ENABLING POLICY & REGULATORY ENVIRONMENT

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EVOLUTION IN PERCEPTION OF BIO WASTE

- ***Earlier Approach*** **: Waste is a source of pollution and technology/ investment focus is on treating the waste and ensuring that "discharges" are within norms stipulated for air and water quality by respective "Pollution Control Boards"**

- ***Current Approach*** **: Bio waste contains organic matter which can be a renewable resource for producing energy & organic fertiliser + Carbon Credits .. often exaggerating economic benefits, which retards large scale use.**

- ***Required Approach*** **: Bio waste disposal must be viewed as potential health hazard/ environmental pollution (with attendant costs). Hence, facilities receiving Bio waste should be incentivized rather than be exposed to market dynamics, which results in uneconomical costs for bio waste**

INDIA - POLICY INITIATIVES TO REDUCE FOSSIL FUELS

 # NAPCC : (National Action Plan for Climate Change) is policy initiative in the right direction. However, needs to evolve from statement of intent to actionable & enforceable programmes (with penalties for defaulters).

 # INTERNAL MARKET MECHANISMS: facilitated through Acts of Parliament, viz REC (Renewable Energy Certificates) under the Indian Electricity Act 2003 & PAT (Perform Achieve Trade) under the Energy Conservation Act 2001. These need to be strengthened through stricter enforcement and levying penalties on defaulters. Also, list of obligated entities may be increased to give the necessary emphasis on Energy Efficiency.

 # POA'S : Programmes for Clean Cookstoves & CFL/LED Lighting offer huge potential for energy saving & generating surplus biomass. However needs more focus & much more ambitious targets.

 # FOSSIL FUEL SUBSIDIES : Even if there are no immediate steps to phase out such subsidies, fearing economic impact on energy consumers and consequent GDP growth, it would be useful to have such information in public domain.

INDIA – FINANCING OPTIONS FOR FOSSIL FUEL REPLACEMENT

 # NCEF (National Clean Energy Fund): growing @ $ 1 billion/ year through cess @ Rs. 100/MT on coal produced/ imported currently. However, policy framework & administrative lacuna, there is, currently, low levels of usage,.

There is a strong logic for applying similar cess on imported LNG/LPG, with dedicated application of providing "viability gap" funding for Cellulosic Ethanol/ Biomethane projects.

 # GCF (Green Climate Fund): is functional with initial pledges of $ 10.2 billion, 50% of which should be converted to commitments by 30th April 2015 … perhaps growing to $ 30 billion by 2016.

India will have to state its INDC's (Intended Nationally Determined Commitments) in COP21 at Paris. These could be evolved keeping in mind criteria for attracting GCF support … innovative & transformative, apart from GHG mitigation.

<u>India could be "preferred destination" for GCF funds allocation, if it showcases success stories (with high scalability factor), such as that of Cement Industry.</u>

TYPICAL PROJECT – TRANSPORT & HEATING FUEL REPLACEMENT

MODULAR 2ND GENERATION BIO-REFINERY , WITH FEEDSTOCK OF AGRI RESIDUES (PADDY STRAW/ COTTON STALKS) PRODUCING ANNUALLY 60,000 TONS CELLULOSIC ETHANOL + 60,000 TONS PELLETS.

The anticipated GHG mitigation would be

 # 60,000 MT Bio Ethanol = 40,000 MT Gasoline, which has GHG factor is 2.22 tCO2/Kilo litre or 2.96 tCO2/MT. Hence mitigation of 118,400 tCO2

 # 60,000 MT Pellets = 24,000 MT LPG, which has GHG factor is 1.65 tCO2/Kilo litre or 3.235 tCO2/MT. Hence mitigation of 77,640 tCO2

 # TOTAL GHG MITIGATION : 190,000 tCO2/ year (with 5% leakage)

Entire thermal & electric energy needs are met from Biogas (from effluent) & lignin residues. E85 complaint prime movers could be deployed for transporting biomass. Hence leakage will be less than 5%. Furthermore, GHG emissions are not a/c for Chemical Fertiliser replacement by Compost (Co-Product of Bio-Refinery)

INDIA – ALTERNATE FUELS – POLICY ISSUES

BIOMASS FOR FOSSIL FUELS REPLACEMENT POLICY INTERVENTIONS REQUIRED

 # PLANTATIONS & DEPOTS : National Mission for Greening India goals to be converted to specific PPP programmes, MoF & MoEF to facilitate funding mechanisms from NCEF & NABARD

 # COOKSTOVES : Registered PoA to made effective through Carbon Financing (NCEF, GCF, etc) and thereby release surplus biomass. Focus on mitigating health hazard

 # BIOWASTE PROCESSING : State Pollution Control Boards to mandate Bio waste processing to Energy and/or Compost & minimise landfills. Capital subsidies for mitigating health/ environment hazard & displacing chemical fertilisers.

 # BIOFUELS & RENEWABLE CNG : MoP&NG to compute delivered cost of Petrol/ Regasified LNG/ LPG … this will incentivise investments in 2nd Gen Biofuel and Biomethane price of > Rs 50/Kg.

FACTOR IN THE ENVIRONMENTAL & SOCIAL BENEFITS FROM BIOWASTE PROCESSING

- **ENVIRONMENTAL POLLUTION MITIGATION : of air pollution, ground water contamination & health hazards from inefficient usage (MSW, Cook stoves) or non processed bio waste (sludge from sewage treatment plants, agri residues, manure)**

- **JOBS CREATION: Create man jobs in biomass supply chain, biowaste processing units.**

- **RELIABLE ELECTRIC SUPPLY: reliable electricity from DDG based on Biomass, providing reliable power to local community & SME's.**

- **ORGANIC FERTILISER : Digester effluent can be processed to good quality compost (>75% dry solids) + liquid fertiliser (for integration with micro irrigation systems), displacing MoP, DAP.**

- **LIQUID CO2/ DRY ICE : Carbone dioxide separated from Biogas, can be liquefied and used as Industrial Gas, feed to Greenhouses or processed to produce "Dry Ice".**