

Sustainability of bioenergy

The experience of the Global Bioenergy Partnership (GBEP)

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GBEP - Working together since 2006



International initiative established to implement the commitments taken by the **G8 in 2005** and receiving renewed mandates from **G7 and G20** since then. The initiative is aimed to promote bioenergy for sustainable development.

Brazil and USA Co-Chairs.

FAO is a founding partner and hosts its Secretariat at FAO HQ in Rome.

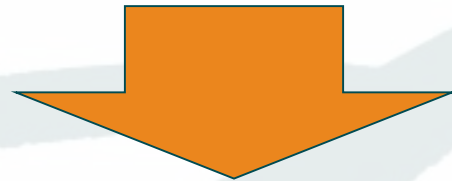
39 Partners and 45 Observers

(Governments and International Organizations)

SUSTAINABILITY is key

Modern bioenergy presents excellent OPPORTUNITIES to decarbonize agriculture and forestry sectors
but not without CHALLENGES.

Focusing on SUSTAINABILITY IS KEY to take out the best of opportunities.



The Global Bioenergy Partnership (GBEP)

has developed the **most widely recognized** and agreed set of **indicators** for the assessment and monitoring of bioenergy sustainability

GBEP Sustainability Indicators (GSI) for all types of bioenergy

ENVIRONMENTAL

1. Lifecycle GHG emissions
2. Soil quality
3. Harvest levels of wood resources
4. Emissions of non-GHG air pollutants, including air toxics
5. Water use and efficiency
6. Water quality
7. Biological diversity in the landscape
8. Land use and land-use change related to bioenergy feedstock production



**THE GLOBAL BIOENERGY
PARTNERSHIP SUSTAINABILITY
INDICATORS FOR BIOENERGY**
FIRST EDITION

ECONOMIC

17. Productivity
18. Net energy balance
19. Gross value added
20. Change in consumption of fossil fuels and traditional use of biomass
21. Training and re-qualification of the workforce
22. Energy diversity
23. Infrastructure and logistics for distribution of bioenergy
24. Capacity and flexibility of use of bioenergy

Implementation of the GSI

Implemented the GBEP indicators in the process of implementation

ECOFYS

UN environment programme

SQ sustainable quality CONSULT

NL Agency Ministry of Infrastructure and the Environment

NL Agency Ministry of Economic Affairs, Agriculture and Innovation

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Ethiopia; Kenya; Jamaica; Vietnam

Pilot GBEP for Bioenergy

Análisis sostenibilidad para las bases de datos

Life Cycle Summary August, 2018

GBEP Sustainability Project Development

Sustainability of Biogas and Solid Biomass Value Chains in Ethiopia

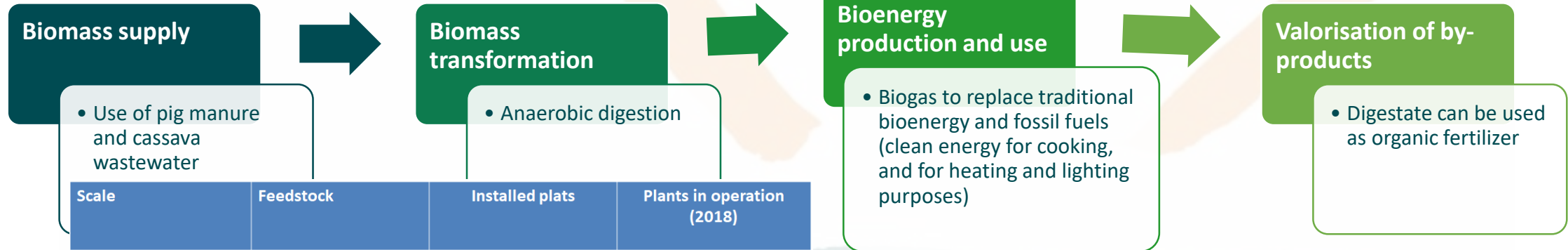
TECHNICAL REPORT

SEI World Agroforestry Centre

Stathmore University

Heidelberg, Darmstadt, Berlin November 2018

Biogas from pig manure and cassava wastewater in Viet Nam



- Use of pig manure and cassava wastewater

- Anaerobic digestion

- Biogas to replace traditional bioenergy and fossil fuels (clean energy for cooking, and for heating and lighting purposes)

- Digestate can be used as organic fertilizer

Scale	Feedstock	Installed plats	Plants in operation (2018)
Small (10 m ³)	Pig manure	450 000	405 000
Medium (500 m ³)	Pig manure, cassava wastewater	14 370	12 933
Large (2 000 m ³)	Pig manure, cassava wastewater	1 000	900

