Promoting Sustainable Manufacturing in Uganda

by

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Presentation Outline

- Introduction: Sustainable Manufacturing
- Overview - Manufacturing Sub-sector in Uganda
- Sustainable Manufacturing indicators
- Government Interventions
- Switch Africa Green- Demand Side Management of Energy use in MSMEs
- Some Successful examples after implementation
- Summary of some Benefits within Companies
- Conclusions and Recommendations
Introduction: Sustainable Manufacturing

• “Sustainable Manufacturing” is described by OECD as managing manufacturing operations in an environmentally and socially responsible manner, which is no longer just to have but a business imperative.

• SM is all about minimizing the diverse business risks inherent in any manufacturing operation while maximizing the new opportunities that arise from improving your processes and products.

• Companies across the world face increased costs in materials, energy, and compliance coupled with higher expectations of customers, investors and local communities.

• This has forced governments and businesses into developing strategies towards green growth-ensuring that their development is economically and environmentally sustainable.
Cont’d

• Businesses of all types are already involved in initiatives and innovations that are helping to foster a healthier environment, enhance their competitive edge, reduce risks, build trust, drive investment, attract customers and generate profit.

• Experiences from those that have pioneered SM, largely show that environmental improvements go hand in hand with profit-making and improved competitiveness.

• Benefiting from sustainable manufacturing to businesses include: creating value, helps build a reputation, attracts investment, spurs innovation, secures loyal customers and brings in repeat businesses.

• It is therefore important, that all businesses around the world try to improve the efficiency of their production processes and products enabling them to contribute to sustainable development and green growth.
The three-dimensional aspects of Sustainable Manufacturing

- **Reasons – why pursue SM**
  - Increase operational efficiency by reducing costs and waste
  - Respond to or reach new customers and increase competitive advantage
  - Protect and strengthen brand and reputation and build public trust
  - Build long-term business viability and success
  - Respond to regulatory constraints and opportunities

Source: OECD
Overview - Manufacturing Sub-sector in Uganda

- Uganda has a high population growth (3.3% Pp.a), at 35 million people.
- The industrial sector occupies a central position in the Ugandan Government’s vision of economic and social transformation; this can only be achieved by enterprises being efficient and innovative.
- The agricultural sector is the basis for most industrial activity in the country.
- Manufacturing Sub-sector which falls largely under the industrial sector has been guided by the Industrial Policy of 2008, a ten year Policy up to 2018.
- It’s contribution to the GDP in 2016 was about 20% (MFPED)
- There is an increase in the number of manufacturing and processing industries in the country, hence increase in demand for energy, water and raw material resources.
- Characterized by mainly processing of agriculture and mineral resources:
  - Agro-processing: Foods and beverages; cotton based textiles and clothing; leather and leather products; Grain and Cereals, Dairy and Dairy products; wood based products; Fish processing,
  - Mining and Construction materials, such as cement, stones/aggregate, sand, etc.
  - Chemicals and pharmaceuticals; Plastics and Packaging materials
Overview - Manufacturing Sub-sector in Uganda - 2

• Largely dominated by Small and Medium sized enterprises.
• with low and medium level of technological development
• Limited access to information, knowledge and technology
• Very few go beyond primary and tertiary processing of raw materials into high quality tradable products.
• Due to inadequate and expensive electricity from hydropower, most of the industries still rely on biomass and fossil fuels as source of power- Disadvantages of application of biomass and fossil fuel include: land degradation, deforestation, pollution to environment due to emissions of carbon dioxide, and destruction of roads due to heavy trucks
• Renewable energy sources include wind, the sun, tides and water.
• The transition towards sustainable manufacturing and green growth is quite highly demanding in particular for SMEs.
• An example is the utilization of the solar energy is still very
Basic relationship between Manufacturing and Environment

