



# ALTERNATIVE FUELS FOR **GREENER** MOBILITY

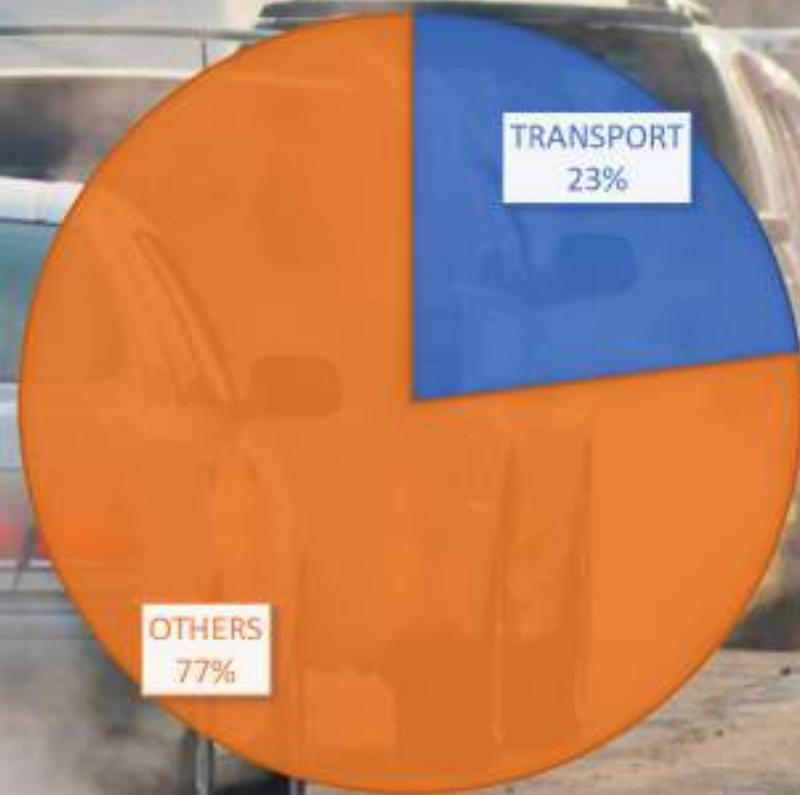




# ALTERNATIVE FUELS FOR **GREENER** MOBILITY



## GHG EMISSIONS



ALTERNATIVE FUELS FOR **GREENER** MOBILITY





# ALTERNATIVE FUELS FOR **GREENER** MOBILITY





# ALTERNATIVE FUELS FOR **GREENER** MOBILITY





# World Health Organization

ALTERNATIVE FUELS FOR **GREENER** MOBILITY



**BIOGAS**  
ASIA PACIFIC FORUM





6.1 MILLION

ALTERNATIVE FUELS FOR **GREENER** MOBILITY



**BIOGAS**  
ASIA PACIFIC FORUM





ALTERNATIVE FUELS FOR **GREENER** MOBILITY





# 3.3 MILLION

ALTERNATIVE FUELS FOR **GREENER** MOBILITY



- MANILA -



ALTERNATIVE FUELS FOR **GREENER** MOBILITY



- DELHI -

ALTERNATIVE FUELS FOR **GREENER** MOBILITY



- KUALA LUMPUR -



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ALTERNATIVE FUELS FOR **GREENER** MOBILITY



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Biodiesel



2<sup>nd</sup> Gen.  
Diesel



Ethanol



Natural Gas



Propane



Electricity



Hydrogen



ALTERNATIVE FUELS FOR **GREENER** MOBILITY



# GAS FUELS

ALTERNATIVE FUELS FOR **GREENER** MOBILITY



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ALTERNATIVE FUELS FOR **GREENER** MOBILITY





AUTOGAS

- 74%



AUTOGAS

- 81%



DIESEL



DIESEL

ON AVERAGE, COMPARED TO DIESEL

ALTERNATIVE FUELS FOR **GREENER** MOBILITY





**27**  
**MILLION**  
**AUTOGAS VEHICLES**

**ALTERNATIVE FUELS FOR GREENER MOBILITY**



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ALTERNATIVE FUELS FOR **GREENER** MOBILITY





**-17% GHG Emissions**



**-11% GHG Emissions**

**ALTERNATIVE FUELS FOR GREENER MOBILITY**





26  
MILLION  
NATURAL GAS VEHICLES

ALTERNATIVE FUELS FOR **GREENER** MOBILITY



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# WHAT IS BIOGAS?



