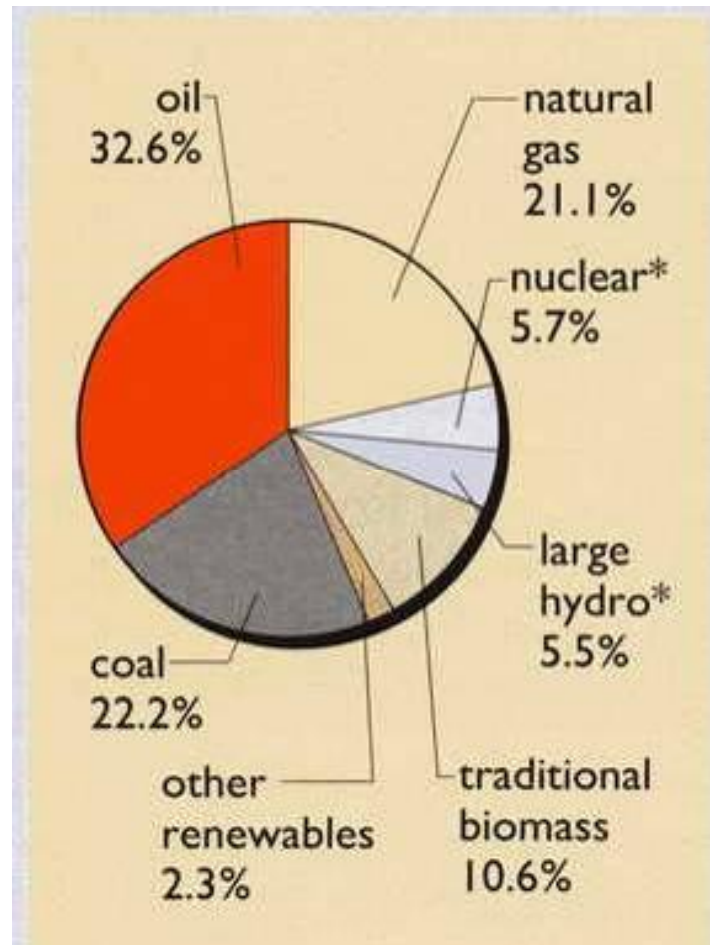




BIOENERGI

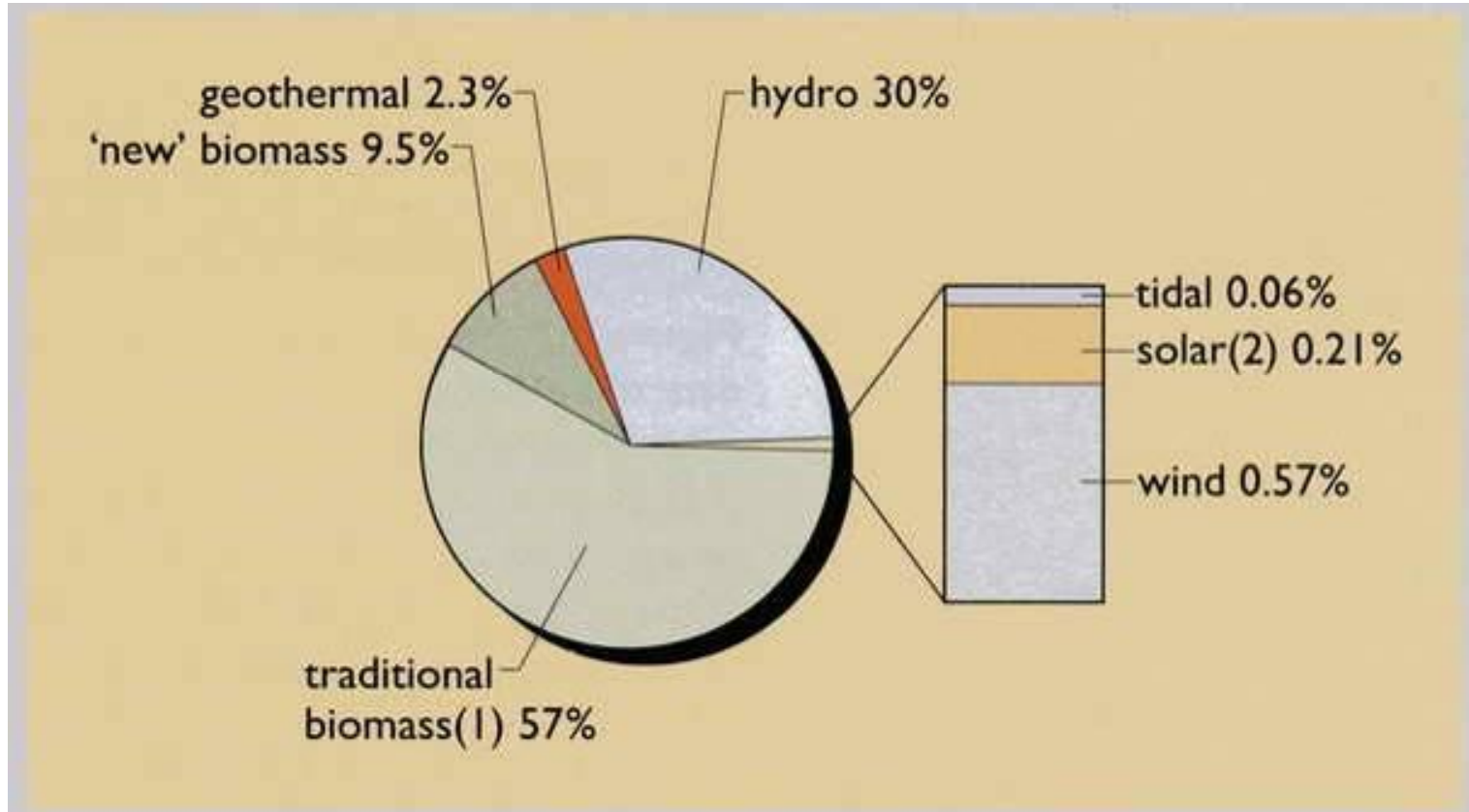
Energi alternatif yang berasal dari sumber-sumber biologis sehingga bersifat dapat diperbaharui (renewable)

