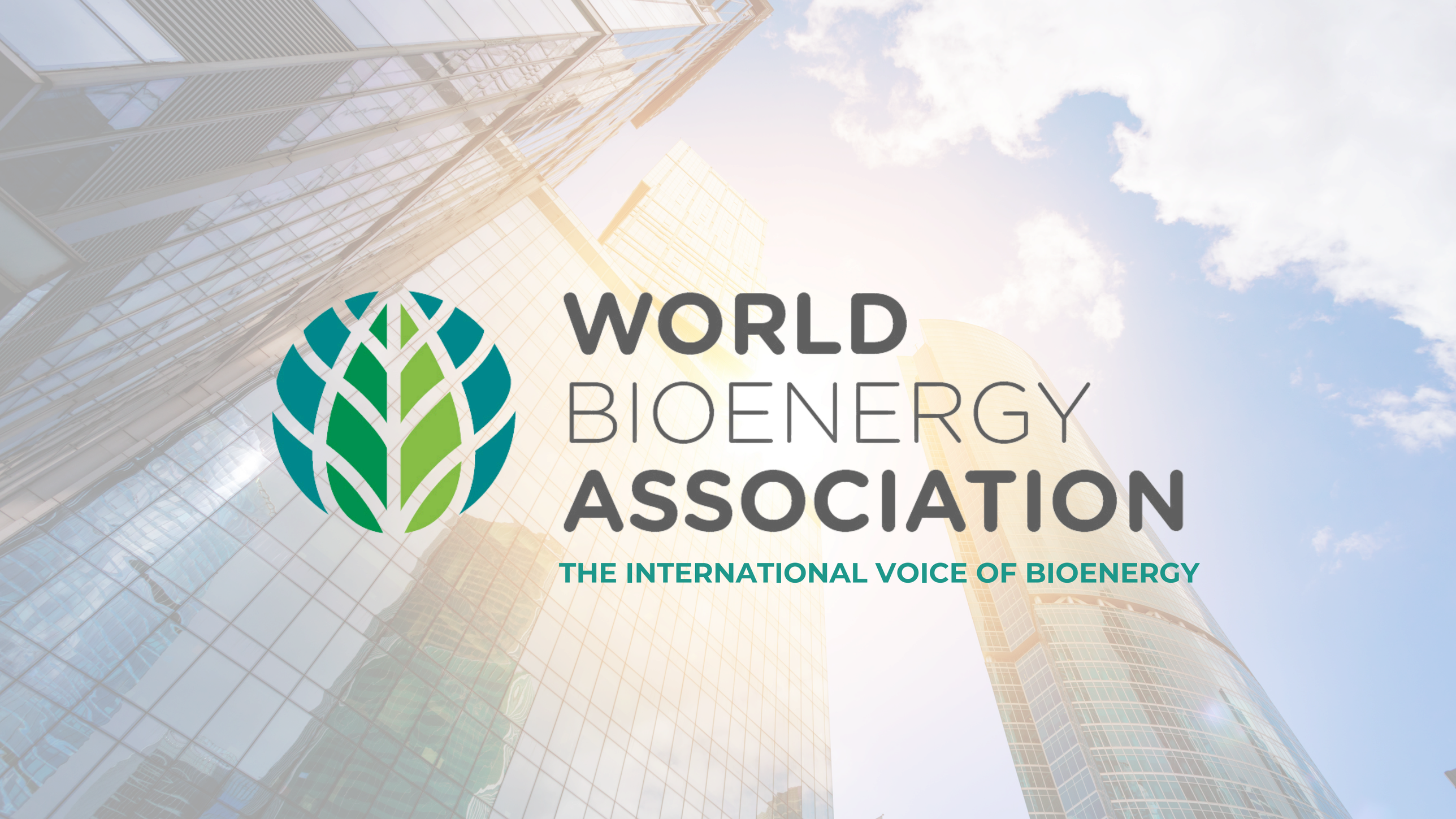


WORLD BIOENERGY ASSOCIATION

THE INTERNATIONAL VOICE OF BIOENERGY

ABOUT WBA

The World Bioenergy Association (WBA) is the global organization dedicated to supporting and representing the wide range of actors in the bioenergy sector. Our members include bioenergy organizations, institutions, companies and individuals.

