

Working Session

Land Use and Bioenergy in the Clean Development Mechanism

WOOD ENERGY SYSTEMS AND CDM

A contribution to the analysis of baseline and project conditions

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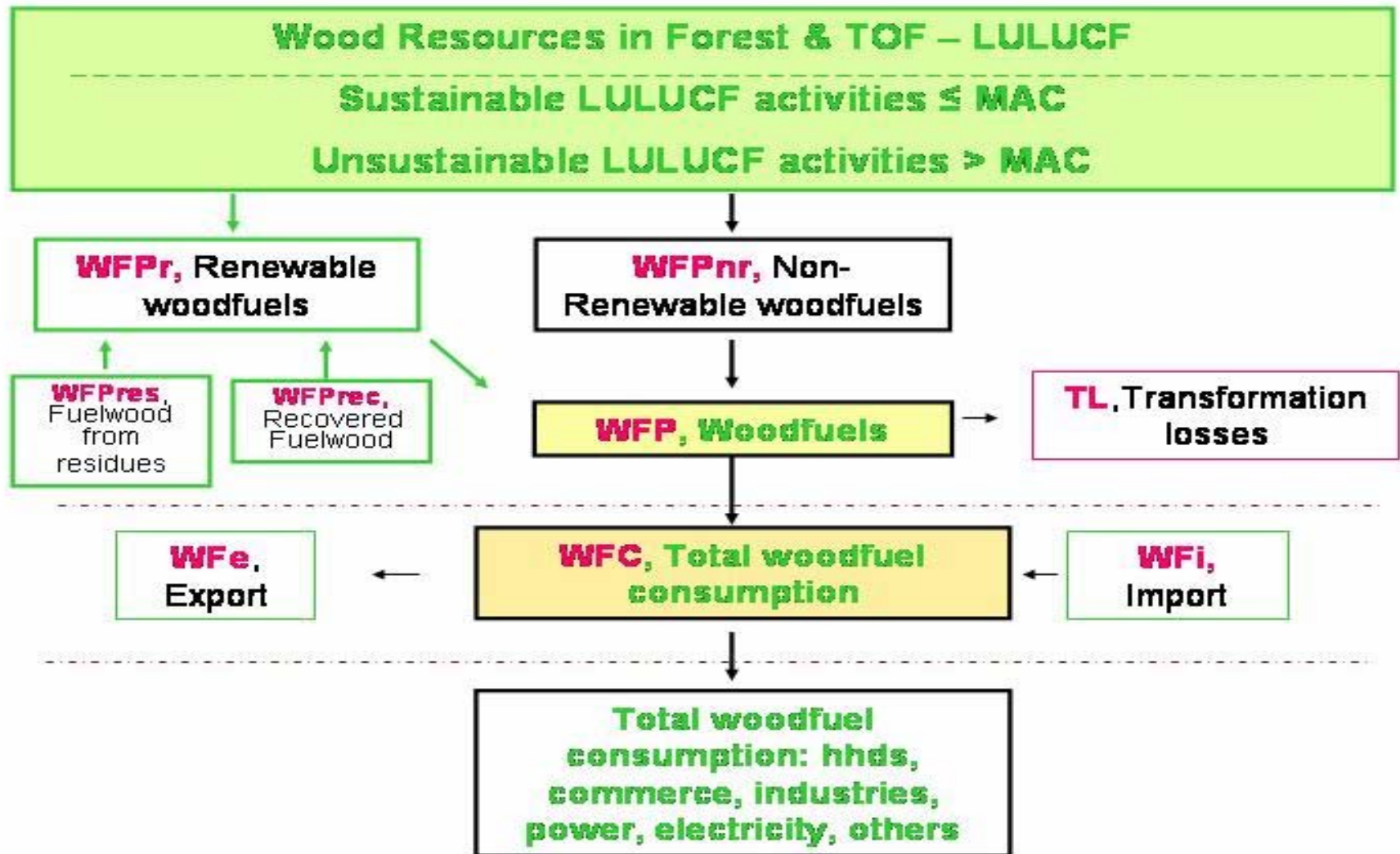
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Aims

- **Woodfuel flows within a WES presented**
- **Sustainable and unsustainable links between LULUCF activities and WES described**
- **Emissions and carbon stocks changes of small-scale WES analyzed**

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Basic calculations

$$\mathbf{WFP = WFP_r + WFP_{nr}}$$
$$\mathbf{WFP_r = MAC_e + WFP_{res} + WFP_{prec}}$$