Global Energy Sources

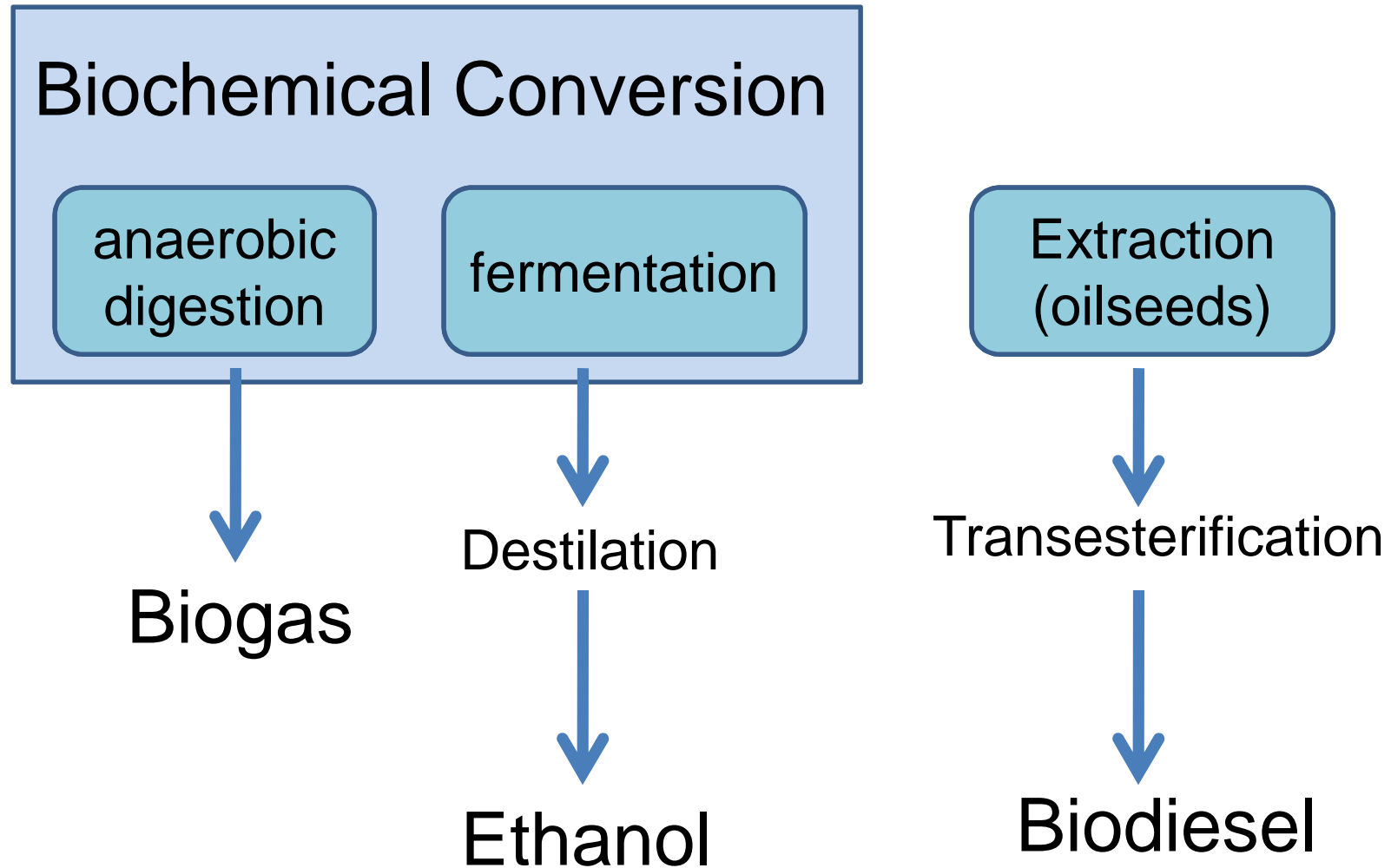


(Data diambil tahun 2002)

Renewable Energy Use



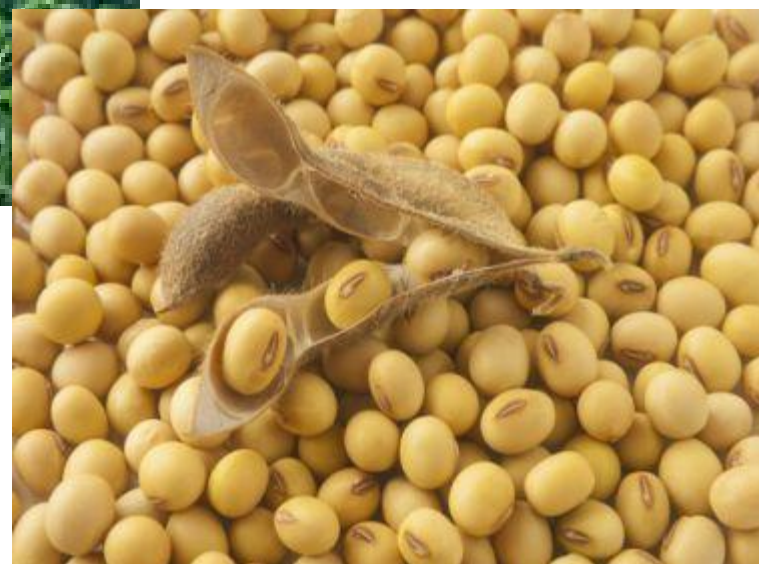
Bioenergy Technologies



Corn



Soybeans



Sorghum



Sugar cane bagasse



Switchgrass



Wood chips and sawdust



Municipal solid waste



Keunggulan

1. Mengurangi ketergantungan terhadap bahan bakar fosil
2. Meningkatkan kualitas lingkungan
3. Meningkatkan pertumbuhan ekonomi

Biogas

Gas yang dihasilkan melalui proses fermentasi secara anaerobik dari bahan-bahan organik seperti kotoran hewan (manusia), limbah domestik (rumah tangga) atau limbah organik lain.