ACTIVITIES

Publications

- Global Bioenergy Statistics
- Factsheets
- Mission Reports
- Policy papers

Events

- Study Trips
- General Assembly
- Webinars
- Bioenergy Associations Roundtable

Partnerships

- Observer - IRENA, UNFCCC
- Liason - ISO Standards
- Member - Go 100% RE, REN Alliance

ORGANIZATION

Alarik Sandrup
Lantmännen

Christian Rakos
Propellets Austria

Elizabeth Woodworth
US Industrial Pellets Association

Glaucia Souza
University of Sao Paulo

Guangqing Liu
Beijing University of Chemical Technology

Jamie Stephen
Torchlight Bioresources

Ketaki Kokil
Ecosense Appliances Pvt. Ltd

Christian Rakos
Renewable Energy Institute

Oscar E. Mijares
Pellet México Bioenergía

Remigijus Lapinskas
Lithuania Biomass Energy Association

Rodrigo O`Ryan
Chilean Biomass Association

Dave Lello
CEO, Ekasi Energy

Justine Akumu
Senior Energy Officer, Ministry of Energy and Mineral Development

Marion Peterson
Chief Operations Officer, Emerging Cooking Solutions

Zoltan Szabo
Ethanol Europe

Tanisha Beebee
Amandus Kahl GmbH & Co. KG

Georgiy Geletukha
Polish Chamber of Biofuels

Glaucia Souza
VP Government Affairs and Stakeholder Relations - Elimini

Board Members

Bharadwaj Kummamuru
Executive Director

Alejandra Leon
Project Officer

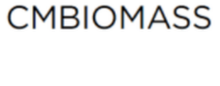
Lízia Branco
Communication Manager

Maria Zettergren
Accounts

Paul Prauhart
Research Assistant

Secretariat

OUR MEMBERS



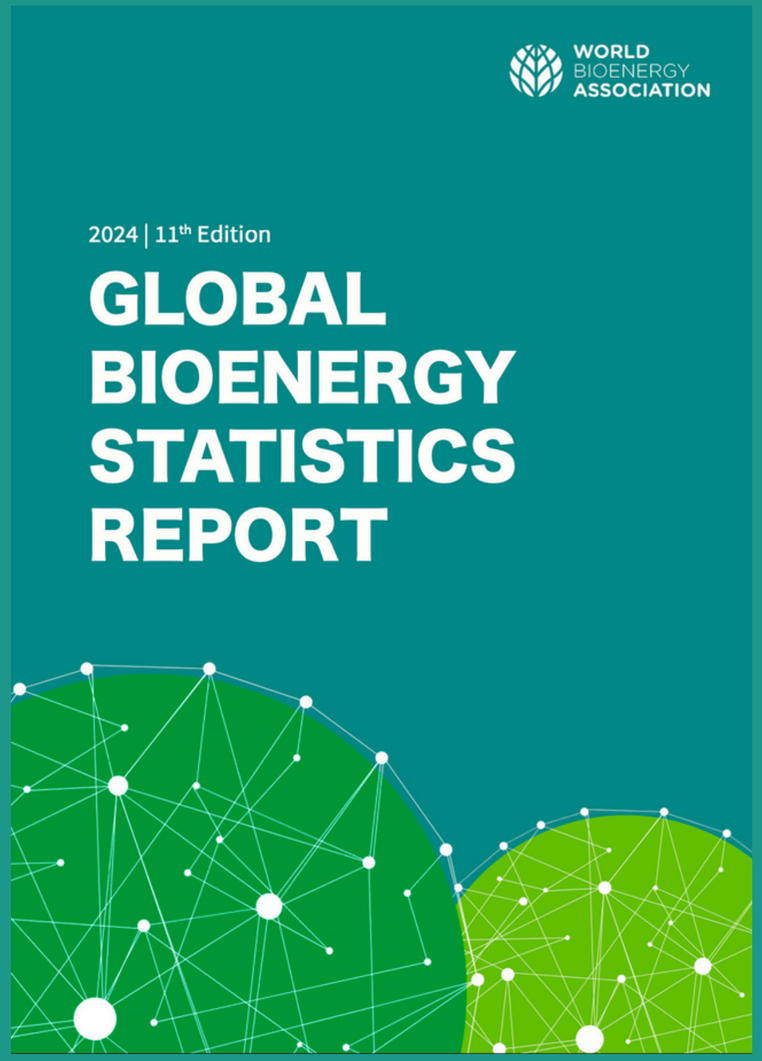
Biomass Fuel Specialist

GLOBAL BIOENERGY STATISTICS (GBS)

The Global Bioenergy Statistics report is the main annual publication of WBA.

