



Biomass



Fundamental of
Renewable
Energy

2 - 3 Febuari 2021

Cawangan Kejuruteraan Elektrik

Introduction

- The oldest source of energy
- Useful for heating & electricity
- Enough biomass resources in the world to cover world's energy demand
- Any organic matter (excluding fossil fuels), that was or is a living organism available on renewable basis and can potentially be used as fuels
- A product of photosynthesis and is a carbon, hydrogen & oxygen based



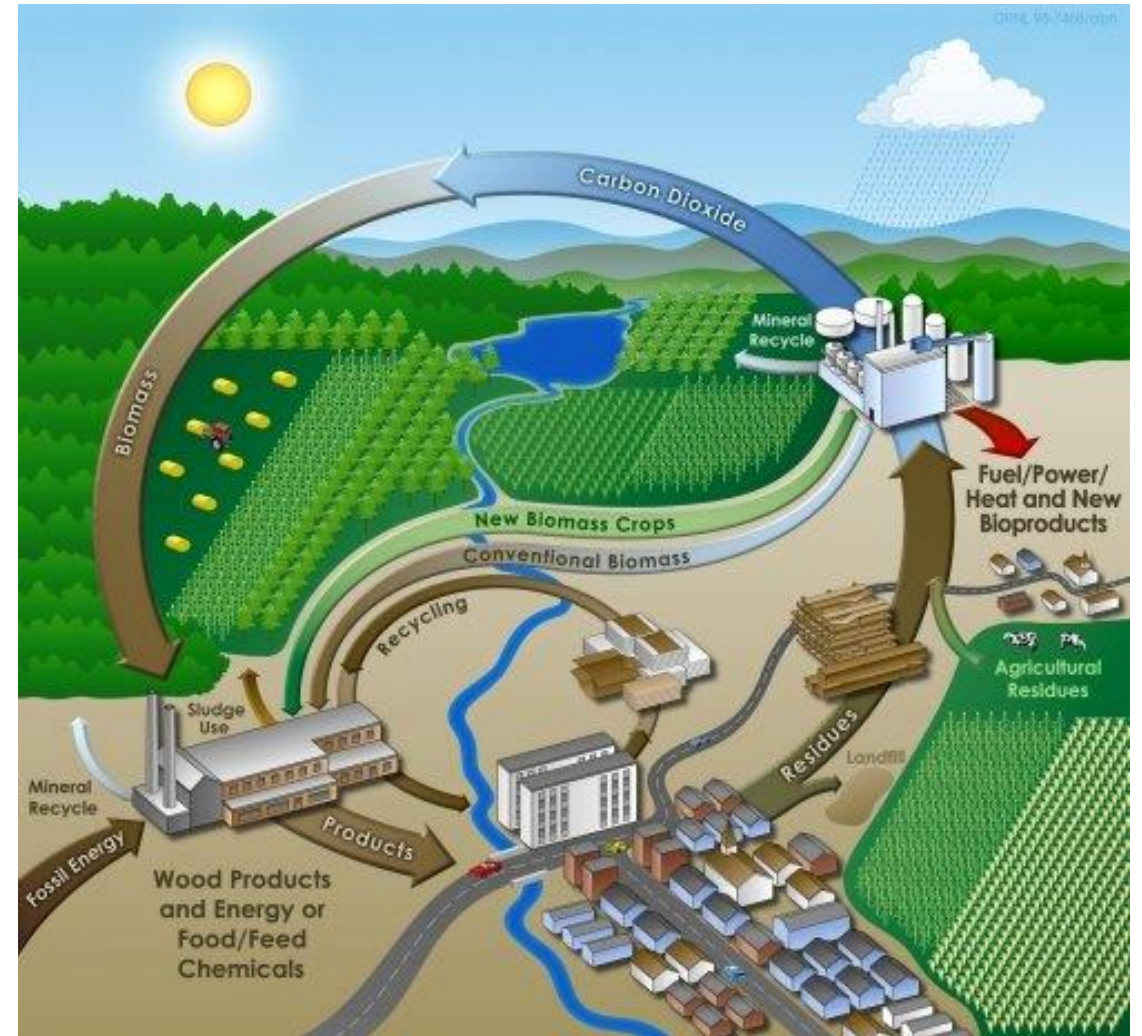
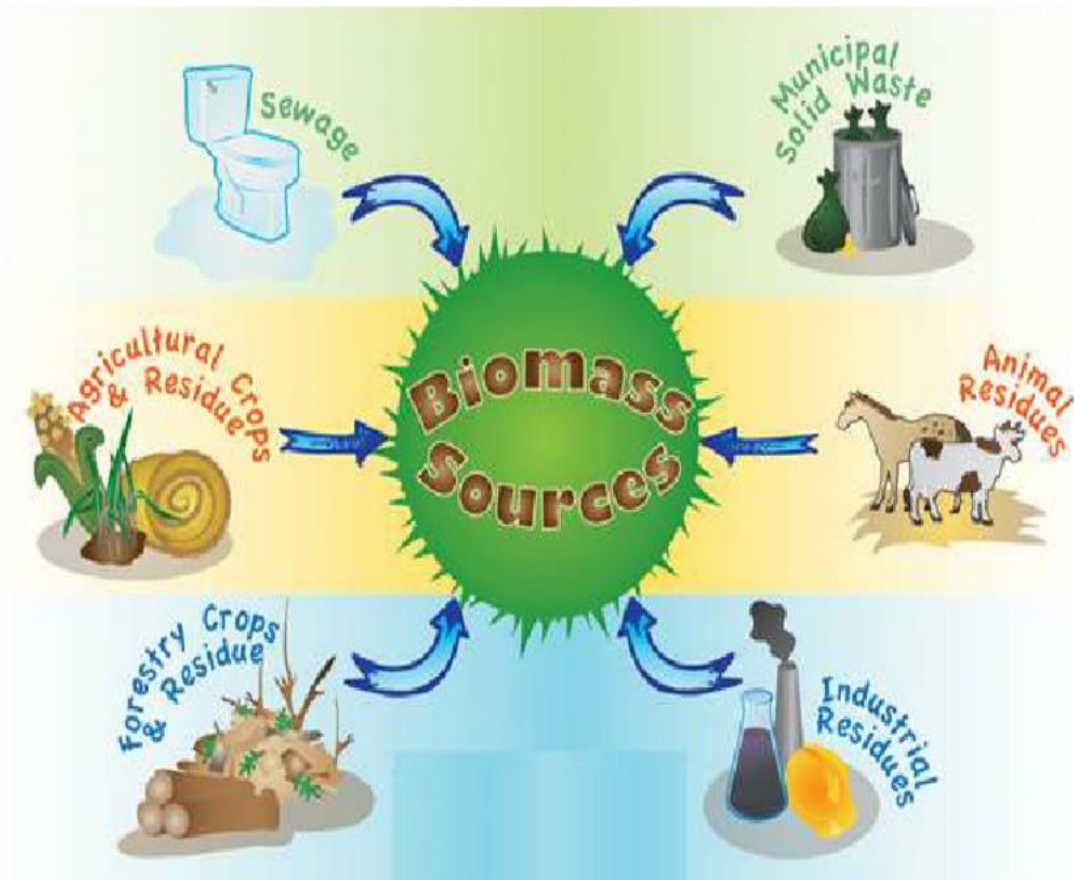
Heat can be used to cook, boil water