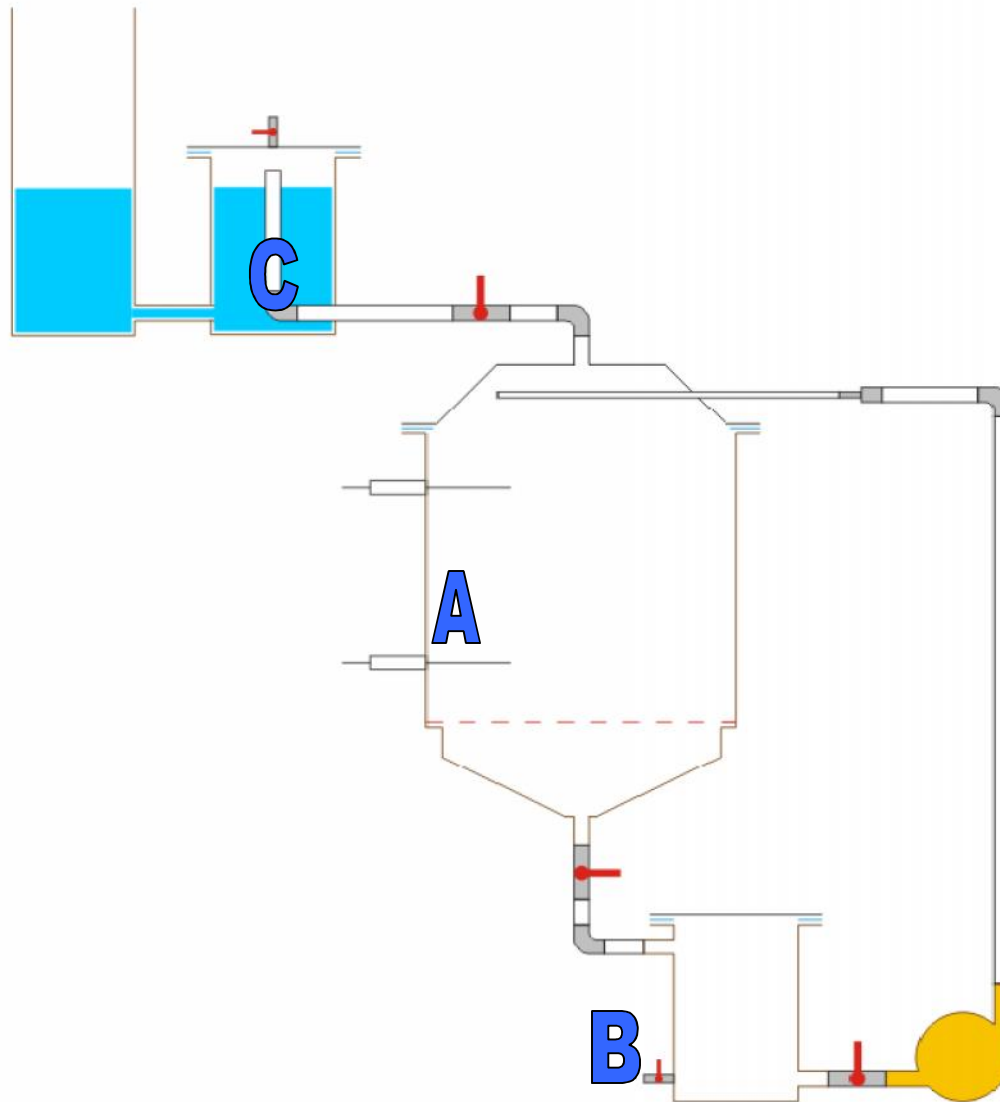
Bakteri : *Methanobacterium sp*



Kandungan gas yang terdapat pada Biogas

| Komponen | % |
|-------------------------------------|---------|
| Metana (CH ₄) | 55-75 |
| Karbon dioksida (CO ₂) | 25-45 |
| Nitrogen (N ₂) | 0-0.3 |
| Hidrogen (H ₂) | 1-5 |
| Hidrogen sulfida (H ₂ S) | 0-3 |
| Oksigen (O ₂) | 0.1-0.5 |

