Climate Change and Waste Management

Important Societal Challenges recognized by:
- Paris Climate Change Agreement 2015
- NDC Action Plan

Source¹: Digest of Environment Statistics 2020 (Statistics Mauritius)
The Government Annual Budget on Waste Management²

Rs 1.5 Billion per annum

Source¹: Digest of Environment Statistics 2020 (Statistics Mauritius)

Source²: Annual report financial year 2020-2021 (Min of Env)

Wastes Landfilled - 2021²

507,992.42 Tonnes

Total wastes generated by 2030 – approximately 684,000 Tonnes

2% increase on average yearly over last 10 years²

Sources of Waste

- Domestic & commercial: 95.5%
- Construction: 1.8%
- Food Industries: 2.0%
- Others: 0.7%

Source¹: Digest of Environment Statistics 2020 (Statistics Mauritius)
Source²: Annual report financial year 2020-2021 (Min of Env)
POTENTIAL ECONOMIC IMPACTS OF CIRCULAR ECONOMY

Environment
Reducing Pollution And Pressure On The Environment

Economy
Boosting GDP
Up To 0.5%

New Industry
Promotes Competition And
Boost Economy Activity

Innovation
Improving The Security
Of Supply Of Raw
Materials

Employment
Creation Of Jobs

Source: ecomauritius.mu
CLIMATE BENEFITS OF CIRCULAR ECONOMY

Source: ellenmacarthurfoundation.org
RENEWABLE ENERGY - AN INTRINSIC PART OF CIRCULAR ECONOMY

RENEWABLE ENERGY FROM WASTE TO ENERGY METHODS TO GENERATE ENERGY

**Thermal Technologies**

**INCINERATION**
- Burn solid at high temperature
- Heat converted to energy
- Steam drives turbine

**PYROLYSIS**
- Break chemical bonds in material
- Fragments unite to form smaller molecules
- Char, tar and gases are by-products

**GASIFICATION**
- Turns biomass into gases without burning by steam adjustment
- Syngas is the product

**Non-thermal Technology**

**ANAEROBIC DIGESTION**
- Microorganisms break down materials & Absence of oxygen
- Waste is fed into a digestion tank
- Biogas and Carbon Dioxide are products
- Compost is a by-product

60 % RE target
Phase out Coal
Biomass Framework

RENEWABLE ENERGY – AN INTRINSIC PART OF CIRCULAR ECONOMY
LIFE CYCLE ANALYSIS - SOLAR PANELS AND BATTERIES

WHAT IF?
Wastes of Renewable Energy are used to generate energy

1.5 million tonnes of glass, metals & Silicon
95% can be recovered

4.75 million tonnes of concrete, metals and composites
90% can be recovered

240000 tonnes of lithium ion batteries
100% can be recovered

Source: newenergysolar.com.au
Disassembling the aluminium and glass parts

Thermal processing at 500°C

95% glass reused

Physical separating cell modules

Evaporates the covering plastic

100% metal reused

Etching away silicon wafers

80% modules reused

Melting broken wafers

85% silicon reused

Collecting materials

Separating solid and liquid with a rotating screw

Precipitation and dewatering

Removing interlayer materials with vibration

Removing film using acid and peroxide

Rinsing the glass

Shredding the PV Panels into 4-5mm pieces to remove lamination

Source: newenergysolar.com.au
# Renewable Energy from Wastes vs Other Energy Sources

<table>
<thead>
<tr>
<th>Source of Energy</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solar PV</td>
<td>• Cost effective</td>
<td>• High space occupancy (1 MW/1 ha)</td>
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<tr>
<td></td>
<td>• Easy to deploy</td>
<td>• Intermittency issues</td>
</tr>
<tr>
<td></td>
<td>• Around 50g of CO₂/kWh</td>
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<tr>
<td>Wind</td>
<td>• Low maintenance</td>
<td>• High CAPEX</td>
</tr>
<tr>
<td></td>
<td>• Low in space requirement</td>
<td>• Visual and noise pollution</td>
</tr>
<tr>
<td></td>
<td>• Around 11g of CO₂/kWh</td>
<td>• Prone to damage in cyclonic conditions</td>
</tr>
<tr>
<td>LNG</td>
<td>• Environmentally clean</td>
<td>• Highly combustible</td>
</tr>
<tr>
<td></td>
<td>• High Efficiency</td>
<td>• High requirements for storage</td>
</tr>
<tr>
<td></td>
<td>• Economical</td>
<td>• High CAPEX</td>
</tr>
<tr>
<td>Coal</td>
<td>• Established energy source</td>
<td>• High GHG emissions – 978 g / CO₂/kWh</td>
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<tr>
<td></td>
<td>• Ensure firm power</td>
<td></td>
</tr>
<tr>
<td>Renewable Energy from Wastes</td>
<td>• Reduces landfill wastes</td>
<td>• High CAPEX</td>
</tr>
<tr>
<td></td>
<td>• Land efficient power plants</td>
<td>• Destruction of useful materials</td>
</tr>
<tr>
<td></td>
<td>• Sustainable process</td>
<td>• Sorting and collection of waste</td>
</tr>
</tbody>
</table>
THANK YOU FOR YOUR ATTENTION