

# INTERNATIONAL CONFERENCE

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“Bioenergy Policy Implementation in Africa”

Round Table 3-Regulations and Standards for bioenergy  
Implementation

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- Overview
- Issues for consideration during policy formulation
  - Relative differences between different fuels and their usage
  - Fuel standards and specifications
  - Engine modifications and performance
  - Conclusions



- Use of biofuels (bioethanol and biodiesel) has several implications for end use and distribution chain
- Specific biofuels and different blends offer advantages and disadvantages
- In view of this –such issues need to be considered when deciding policy frameworks and objectives of a biofuels market.
- Some of the policy considerations include; blending ratios; vis a vis- GHG emissions, engine modifications and related technical issues such as cold starting, vapour pressure, air quality, viscosity, public perception, infrastructure



- From the perspective of end use and distribution, bioethanol and biodiesel are attractive because they have close physical and chemical characteristics to fossil diesel and gasoline
- However, bioethanol and biodiesel are not exact analogies for petrol and diesel-For example bioethanol has lower heating value, vapour pressure, high oxygen content-which can be taken advantage of and use it as an octane enhancer to replace lead and/or MTBE
- Slightly more hydrophilic profile leading to corrosion of infrastructure.
- Biodiesel has slightly higher viscosity and standards difficult to keep due to widespread production possibilities.



- Fuel standards play a major role in defining opportunities for biofuels through dictation of blending ratios
- There is therefore need for robust and clear systems for fuel standards and specifications which create consumer confidence
- Apart from providing standards which are available to fuel companies and car manufacturers
- Customers need to know and trust the safety of biofuels for engine effects and warranties
- However, situations where car manufacturers insist that no fuels can be used in their engines can create barriers for market development
- For these reasons, various countries specify different blending ratios – E2, E5, E20, E85-B2, B5, B20, B100 and corresponding standards



- Some of special technical features which go into standards include for example for biodiesel , greater chain length of biodiesel than fossil diesel resulting in lubricity being compromised for biodiesel as it penetrates into the crankcase through the piston rings.
- For bioethanol, a key challenge especially during cold periods in winter –typical of northern countries –is the lower vapour pressure
- Vapour pressure reduces as ethanol content in blends increase- resulting in ignition difficulties especially in colder regions.



- Engine modifications/developments are essential as blending ratios increase –such as carburetor/Fuel injection systems, fuel filters, ignition systems, change of lubricants, basic engine design, cold start systems.
- Bioethanol for example (Based on Brazilian example) -up to E5 (no necessary modifications), E5-E10(carburetor modification for vehicles upto 12-20 years old), E10-E25(carburetor/fuel injection systems, ignition systems, fuel pressure devices and fuel filters), E25-E85, and above E85 specially designed engines
- A typical example for specially designed engines-Flex-Fuel Engines (FFVs) which alternate between two sources of fuel
  - Between petrol and bioethanol
  - Petrol and natural gas-Brazil providing leadership
- FFVs are designed with higher compression ratios and flexible ignition systems resulting in improved fuel efficiency and reduced emissions



- To develop a regulatory framework and set standards requires;
  - In depth understanding of various technical issues
  - Provide clear information about the physical and chemical characteristics (energy density, oxygenate levels, octane number, cetane number, hydrophilic effects)
  - Provided clear information on types of fuels that is recommended
  - Future engine developments will require to be energy and environmentally efficient
  - Gradually adapt and optimise for higher blend biofuels



**CEEEZ**

**END OF PRESENTATION**



**THANK YOU**

**END OF PRESENTATION**