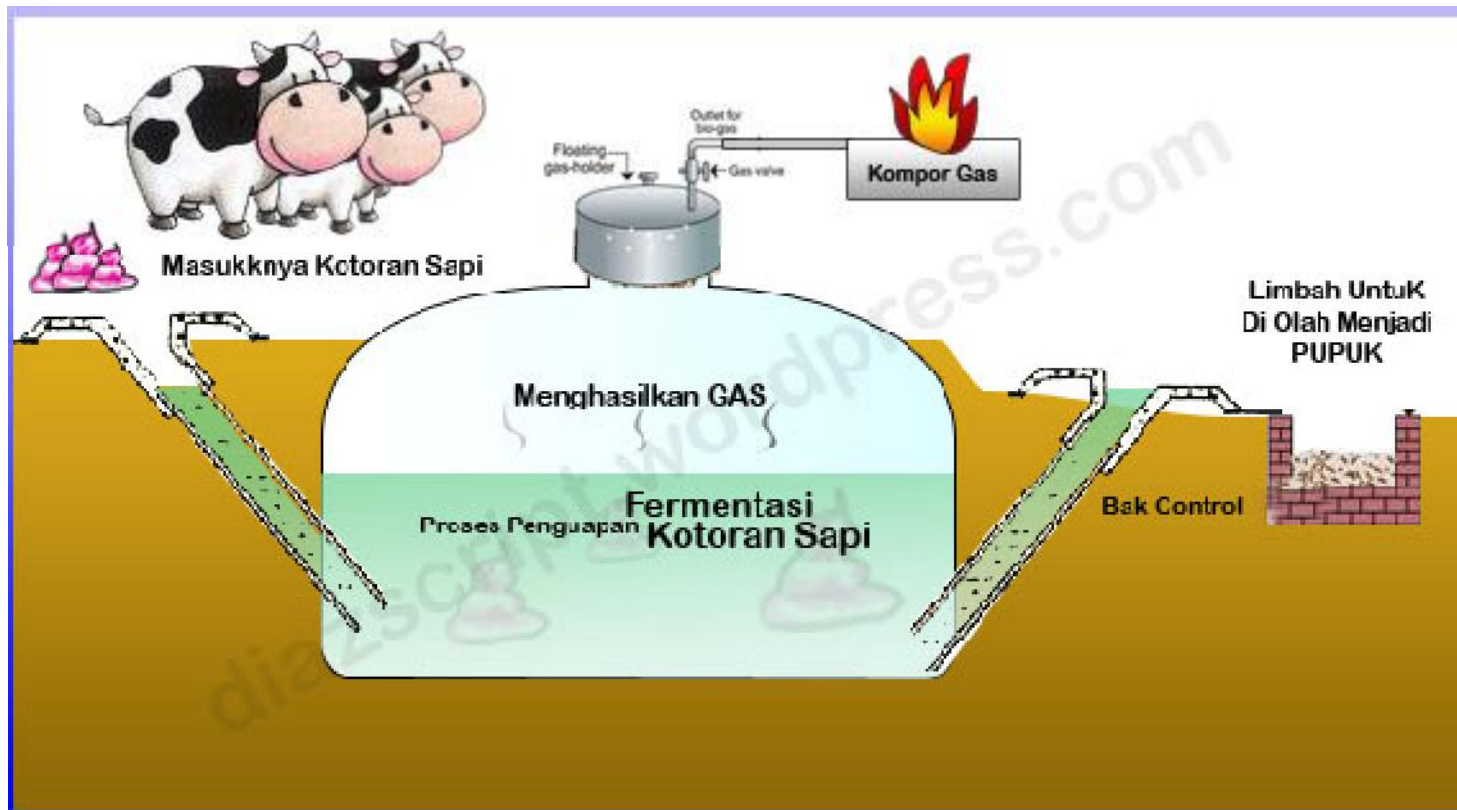
Skema Bioreaktor

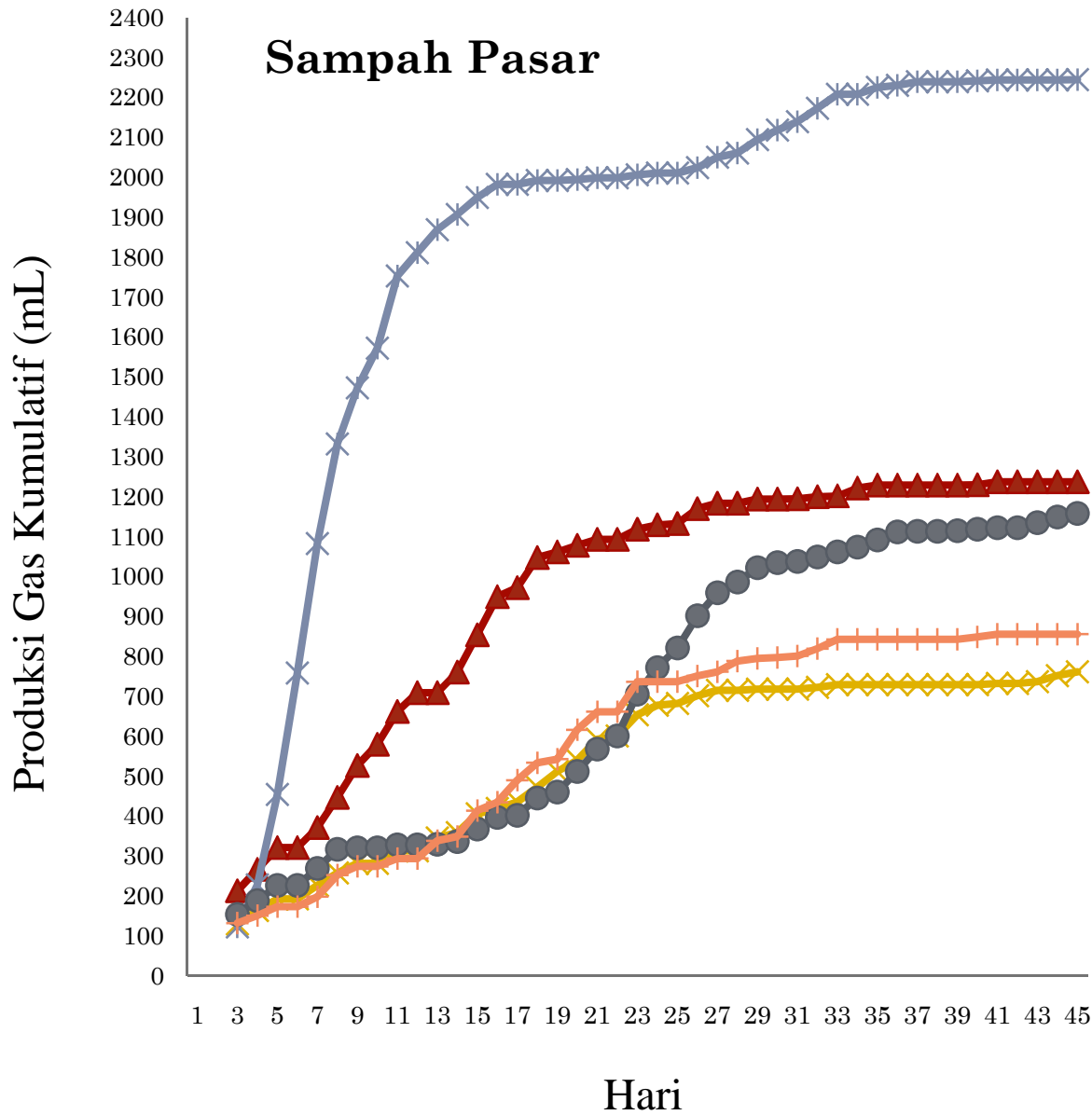


A : Digester

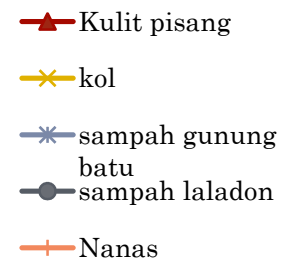
B : Penampung Lindi

C : Penampung Biogas





| Bahan | Biogas (ml/kg Biomasa) |
|----------------------|------------------------|
| Kulit Pisang | 2480 |
| Kol | 1520 |
| Sampah Pasar G. Batu | 4500 |
| Sampah pasar Laladon | 2320 |
| Kulit Nanas | 1720 |



Bioetanol

Sebuah bahan bakar alternatif