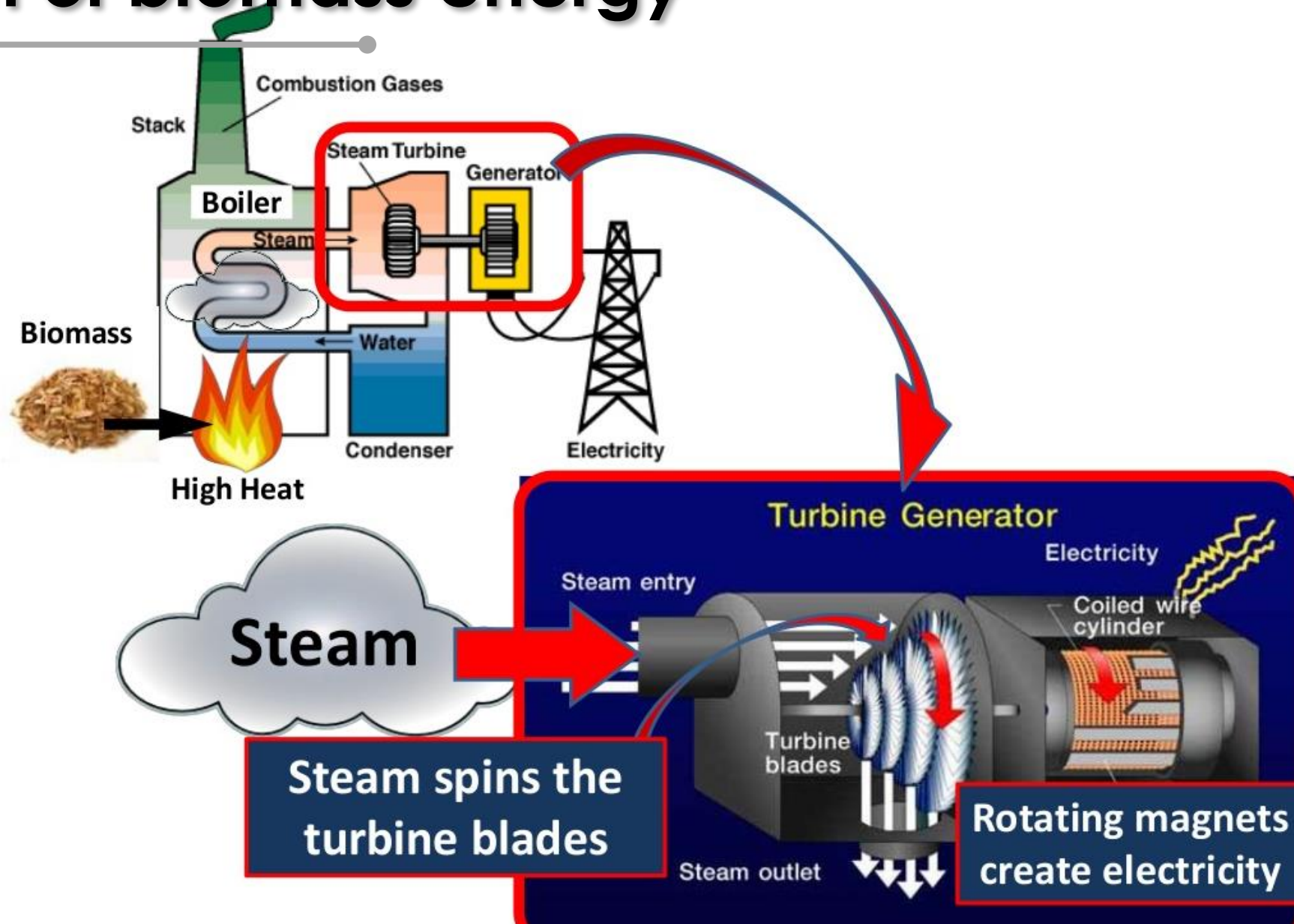
We can use fire to make steam,
and make steam do work for us



