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# **Draft JCM methodology for biodiesel production from waste oil in Mongolia**

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# Biodiesel?

- Biodiesel is a fuel derived from biological materials, such as vegetable oil and animal fat.
- Its carbon emission does not add extra carbon in the atmosphere.



# Use of Biodiesel in Mongolia

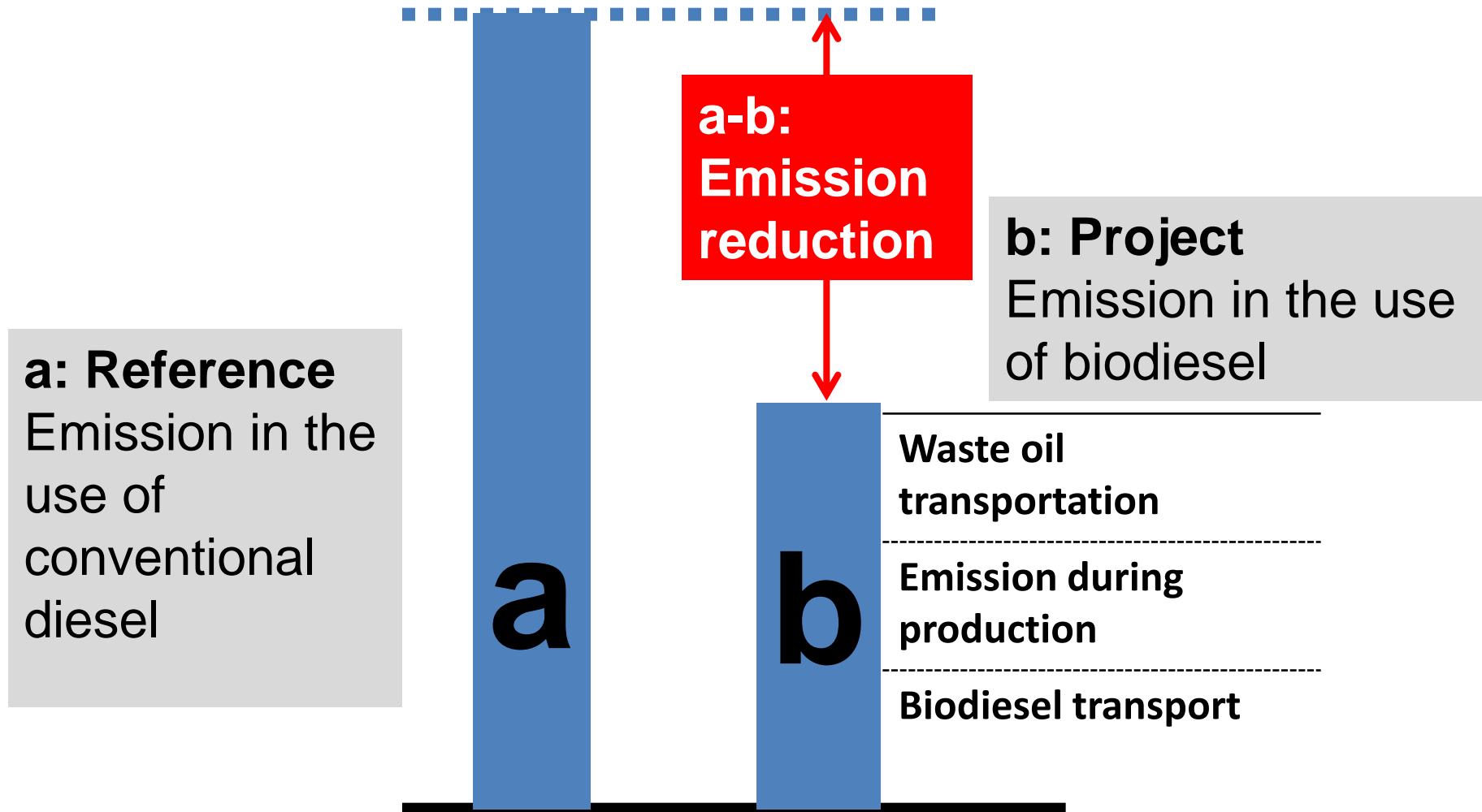
## **Suitable for...**

- Vehicles
- Construction machines
- Power generators
- Heat

## **Reduction in....**

- waste
- air pollution
- carbon emission
- energy bill

# Calculating CO2 reduction



# a. Reference Scenario

Use of conventional diesel