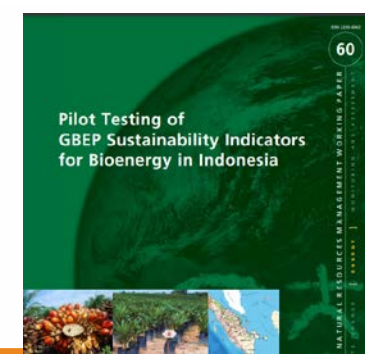
Sustainability

- Reduced health risks (ind. 15)
- Demand for skilled jobs (ind. 12)
- Reduced household expenditures on energy (ind. 11)
- Digestate as biofertilizer for improved soil quality and better food security and nutrition (ind. 10)

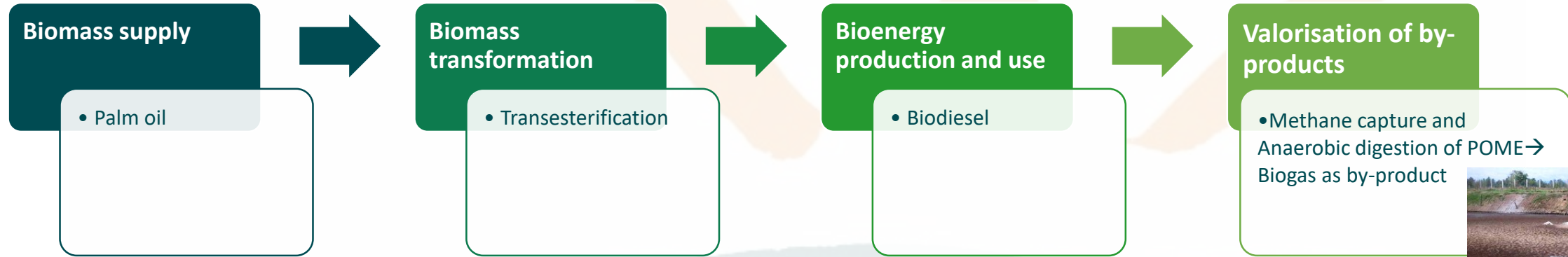
Recommendations:

- Poor management of ADs to be improved to maximize benefits and reduce risks (digestate discharge, methane leaks and poor efficiency) → capacity development for farmers
- Promotion of power generation from surplus of biogas with use of generators at farm and industrial levels (avoiding gas venting/flaring)
- Micro-financing schemes to support AD installations 7 buy generators at household level

Palm oil in Indonesia - Improving value chains through circular economy approach – POME in Indonesia



CASE STUDIES



Sustainability aspects:

Sustainability concerns

- GHG profile to be improved
- Land Use Change
- Biodiversity concerns
- Land Tenure structure

Opportunities

- Income for smallholders
- Increased Energy access
- Clean cooking, health implications

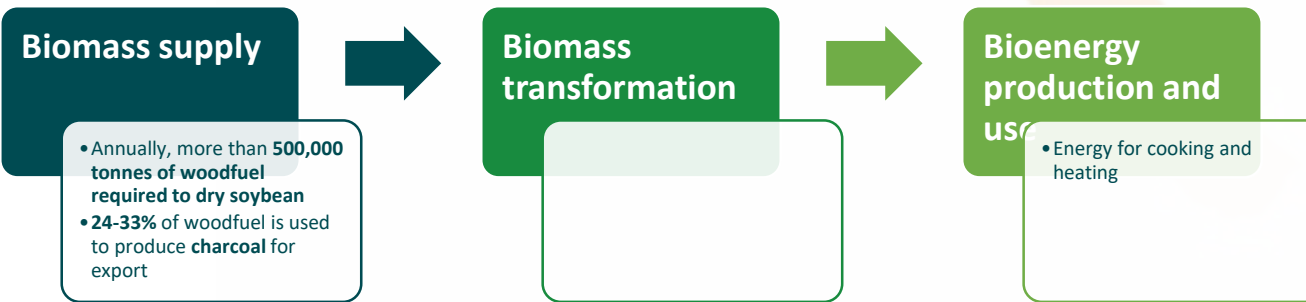
Recommendations:

- POME anaerobic digestion must be incentivised through both waste regulation and biogas/biomethane incentivisation policies
- Co-benefits
 - Reduce GHG lifecycle emissions through reduced CH4 emissions and reduced dependence on fossil fuels for industrial activities
 - Reduce soil contamination and improve water quality
 - Enhanced access to modern energy services
 - Biofertilizer for improved soil quality and better food security and nutrition