ALTERNATIVE FUELS FOR **GREENER** MOBILITY



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# ANAEROBIC DIGESTION



FOOD WASTE



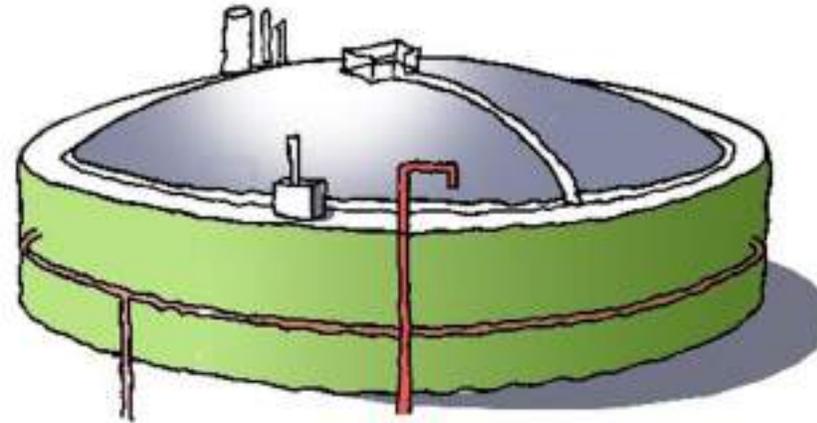
WASTEWATER



AGRICULTURE



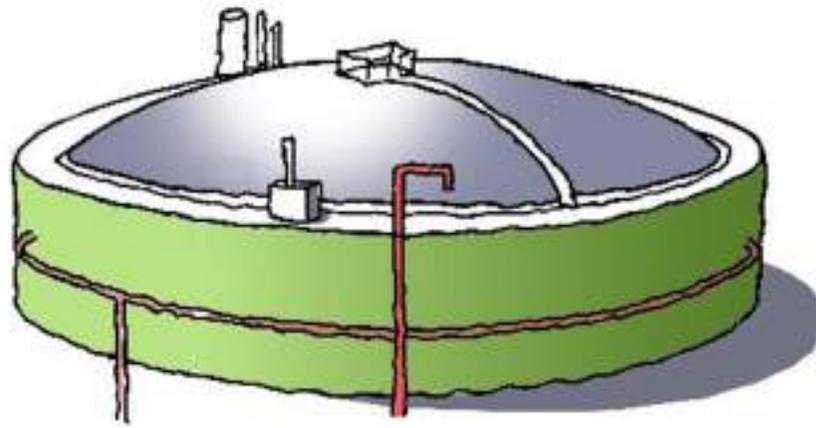
ANIMAL WASTE



Hydrolysis  
Fermentation  
Acetogenesis  
Dehydrogenization  
Methanogenesis



# ANAEROBIC DIGESTION



Hydrolysis  
Fermentation  
Acetogenesis  
Dehydrogenization  
Methanogenesis



METHANE



CLEANER WATER

**CO<sup>2</sup>**

CARBON DIOXIDE



BIO-SLURRY



BIOGAS

[www.apacbiogas.org](http://www.apacbiogas.org)



