VIENNA ENERGY FORUM-THE VEF VIRTUAL SERIES

Sustainable Energy and Food Systems-Session 5

AGRO-INDUSTRY

1. INTRODUCTION

In preparation for the 2021 Vienna Energy Forum (VEF), UNIDO and the VEF founding partners launched an online schedule of events entitled 'the VEF Virtual Series'. The purpose of the series is to discuss the role of sustainable energy and innovation in driving recovery in three sectors, namely industry, products and food systems.The Virtual Series brings together selected representatives from private sector, academia, think tanks, NGOs, CSOs and Governments to consider key issues related to each theme.

The first virtual session of Sustainable Energy and Food Systems brought together 18 experts who shared their knowledge, lessons learnt and proposed actions to identify and develop opportunities to advance the energy/food systems nexus interventions.

The session commenced with a welcome and introductions from Mr. Dejene Tezera on behalf of the VEF founding partners. He explained the motivation behind the initiative, the objectives, and the format of discussions.

This was followed by a scene-setting presentation of Ms. Passant Fouad, from Juhayna, a food processing enterprise based in Egypt. The presentation outlined the Juhayna's experience, motivation and results of integrating sustainable energy in their food production process.

The experts then joined discussions in four breakout sessions chaired by the moderators:

- Breakout Group 1, Global Perspectives: Moderated by Ms. Deepa Thiagarajan, MSU
- Breakout Group 2, Country Voices: Moderated by Ms. Cherop Soy, SDG7 Youth constituency
- Breakout Group 3, Enablers for Progress: Moderated by Mr. Olivier Dubois, FAO.

2. SUMMARY OF DISCUSSIONS

The speakers discussed the challenges and opportunities related to each of the three themes and shared their recommendations towards better alignment between the energy and agriculture sectors to accelerate the sustainable development in the target countries.
The section below provides a summary of the main discussion points and take-aways.

2.1 GLOBAL PERSPECTIVES

CHALLENGES

Energy efficiency is not the priority for farmers and often neglected in the agriculture development. Access to energy or high cost of energy is still a constraint for the SME development.

Even though agricultural biowaste has significant energy potential and have health impacts, there are gaps on laws and regulations permitting the utilization of organic waste.

Matching the right projects with the investors can increase the confidence in the investment environment. There is a gap in this area.

Finance solutions need to be more affordable for smallholders that is one of the most climate vulnerable group worldwide. There is not enough financing channelling towards smallholder farms.

In general, there is a low awareness of available sustainable energy technologies that can be integrated into food-systems in developing countries.

OPPORTUNITIES

There are several opportunities for sustainable energy use in the agro-industry to create low carbon emission pathways such as circular economy solutions, organic waste utilizations to produce energy and green fertilizer, mini-grids to replace diesel generators, increase access to cold storage, irrigation and clean drying.

There is still an enormous potential of sustainable energy use in food-systems in developing countries. India is a good example where:

1. Total savings from replacing conventional pumps with solar-powered pumps adds up to US $25.7 billion annually. India is the world's leader in deploying solar water pumps (more than 300,000). It has ambitious plans worth $18 billion to deploy more than 2.5 million solar water pumps for irrigation by 2022.
2. Beyond irrigation, CEEW has estimated a market potential of more than $50 billion in India alone for solutions such as cold storages, food processing machines, etc.
3. This market is now being tapped into because there is an ecosystem of contributors, which blends government policy and finance, civil society to support new rural enterprise creation, private sector innovation for last-mile delivery and pooled funding among donors and investors to create capital scale

2.2 COUNTRY VOICES

CHALLENGES

Energy is not the priority: Energy and energy efficiency is not at the core of the business for the agricultural sector, these types of changes are typically difficult to implement since they require behavioural changes.

Smallholder farmers: Additionally, there are financial barriers where small enterprises do not have resources to invest in new technologies.

Common challenges in developing countries: There is a lack of awareness of stakeholders on the benefits of energy efficiency and renewable energy. There is a lack of technical capacities and a supportive policy environment.

Examples from countries:

Ukraine: The policy framework in Ukrainian legislation has gaps. It is difficult to conduct an environmental impact assessment since there are no existing guidelines for the emerging technologies. Additionally, there is a lack of qualification and capacity for clean energy projects. The logistics for a circular economy strategy is not cost effective since there is no market mechanism for CO2 reduction in Ukraine at the national level.

Bangladesh, the agro-industries are not in the priority of the national government. It is a big challenge to make this sector a priority.

OPPORTUNITIES

Large companies are starting to require net zero targets creating a business case for implementing energy efficiency measures and renewable energy solutions upstream. This creates a push for companies in the supply chain to invest in sustainable energy technologies to comply with the environmental expectations of their clients.

Biochar: using 1 ton of biochar = avoids the equivalent to 3 tons of CO2eq
Gasification: For each megawatt that an agroindustry generates using a gasification solution will avoid the equivalent amount of CO2 emissions of, at least 4300 diesel trucks on a yearly basis.

2.3 ENABLERS FOR PROGRESS

CHALLENGES

Financial barriers: Some technologies must be imported, which adds to the investment costs of RE technologies which are already high. Government must develop investment promotion programs.

Lack of communication between Agriculture and Energy ministries. Agriculture Ministries usually take for granted that energy is given. In FAO they have a working group involving relevant ministries to develop an enabling environment.

There is a lack of focus on the synergies of the users of energy in rural areas.

