



Ministry of Industry and Trade



Implemented by

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# Challenges and opportunities for bioenergy market in Viet Nam



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# CURRENT STATUS OF BIOENERGY IN VIETNAM



# FEEDSTOCKS

## Main types of biomass



### Agricultural waste

- Rice husks and straw
- Garbage from corn
- Coffee waste
- Coconut shell
- Waste from sugarcane (bagasse, top, leaves)
- Peanuts byproducts
- Cashew nut shell
- Cassava root
- Other types

### Energy crops

- Energy plants (fast growth and high calorific value)
- Elephant grass
- Other types

### Waste from forests

- Wood fuel and firewood
- Bamboo
- Others (activated carbon)

### Other types

- Garden plants and family plants
- Wood for construction
- Wood waste from processing factories (wood shavings, sawdust)
- Scattering trees, etc.

# FEEDSTOCKS

## Main types of biogas



Livestock waste



Cassava waste



Organic municipal waste

# INSTALLED CAPACITY IN 2021

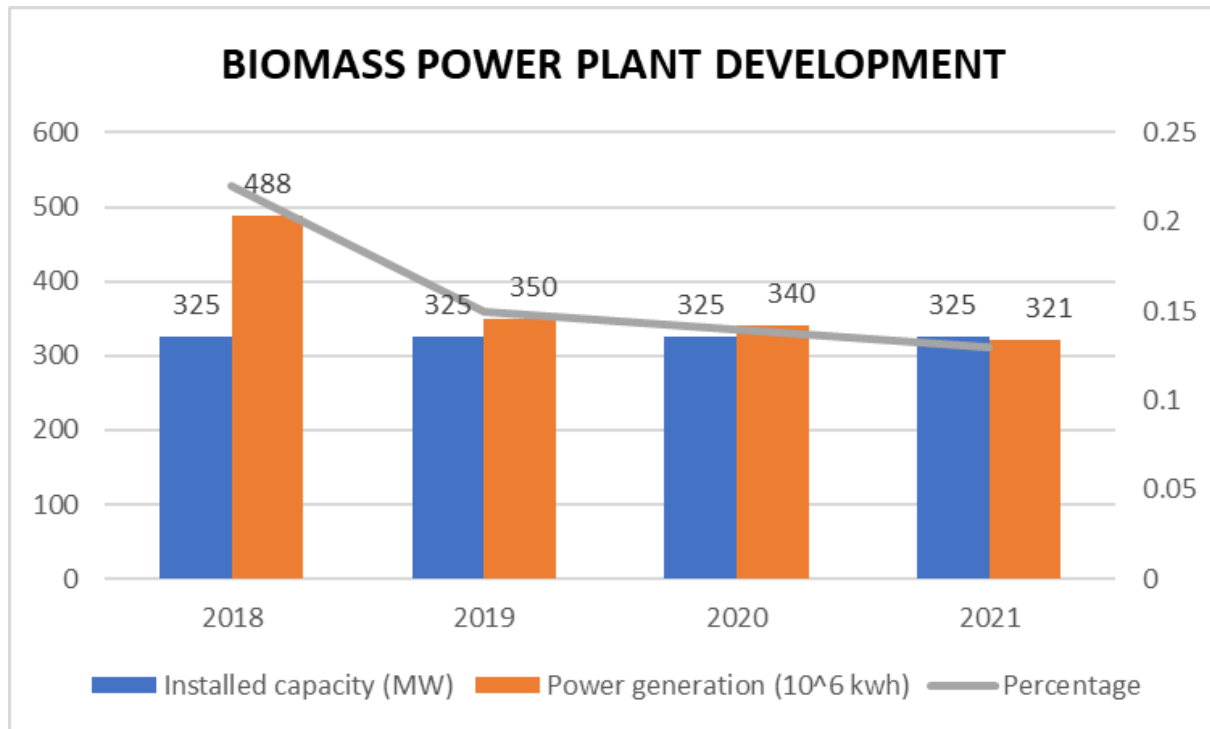
Type of source	Installed capacity (MW)	Percentage (%)
Hydro power plant	17,491	22.36%
Coal thermal power	25,397	32.47%
Oil thermal power	1,579	2.02%
Small hydro power plant	4,648	5.90%
Gas power plant	24	0.02%
Gas turbine	7,398	9.46%
biomass PP	325	0.42%
Wind	4,126	5.27%
Solar farm	8,872	11.38%
Rooftop solar	7,760	9.92%
Imported electricity	572	0.73%
Diesel	24	0.03%
<b>Total</b>	<b>78,219</b>	<b>100%</b>

