Economic Perspective of E-waste Management

1st Eko International E-waste summit 24th-25th of February
By Haroon Adekilekun
(Appointed e-waste Manager for the Lagos State Government)
Local Content Development Initiatives (PPP Scheme)

Lagos State Environmental Protection Agency (LASEPA)
Approach under Supervision of Ministry of Environment
WASTE MATERIALS JUST EVACUATED
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E-WASTE MATERIALS SORTED
E-waste Evacuated
Introduction

- The economic perspectives of E-waste management in broader term mean WASTE to WEALTH. This is a scheme of Lagos State government for the purpose of waste management through minimization and Recycling in order to develop human capacity for towards economic potentiality of the citizenry of the state.
Contn’d

- United Nation estimated that approximately 50 million of e-waste are generated worldwide each year, Green peace expert projected the volume in 2010 to be 150 million tones.

- It therefore means that Lagos State a heart beat of economy in Nigeria stand a better chance to exploit this economic potentiality in the sub African state.
The Lagos State government introduced Public-Private Partnership option of managing ‘waste to wealth’ scheme, which means the investor shall partner with government in the areas of E-waste logistic and collection, E-waste warehousing, E-waste sorting and packaging, E-waste equipment and overhead and Labour cost in managing this hazardous waste. Considering the lending rate in our commercial banks at 28% which is not favourable in long term loan, the repayment at that lending rate will not be less than 5-10 yrs depending on the economic and political situation of the country like Nigeria.

Presently we have in Lagos state ‘waste to wealth’ PPP project in the state such as ‘Fertilizer Recycling Plant at Odogunyan, in Ikorodu, Earth Technology partnering with LAWMA, Solid Waste Recycling PPP project at Epe, MSC Ltd. in conjunction with LASEPA on E-waste management, to mention but few.'
A total of N3,098 million is the estimated investment costs of the e-wastes project. These costs are broadly classified into:

- Capital Expenditure - N2,504m ($15.7m)
- Working Capital - N594m ($3.6m)

The Capital Expenditure consists of:

- 1 No 10-line e-waste Recycling Plant to be supplied by a Singapore firm. The quotation for the plant has been viewed alongside similar suppliers and found to be competitive.

- 1 No 2000 KVA Electricity Generating Plant to provide alternative power supplies for the Factory’s use in case of outage from the public power supplies.
Contn’d

- 1 No Electricity Transformer to assure that the electricity load supplies to the Factory is assured and to eliminate fluctuations due to stress on the transmission tools. An owned transformer provides a good bargaining tool for securing direct supplies from the public electricity company.

- 1 No factory Building to accommodate the Gate House, Factory Operational Areas, Office Building, Conveniences, Storage, Loading/Offloading Bay, and infrastructures.

- The Cost of acquiring the land for the factory site and the provision of required infrastructures such as the construction of a paved road to the site, provision of solar powered street light, etc.

- Cost of acquiring 5 No e-waste haulage vehicles, 2 No operational/administrative vehicles, 2 No Staff Buses alongside Furniture & Fittings for the offices and factory’s use.
The Working Capital covers a 6-month provision to cover
• Administrative and Staff Costs
• Factory Operational Costs

Materials Procurement Costs – By its nature, the e-wastes are supposed to be free of charge as they no longer represent value to those holding them. And as is the practice in other parts of the world, users/manufacturers are at one time or the other paying for the disposal.

Community Relations Expenditure (safe e-waste disposal PR and Advocacy Campaign, Community CSR programmes).

Summary of the Investment Costs and Detailed breakdown are provided below.
LASEPA STRATEGY ON E-WASTE MANAGEMENT IN LAGOS STATE

E-WASTES STAKEHOLDERS FORUM

- With series of Seminars with formal and informal sectors. A Stakeholders Forum was created which includes corporate organisations and informal sector such as Union Bank plc, First bank plc, UBA bank Plc, NLNG (Nigeria Liquefied Natural Gas), Diamond bank, AIA Insurance, etc, all these organizations have their representative in this committee. This is headed by HOD of Hazardous Materials Management- Mrs Yahya I.G, formerly Mr Adekunbi.