**WASTE**



**DIGESTION**



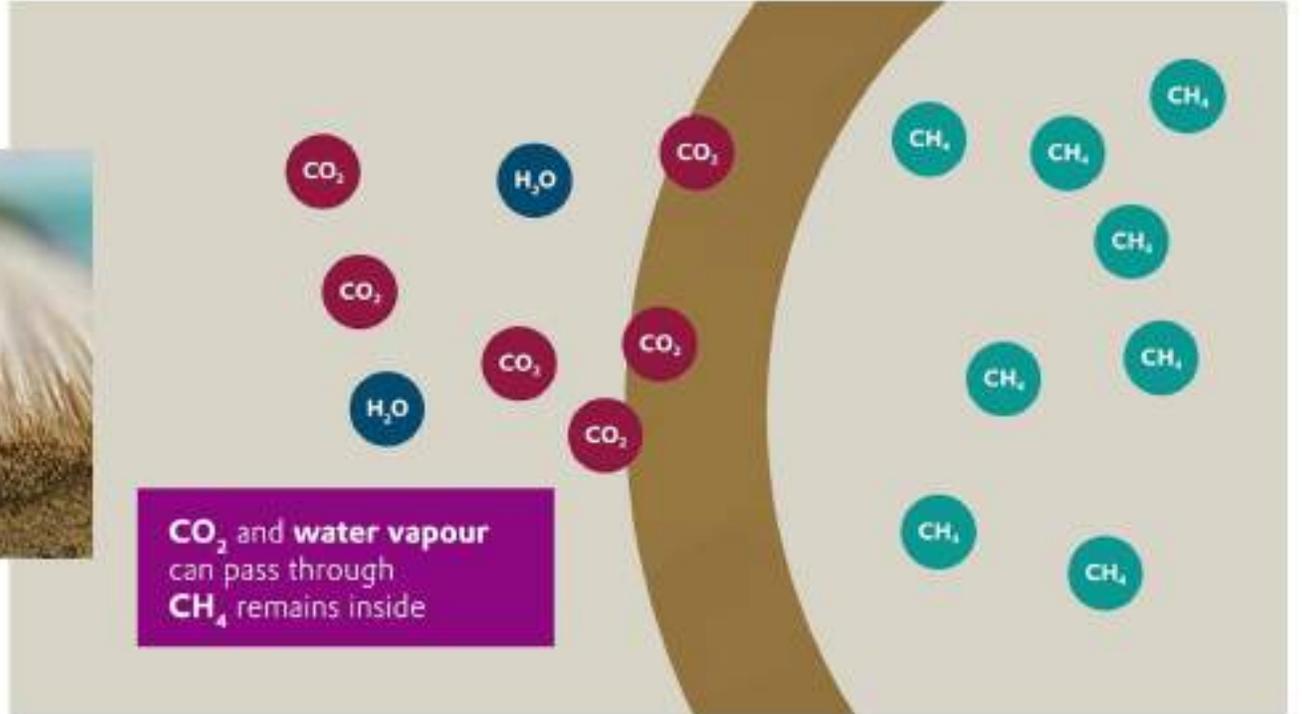
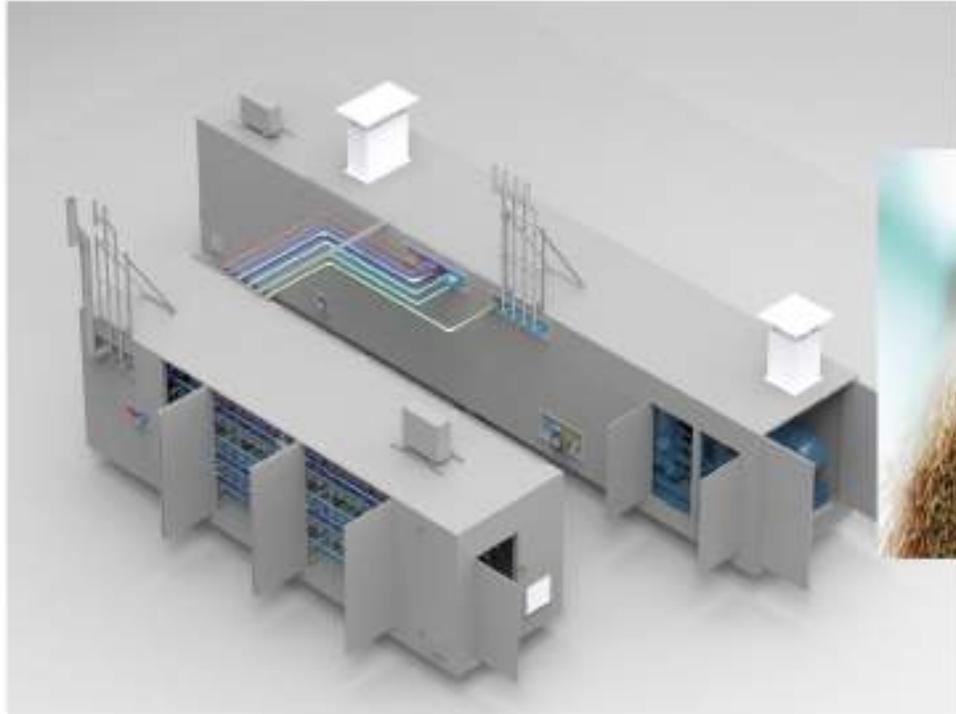
**UPGRADING**