# ELECTRICITY GENERATION IN 2021

MWh

Type of source	Powe generation	%
Hydro power plant	78,553	30.59
Coal thermal plant	119,024	46.36
Gas turnie	26,315	10.25
Wind power plant	3,344	1.30
Solar farm power plant	14,848	5.78
Rooftop solar	12,940	5.04
<b>Biomass power plant</b>	<b>321</b>	<b>0.13</b>
Diesel	5	0.00
Imported electricity	1,403	0.55
<b>Total</b>	<b>256,753</b>	

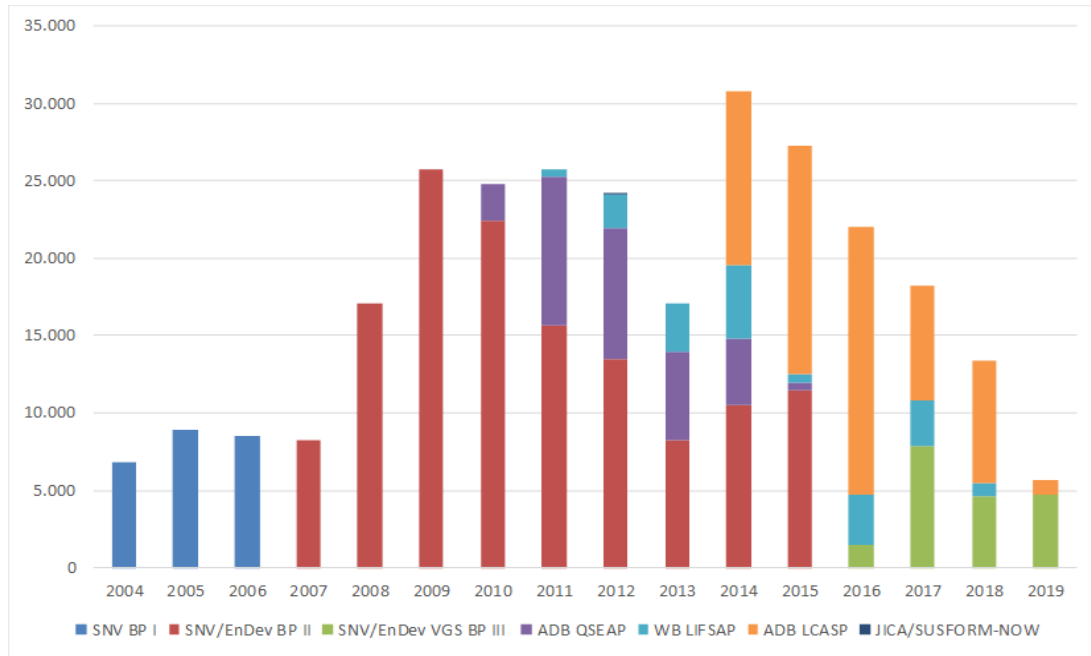
# LOOKING BACK...BIOENERGY DEV.





# LOOKING BACK...BIOENERGY DEV.

## NUMBER OF SMALL-SCALE BIOGAS PLANT



# Substantial Potential of Bioenergy for Viet Nam

<b>Potential of Biomass Power Plants (referring to 2035)</b>	Power
	(MW)
Rice husk (Source: IE Nov 2021)	370
Wood-Firewood from forest industry (Source: IE Nov 2021)	3.360
Bagasse Sugar Industry (Source: IE Nov 2021)	470
Rice straw (Source: IE Nov 2021)	1.324
Woodfuel from wood plantations (Source: IE Nov 2021)	1.300
Others from agricultural residues (Source: IE Nov 2021)	360
Pulp & Paper Industry (Source: Nguyen Thuy Hien, 2005)	200
Co-Firing Biomass in coal power plants from wood pellets export / 3.0 mio ton 2020 (Source: FutureMetrics,USA, 2021)	900
Biogas to Bioenergy (Source: GIZ, 2021)	1.377
<b>Total Potential</b>	<b>9.661</b>
Bioenergy potential versus 2020 coal power:	47,1%
Bioenergy potential to reduce CO2 emissions caused by coal power	47,1%

