

# SSC cases for EB 36

# Plant oil production and use for transportation

- Technology: pure plant oil or max 10% blend with diesel
  - Oil source: Sunflower, Nabo (Transesterification not done)
  - Used in farm machinery and vehicle fleets
- Engine conversion (fuel supply and injection system) for pure oil
- Producer to claim CERs, end user included in the boundary
- As per Board approved **SSC biomass leakage guidance**
  - Demonstrate biomass production area not a forest in the last 10 years
  - Calculate field to wheel emissions of plant oil
    - Energy for processing (pressing, filtering)
    - N<sub>2</sub>O emissions from fertiliser ( also from crop residues for N fixing crops)
  - Account for any pre project shift or competing use

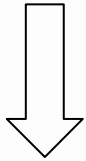
# Engine durability with plant oil

- Potential engine problems can occur: Biodiesel Handling Guidelines, US DOE, 2006 states “vegetable oil in CI engines at levels as low as 20%, cause long-term engine deposits, ring sticking, lube oil gelling, and other maintenance problems and can reduce engine life. To avoid viscosity-related problems, vegetable oils and other feedstocks are converted into biodiesel”
  
- Key question for GHG emission: Does the fuel consumption of vehicles vary with plant oil or blends?
  - **10% blends** no change in SFC ( e.g. EC-DG JRC/IPTS, 2003; SAE 811215 or SAE 2003-01-0767 etc.)
  - SFC monitoring challenging, error margin may be large
    - Different vehicles, plant oils and blends ( large sample size needed)
    - Road conditions, ambient conditions etc may change.
  - **Pure plant oil:** Over 30000 vehicles run on including ships, trains, better SFC in some cases
  - Engine conversion kits ( one tank system and two tank system)
  - Over 25 vendors in Europe

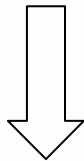


# Type I or Type III limit?

## 15 MW type I limit



15 MW / 100 kW  
= **150 cars**



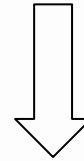
15 MW/ 250 kW  
= **60 buses**



60 buses replacing 100 litres diesel/day \*  
365 days \* 2.6 kg CO<sub>2</sub>/litre diesel = **5700 tCO<sub>2</sub>e**

- 2.2 Mn L/yr diesel or about 1750 tons
- Equates to approx 2000 tons of plant oil per year
- At 0.9 tons oil/Ha approx 2000 Ha or 4000 Ha with intercropping
- Approx 5,000 CERs, much less for blends

## 60 kilo tons type III limit



60 kton / 2.6 kg  
CO<sub>2</sub>/litre diesel / 30  
litres diesel per day  
per car / 365 days  
= **2000 cars**



60 kton / 2.6 kg  
CO<sub>2</sub>/litre diesel /  
100 litres diesel per  
day per bus / 365  
days  
= **600 buses**



- 23 Mn L/yr or 18000 tons of diesel
- 20000 tons of plant oil per year
- 22000 Ha of crop, 44000 Ha or more with intercropping
- 60000 CERs/ yr



# Bottling of biogas

AMS III.H. now

Proposed revision of AMS III.H