**FUEL**

**ALTERNATIVE FUELS FOR GREENER MOBILITY**





ALTERNATIVE FUELS FOR **GREENER** MOBILITY



# BIOGAS FOR TRANSPORTATION

CHIANGMAI, THAILAND



ALTERNATIVE FUELS FOR **GREENER** MOBILITY



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# BIOGAS FOR TRANSPORTATION



ALTERNATIVE FUELS FOR **GREENER** MOBILITY

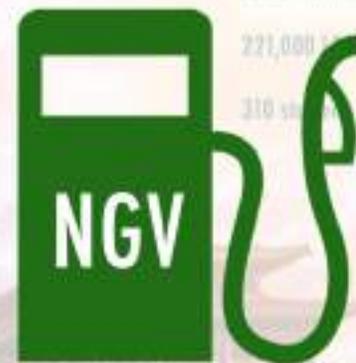




6,080,000



6,737



8,400



>100,000



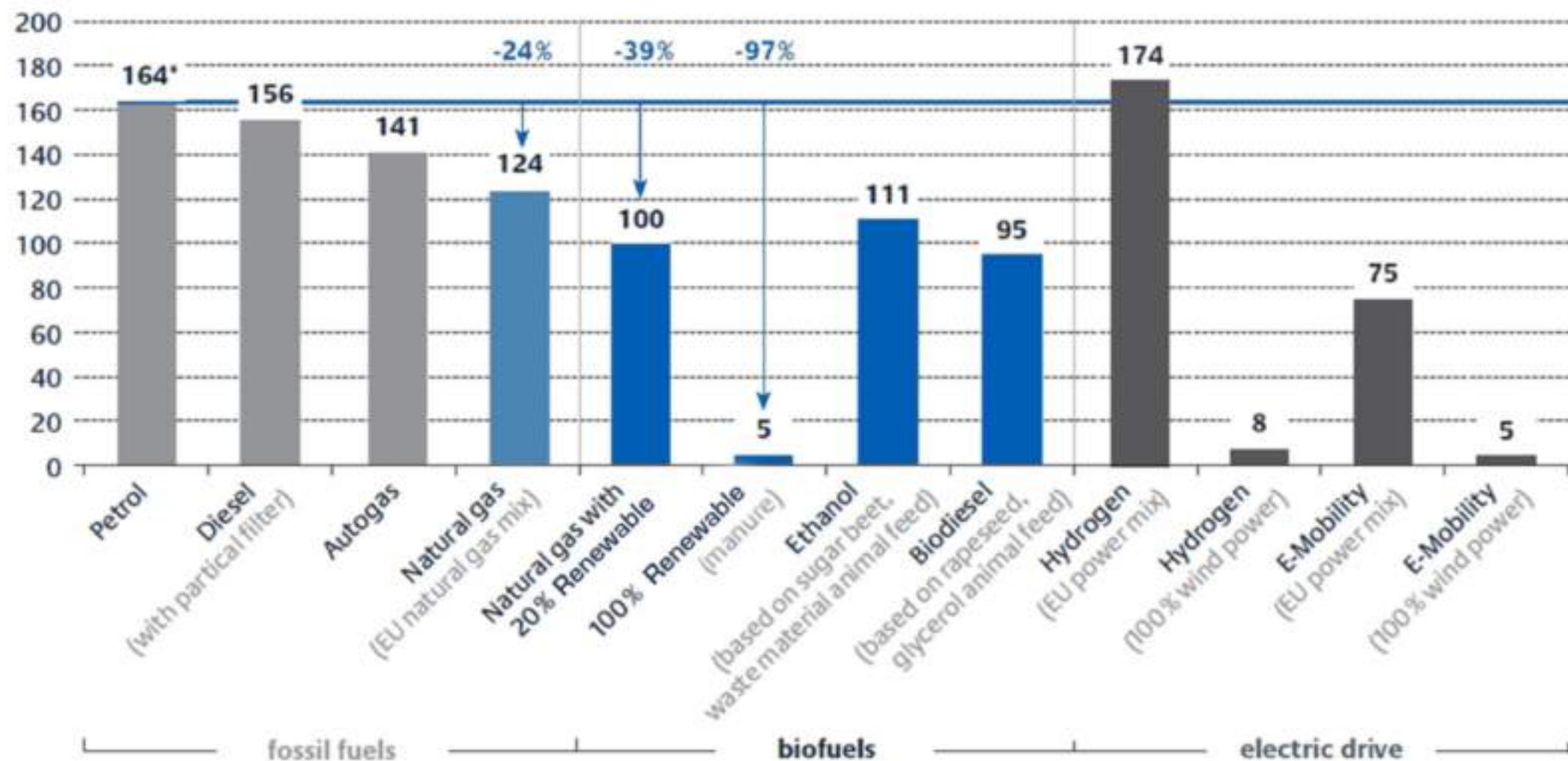
310

6,080,000 NGV  
8,400 stations  
221,000  
310

ALTERNATIVE FUELS FOR **GREENER** MOBILITY



WTW GHG emissions in g CO<sub>2</sub> eq./km



\* reference vehicle: gasoline engine (induction engine), consumption 7l per 100 km