Sources: listed in the table, Bloomberg, Estimations and calculations by E.Quadrat

# DEVELOPMENT ORIENTATION OF BIOENERGY IN VIETNAM



# Key policies and support mechanisms for bioenergy in Viet Nam

## Orientations for Vietnam's national energy development strategy up to 2030, vision to 2045 (Resolution No. 55, dated 11/02/2020)

- Strongly encourage the development of **biomass energy**
- Highly promote investment in **biomass power plants**
- Focus on utilization for **cogeneration from biomass sources**

## The Viet Nam Renewable Energy Development Strategy (VREDS) up to 2030, vision to 2050 (Decision No. 2068, dated 25/11/2015)

- The share of **electricity produced from biomass sources** is expected to reach approx. 3.0% in 2020; **6.3% in 2030** and **8.1% in 2050**.
- The share of **heat produced from biomass sources** is expected to reach approx. 17% in 2020; **14% in 2030** and **12% in 2050**.

# Key policies and support mechanisms for bioenergy in Viet Nam (cont.)

## The Viet Nam Power Development Plan for the period 2011-2020, consideration to 2030 revised *(Decision No. 428, dated 18/03/2016)*

- Next to capacity targets specified for wind and solar, the share of **electricity produced from biomass sources** is expected to reach approx. 1% in 2020, **1.2% in 2025** and **2.1% in 2030**.
- Further development of biomass power sources through applying **cogeneration** method in **sugar mills and food processing plants as well as co-combustion of biomass and coal in coal-fired power plants**, etc.

# Key policies and support mechanisms for bioenergy in Viet Nam (cont.)

- ✓ Electricity of Vietnam (EVN) purchases all generated power of renewable energy powerplants.
- ✓ Validation of power purchase agreement is 20 years.
- ✓ Electricity price subject to adjustment according to USD/ VND exchange rate.
- ✓ Incentives on investment capital and taxes (exemption / reduction of import tax, corporate income tax).
- ✓ Land incentives: land use levy exemption / reduction.

# FIT mechanism to develop bioenergy

Type of RE	Status		FIT (UScents/kWh)	Note
	Current	On proposal		
Biomass	FIT (CHP)		<ul style="list-style-type: none"> <li>- Combine heat production (CHP): 7.03</li> <li>- Non-CHP: 8.47</li> </ul>	Decision No. 24/2014/QĐ-TTg dated on 24/3/2014 & Decision No. 08/2020/QĐ-TTg dated on 05/3/2020
Waste	FIT		<ul style="list-style-type: none"> <li>- Solid waste landfills: 7.28</li> <li>- Directly incinerated: 10.05</li> </ul>	Decision No. 31/2014/QĐ-TTg dated on 05/5/2014
Biogas		x	No have	

# Opportunities and challenges





# Opportunities

- Biofuels have **great potential** for production of electricity
- Vietnam's demand for energy and electricity is enormous
- Had mechanisms for biomass power and electricity garbage projects
- Co-firing of biomass in coal power plants (approx. 3 million tons of wood pellets) being currently exported abroad, which equal up to 900MW of coal power replacement and respective CO<sub>2</sub> emissions;

# Challenges

- Lack of stability and sustainability of the fuel supply;
- Feedstock prices change seasonally
- Issued incentive mechanism is not attractive yet, it based on technology leads to difficult to implement
- Bagasse biomass power plants can operate both in and off season, however we don't have mechanism to encourage
- No have mechanism to encourage biogas electricity
- No have the understanding of the potential of short term use of wood-pellets in coal power plants

# RECOMMENDATION



# Recommendation

- Turn waste to produce biogas electricity bring multi benefits, the GoV should have incentive mechanism
- FIT biomass: Must be reviewed and should not be based on type of bioenergy technology
- Bonus for international efficient state-of-the art technology
- Have study to utilize the wood pellets co-firing in coal power plants
- **Have closely cooperation among three Ministries: MARD, MONRE and MOIT**

# Thank you!

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