The report focusses on the **global development of biomass to energy** – supply, production and consumption.

The data is presented on different geographical levels – global, continental and regional levels. These reports are published since 2014 and have been downloaded by governments, financial institutions, universities and companies.

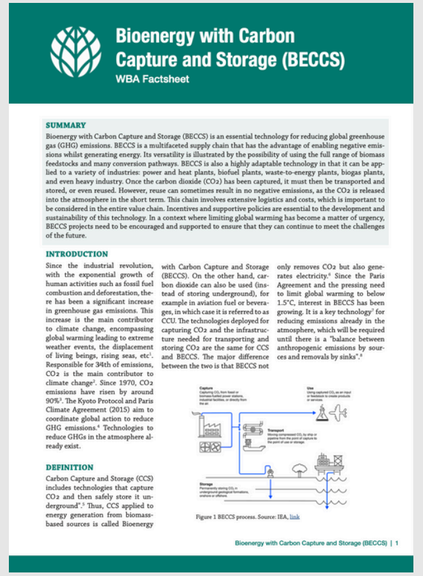


FACTSHEETS

WBA factsheets present an **unbiased** overview of bioenergy technologies and are a **guiding tool** for policy makers, researchers and companies.

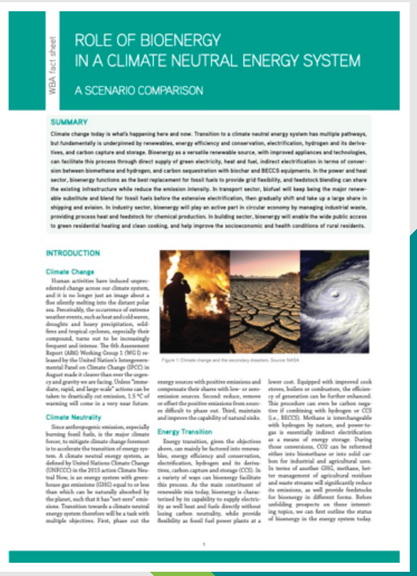
The objective of drafting and publishing factsheets is to bring **rational arguments in the public discussion** and to **support the development of bioenergy**.

All factsheets are drafted along the same outline: summary, introduction, definitions, basic figures explaining technology, policy and economics, global statistics and a brief opinion of WBA on that subject.


Bioenergy with Carbon Capture and Storage (BECCS)
WBA Factsheet
SUMMARY
INTRODUCTION
DEFINITION
Figure 1 BECCS process. Source: IEA, link
Bioenergy with Carbon Capture and Storage (BECCS) | 1


WBA fact sheet
CLEAN AND EFFICIENT BIOENERGY COOKSTOVES
SUMMARY
INTRODUCTION
BASIC COOKSTOVES


WBA fact sheet
GLOBAL BIOMASS POTENTIAL TOWARDS 2035
SUMMARY
INTRODUCTION
March 2016


WBA fact sheet
ROLE OF BIOENERGY IN A CLIMATE NEUTRAL ENERGY SYSTEM
A SCENARIO COMPARISON
SUMMARY
INTRODUCTION
Climate Change
Climate Neutrality
Energy Transition

WHITE PAPERS

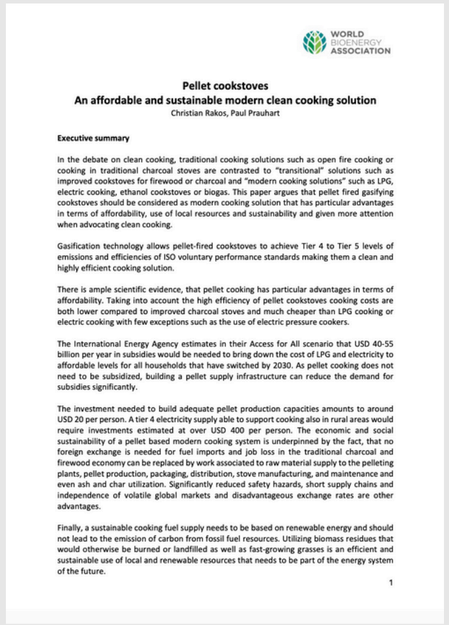
WBA white papers offer a comprehensive **overview of the bioenergy sector**, encompassing the latest data on bioenergy development, policy frameworks, financing trends, and insightful **case studies** specific to **targeted countries or regions**.