OPPORTUNITIES

Feed-In-Tariffs/Policies in the electric grids: When in a country there is no legal possibility to sell electricity to the grid, there is a strong need to match the peak production of the RE system with the actual consumption or self-consumption of the plant/industrial plant. Hence, some systems must reduce their size to avoid the excess of peak energy (i.e., in the middle of a sunny day, in the case of PV). Therefore, if there is a possibility to sell that excess energy, it is possible to size the average power, leading to economies of scale effect on the CAPEX, leading to a more comfortable investment and the matching of the loads.

Technical assistance: Companies that opt for transitioning to RE and get technical advice from other entrepreneurs/companies or governmental entities will benefit from their savings in terms of finance, CO2 emissions avoided, environmental penalties, and the strengthening of their image due to the change.

Market led model can bring possibilities to break the higher front costs around financing, even for limited capacity institutions to implement RE.

There is a high value added on luxury items produces by small farms for the global market. The added value provides an opportunity for big companies that buy from small farms to provide and incentive/finance RE technology projects in these small farms. Hence, this is a niche for the government and the private sector. However, the challenge will be to make sure that the value-added trickles down to small farms.

Inclusive agribusiness model: Working with cooperatives and linking the data they produce towards the expertise of technologies where specific delivery models can be deployed. Models that can possibly break the affordability barrier and avail the farmers.

3. RECOMMENDED ACTIONS

On the basis of the discussions held during this session, the following recommendations were proposed to address the three key issues, and the broader theme:

3.1 GLOBAL PERSPECTIVES

Smallholder agriculture: we need more polices and financing aiming at smallholder agriculture to increase efficiency of smallholder farmers.

We should have available tools to assess sustainability in food–, agri-industry value chain.

When designing the sustainable energy interventions in agro-industry, analyze the components such as:

- general sustainability assessment of the industry, GHG emissions being one of the important indicators
- environmental and social impacts
- quantify sustainability of the value chain

Reduce **farmers' exposure to the sustainable energy costs**: reform and reduce subsidies of fossil fuels for farmers in the intensive farming.

Promote **more collaboration** with energy and water stakeholders through integrated policy planning of water and energy.

Bioenergy systems utilizing biowaste can create green energy and green fertilizer. Modern biomass technologies is an integrated solution for hybrid systems such as cooling, PV by providing base load, due to its high availability compared to solar and wind. Commercial scale bioenergy systems using agricultural residues can create employment along the supply chain and generate income (organic fertilizers).

3.2 COUNTRY VOICES

Circularity/bioenergy: Creating circular economies is a clear path to enhance efficiencies and lower the carbon footprint. Agro-industries need to incorporate their waste biomass to their energy source. Proven technologies are more accessible and allow efficient use of biomass as a fuel at smaller scales than previously thought. Thailand: Sustainable Energy and Agro-industry System Indication. Example: Thailand produces a lot of tapioca starch, during the process there is a lot of wastewater. They successfully produce biogas utilizing wastewater as feedstock to produce heat to dry the tapioca starch and electricity.

Prosumers: Converting agro-industries into energy co-generators and potentially tri-generators, in the form of cold water or air, is the doorway for better food production with much less carbon emissions.

Develop specific clean energy strategies to make the sustainable energy technologies more competitive in the long and short run.

Future planning of food security: Governments must analyze and identify what their citizens are consuming, in terms of food, now and what they will eat in the future to achieve food security.

3.3 ENABLERS FOR PROGRESS

Stop fossil fuel subsidies: Governments must stop subsidizing fossil fuels. The projects in the global south often fail when it becomes clear that they are competing against heavily subsidized fossil fuels. The investment is no longer viable for the for an agri-business – e.g., for a processing unit that is running on diesel (boilers or generators). One must invest in the beginning of a RE project, and when competing with subsidized fossil fuels, the amortization time is too long, making it unattractive intervention. Governments must consider the angles often neglected such as comparing the health impacts and costs of fossil fuel-based economy to the value addition, environmental, social, economic, job creation benefits of renewable energy. Governments should champion the recognition of the environmental and social benefits. These will only be able to unravel if they provide incentives.

Supportive policies and standards: Development of a supportive and regulatory framework that focuses on RE&EE. Investing in RE&EE research, knowledge, and skill development, with a focus on linkages with Industry 4.0. Governments must get involved with quality standards for products and services that deliver RE&EE solutions within the food value chain. E.g., minimum energy performance standards, EnMS Certifications.

Energy efficiency focus should not be neglected and be an integral part of in the sustainable energy policies: For instance, tax exemption on EE appliances, mechanisms, subsidies, financing the substitution of highly energy consuming appliances.

Enable local innovation and innovators: Locally driven innovation may not always have to be 'top notch'; they can be more frugal but if they meet the micro businesses in the food industry to become more energy efficient and sustainable and the long run then they shall be encouraged to be used. Frugal innovation can often play a big role. Part of being an enabler for progress from governments entails how to push for more R&D and the commercialization of innovations that fit different markets. Not all the technologies have to come from one same region. There are opportunities for young people, technologists, and engineers to optimize energy systems using digital tools when it comes to analyzing e.g., energy losses, energy mechanisms (heat driven or solar).

Governmental incentives to ultimately optimize the use of national energy sources within a country (e.g., Feed-In-Tariffs): Regulations and policies allowing selling electricity to the grid provide investors to make use of the excess electricity of variable renewable energy sources (such as PV). This results in economies of scale effect on the CAPEX, leading to a more comfortable investments and the matching of the loads. This in turn will remove some of the load from the grid (costing less maintenance money to the government), incentive companies to sell their excess electricity and optimize the system.

Focus on enterprise level interventions: Energy companies have their role to play but it is better to focus on integrate RE production on the site (within the agro-industry enterprises) to create added value and increase the reliability of feedstock supply in the case of bioenergy systems.