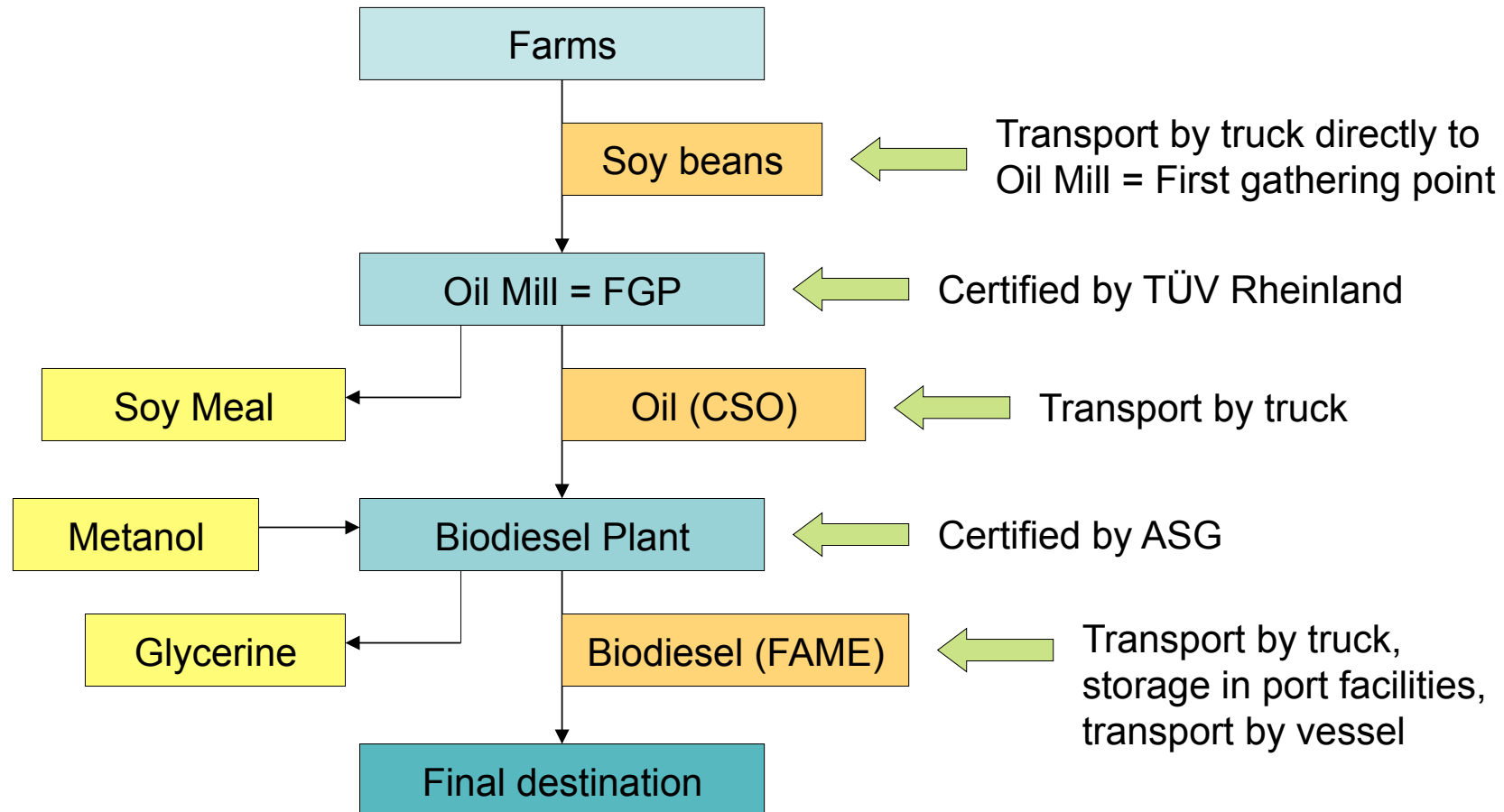
A man and a woman in business attire are standing in front of a large, metallic globe sculpture. The man is on the left, wearing a dark suit, white shirt, and red tie. The woman is on the right, wearing a brown blazer over a light green shirt. They are both smiling and looking towards the right. The background shows a clear blue sky and some greenery.