These papers go beyond conventional reports by adopting a commentary format, presenting a **nuanced qualitative analysis** infused with the **first-hand experiences** of WBA within the respective countries of study.

POSITION PAPERS

WBA frequently issues position papers to **inform the bioenergy and wider energy community** about the opinion of WBA on various technologies, policies and debates surrounding bioenergy.

These are issued either by WBA or jointly with other leading organizations.



WORLD BIOENERGY ASSOCIATION

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.

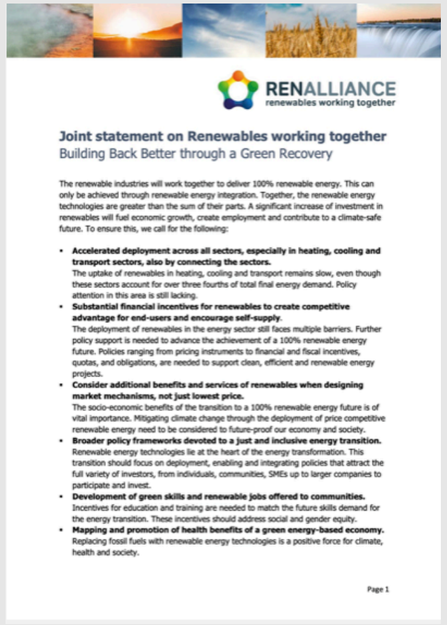
There is ample scientific evidence, that pellet cooking has particular advantages in terms of affordability. Taking into account the high efficiency of pellet cookstoves cooking costs are both lower compared to improved charcoal stoves and much cheaper than LPG cooking or electric cooking with few exceptions such as the use of electric pressure cookers.

The International Energy Agency estimates in their Access for All scenario that USD 40-55 billion per year in subsidies would be needed to bring down the cost of LPG and electricity to affordable levels for all households that have switched by 2030. As pellet cooking does not need to be subsidized, building a pellet supply infrastructure can reduce the demand for subsidies significantly.

The investment needed to build adequate pellet production capacities amounts to around USD 20 per person. A tier 4 electricity supply able to support cooking also in rural areas would require investments estimated at over USD 400 per person. The economic and social sustainability of a pellet based modern cooking system is underpinned by the fact, that no foreign exchange is needed for fuel imports and job loss in the traditional charcoal and firewood economy can be replaced by work associated to raw material supply to the pelleting plants, pellet production, packaging, distribution, stove manufacturing, and maintenance and even ash and char utilization. Significantly reduced safety hazards, short supply chains and independence of volatile global markets and disadvantageous exchange rates are other advantages.

Finally, a sustainable cooking fuel supply needs to be based on renewable energy and should not lead to the emission of carbon from fossil fuel resources. Utilizing biomass residues that would otherwise be burned or landfilled as well as fast-growing grasses is an efficient and sustainable use of local and renewable resources that needs to be part of the energy system of the future.

1



RENALLIANCE
renewables working together

Joint statement on Renewables working together
Building Back Better through a Green Recovery

The renewable industries will work together to deliver 100% renewable energy. This can only be achieved through renewable energy integration. Together, the renewable energy technologies are greater than the sum of their parts. A significant increase of investment in renewables will fuel economic growth, create employment and contribute to a climate-safe future. To ensure this, we call for the following:

- **Accelerated deployment across all sectors, especially in heating, cooling and transport sectors, also by connecting the sectors.**
  The uptake of renewables in heating, cooling and transport remains slow, even though these sectors account for over three fourths of total final energy demand. Policy attention in this area is still lacking.
- **Substantial financial incentives for renewables to create competitive advantage for end-users and encourage self-supply.**
  The deployment of renewables in the energy sector still faces multiple barriers. Further policy support is needed to advance the achievement of a 100% renewable energy future. Policies ranging from pricing instruments to financial and fiscal incentives, quotas, and obligations, are needed to support clean, efficient and renewable energy projects.
- **Consider additional benefits and services of renewables when designing market mechanisms, not just lowest price.**
  The socio-economic benefits of the transition to a 100% renewable energy future is of vital importance. Mitigating climate change through the deployment of price competitive renewable energy need to be considered to future-proof our economy and society.
- **Broader policy frameworks devoted to a just and inclusive energy transition.**
  Renewable energy technologies lie at the heart of the energy transformation. This transition should focus on deployment, enabling and integrating policies that attract the full variety of investors, from individuals, communities, SMEs up to larger companies to participate and invest.
- **Development of green skills and renewable jobs offered to communities.**
  Incentives for education and training are needed to match the future skills demand for the energy transition. These incentives should address social and gender equity.
- **Mapping and promotion of health benefits of a green energy-based economy.**
  Replacing fossil fuels with renewable energy technologies is a positive force for climate, health and society.

Page 1

WORLD BIOENERGY ASSOCIATION

WBA POSITION ON COVID19:
IMPACTS AND OUTLOOK FOR BIOENERGY

BIOENERGY AS ESSENTIAL SERVICE. Bioenergy (including solid biomass, liquid biofuels and biogas) has provided clean, on demand energy and its role in meeting end use of electricity, heating and transport fuels should be recognized as essential product and service in times of crisis.

A BIOENERGY FUTURE. Policy makers should assure investors and the wider bioenergy community of their support to bioenergy and its crucial role in reducing fossil fuel use, generating jobs, local economic development and combating climate change.

DIS-INCENTIVIZE FOSSIL FUELS. Low oil prices, low cost of renewable energy sources and the momentum towards a clean energy future provide the opportunity for policy makers to dis-incentivize fossil fuels development by eliminating subsidies, implementing carbon pricing policies and developing fossil fuel exit strategies.

BUILD BACK BETTER WITH BIOENERGY. Recognizing the crucial role of bioenergy in the global energy mix, governments should include support to sustainable bioenergy technologies and pathways as key themes at the centre of economic recovery packages. No more fossil fuel support.

TIME FOR AMBITION AND ACTION. Recognizing that we face a climate urgency, national governments must increase their climate ambition by setting long term, ambitious and stable targets for bioenergy and renewable energy.

World Bioenergy Association, Kammakargatan 22, SE 111 40 Stockholm, Sweden
Tel.: + 46 (0)8 441 70 84, info@worldbioenergy.org, www.worldbioenergy.org

June 2020

Carbon tax – key instrument for energy transition!

Global warming is the most challenging problem facing humanity today due to the excessive use of fossil fuels. Carbon tax (carbon dioxide tax) is a simple and efficient way to reduce the use of fossil fuels, improve energy efficiency, and make renewables more competitive. It can be tax neutral, as reducing other taxes will complement carbon tax implementation. It is a smart move to a more sustainable lifestyle and investment for the future. Therefore, the carbon taxes are an indispensable tool for rapid transition to a climate compatible energy system using less fossil fuel and more renewables.

- **Easy to apply**
  All countries already have some kind of energy taxation and it is administratively easy to introduce the carbon tax in all countries at a low level.
- **Easy to calculate**
  The tax is easy to calculate based on the carbon content of the fuel and the importers or big energy producers can easily estimate and pay the tax.
- **Tax neutral**
  Carbon tax must not lead to higher taxation in general. The Carbon tax can be raised at the same time as other tax is reduced.
- **Economic**
  The Carbon tax will make it more profitable to use fossil fuels efficiently, switch to renewable energy sources or to abstain from using fossil energy altogether. For countries with large fossil fuel imports, the carbon tax can stimulate the internal economy and improve terms of trade.
- **Efficient**
  The purpose of carbon taxation is not to punish people for their life style or technical equipment today, but to help them make the right choices and investments for the future.

Background and theory

Polluter Pays Principle and Carbon Dioxide Tax

Internalizing environmental costs: According to Polluter Pays Principle (PPP), emitters of CO_2 should pay a Carbon tax for their emissions and in this way pay for current and future costs caused by the emission. Hence, the environmental costs (external costs) are internalised and made a part of the total cost of the polluting activity.

Carbon content of the fuel as basis: The Carbon tax should be in relation to the emission of CO_2 by the different fossil fuels. This is well known, and in direct relation to the carbon content of each fuel.

