

Global Development of the bioenergy industry

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Biomass Power ON

Copenhagen, Denmark

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World Bioenergy Association

- International association with mission to promote sustainable development of all bioenergy technologies
- Key priorities
 - International advocacy
 - Platform for promotion and engagement
 - Knowledge hub
- WBA covers all sectors of bioenergy including solid biomass, liquid biofuels and biogas



INDIA: THE NEXT BIG BIOENERGY REVOLUTION

WBA White Paper

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Design by L. Dito Branca



Pellet cookstoves An affordable and sustainable modern clean cooking solution

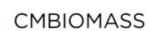
Christian Rakos, Paul Prauhart

Executive summary

In the debate on clean cooking, traditional cooking solutions such as open fire cooking or cooking in traditional charcoal stoves are contrasted to "transitional" solutions such as improved cookstoves for firewood or charcoal and "modern cooking solutions" such as LPG, electric cooking, ethanol cookstoves or biogas. This paper argues that pellet-fired gasifying cookstoves should be considered as modern cooking solution that has particular advantages in terms of affordability, use of local resources and sustainability and given more attention when advocating clean cooking.

Gasification technology allows pellet-fired cookstoves to achieve Tier 4 to Tier 5 levels of emissions and efficiencies of ISO voluntary performance standards making them a clean and highly efficient cooking solution.