yang diperoleh dari bahan-bahan
organik (biomass) melalui proses
fermentasi aerob

Production schemes for bioethanol

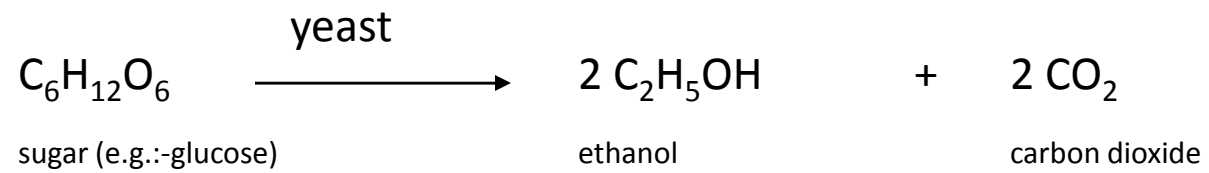
- Bioethanol is mainly produced in three ways.

– sugar → ethanol

– starch → sugar → ethanol

– cellulose and hemicellulose → ethanol

The main reaction involved is [fermentation](#)



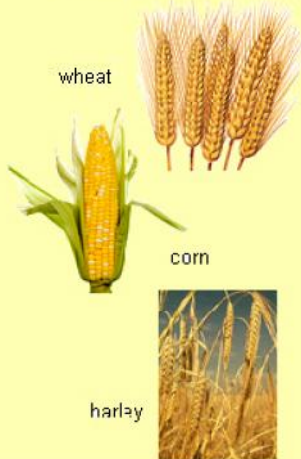
BIO-ETHANOL PRODUCTION
with various feedstocks