The Swedish example: Sweden introduced carbon tax in 1990. Since then Sweden has experienced rapid economical growth and decreased carbon emissions. GDP increased by 60 percent in real terms. Greenhouse gas emissions decreased by 25 percent 1990–2014, and the use of bioenergy doubled. The diagram shows changes from 1990 (1990 = 100 percent).

Applied to all sectors: The Carbon tax should be introduced in all sectors of society. If cap and trade is used for certain sectors, Carbon taxes should be adopted for other sectors and in the long run, it should replace cap and trade system.

General acceptance needed: Initially, the level of the Carbon tax is not the main issue. More important is to get a general acceptance. Once the tax is introduced, it can be raised gradually to make it possible for companies and individuals to take action to reduce their use of fossil fuels.

A green tax shift: The purpose of the tax is not to increase taxation, but to steer the economy in a sustainable direction. Other taxes can be lowered to compensate for the raised Carbon tax, in a "green tax shift". If the tax shift is not applied, incomes from the Carbon tax can be used for research and development of renewable energy technologies or for adaptation and compensation for people affected by the emissions. ₀

SVEBIO
Swedish Bioenergy Association
Holländargatan 17, 111 60 Stockholm, Sweden
ph +46 8 441 70 80, e-mail info@svebio.se, www.svebio.se

World Bioenergy Association
Holländargatan 17, 111 60 Stockholm, Sweden
ph +46 8 441 70 84, e-mail info@worldbioenergy.org
www.worldbioenergy.org

January 2015

AEBIOM

We call upon governments to take the low price of oil as a window of opportunity to act against fossil carbon emissions!

There has rarely been such an opportunity for the global community to take action against fossil carbon emissions and global warming as there is now; in January of 2015. The North Sea Brent oil price has plummeted from 110 USD per barrel last summer to around 50 USD now, a fall of more than half, which will dramatically affect energy markets. All users of oil products at market prices around the world will now perceive their diesel, petrol and fuel oil as cheap.

This gives us a unique opportunity to introduce and raise fees and taxes on carbon dioxide emissions in all countries, keeping it painless for citizens. It represents also a chance to abolish subsidies for fossil fuels in countries with governmentally guaranteed fuel prices. The best strategy would of course be to agree a minimum carbon emission fee in the UN, but it is difficult to reach consensus by negotiation between so many countries. **Therefore every government should consider urgently acting on its own, not waiting for global agreement. There are three types of country that should take action as soon as possible:**

1. Countries that already have carbon fees or taxes should take the opportunity to raise these. As an example, in Sweden, petrol and diesel prices have decreased by over 2 SEK per litre (20 euro cents) and there is a clear opportunity to raise fuel duty by up to half that amount, without much consumer reaction. The situation is similar in all European countries, many urgently need to strengthen their state budgets by increasing revenues. Higher carbon fees, duties or a tax is one way to do it.

2. Countries with no fees or taxes on carbon emissions should introduce such measures now, both on fossil transport fuels and on fossil fuels for heating. They can introduce such taxes at a lower level, but with the current drastic fall in oil prices, even relatively high carbon dioxide fees may be accepted by consumers. The important thing is to act now, before oil prices climb again.

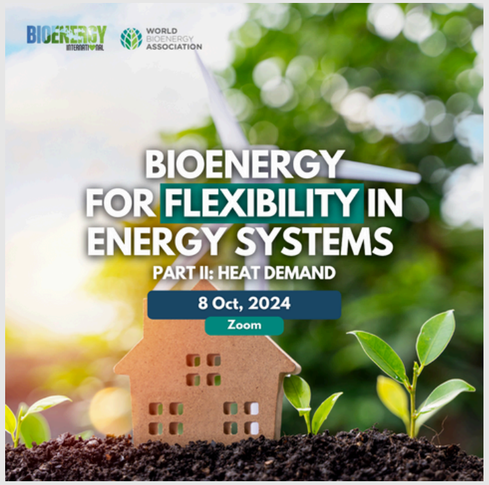
3. Finally, countries with fixed and state-guaranteed prices on fuels, many of which are oil-producing nations, should take away the guarantee. Guaranteed prices vary between country, but total subsidies are very high at the global level. When world market prices for oil were climbing some years ago this resulted in budget problems for many countries. One example is Nigeria, where President Goodluck Jonathan tried to abolish the country's fixed fuel prices, resulting in protests and rioting. Now, these countries have a chance to abolish such policies and even introduce a low carbon fee. When oil prices start to climb again, it will mainly be attributed to market prices.