Renewable woodfuel production

$$\mathbf{WFP \leq MAC_e}$$

Non-renewable woodfuel production

$$\mathbf{WFP > MAC_e}$$

Basic calculations

Woodfuel consumption

$$\mathbf{WFC = Fwc + (Fwi - Fwe) + Chc + (Chi - Che)}$$

Woodfuel production

$$\mathbf{WFP1 = WFP_r + WFP_{nr} = WFC + TL + WFe - WFi}$$

LULUCF Activities and Woodfuel Production

$$\mathbf{WFP2 = WFPIulucf = WFPIu + WFPIuc + WFfa}$$

$$\mathbf{WFP2 = [Fwlu + Fwluc + Fwfa] + [Chfa]}$$

SUSTAINABLE WOOD ENERGY DEVELOPMENT IN CEE COUNTRIES
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Woodfuel Production Approaches

WFP1 ≠ WFP2



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Woodfuel production from non-renewable supply sources

$$\mathbf{WFP_{nr} = WFP_2 - MAC_e}$$

$$\mathbf{WFP_{nr} = WFP_{def} + WFP_{dev} + WFP_{over} - MAC_e}$$

Sustainability indexes

a) based on woodfuel consumption surveys

$$\text{SI 1} = [\text{WFP1} - \text{MAI}] 100 / \text{MACe}$$

b) derived from LULUCF activities

$$\text{SI 2} = [\text{WFP2} - \text{MACe}] 100 / \text{MACe}$$

Only SI 1 can be calculated with accuracy

Analysis of emissions of small-scale WES

**Emissions from non-renewable woodfuel production
(WFPnr)**

$$\text{CEWFPnr} = \text{CEWFP1} - \text{CEMACe} =$$

$$= \text{CEhhd} + \text{CEcom} + \text{CEind} + \text{CEcarbonis} + \text{CEff} + \text{CE} \\ \text{deforest} + \text{CEdeveget} - \text{CEMACe}$$

Carbon stocks in WES

$$\mathbf{CST = CSf + CStof + CSa + CSr - CSdef - CSdeveget}$$

$$\mathbf{\Delta CSTnr = \Delta CSdef + \Delta CSdeveget + \Delta CSover}$$

Variation of carbon stocks within the project area due to unsustainable woodfuel production

Emissions from non-renewable woodfuel use

$$\mathbf{CE_{total} = CE_{WFPnr}}$$

$$\mathbf{CE_{WFPnr} = CE_{hhd} + CE_{com} + CE_{ind} + CE_{carbonis} + CE_{eff} + CE_{deforest} + CE_{deveget}}$$

$$\mathbf{SI2 = [\Delta CE_{def} + \Delta CE_{deveget} - CE_{MAI}] \times 100 / CE_{MAI}}$$

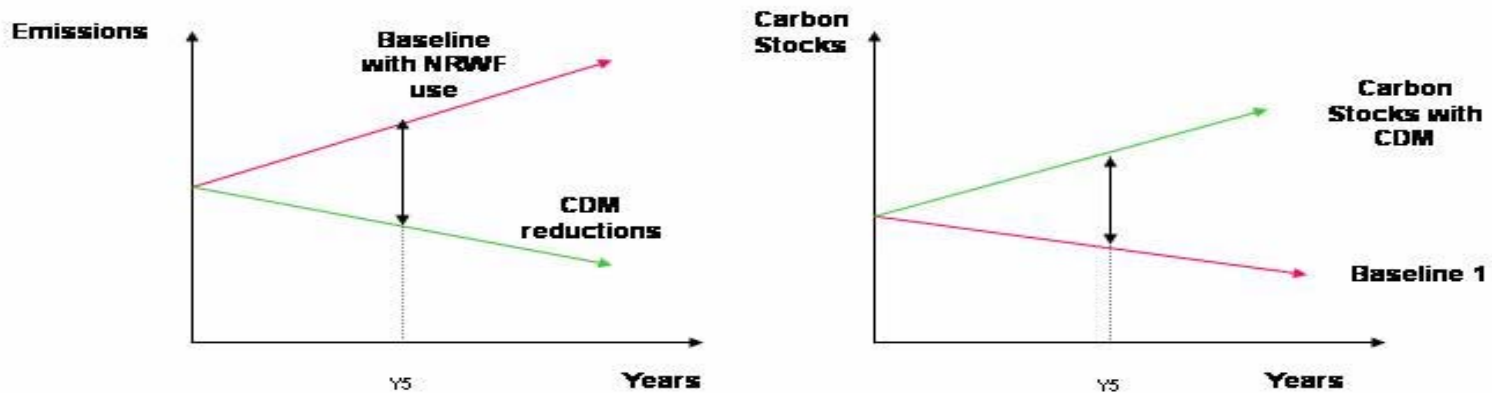
$$\mathbf{SI2 \pm 1 \quad \text{if } SI2 \geq 1}$$

WES with non-renewable use of woodfuels

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Baselines & Carbon Stocks in WES



Definitions Proposed

Renewable energy: consists of energy produced and/or derived from sources infinitely renovated (hydro, solar, wind) or generated by combustible renewables (sustainably produced biomass); usually expressed in energy units and, in the case of fuels, based on net calorific values.