Biomass sources & cycle

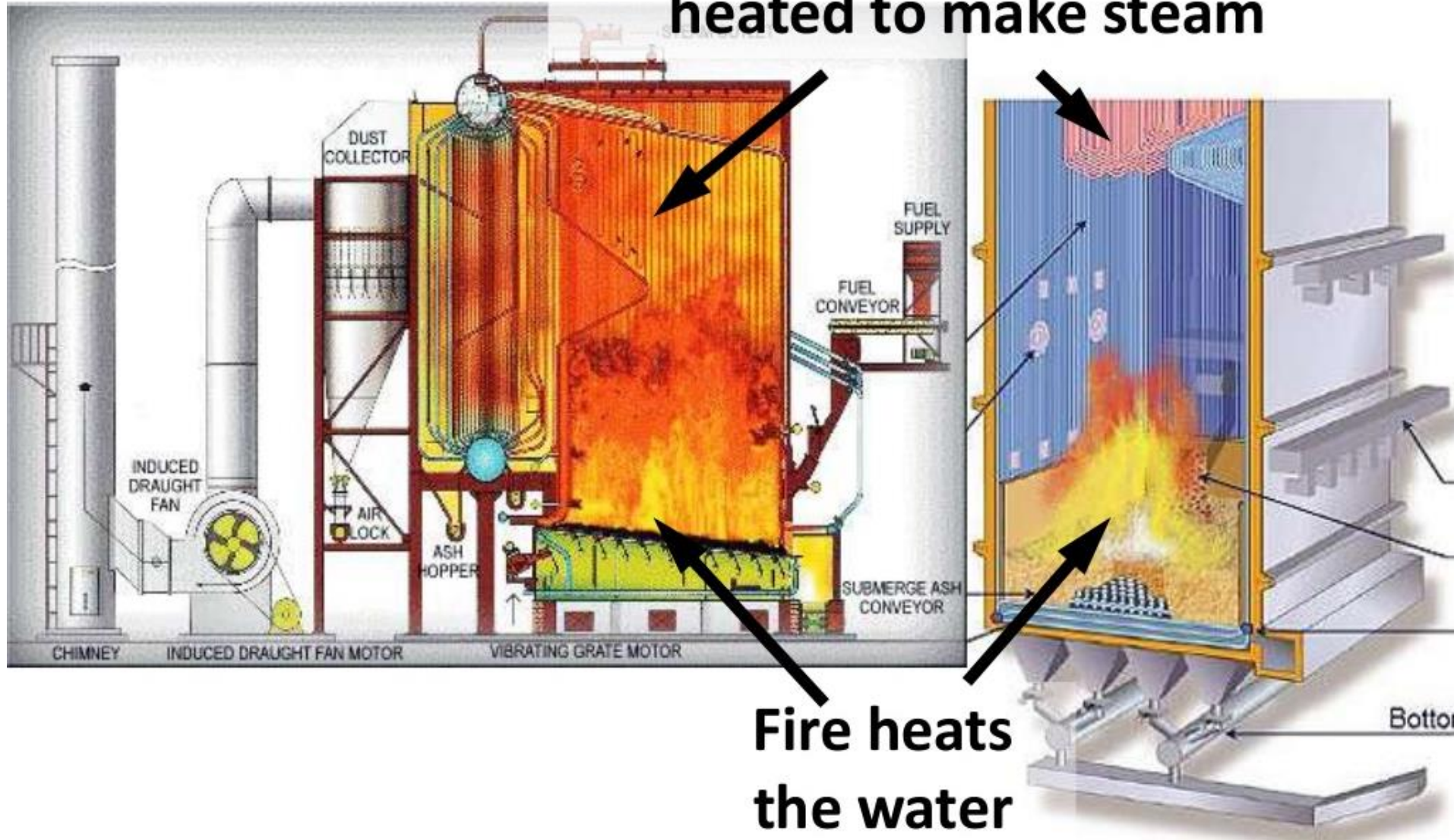


Conversion of biomass energy



Inside a biomass steam boiler

Pipes filled with water are heated to make steam





