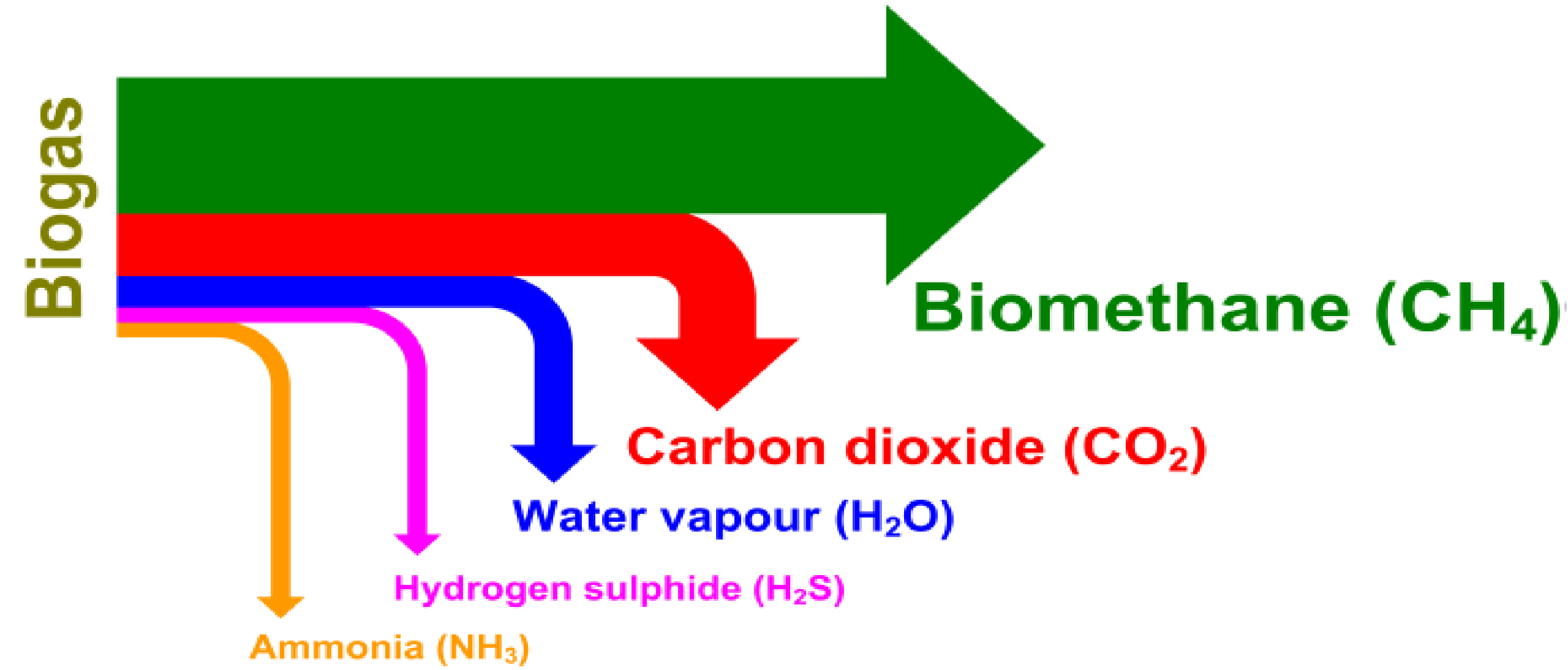


# **BIOGAS**

**Usage and economical background**

**Biogas is a flammable gas, which is generated by fermentation of biomass.**

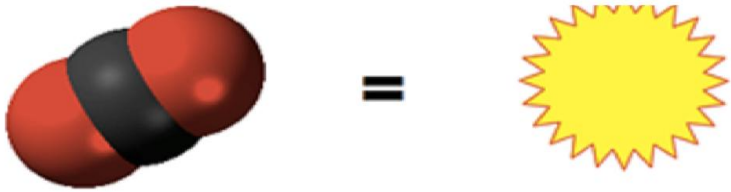


