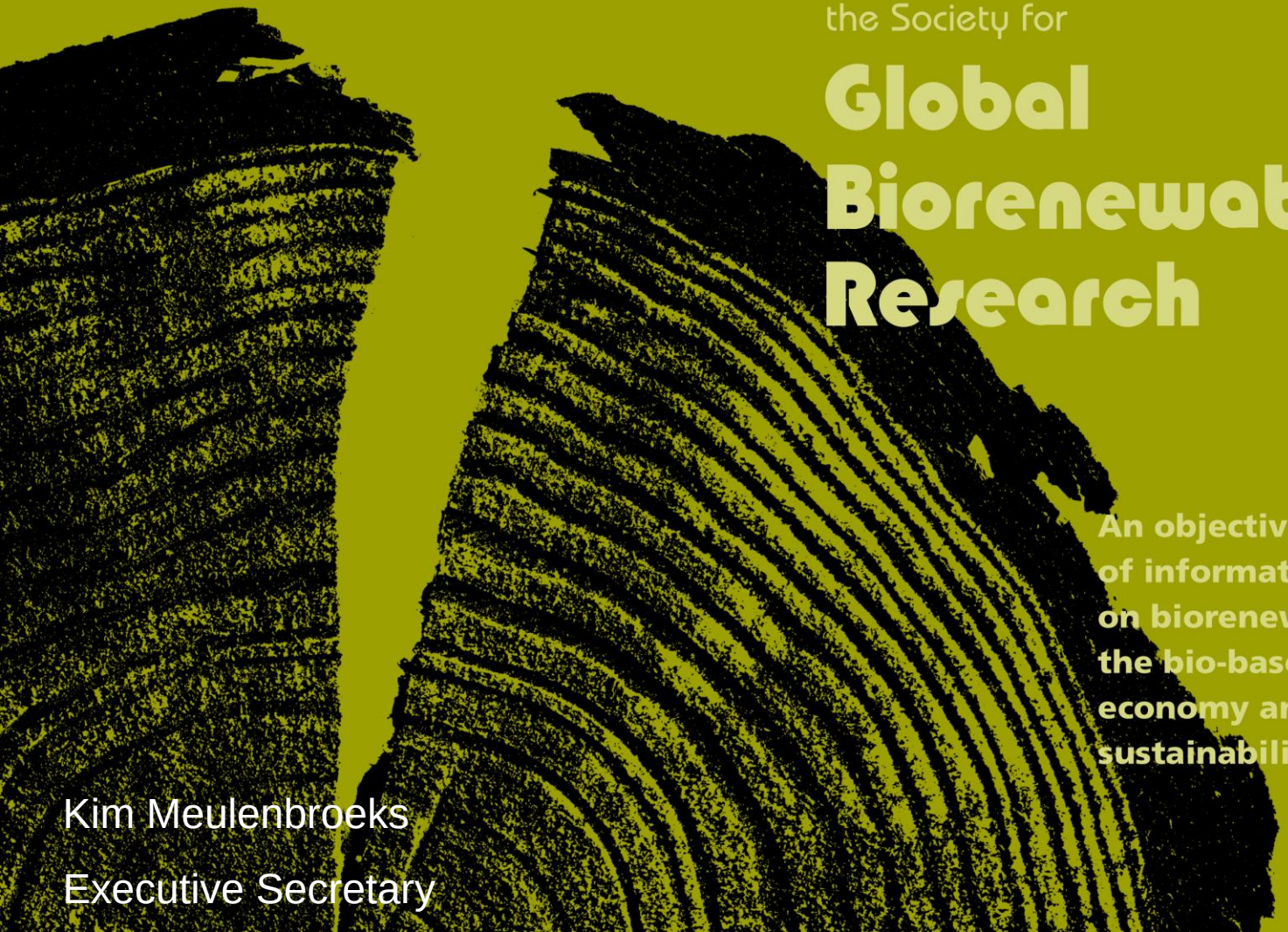
GBR Society

the Society for

Global Biorenewables Research



An objective source of information on biorenewables, the bio-based economy and sustainability

Kim Meulenbroeks

Executive Secretary

The science of sustainable bioenergy production

Reasons for changing to renewable resources:

- Rural economic development
- Energy security
- Reduction of GHG emissions

Comparison between biofuels and other renewable resources, such as wind, solar and hydrogen power.

Conclusion:

- High financial investments
- First years negative energy balance
- ~ 50% of the transportation sector can not be replaced by other renewables

Some of the presenters stuck to the current situation focusing on technologies that are used today. Others looked into (near-) future scenarios.

The science of sustainable bioenergy production

Key question is not **IF** biofuels are sustainable but **HOW** biofuels are implemented.

Main causes for concern are the possible impact of Land Use Changes

- Opportunities and capacities differ a lot around the world with regional issues, Africa and Latin America have land available

Land Use Changes may be limited by:

- Usage of whole crop / 2nd generation technology
- Usage of pasture land
- Usage of perennial crops
- Usage of double crops
- Increase of crop yield
- Usage of land that can’t be used to grow food crops - Agave

The science of sustainable bioenergy production

Success stories:

Bioethanol production from sugarcane in Brazil
Using 1% of arable land for replacing 30% gasoline.
Economically viable – without subsidies
Social implications for sugarcane workers, very low education but:

- Higher income that other agricutural sectors
- Higher percentage of registered employees – better social welfare
- Higher education of offspring

Next generation technologies for biomass conversion technologies

- using parts of the plant not used for human consumption
- engineering bakers yeast to convert also the cellulosic parts
- leading to 85% cellulose conversion without adding cellulase

If SA would be able to implement these new technologies, they would be able to produce enough biofuels for domestic use and possibly also for export.