ISCC Audits for biodiesel based on
soy beans, experience in Argentina

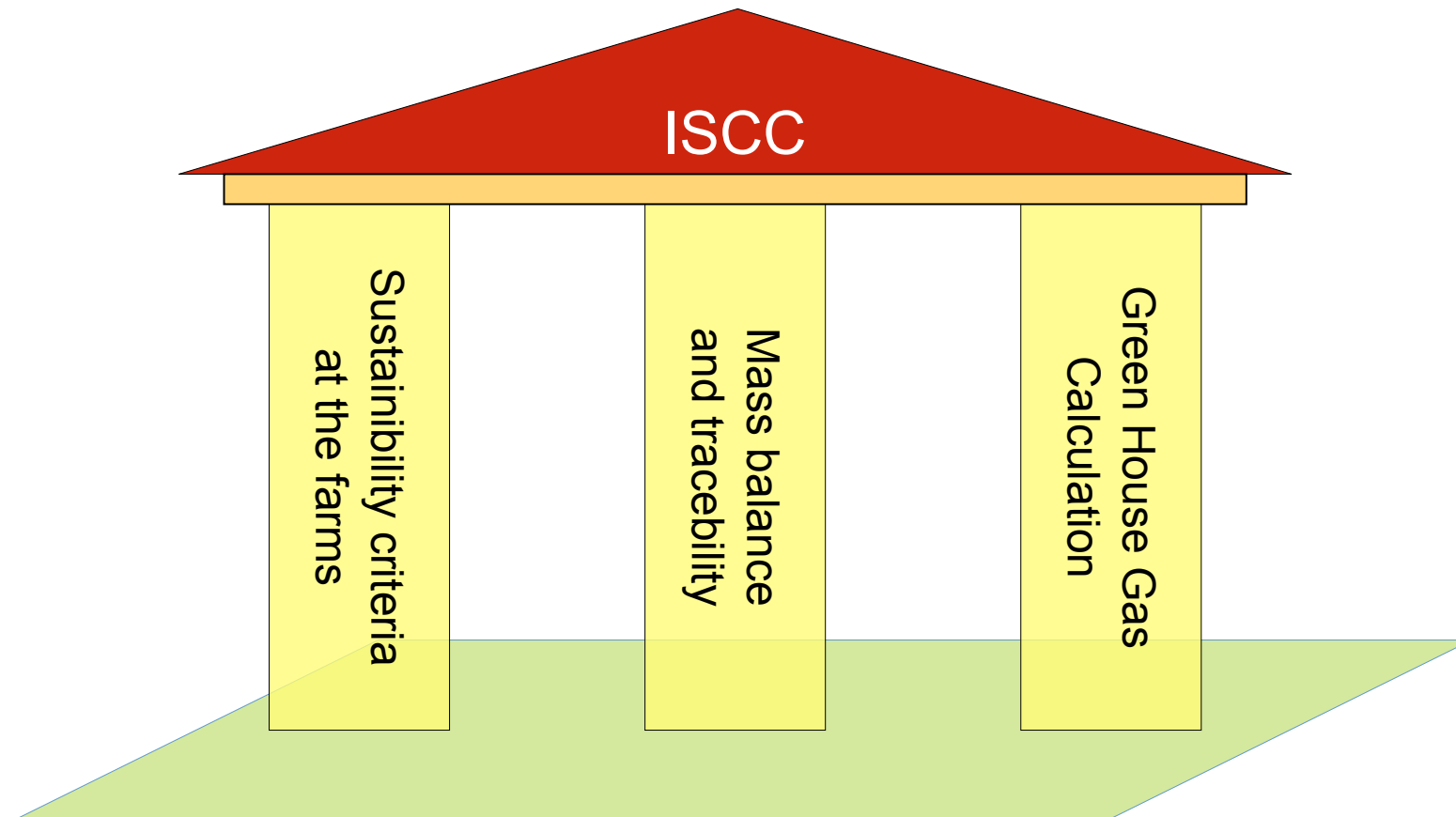
Dr.-Ing. Thorsten Malchow
Sao Paulo, 9 of November 2011



