**BIOENERGY FEEDSTOCK - CALCULATION REPORT**

**Estimating the energy yield of sugar and starch plant species**

Questions: 1. How much are energy density and storage volume per ha of the final fuel?

2. Which of the selected species has the highest gross energy yield per hectare?

3. Which losses are to be considered and how much are they approximately?

4. Are there relevant amounts of energetically usable byproducts or residues?

5. Taking into account all circumstances incl. environment, which crop species

would you recommend for energetic use in your region?

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| Calculation formulas:  70tFM/ha x 90l/tFM = 6,300l/ha = 6,300l/ha x 0.79 kg/l = 4,977kg/ha . 6,300l/ha= 6.3 m³/ha  4,977 kg/ha x 26.8MJ/kg = 133,384MJ/ha / 3.6 = 37,051kWh/ha  ED: 37,051kWh/ha / 6.3m³/ha = 5,881kWh/m³ or 5,88MWh/m³  9tFM/ha with 380l Ethanol per tFM 9 x 380 = 3,420l/ha x 0.79 kg/l = 2,701.80kg/ha . 3,420l/ha = 3.42m³/ha  2,701.80kg/ha x 26.8MJ/kg = 72,408.24MJ/ha = 20,113.40kWh/ha (divide 72,408.24MJ / 3.6MJ)  ED: 20,113.40kWh/ha / 3.42m³/ha = 5,881kWh/m³ or 5,88MWh/m³  Suger cane 133,384MJ/ha = 37,051kWh/ha equates Corn 72,408.24MJ/ha = 20,113.40kWh/ha |

Data list:

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| **Common name and/or**  **scientific name** | **FM1)**  **yield** | **Convers.**  **rate2)** | **Den-sity3)** | **Heating value3)** | **Energy density3)** |
| **-** | **YFM** | **w** | **ρ** | **LHV** | **ED** |
| - | tFM/ha | lEtoH/tFM | kg/l | MJ/kg | kWh/m³ |
| Sugar cane  *Saccharum officinarum* | 70 | 90 | 0.79 | 26.8 |  |
| Corn/Maize  *Zea mays* | 9 | 380 | 0.79 | 26.8 |  |
|  |  |  |  |  |  |
| 1) Fresh matter of harvested crops 2) Conversion crop to final fuel 3) Ethanol 4) per ha and y  You may enter also ranges of values. In case of space requirement, use the back. | | | | | |

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| Answers:  In case of space requirement, use the back. |