Boiler



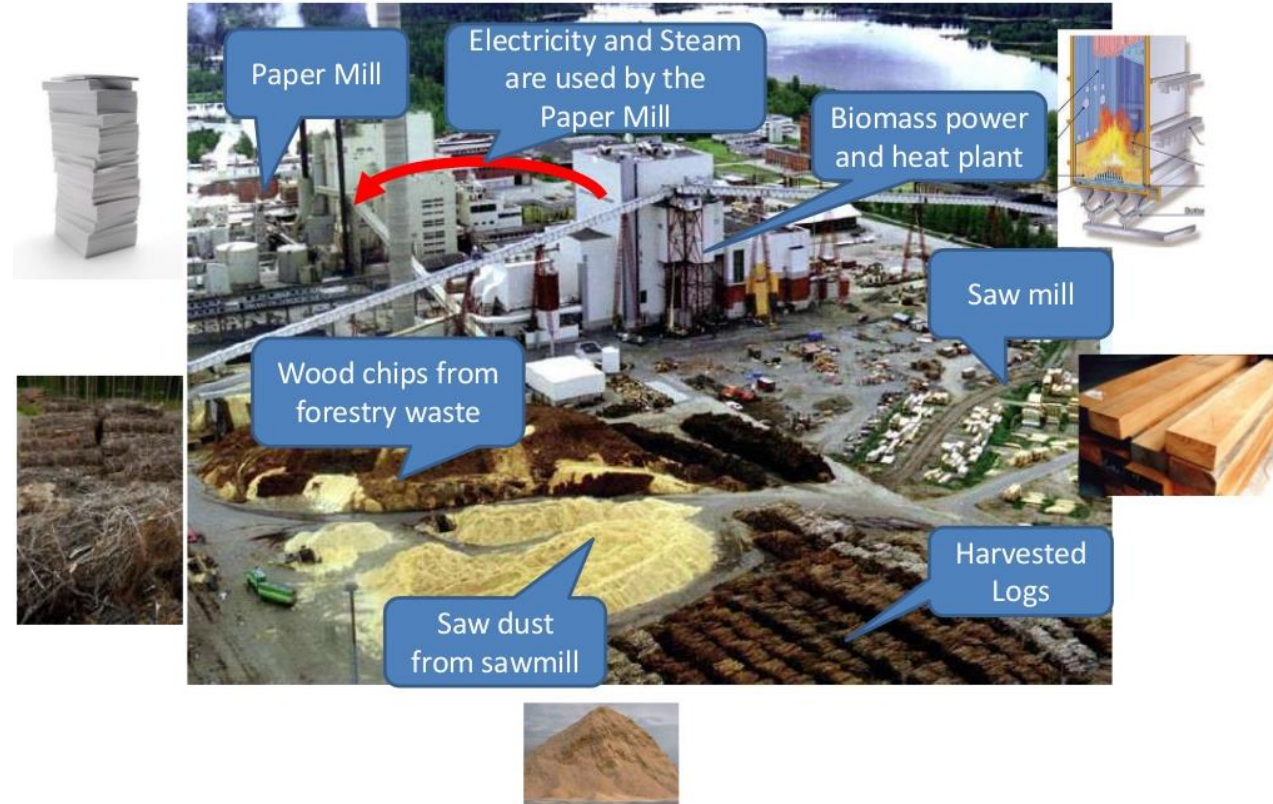
Steam Turbine



Farmers often burn their crop waste to get rid of it



Bringing it all together...with no waste!