# **Advantages of biogas**

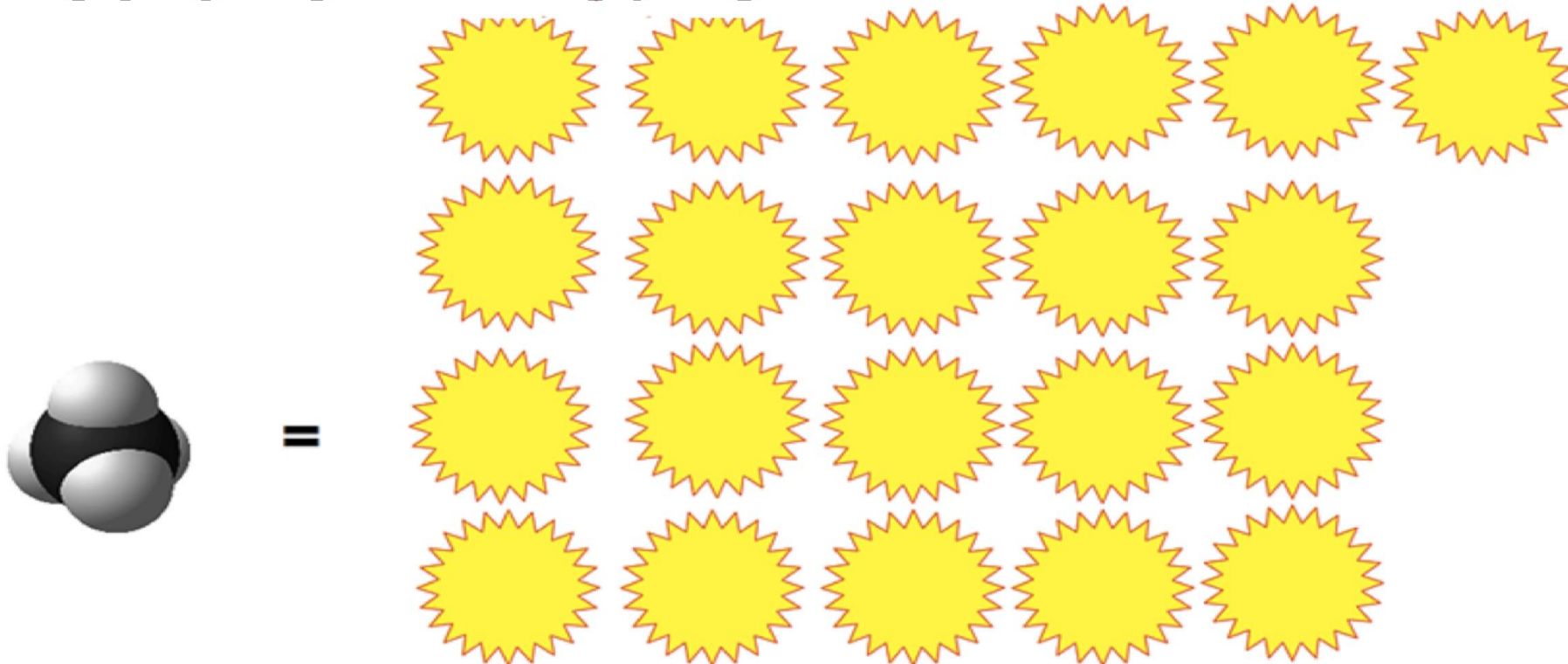
- **Constantly available**
- **Storage ability**
- **Transportability**
- **Induction to gas system**