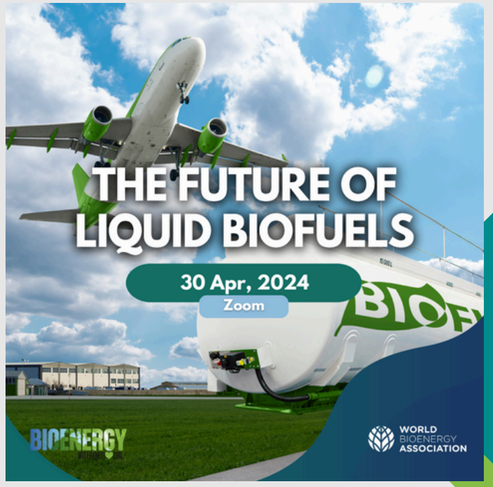
There is convincing research showing that carbon emission fees are the most efficient general method to combat climate change. The main reasons why carbon fees are so efficient are:

- Carbon dioxide fees raise the price of fossil emissions and thereby penalise fossil fuels for their negative effects on the climate. Consequently carbon dioxide fees also favour renewables and energy efficiency.
- Carbon dioxide fees are fair and logical because they are proportional to the actual emissions. Increased costs on emissions thus help individuals and enterprises to make better decisions for our common future. They can calculate new profitable investments or change behaviour to improve their economy, e.g. buy a more efficient car, insulate the house, take the bike instead of the car, or use public transport. Businesses can develop new products that can be competitive on a market where more efficient products are in demand, etc.

WEBINARS

Since the beginning of the COVID-19 pandemic, WBA started organising multiple webinars on a wide range of fields. For multiple times, representatives of exemplar organizations and associations gathered to discuss pressing subjects and to share experiences about their own line of activity. The recordings are of these events are made available to the public in our website.





We believe Africa is going to be the next very large market for pellet production and use and we can see rapidly growing numbers of inquiries and projects emerging.

Because of the enormous potential and the relevance of pellet cooking for sustainable development and climate protection the World Bioenergy Association has set up the **website www.propellets.africa** to **support African developers of pellet plants**. This website includes a section that **lists all relevant suppliers**. We have a specific **working group on advanced biomass cooking** that open for all members interested in the subject.

If you are interested in presenting your company in the Pellets.Africa website or in becoming member of the World Bioenergy Association please feel free to contact the Executive director of our organization, Mr. Bhardawaj Kumamuru: bharadwaj.v.kummamuru@worldbioenergy.org

“BIOENERGY HORIZONS”

Building on the success of “Bioenergy for the Future,” we are excited to announce the launch of our **new digital documentary series**, “**Bioenergy Horizons**”—a collaborative effort between the **World Bioenergy Association** and **BlackRook Media**.

“Bioenergy Horizons” will combine **evidence-based journalism** with compelling storytelling to present **cutting-edge innovation** and adoption across the globe.

Spanning over **50 countries**, the series will draw on the expertise of WBA members and the broader **bioenergy community**, sharing authentic, powerful stories from the heart of companies, associations, and individuals driving vital progress toward a safer, more sustainable world.

GENERAL ASSEMBLY

The WBA General Assembly is the annual gathering of our members and the wider bioenergy community. It is an opportunity for the stakeholders including private sector, associations, researchers, and civil society to discuss and debate the challenges and opportunities for the growth of the bioenergy sector.

Brazil, 2024

China, 2023

India, 2022

Austria, 2021

Sweden, 2019

COLLABORATIONS

- Observer organization, UNFCCC
- Observer organization, Green Climate Fund
- Liaison, ISO 13065: Sustainability criteria for bioenergy
- Cooperation, IRENA
- Steering Committee member, REN21
- Member, REN Alliance
- Founder, Go100% campaign
- Alliance for Rural Electrification (ARE)
- Bioenergy International Magazine
- Bioenergy Insight
- FutureIsClean campaign
- Energy Business Review (EBR)

CONTACT US

Address: Kammakargatan 22, SE-111 40 Stockholm, Sweden
Phone: +46 08 441 70 84
Email: info@worldbioenergy.org