$$\begin{aligned} \text{CO}_2 \text{ (tCo}_2\text{/year)} &= \text{Biodiesel consumption (kl / year)} \times \text{Net Calorific Value of biodiesel (GJ/ kl)} \\ &\times \text{Emission Factor of conventional diesel (tCo}_2\text{/ GJ)} \end{aligned}$$

...need to monitor

## b. Project scenario

**Emission source 1**  
CO2 emission during  
waste oil transportation

+

**CO2**  
(tCO2/year)  
Project

=

**Emission source 2**  
CO2 emission during  
biodiesel production

+

**Emission source 3**  
CO2 emission during  
biodiesel transportation

# Emission source 1: Waste oil Transport Process

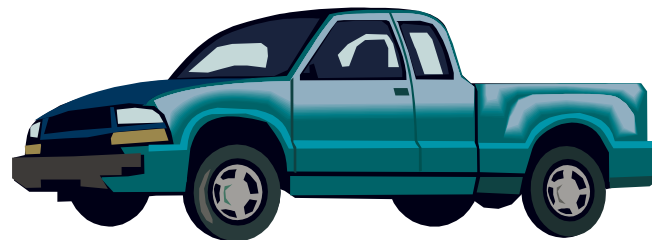
**CO2**  
(tCO2/year)

=

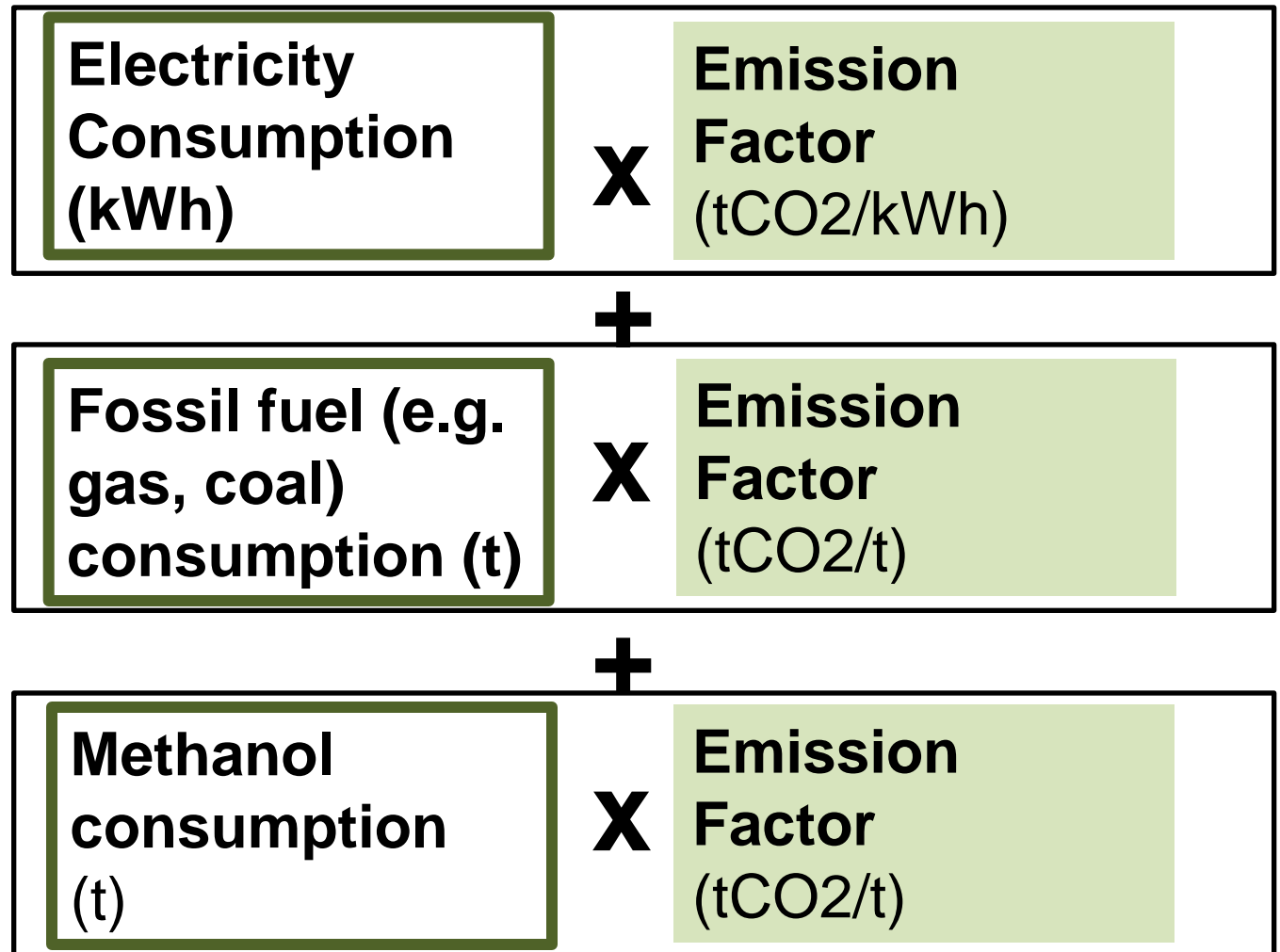
**Driving  
distance of  
the vehicle  
km(year)**