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Operations</th>
<th>Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Materials or intermediate products used to</td>
<td>Processes to turn inputs into products and activities necessary to operate</td>
<td>Products manufactured and their use and treatment at the end of their</td>
</tr>
<tr>
<td>manufacture your products</td>
<td>the production processes (e.g. facility operation, transport of inputs</td>
<td>lifetime.</td>
</tr>
<tr>
<td></td>
<td>and products, business travel, staff commuting and other overheads)</td>
<td></td>
</tr>
</tbody>
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![Diagram showing the relationship between inputs, operations, and products in manufacturing and the environment.](image)
Sustainable Manufacturing indicators

- For sustainable operations, there is need for
  - Sustainable water intensity- water is at the heart of all aspects of sustainable development (SDG 6-water Goal)
  - Energy intensity
  - Greenhouse gas intensity
  - Proportion of land
  - Infrastructure
  - Industrial symbiosis
- For sustainable manufacturing/agro-industry, need sustainable agriculture.
The Perfect Storm scenario

It is predicted that by 2030 the world will need to produce around 50 per cent more food and energy, together with 30 per cent more fresh water, whilst mitigating and adapting to climate change.

(Beddington 2009)
Government Interventions in supporting Sustainable Manufacturing: Policy & Institutional Framework

- Policies and Institutions
- Policies which include the Buy Uganda Build Uganda Policy branded Zimba Uganda, an initiative
  - to increase local content in major projects to create jobs and increase incomes;
  - To increase the consumption of locally manufactured goods and services (providing the market)
- Industrial Policy, 2008; Trade Policy, 2008; Cooperative Development Policy; Quality and Standards,
- Renewable energy Policy, 2007 for renewable energy generation and promoting energy efficiency projects
- High cost of Capital: To address the challenge of high interest rates, the Central bank has reduced the CBR to 11%, but the commercial banks rates are still high
Government Policies and Institutions Cont’d

• MFPED: The Development of Green Growth Strategy
• MTIC:
  • The Uganda Cleaner Production Center (UCPC), turned into a Trust in 2017
  • Uganda National Bureau of Standards (UNBS)
• MWE:
  • National Environmental Management Authority (NEMA)
• MEMD

• Most Industries in these key sectors have got waste treatment plants, although with continuous reminders to keep modifying them.
• Little linkages within the entire value chain of the demand-supply chain of the manufacturing sector
Switch Africa Green- Demand Side Management of Energy use in Manuf. MSMEs

• MTIC in collaboration with UCPC have been implementing the SAG project which is funded by European Union aiming at supporting the development of green businesses and eco-entrepreneurship and use of sustainable consumption and production (SCP) practices

Specific objectives;
• To create awareness about energy management and conservation among MSMEs.
• To facilitate adoption and implementation of energy efficient techniques and practices in order to create model MSMEs for sustainable energy use in the sector

Among the Industries participating in the project are from the Tea processing, juice beverages and herbal medicinal products, dairy processing, Grain and cereals – Rice and Maize processing, Metal foundry and Machine fabrications, vegetable oils and products, leather processing, textiles and Sugar manufacturing.
Switch Africa Green- Demand Side Management of Energy use in Manuf. MSMEs

Tea Factories
Tea Industries after adapting Energy Efficient Techniques

The extended withering troughs (25.5 M) at Kayonza Growers Tea Factory

Some of the energy efficient motors installed at the factory

Adopted Measuring and data recording practices, such as Firewood usage
Some Tea factories new systems

Installed LED tubes

Installed PVC rollers to improve quality of tea by removing fibers in made tea

Adopted wood seasoning and storage practices

Serviced Capacitor bank to improve power factor at the factory
Juice Beverages and Herbal Medicinal products
## Summary of some Benefits within Companies

