

The Dawn of Greater Energy Independence – why Europe also needs to count on sustainable bioenergy

May 3, 2022, Brussels, IEA Bioenergy: the Ukraine war has exposed Europe's critical dependence on fossil fuel imports, so EU Member States are discussing the required steps to break away from their dependence on fossil fuels. Meanwhile in its latest Assessment Report the IPCC also calls for rapid action to move away from fossil fuels to reverse the trends in climate change. Paul Bennett, Chair of the Executive Committee of IEA Bioenergy refers to the advantages of bioenergy contribution to energy security in a fossil free future.

Europe is looking for ways out of its dependence on coal, oil and especially gas and move towards climate neutrality. Energy savings and renewable energy are the key tools to achieve that. Solar and wind energy are the focus of public attention when it comes to sustainable energy independence and energy security. Little attention is paid to the global potential of bioenergy from sustainably sourced biomass - and wrongly so. Because without bioenergy, the urgent step toward fossil free greater energy security and climate neutrality will not succeed. It is the overlooked giant of the energy transition.

The three perspectives of energy security, energy independence and climate change mitigation are in the focus of bioenergy:

- We need to utilize the vast potential of energy production from sustainable biomass
- We need a heat transition for climate-neutral energy security
- We need to seize the opportunities of bioenergy to combine renewable energy production with CO₂ removal from the atmosphere.

Perspective #1: Utilize the vast potential of energy production from sustainable biomass

Bioenergy is the most widely used renewable energy in the world. It accounts for about ten percent of global energy supply (for electricity, heating, cooling and transport). In Europe, bioenergy represents about 60 percent of renewable energy. There is room to expand the mobilization of biomass in a sustainable way and use it for modern and clean bioenergy applications.

Thus, bioenergy is an important and essential part of global, but also of European energy security. It allows for more independence from fossil fuels. Bioenergy prices are much more stable than fossil fuel prices; it can be produced from local resources and absorb seasonal fluctuations of other renewables; bioenergy is compatible with current infrastructures, so it can already be used now. Most importantly, biomass can be stored, it is versatile and can deliver heat and power, supply fuels for transportation or deliver renewable gas.

Bioenergy contributes substantially to climate change mitigation when it is produced from biomass that is grown sustainably or based on waste and residues; converted to energy products efficiently and used to replace fossil fuels.

However, bioenergy is in the slipstream of solar and wind energy, which does not do justice to its global importance. Only with an expansion of sustainable bioenergy – in addition to energy savings and strong growth of other types of renewables – we will be able to meet the increasing demand for renewable energy and also achieve more (national) energy independence. Around 96% of the EU's current use of biomass for bioenergy originates from the EU itself.

It is necessary to:

- Expand deployment of existing technologies such as biomethane to replace fossil gas, or combined heat and power production from biomass.
- Commercialize new technologies such as biomass gasification or integrated biorefineries to co-produce biochemicals, biofuels and heat.
- Ensure sustainable biomass supply for renewable fuels, e.g. through the implementation of certification and other sustainability governance systems.

Take away:

For the transition to a climate neutral society, all types of renewables are important. We need to reduce

energy demand and maximize the contribution of fuels, power and heat from renewable resources – including biogenic resources - to reduce greenhouse gas emissions and protect the climate. This contributes to the targets of the European Green Deal and to both global and national energy security.

Perspective #2: Heat generation through bioenergy - the overlooked giant

Heat generation (for buildings and industry processes) represents more than 50 percent of global energy consumption and is still largely dependent on fossil fuels such as oil, gas or coal. Moving away from fossil resources in heat generation is a key component in decarbonization. This fact is largely underestimated since the attention of policymakers and the public is more on electricity generation where other renewables (solar, wind) can play a leading role.

For heat generation, biomass is currently by far the most important renewable energy source. It includes heat supply from solid fuels, liquid fuels, gaseous fuels and the biogenic fraction of waste. A large proportion of biobased heat is already produced from residual materials and green waste.

Biomass can be stored cost-effectively on a larger scale (wood chip or pellet storage, biomethane storage, liquid biofuels storage) and can be used in a targeted manner. It is also capable of providing heat at a high temperature level without additional costly technology.

It is necessary to:

- Reduce energy demand for domestic heating through efficiency measures, for example better insulation
- Stimulate the transition of fossil fuels in industries to renewable heat
- Deploy district heating in urban areas to replace individual fossil stoves and boilers

Take Away:

A transition away from fossil-based heating is necessary to move towards a carbon neutral and secure energy system. Bioenergy is the overlooked giant of the energy transition - particularly for renewable heat - and, due to its great decarbonization potential, a decisive key to energy security.

Perspective #3: Combining renewable energy production with CO₂ extraction from the atmosphere.

To stabilize global temperatures in the coming decades, removal of CO₂ from the atmosphere, so called “negative emissions”, will be a necessity, not just an option. This was recently confirmed by the IPCC [Sixth Assessment Report](#). One of the leading negative emission pathways is „BECCS“, i.e., Bioenergy with Carbon Capture and Storage. CO₂ generated in the process - which was initially absorbed from the atmosphere during plant growth - is not released back to the atmosphere, but captured and stored underground. This way BECCS combines renewable energy production with negative emissions.

It is necessary to:

- Intensify research to improve CO₂ capture and storage processes
- Bring BECCS from pilot to full scale projects
- Improve business models and regulations regarding CO₂ capture and storage,
- Invest in CO₂ distribution and storage facilities

IEA Bioenergy is among the world’s most renowned research collaborations on bioenergy, offering unbiased, scientific, and sound information for policy makers, industry, and researchers on how to proceed with bioenergy as a renewable solution.

IEA Bioenergy is a Technology Collaboration Programme which was set up by the International Energy Agency (IEA) in 1978. Currently 25 countries from all over the globe, as well as the European Commission, participate in IEA Bioenergy. Its work is organized through 11 topical Tasks which are collecting, summarizing and reporting scientific evidence in the wide field of bioenergy.

For more information see: ieabioenergy.com



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