Forest biomass for bioenergy – Supply and demand in Paraguay



CASE STUDIES



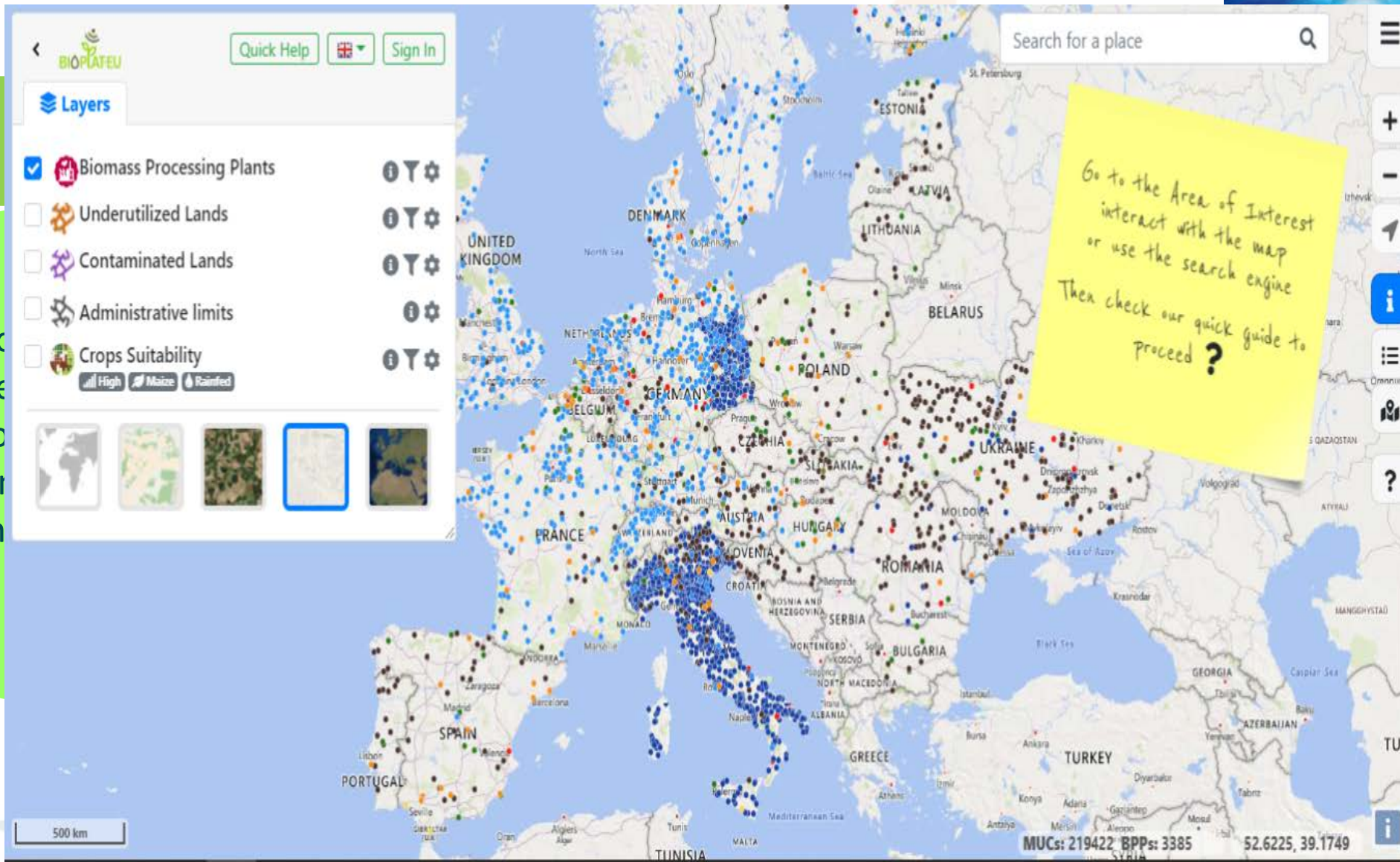
	Sectors	From... (t/y)	...to (t/y)
Demand	Household	4 100 000	6 100 000
	Industrial	4 415 000	6 047 000
	Total	8 515 000	12 147 000
Sustainable forest biomass supply for bioenergy production	Total	927 560	1 162 365
Net balance	Total	-7 587 440	-10 984 635

Recommendations:

1. Incentivize the **sustainable management of productive native forests**, for example, incentivizing sustainable forest management practices.
2. **Maximise control over, and sanction of, deforestation and of the illegal trade of forest products and by-products.**
3. Guarantee the **traceability** of biomass products and by-products (e.g. charcoal).
4. Promote the introduction of **improved biomass cookstoves** for households, and at the industrial level promote the use of chips instead of fuelwood and charcoal

This negative balance between supply and demand of wood from sustainable production is one of the major drivers of deforestation in Paraguay after forest conversion to agricultural land and pastures

GSI in EUROPE – H2020 EU-funded projects



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Thank you



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