricity sectors, bioenergy has a key role to play in the energy transition. It, too, has its critics, however: monoculture crops grown for biogas production are creating trade-offs with other objectives that need to be safeguarded such as food production and biodiversity.

Mixed prospects for bioenergy

Twenty years after the German Renewable Energy Act (EEG) was passed, financial support will now be phased out for many biogas facilities in the next few years, thus raising the issue of reinvestment. As a result of economies of scale for wind and photovoltaic energy and the considerable expansion of their capacity, the times during which high electricity prices can be charged are becoming increasingly short. Moreover, subsidies are being devalued by price increases for input materials partly due to stricter sustainability requirements. This has led to a stagnation in demand for electricity production facilities subsidised under the EEG, as a result of which the use of bioenergy decreased last year. At the same time, the fuel sector and commercialisation of excess heat are becoming increasingly important for the economically viable operation of the facilities. Biomethane in particular is benefiting from the current high gas prices and is also set to become more competitive compared with natural gas in the medium to long term as a result of rising CO2 prices. Before biomethane can be fed into the gas grid, however, the facilities need to be extensively retrofitted; in addition, the necessary infrastructure, such as district heating pipelines and feed-in systems, has often not been put in place yet. Moreover, biogas facility operators are frequently confronted with extensive regulations that are not fit for purpose. One example of the counterproductive effect of overregulation is the most recent amendment of the EEG (federal funding for energy and resource efficiency in industry) from May of this year. Funding is now only granted for new facilities that use less than 25 per cent "plant-based primary biomass", and even for existing facilities the "corn cap" for funding under the EEG is to be gradually reduced to 30 per cent. The legislation is designed to limit the use of energy crops in order to meet the increasingly ambitious biodiversity requirements. However, an unintended impact of this has been a cap on particularly valuable input materials such as cover and catch crops, too. One of the reasons why this is not expedient is that the existing sustainability requirements for the facilities are already sufficient.

Alternative biomass as the key to sustainable use

To ensure the sustainable use of bioenergy, it is essential to harness all the available biomass potential. Debate on this topic is often too narrow in its focus in that it only distinguishes between energy crops and waste products/residuals. Biomass crops such as clover grass, catch crops and secondary crops, permanent grassland and rewetted peatlands in particular offer a useful alternative. They will become increasingly relevant in future , as they could replace the energy crops used up to now such as corn and rapeseed, thus mitigating the trade-offs between biodiversity, food production and energy generation. Positive side-effects of this are an enhanced soil nutrient status and erosion protection. At policy level, incentives for using alternative biomass crops can be created by offering intelligent subsidies. At the same time, research needs to be stepped up with a view to developing economically valuable, energy-dense biomass and enhancing the productivity of biomass facilities.

Bioenergy as structural support for rural areas

It is also worthwhile to consider bioenergy from the point of view of rural areas, as it undoubtedly has a positive structural impact: it creates added value and generates additional income for farmers. Moreover, it helps to boost supply in rural areas not only by promoting local electricity production but also by guaranteeing affordable energy prices. This strengthens competition in the regions and enhances people's quality of life. Bioenergy will also play an important role particularly in the heat and transport sectors in future. We therefore ought to devote greater attention to bioenergy. If we are to make a success of the energy transition and become a climate-neutral economy, it will be crucial to harness its full potential.

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