The client: Oil Mill + Biodiesel Plant in Argentina



The 3 columns of the ISCC audit



Audit of the sustainability criteria at the farms

- Certification audit:
 - 23 farms operated by the client, owned land and rented land
 - 2 Farms audited on-site. Revision of the documents of all farms by sample in the central office of the client
- Follow up audit:
 - 25 farms operated by the client (23 + 2 new farms)
 - 32 farms from 4 providers of the client, owned land and rented land
 - Visiting the central offices of the 4 providers evaluation of the documents of all farms by sample
 - 6 Farms audited on-site: 1 farm each of each provider and 2 farms operated by the client
- Audit team: Qualified ISCC auditor + agricultural expert



Audit of the sustainability criteria at the farms

- Main topics to audit in the office:
 - Self declarations of all farms
 - Conditions and history of the land (no go areas, satellite images)
 - Contracts of renting the land, documentation of property
 - Contracts with service providers (tilling, harvesting, agro chemicals)
 - Registers of shipment of the grains (carta de porte – nota fiscal)
 - Management system, procedures
 - Structure and responsibility, organisational chart
 - Training records
- Main topics of audit during the on-site farm visits:
 - Conditions of the land and of the surrounding
 - Good agricultural practices
 - Interview with the people: Social and safety conditions, level of knowledge



Mass balance and traceability audit in the Oil Mill

- Applied method:
 - Mass balance with physical mixing of sustainable and non sustainable biomass
 - Book keeping of credits of sustainable biomass
 - Balance period 3 months
- Certification audit:
 - Revision of the balance method (the balance sheet itself was still empty)
 - Structure and responsibility, organisational chart
 - Training records, knowledge of the people
- Follow up audit:
 - Detailed revision of the mass balance sheet (more than 3.000 entries)
 - Sample revision of the shipping papers for sustainable material (carta de portes, nota fiscal, sustainability declarations), about 40 cases evaluated
 - Correct application of conversion factors
- Recommendation:
 - Integration of sustainability accounting in existing IT System for warehouse management in order to control the huge amount of data in future