# The danger of methane

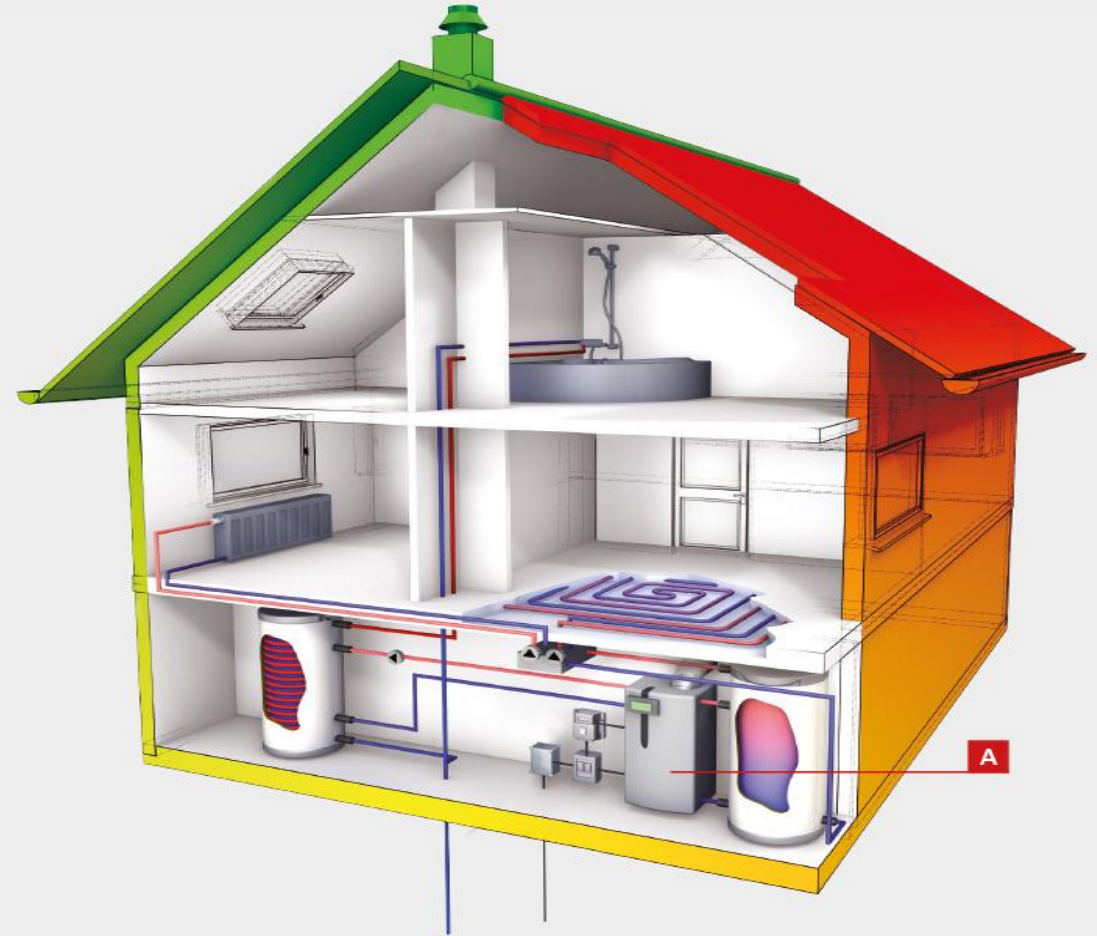
**Carbon dioxide = 1 sun**



**Methane = 