WBA Membership

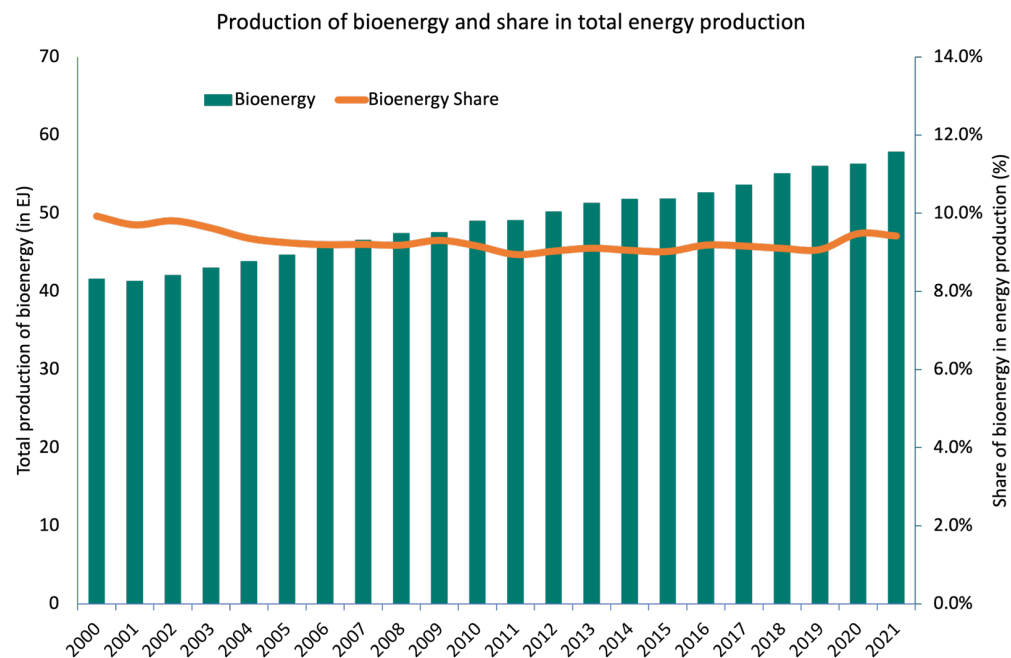


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World Bioenergy Association

Bioenergy is largest renewable energy source

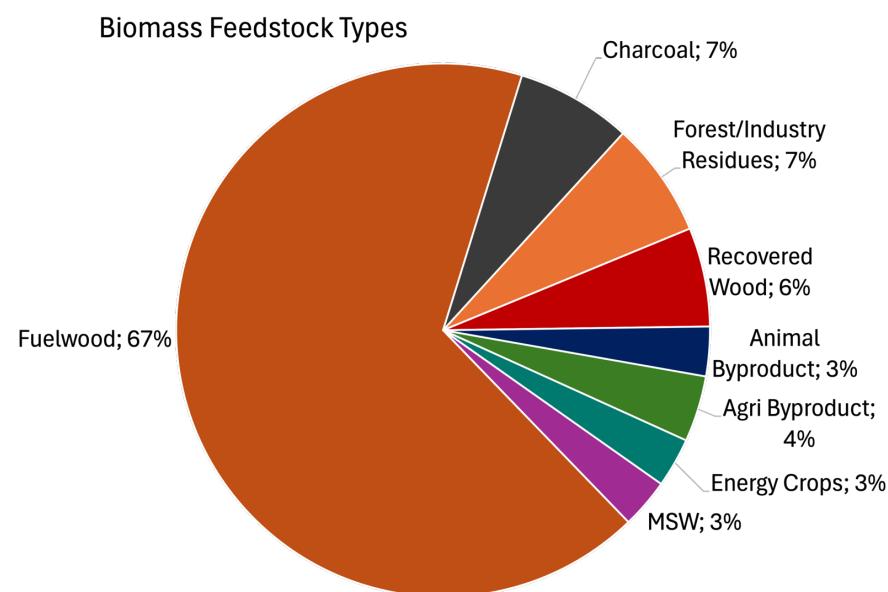
- RE share in 2022: 14%
- Bioenergy accounted for 65%
- Steady growth rate since 2000
- Government policies are major drivers
- Key obstacles – Lack of awareness, logistics, finance, perception etc.



Source: IEA Data, WBA calculations

Where does bioenergy come from?

- Typically, energy from biomass is predominantly from wood-based sources
- Forestry (Fuelwood, charcoal, residues) accounts for > 85%
- Traditional biomass accounts for half of all bioenergy
- Agriculture/Crops account for 10% - hold immense potential

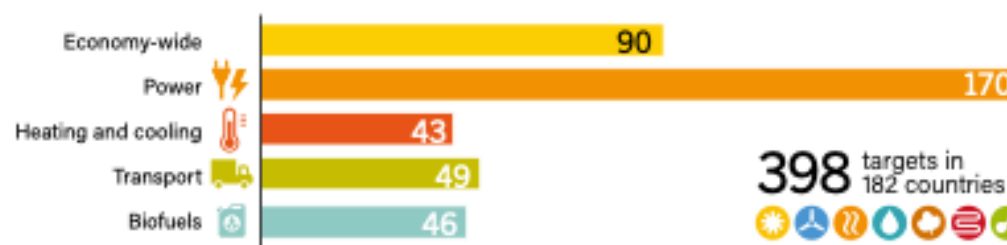
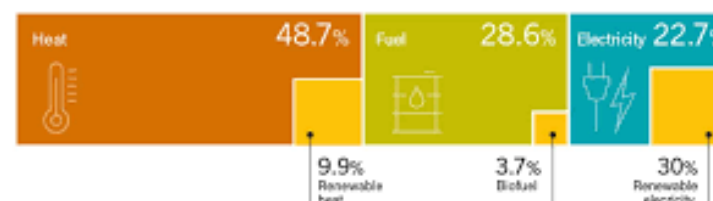


Source: IPCC Bioenergy, WBA calculations

Critical need for bioenergy solutions

- Energy demand among end use sectors varies significantly
- Disparity mainly due to significant policy support for power
- Growth of renewables is not the same among all end use sectors
- Bioenergy – one of only RE sources with solutions in all sectors

Total Final Energy and Total Modern Renewable Energy Share, by Energy Carrier, 2020