Biogas **from Poop to Power**



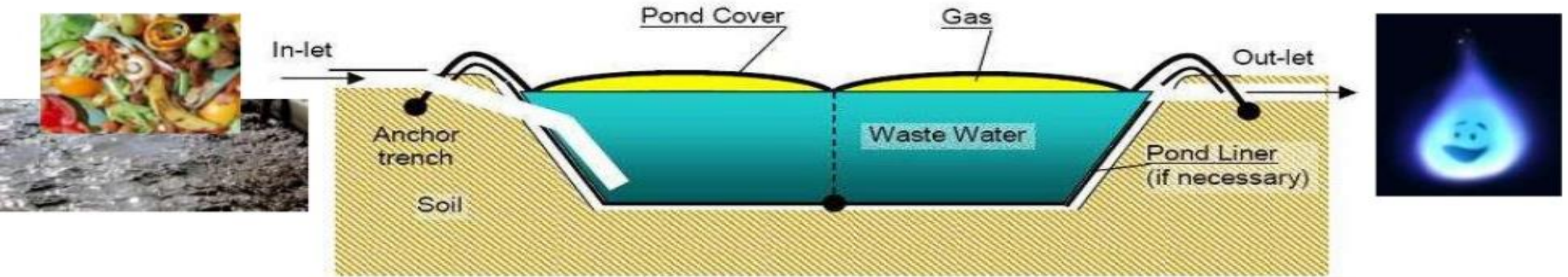
Farms can be dirty places



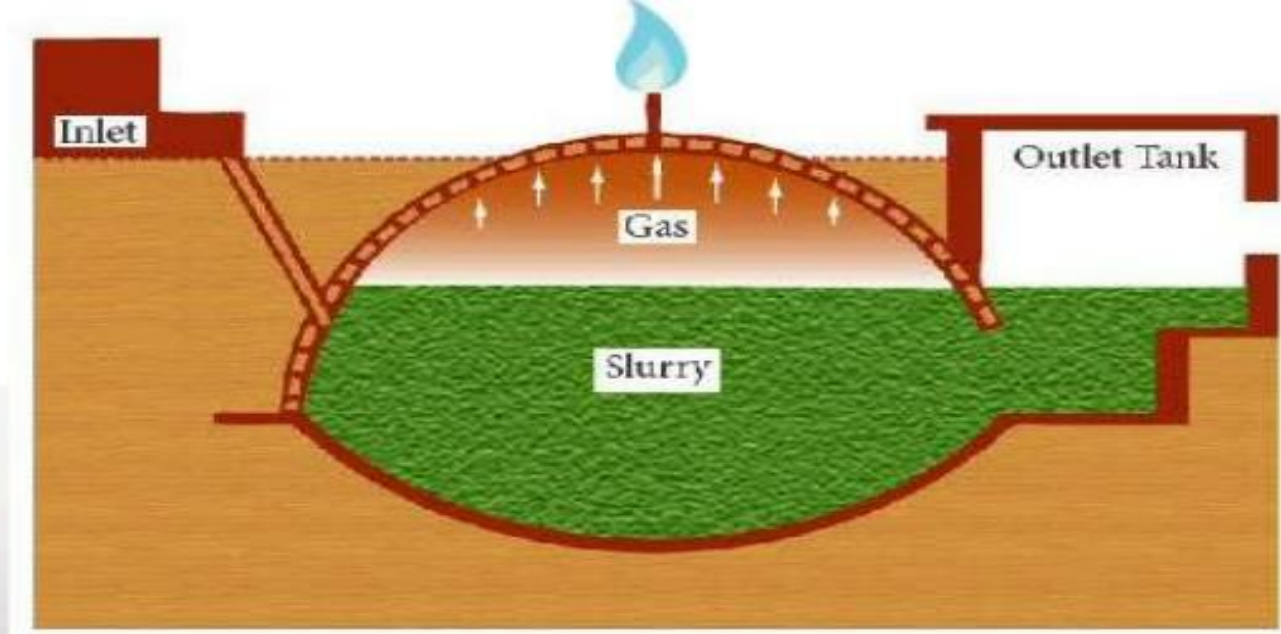
**Making food can leave
behind a lot of nasty waste**