21 suns**



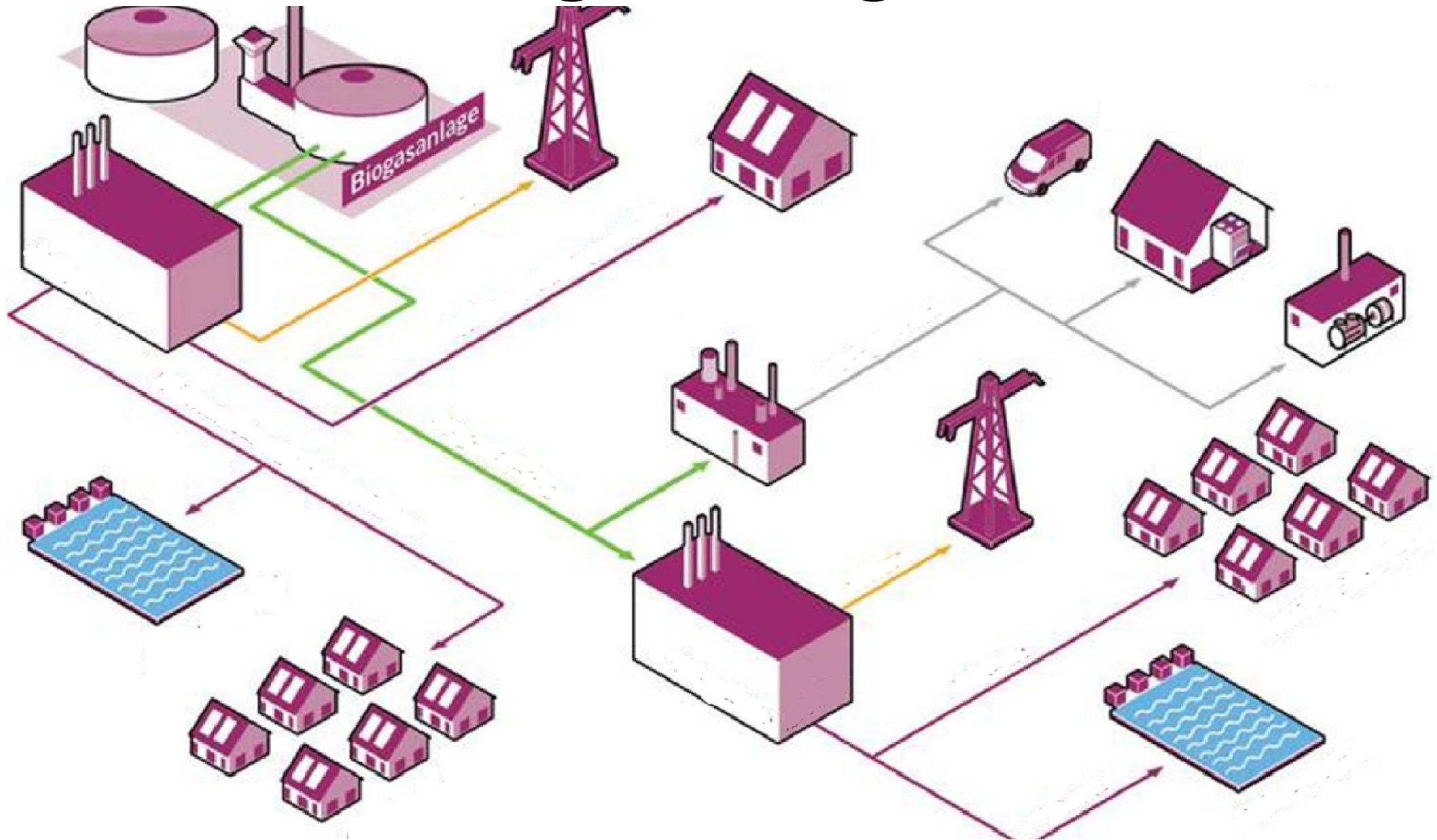
# Usage of biogas in a combined heat and power system