1st generation

sucrose-containing
feedstocks



starchy materials



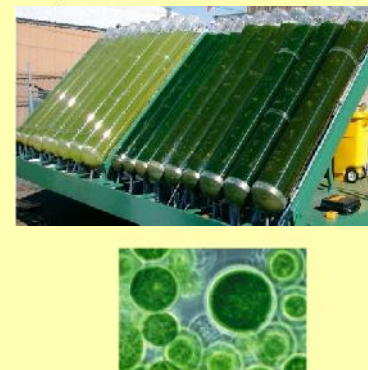
2nd generation

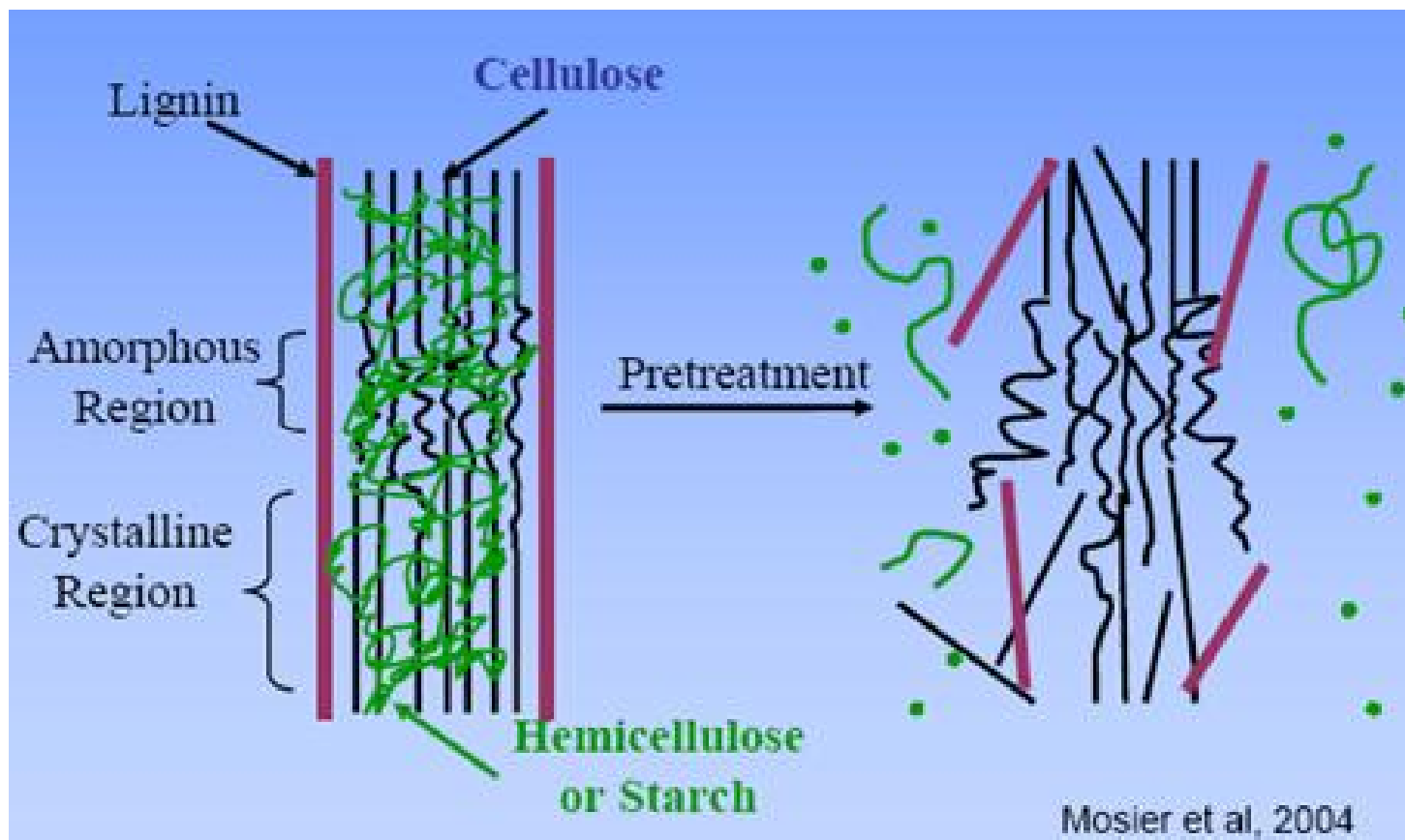
lignocellulosic
biomass

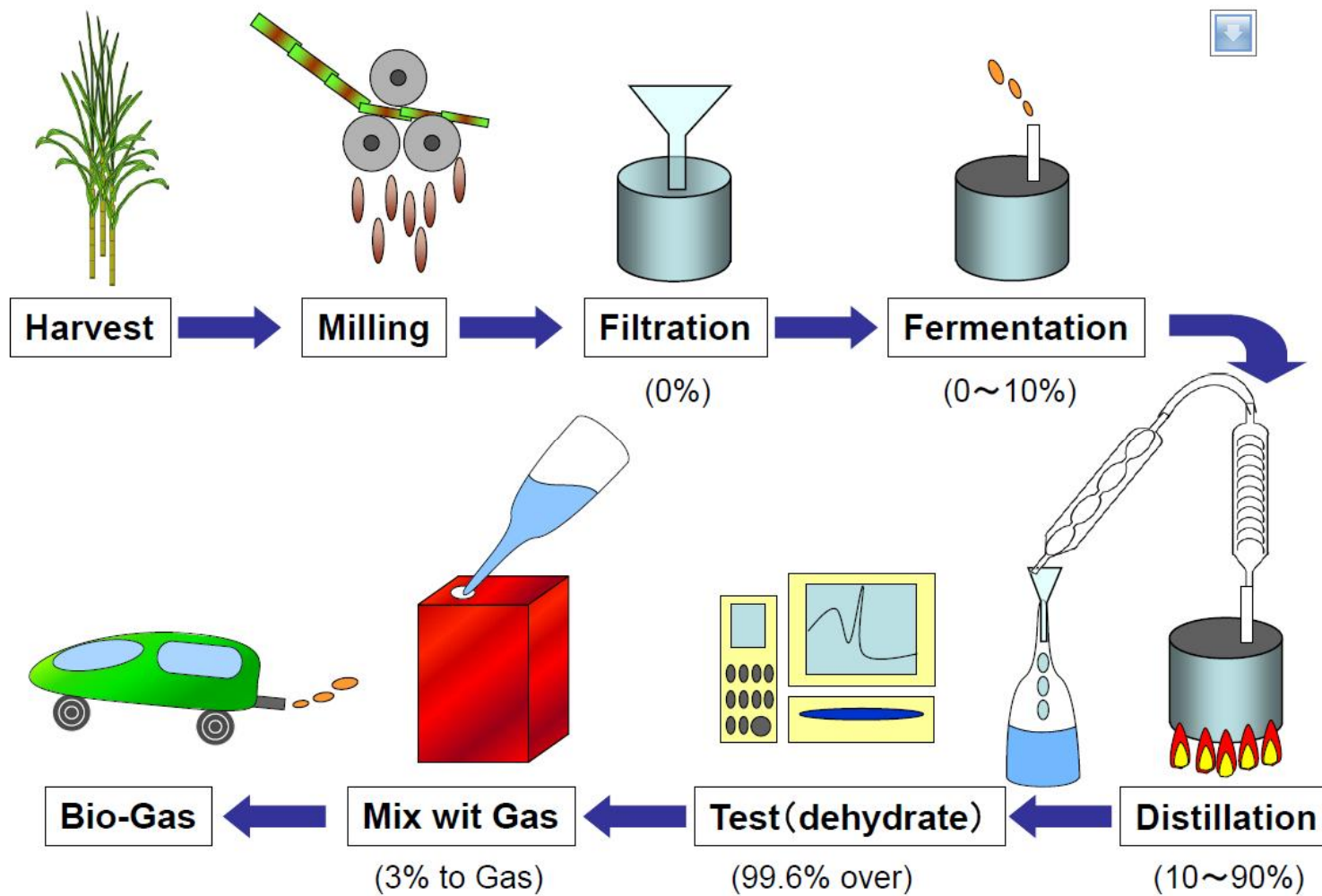