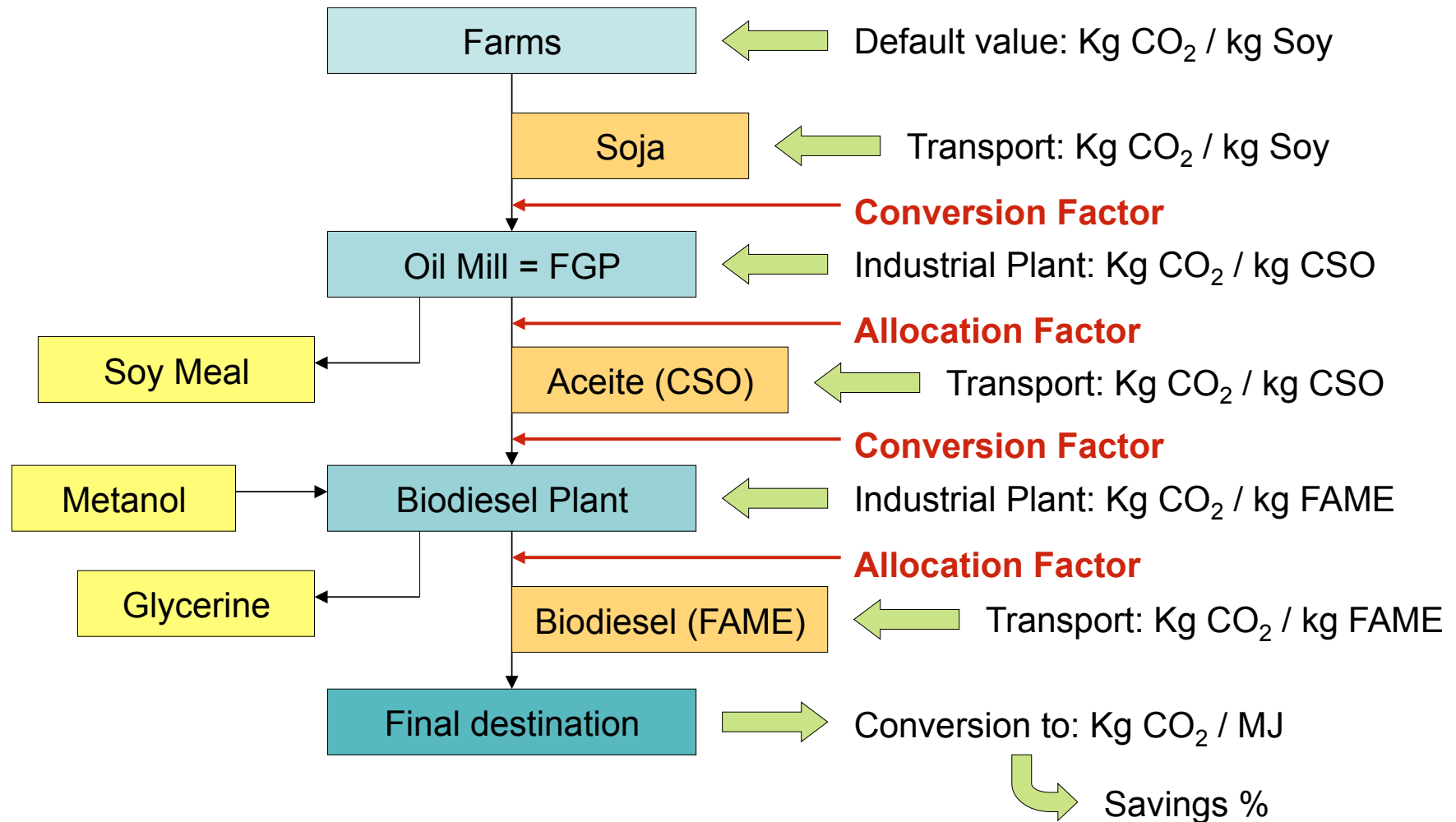
GHG Calculation step 1: Emissions for each unit

Calculation for each process step	Specific consumption per kg product	Emission factor kg CO ₂ per unit of consumption	Sum kg CO ₂ per kg product
Energy (gas, diesel, electricity)	● →	● →	●
Inputs (fertilizer, hexane, metanol, etc.)	● →	● →	●
Waste (waste water)	● →	● →	●
			↓
			↓
			↓
			↓
			Kg CO₂ / kg product

Apply this calculation to every process step:
 Farm, first gathering point, oil mill, biodiesel plant, transport by truck and vessel



GHG Calculation step 2: Assamble the parts



Audit of the GHG Calculation

- Applied method:
 - Excel sheet similar to step 1 and 2 shown above
 - Default value for the farms, transport and conversion units calculated
- Certification audit:
 - Verify the calculation in details (time consuming)
 - Correct use of the units (kg CO₂ / kg Soy, kg CSO, kg FAME, MJ)
 - Sources for emission factors (literature)
 - Statistical security of data in case of own measurements
 - Correct application of conversion and allocation factors
 - Correct use of the default values (The transport from farm to first gathering point is not included in the default value for the farm)
 - Correct application of the transport distances (the truck is empty on its return journey?)
- Follow up audit:
 - No changes since certification audit
- Recommendation:
 - Start collecting data from the farms in order to reach 60 % reduction



Thank you for listening!



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