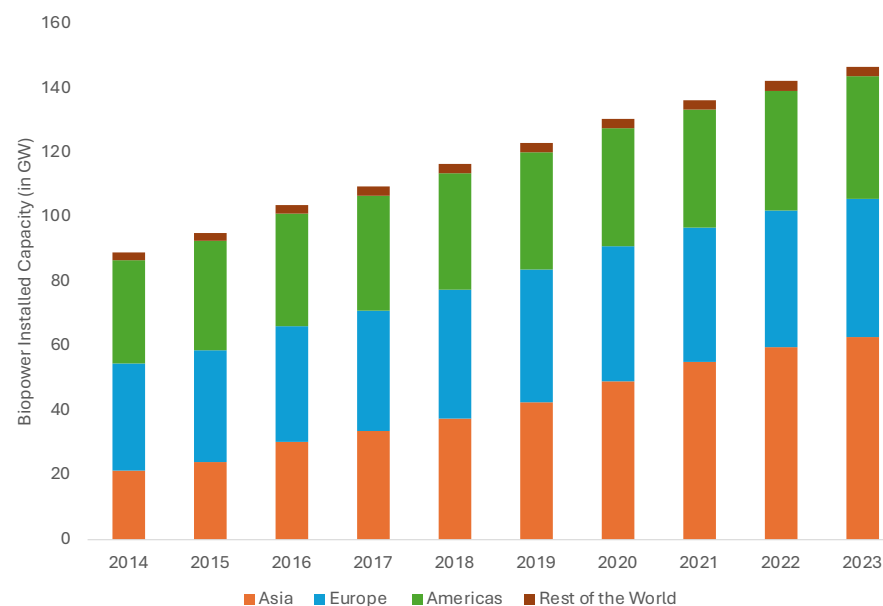


Source: REN21. See endnote 201 for this module.

Source: REN21

Biopower installed capacity

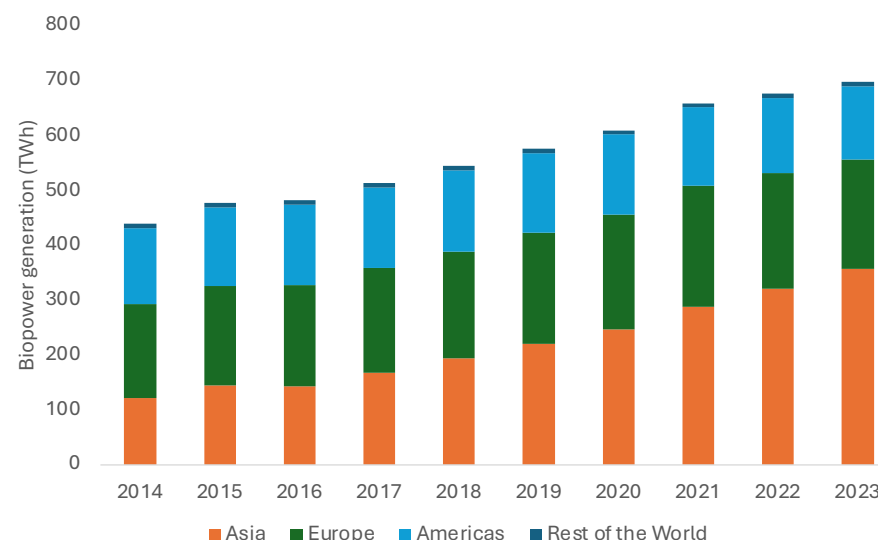
- In 2023: **150.3 GW of biomass power** was installed
- Regional policy uncertainty, high interest rates and supply chain issues were key obstacles
- Regional Insights:
 - **China and Brazil** are top 2 in terms of installed capacities
 - **United States & India:** Both contributed 11 GW each
 - **Japan:** Recorded the highest annual growth rate at 18%.



Source: IRENA

Biopower generation globally

- **697 TWh** of biopower was generated, accounting for **2.4% of global electricity**.
- **Key Contributors in 2023:**
 - **China:** Generated more than a quarter of the world's biopower at **204 TWh**.
 - **Brazil:** Produced **54 TWh**, the second-highest globally.
 - **Japan:** Contributed **49 TWh**



Source: IRENA, Ember, WBA

RE are part of mainstream

- Momentum in international energy and climate community towards phase out of all fossil fuels
- NDC's are a key driver for national policies
- Fossil fuels still account for 80% of energy mix – need all technologies and solutions for decarbonizing
- Biofuels, BECCS, biomass heat, biomethane are all needed



CNN

UK becomes the first major economy to stop burning coal for electricity, closing its last power plant

Britain's last coal-fired power plant will close on Monday, ending 142 years of coal-generated electricity in the nation that sparked the...