3rd generation

algal biomass

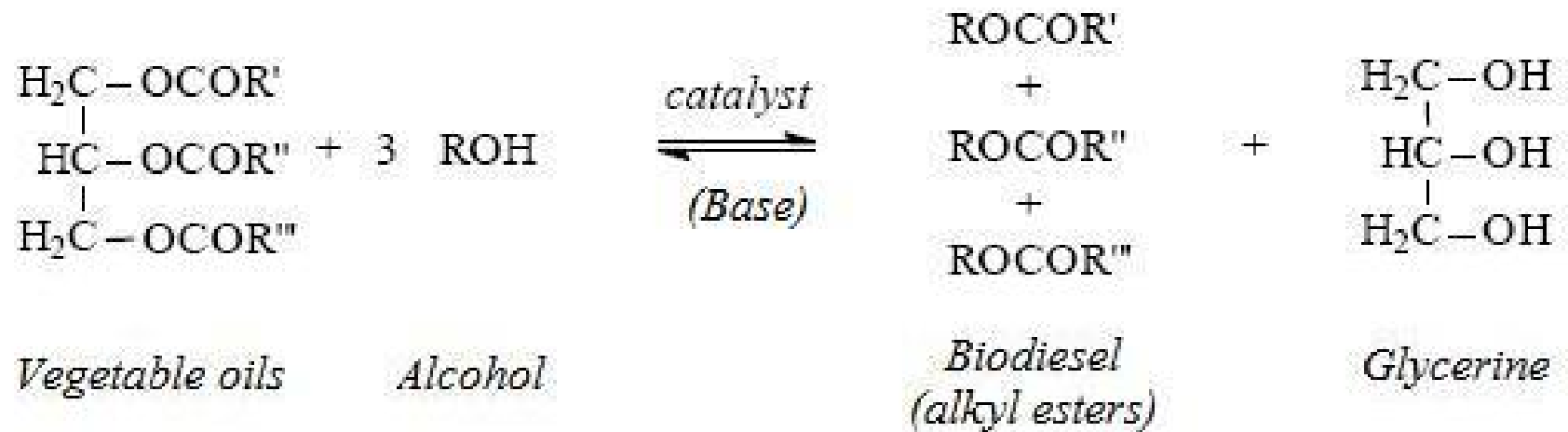






Biodiesel (Solar)

Reaksi kimia pembuatan biodiesel



POTENSI BAHAN BAKU BIODISEL

| JENIS TANAMAN | SUMBER | KADAR (% BAHAN KERING) |
|---------------|-------------|---------------------------|
| JARAK PAGAR | BIJI | 40 – 60 |
| KAPUK RANDU | BIJI | 24 – 50 |
| KEMIRI | KERNEL | 57 – 69 |
| NIMBA | DAGING BIJI | 40 – 50 |
| NYAMPLUNG | INTI BIJI | 40 – 73 |
| BINTARO | BIJI | 43 – 64 |