How to Capture Biogas



Tank type biogas plant

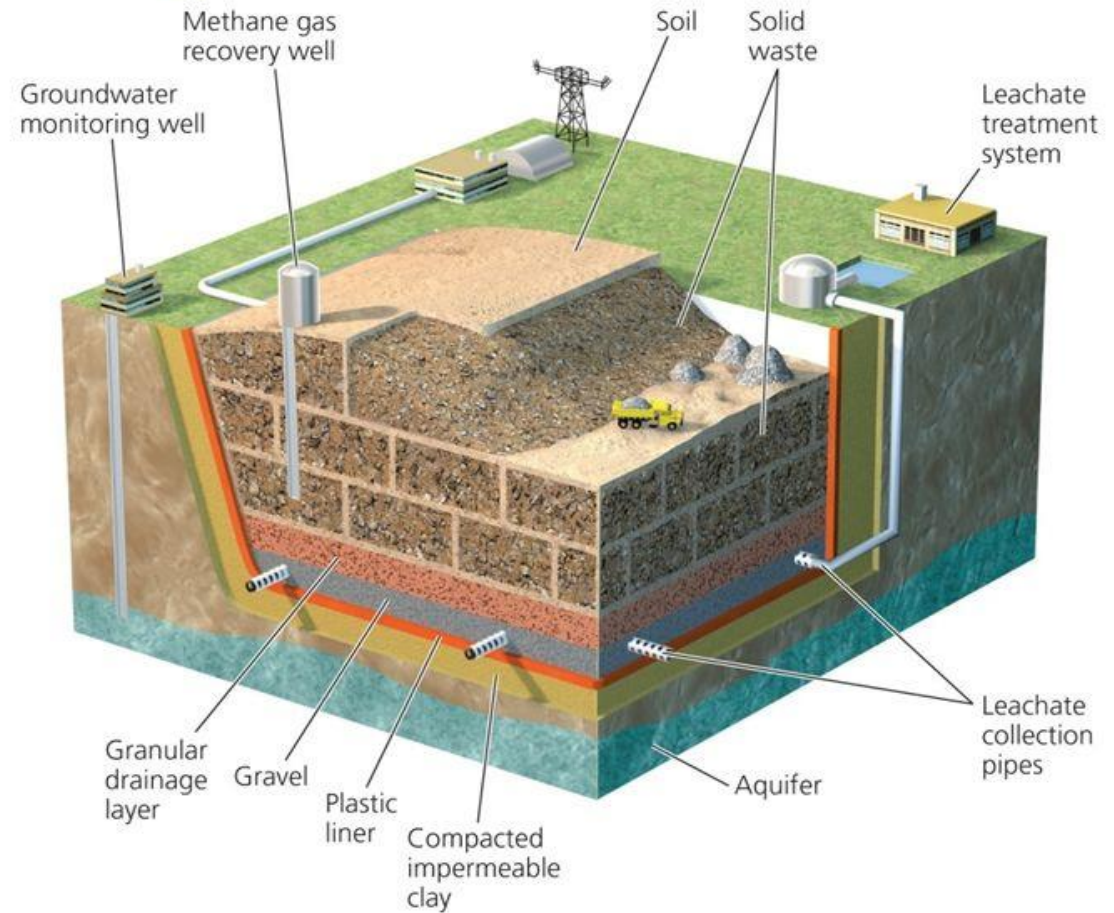




- Humans also produce a lot of waste
- Covered landfill capture Methane which can be used to generate electricity

A typical sanitary landfill

To protect against environmental contamination, landfills must be located away from wetlands, earthquake-prone faults, and 20 ft above water table