3 days ago



The Guardian

End of an era as Britain's last coal-fired power plant shuts down

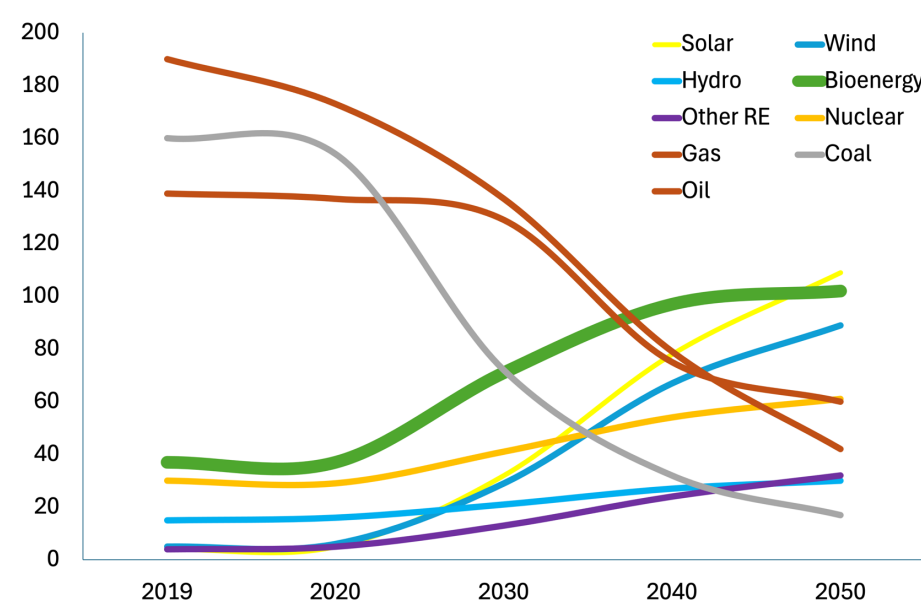
UK's 142-year history of coal-fired electricity ends as turbines at Ratcliffe-on-Soar plant in Nottinghamshire stop for good.

3 days ago



Bioenergy in NZE pathways

- Sustainable bioenergy delivers emissions reductions across a wide range of area:
 - Low emission fuels for aviation, shipping and other forms of transport
 - Replacing natural gas with biomethane and other fuels
 - Replacing coal with solid biomass fuels in large CHP facilities
 - Clean cooking solutions
- In NZE scenario, bioenergy will be the 2nd largest fuel in 2050!!

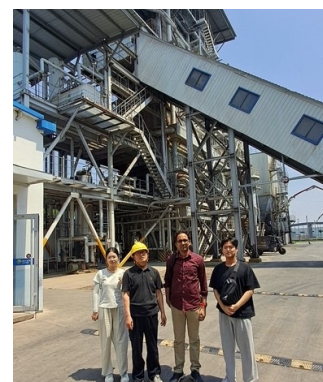


Industrial Decarbonization: Case Studies

- India
 - World's largest vaccine manufacturer
 - Agro briquettes
 - Key: Feedstock Flexibility
- Indonesia
 - MNC's focussing on shifting from gas to biomass heat
 - Significant economic savings and environmental benefits
- China
 - Export oriented company looking for green credentials and security of supply
 - Use of wood waste as primary fuel



Vaccine manufacturer – India



Food processing – China



Brewery in Indonesia

Bioenergy in India

- Biomass power has decent contribution to energy mix
- To combat environmental pollution, government driving the uptake of agro pellets in power plants
- Mandatory 5% co firing of biomass pellets (approx. 40 million tonnes)
- Current use: approx. 200k (Installed capacity: 5 million tonnes)
- Challenges remain – logistics, technology, finance



Conclusion

- Bioenergy is an important part of the current **energy mix** – more so in the future
- Critical to **communicate** better, the role of bioenergy in the international context
- **Emerging** economies need technology, policy, logistics support for deploying bioenergy at scale
- Need to strengthen **cooperation** within the sector



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