

**ENERGIZING RURAL  
LIFE AND INDIAN  
ECONOMY  
SIMULTANEOUSLY**

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# The Central aspect of a win<sup>5</sup> plan

- (a) Generate liquid bio-fuels to replace high speed diesel from waste land and
- (b) Use all solid wastes from agriculture, plantations, and urban areas as well as solid wastes from oil seed processing units with currently available technologies **regardless of scale**

to get

**Transport oil replacement, distributed electricity generation at 10 to 1000 kWe)**

# What is win<sup>5</sup> here?

1. Any transport oil generated implies replacement for money going out of the country, but distributed within the country.
2. The number tree-culture jobs at various skill levels created is in units of millions - much better assured rural income (elimination of related suicides).
3. Much less sensitivity to international oil price changes.
4. The solid bio-fuels will help generate distributed electricity that will help create better rural quality of life and enable other change agents to be brought in.
5. Making a large tract of land green and rich and so allows climate change mitigation

# WHAT IS THE STRATEGY?

1. Allow growing of oil seed bearing trees on waste land to get oil and solid wastes .
2. Create these in a “industrial pathway” to ensure investment and returns, even if the payback is 5 to 6 years.
3. This may actually provide a role model even for agriculture (agriculture as an industry).
4. Avoidance of agricultural land is to prevent conflict between food and fuel.

# WHAT IS THE STRATEGY?

- Use existing know-how to treat all bio-wastes as fuel resources.
- The use of **tree-culture** instead of **agriculture** provides for year-round work.
- 2. Central Government is for policy and India, Inc for production
- 3. Principal owner of output –oil, Oil India Ltd, etc

**Profit making “India, Inc” is allowed to procure land on lease and is required to grow oil seed bearing trees and others.**

# Waste Assets - a summary

- 100+ million tonnes of agricultural wastes
- 20+ million tonnes of plantation waste
- 33+ million Hectares of waste land that could lead to 33 + million tonnes of non-edible oil (equivalent of 25 to 27 million tonnes of HSD) and 130 million tonnes of solid biomass
- 40000+ tonnes per day of Urban solid waste

Let us just examine the extent of waste land as it is important.

# Techno-economic issues - 1

- ▣ There are a large variety of species – Jatropha, Pongamia, Castor, Mohua, Sal, etc, etc
- ▣ Extraction process is by screw/solvent processes, choices decided by economics
- ▣ For use in thermal applications (perhaps not the most appropriate), they can be used on as-processed basis.
- ▣ **For reliable use in transport vehicles, trans-esterification is desirable.** Both extraction and further processing are standard processes assimilated by the industry.
- ▣ Tests have been made at RDSO with large power engines used for rail traction. Technical issues have been addressed in several laboratories – power performance and emissions. There is a large body of international work that is accessible.

# Summary

- ▣ By designing a package with suitable owners of the products – **IOC - Oil**, **village institutions - electricity from bio-residues**, **Investors - Output from lands leased from Government**, one can generate internal revenue to substantially reduce the FE outgo.
- ▣ Provide in this process an additional 60+ million jobs across the country.
- ▣ Provide institutional core support at the centers currently active and create a few more centers across the country to support S & T demand.