**X**

**Emission  
Factor  
(tCO2/km)**



# Emission source 2: Production Process





# Emission source 3: Biodiesel transport process

**CO2**  
(tCO2/year)

=

**Driving  
distance of a  
vehicle  
km(year)**

**X**

**Emission  
Factor  
(tCO2/km)**



# What you need to monitor

Parameters (Mandatory)	How to monitor	Practicality
Amount of biodiesel consumption (kl)	Production control records, sales records	Easy
Driving distance to transport waste oil (km)	Odometer	Need to verify
Amount of electricity consumption (kWh)	Electric meter, electricity bill	Easy as long as the bills are kept
Driving distance to transport biodiesel (km)	Odometer	Need to verify
Amount of fossil fuel consumption (kl or kg)	Bills, meters	Easy as long as the bills are kept
Amount of methanol consumption (l)	Purchase record	Easy as long as the bills are kept

IF APPLICABLE

# What you do NOT need to monitor

Parameters (Mandatory)	Value	Source
Electricity Emission Factor (tCO <sub>2</sub> /MWh)	1.1501/1.0559	MEGD
Fossil fuel emission factor (tCO <sub>2</sub> / GJ)	depends on the fuel	2006 IPCC Guidelines
Methanol emission factor (tCO <sub>2</sub> /t)	0.36	
Net calorific value of conventional diesel (GJ/kl)	0.0741?	2006 IPCC guidelines
Net Calorific value of biodiesel (GJ/kl)	23.76	2006 IPCC Guidelines
Transport emission factor (tCO <sub>2</sub> /km)	?	

# Calculation example

- See Excel

# Remaining issues

- What is the emission factor of transport, tCo<sub>2</sub>/km?
  - Option 1: IPCC default value in US / Europe
  - Option 2: Default value used in China
  - Option 3: Identify Mongolia-specific value, based on fuel efficiency (6.3km/liter?)
    - Is there an official figure of average fuel efficiency in Mongolia?

# Remaining issues 2

- How can driving distance of transport vehicles verified?
  - By automobile retailer?
  - By government authority?
- Validity of assumptions
  - Only pre-registered vehicles are used for transporting waste oil and biodiesel
  - Sold biodiesel is 100% consumed.

# Remaining issues 3

- This methodology is applicable only to biodiesel derived from waste oil.
  - What are other materials that could be used for biodiesel production in Mongolia?

**Thank you!**  
**Баярлалаа !**