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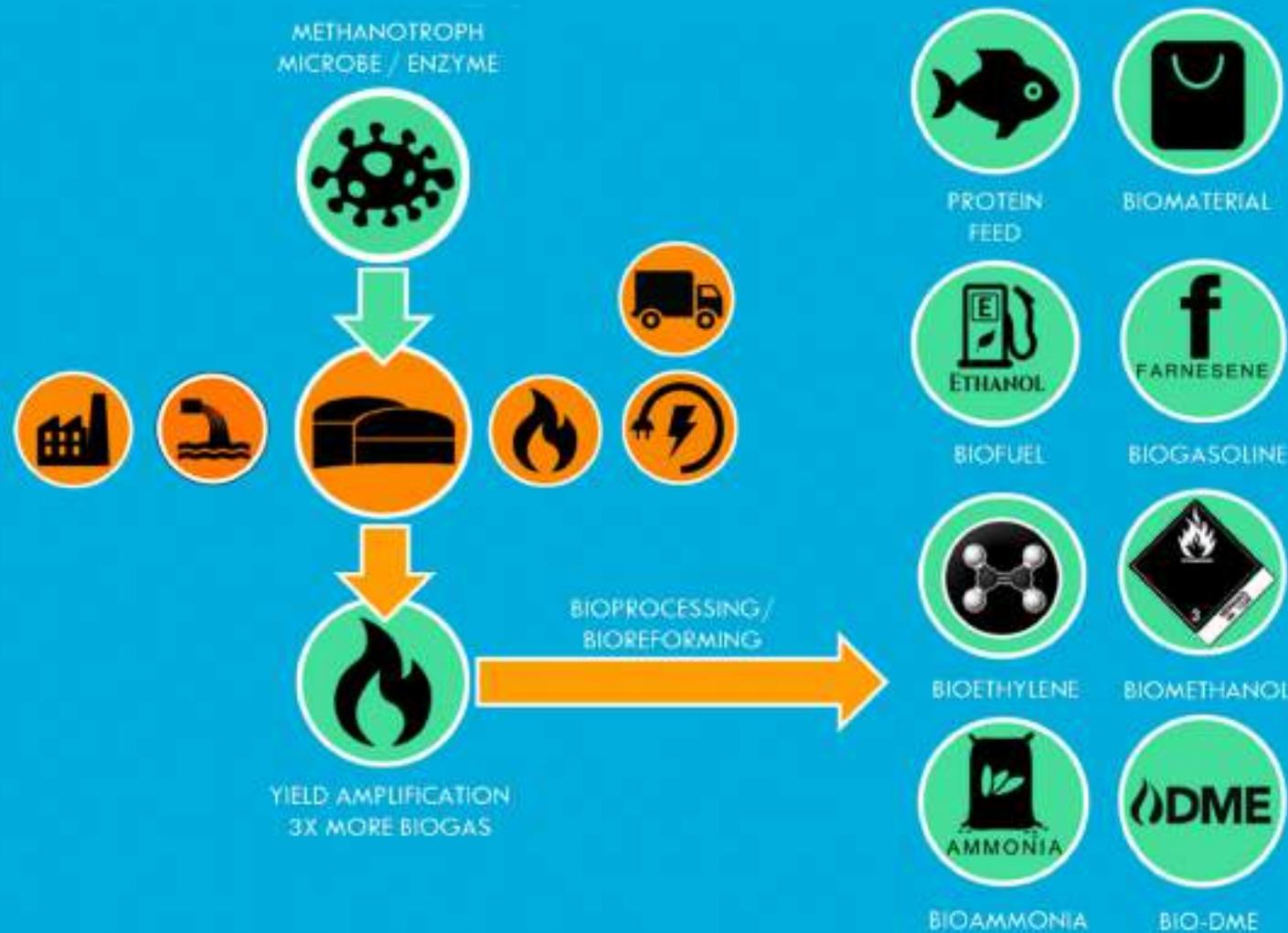


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