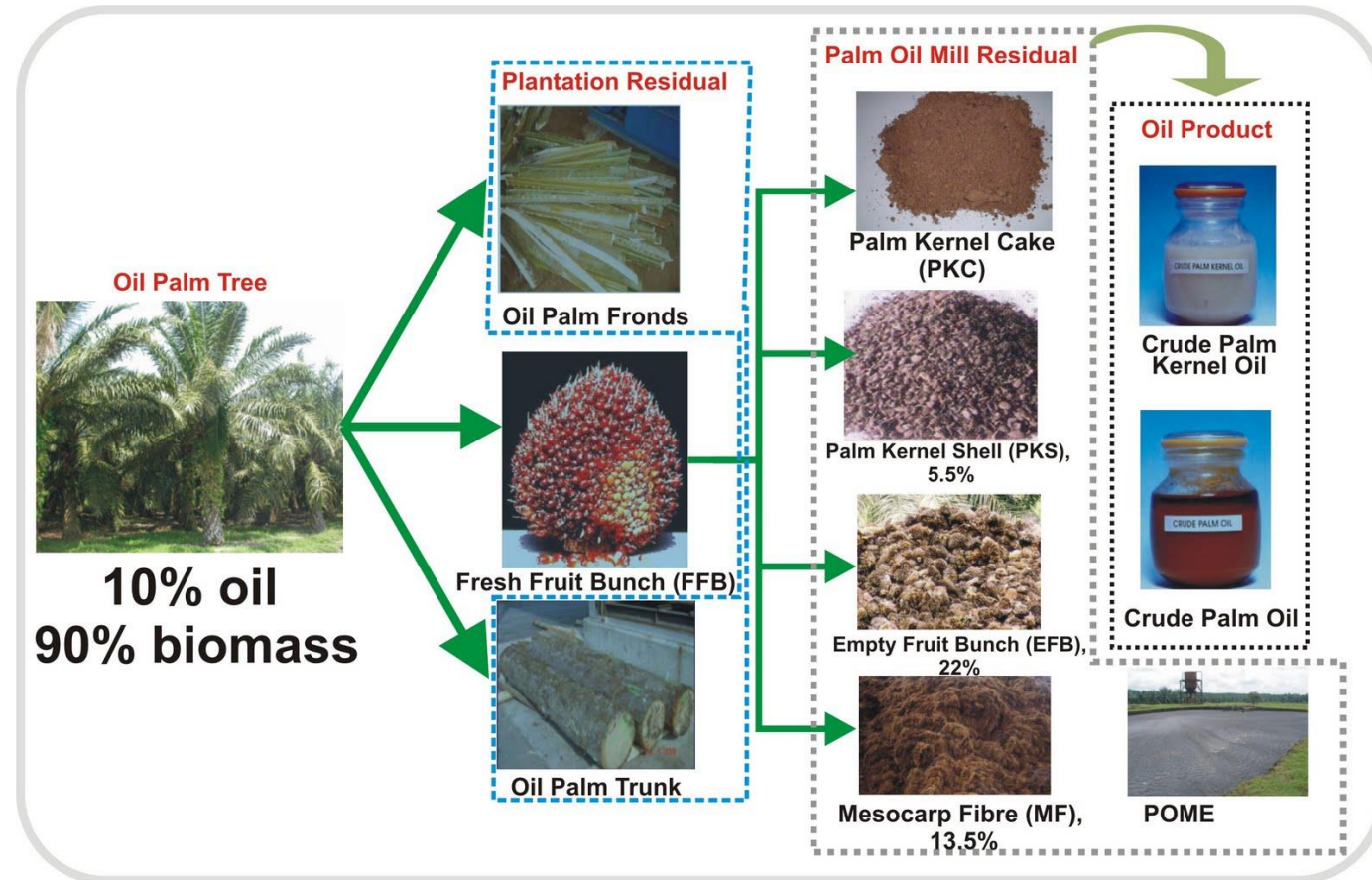
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Major Biomass resources in Malaysia

Oil palm, Wood, Paddy, Sugarcane, Municipal waste

BIOMASS SOURCES IN MALAYSIA



**Biomass potential (products of palm oil) –
1.34 GW in 2030**



THANK YOU