<table>
<thead>
<tr>
<th>Name of Other companies</th>
<th>Conservation and Energy Efficient Measures</th>
<th>Other Benefits</th>
</tr>
</thead>
</table>
| Aloesha Organic Natural Health Products Ltd | • Installed efficient institution stove to reduce energy losses  
• Constructed a fire wood shade to ensure proper seasoning  
• Replacement of high energy consuming bulbs with LED Bulbs | Reduced time for boiling, Improved cost savings, Occupational Health and safety of workers  
The company has so far earned a National Drug Authority Certificate  
Applied for UNBS Certification |
| Mpanga Growers Tea Factory | • Repaired the power back up system (diesel generator) to reduce waste generated during loadshedding | The factory has eliminated tea that could be lost during load shedding. It was estimated that 3 tone tea could be lost for a 24 hours load shedding |
| Buzirasagama Tea Factory Ltd | • The company serviced the Capacitor bank leading to power factor improvement from 0.85 to 0.98  
• Installed translucent sheets to take advantage of day light  
• Replaced 25Hp motors that were rewound more than once | This resulted into an annual saving of USD 6526.6 from 665.7 M3 of wood saved.  
This consequently resulted into reduction in Greenhouse gas by 491286.6 kgCO2eq |
| GBK Dairy Products Ltd | Upgraded the steam system by repairing leaks and insulation of all un-lagged steam pipes to eliminate heat loss and steam leaks | Improved thermal efficiency which reduced and improved fuel utilization leading to cost savings |
| Pearl Dairy Ltd | The company is gradually switching from use of fossil fuels to bio-mass by installation of bio-mass fueled boiler | Reduction in emission of Greenhouse Gas emissions from combustion of fossil fuels |
Promoting Industrial Symbiosis

Three primary sectors for resource exchange:

- By-product and waste exchange
- Utility/infrastructure sharing such as energy, water, and wastewater
- Joint provision of services - meeting common needs across firms for ancillary activities such as fire suppression.

The Circular Economy
Examples of Industrial Symbiosis synergies

- Wastes from metallurgical companies
  - Scrap recycling
  - Battery recycling

- Wastes from Food/Agro-processing industries
  - Damaged fruit and vegetables for composting or anaerobic digestion
  - Spent grains from brewing for animal feed

- Wastes from the wood products, paper and packaging industries
  - Packaging waste recycling
  - Wood sawdust recycling

- Leather and leather products industries
General Benefits in respect to Sustainable Manufacturing

- Environmental, social & financial benefits
  - Emissions reduction
  - Diversion of organic and industrial waste from landfills
  - Resource savings
  - Reduction of raw material cost through byproduct valorization
  - Extra revenues
  - Development of new technologies for the recovery of waste
  - Jobs creation
  - New enterprise investments established
Conclusions and Recommendations

- The companies have appreciated awareness creation, the trainings and technical assistance provided by the Project, and have got savings as a result.

- Most industries have adopted use of natural day light and replaced high energy consuming bulbs with the LED energy saving bulbs.

- Due to the limited funding and time for the project, few companies have benefited. More are still requesting for capacity building and awareness creation.

- Financial constraints limit SME technology adoption and innovative measures towards green entrepreneurship.

- Due to the costs involved in addressing energy efficient challenges, low hanging fruits/quick wins were emphasized as funds are resourced to replace major equipment.

- Others have asked for markets, proper packaging materials and technical assistance for certifying their products with UNBS.

- Other institutions including training institutions and domestic homes have requested for such kind of training and awareness creation.
Recommendations

- Strengthen Policy coherence to promote SM
- Promote generation and integration of all energy sources to reduce on the cost and sustain the sufficient supply of power to industries
- There is need to strengthen awareness creation and trainings
- Strengthen support for Various projects and initiatives regarding sustainable consumption and production practices
- Promote more of the renewable energy sources than fossil fuel to reduce emission of carbon dioxide
- Improve financing mechanisms to promote technology transfer and innovation
- Companies to keep collecting their data and calculating indicators to help improve immediate performance
- Companies should upgrade employees’ skills and competences
THANK YOU FOR YOUR ATTENTION!

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