Mini-KWK-Anlage

Anmerkung: neuer  
Brennwertkessel  
in Systemhaus  
nicht dargestellt

# Usage of biogas

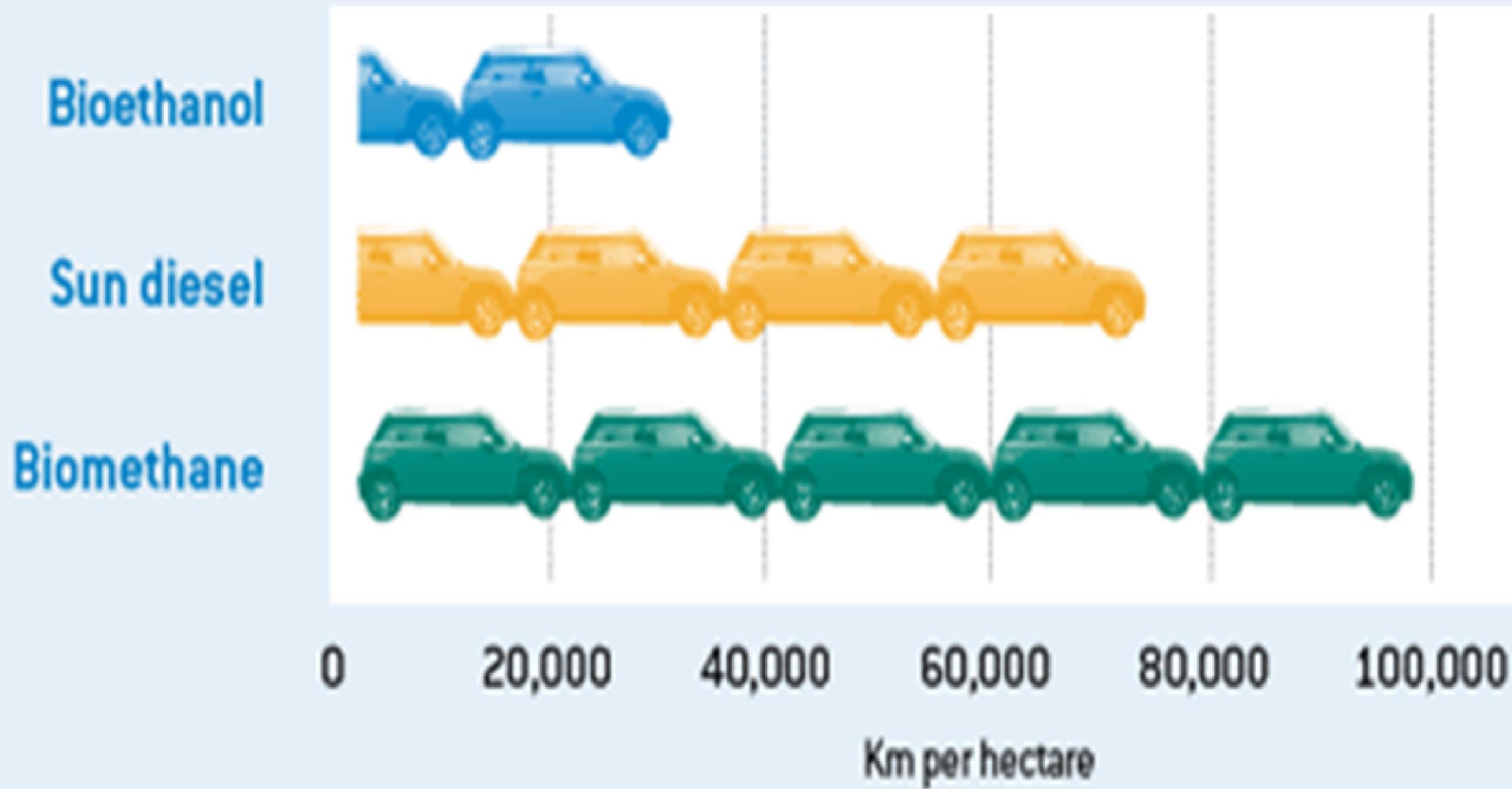


# Biogas as fuel

- ✓ In order to be used as a fuel, biogas needs to be compressed to 200 – 300 bar. During this process the main amount of CO<sub>2</sub> is removed.
- ✓ It is environmentally friendly, as it is almost CO<sub>2</sub> neutral.
- ✓ With the outcome of one hectare corn, the energy produced is enough for an average car to drive for 70,000 km



## RELATIVE EFFICIENCIES – THE MINI TEST



**Biomethane is much more effective than conventional fuels.**



# Biogas = profitable ?

- Investition: 11.000.000€
- 30.000t Corn per Year -> 100t Corn per Day -> Energy for 2.200 Housholds, Warmth for 150 Housholds.
- -> Profit: 1.000€ per Household = 2.200.000€ per Year (Brutto) ->
  - - Payment for workers,
  - - Money for Biomas,
  - - Transport costs
  - + Bonus from EU(Money)

# Comparison between Greece and Germany in biogas production

	Percentage of energy produced by biogas	Factories that produce biogas	Amount of energy produced	Percentage of farmland used for biogas production
Greece	2%	10	44 MW	3%
Germany	4%	8,100	3,000 MW	12,9%

# Efficiency of energy sources



10 KW

x50



500 KW

x2



1 MW



x1,000

1 GW



x2

2 GW

# **European Union goal :**

**Until 2020, 20% of energy production in each european country -> renewable sources**

- Germany 27%**
- Greece 16%**
- France 8%**
- Turkey 20%**
- Austria 33%**

- Hungary 8%**
- Lithuania 23%**
- Czech Republic 12%**

**It's not an easy task...**

**LET'S WORK  
ON IT**