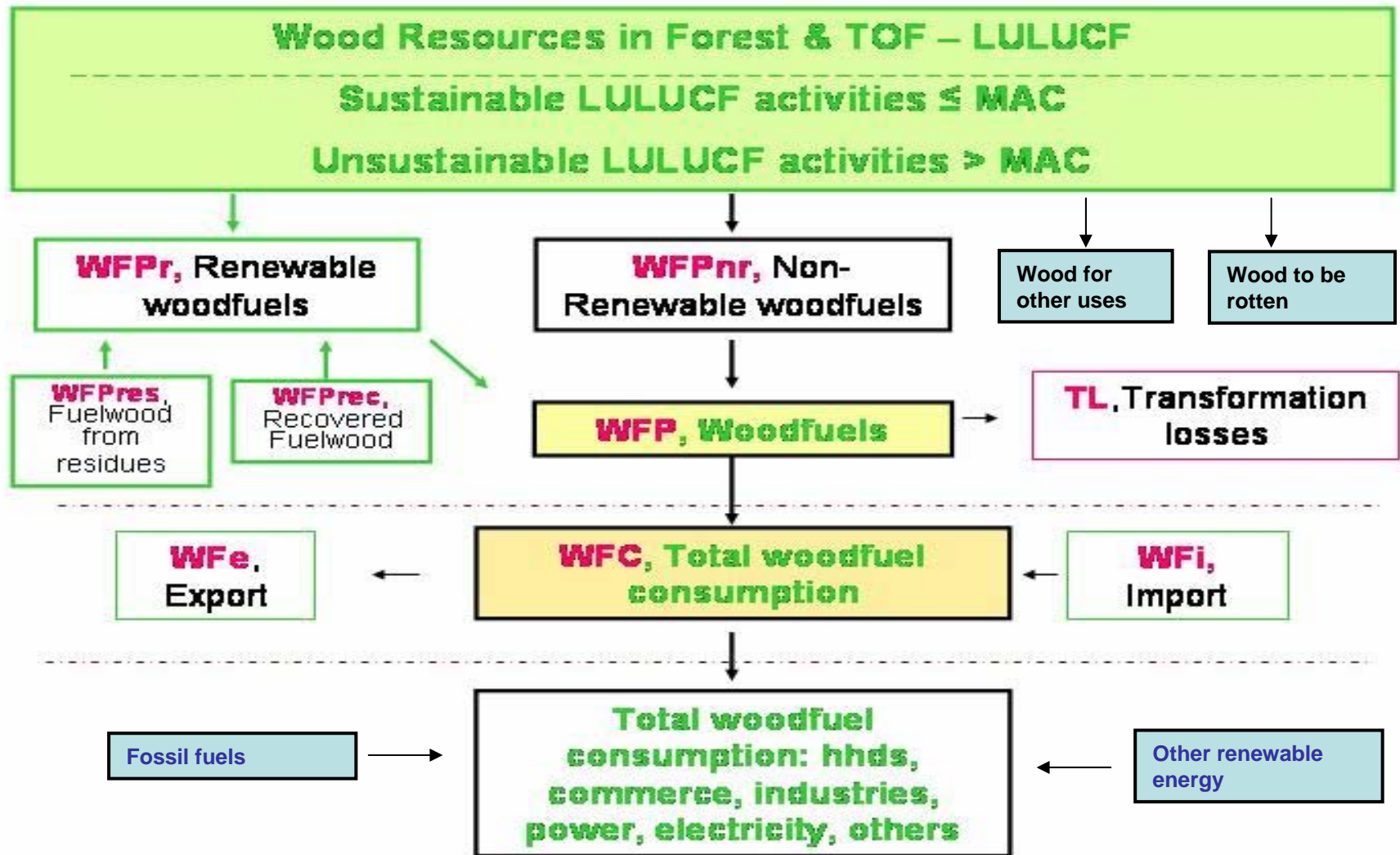
Renewable wood energy: energy derived from **renewable woodfuels** corresponding to the net calorific value of the fuel

Renewable Woodfuels: consist of woodfuels (fw & ch) produced and/or derived from supply sources infinitely renovated following sustainable production practices such as SFM

Devegetation? Degradation? Afforestation? Reforestation?

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Conclusions

Calculation of woodfuel flows from supply sources could be complicated

Definition of project area is critical for CDM project design

Woodfuel production should be estimated from consumption

Woodfuel production from deforestation is an option for verification

Terms with clear definitions are needed

Definitions of “sustainable” & “renewable” woodfuel production needed

CDM is essential for modernisation of traditional WES

The background of the slide features a stack of wood logs. In the center of the stack, a fire is burning, with a bright white and yellow flame rising upwards. The entire scene is set against a solid blue background. The text 'Thank you' is centered in the upper half of the image.

Thank you

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