- Leaders of Association such as NARAP, NETAN, CAPDAN, Igwe of Alaba are members to involve informal sectors.
LASEPA STRATEGY ON E-WASTE MANAGEMENT

WORKING WITH LOCAL GOVERNMENT

- Collection from homes (grassroots) will be carried in conjunction with 57 LGA, with designated point in the LGA under control of LASEPA

THOROUGH E-WASTE STAKEHOLDERS FORUM

- Corporate Organisations are to submit inventory, which will be inspected before evacuation to the recycling site along Sagamu-Ikorodu road

- Regular Meetings/Training for Informal Sector including markets by the Department of Hazardous Materials Management
LASEPA STRATEGY ON E-WASTE MANAGEMENT

- Sponsored Trip to Singapore, USA, and Japan to understudy E-Waste Technology and how to evolve local content initiative (GM, LASEPA Engr. Shabi).
- Monitoring of e-waste Evacuation Progress in the State, Warehousing.
- Conduct training for Informal Sectors on Practical Safety Measures in handling e-waste materials.
LASEPA STRATEGY ON E-WASTE MANAGEMENT

- Has garnered and currently updating the database of e-waste databank which includes Manufacturing sector, Higher Institutions, Banks, Oil and Gas industries etc, also informal sector not limited to NETAN, CAPDAN, ALABA MARKET, All Market in Lagos State, GSM Village, Refrigerators and Air-conditioning Associations.

- On this note, other corporate organization who are yet to get involve should join from this event.
LOCAL CONTENT INITIATIVES

2 options for machines:

1. Via NOTAP (National office for Technology Transfer and Promotion), FIRO and team of engineers are working with identified technicians in South West to build a machine for this project as done for Battery, Copper, Plastic and Aluminium recycling: meeting international market value.

2. To patronise foreign manufacturing companies who have submitted their quotes such as Eldan Recycling, Ecomation Oy, Shred-Tech, MRT Systems, Jiang Xi M
LOCAL CONTENT INITIATIVES

Typical view of a shredder
LOCAL CONTENT INITIATIVES
view of an approach
On declaring two-day Lagos Infrastructure Forum held at the Eko Hotels, Victoria Island in 2009:

**Governor of Lagos State, Babatunde Raji Fashola (SAN)** has pledged to make the state one of the best mega-cities in the world, as shown in the following pronouncement

“It is in our heart what tomorrow will look like and we are steadily working towards it.”

He said this in his speech titled: “Building infrastructure for a megacity vision and practice, learning from Singapore.”

Lagos, he further said, is “not a megacity because of anybody’s fantasy but by virtue of its potential and population.”

Hence Our Action Governor has approved the Management of e-waste at 18th State Executive meeting session in State House 2010.
LOCAL CONTENT INITIATIVES

- We have commenced structure and infrastructure to host e-waste recycling plant in Lagos State in accordance with best global practice (in environmentally sound manner)
- PPP in Governors office involvement to encourage private participation and drafting of 20 years MOU with MSC Limited, which evolved SPV EMRIC to allow foreign participation.
- A land mass of 5 acres will be released in support of the project
- Thus we can not receive huge chunk of e-waste only to be used to send it back to the source - OF WHAT VALUE TO OUR DEVELOPMENT HERE IN NIGERIA?
- Our informal Sector is very much vulnerable to toxicity of the e-waste hence need for an organized and formal method of e-waste recycling creating jobs and materials for manufacturing sector including electronics (industry) under control from LASEPA.
Local Content Development Initiatives

- We have commenced operation of a formal sector for e-waste recycling along Sagamu Road in conjunction with LASPA under supervision of Ministry of Environment of Lagos State Government.
- We have created job for over 50 staff well enumerated and trained while in the next years we hope to generate more.
Indicative: ROI

- Input to line 200kg/hr
- Output per year = 561 ton per year
- One year analysis

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<th>Working days</th>
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<th>Hours</th>
<th>Efficiency</th>
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<td>300</td>
<td>1</td>
<td>8</td>
<td>75%</td>
<td>80%</td>
<td>2400 hrs</td>
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<td>Maintenane hours</td>
<td>20%</td>
<td>340 hrs</td>
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</table>
### Indicative Analysis

- **Output per kg**
- **Input to line kg/hr**

<table>
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<tr>
<th>Input materials</th>
<th>200kg/hr</th>
<th>100%</th>
<th>Fe</th>
<th>Cu</th>
<th>Al</th>
<th>Plastics</th>
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<tr>
<td>Magnetic s.</td>
<td>32</td>
<td>16</td>
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<tr>
<td>Plastic</td>
<td>50</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>25</td>
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<tr>
<td>Fine cu</td>
<td>5</td>
<td></td>
<td></td>
<td>2.5</td>
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<tr>
<td>Seperated Cu</td>
<td>13</td>
<td></td>
<td></td>
<td>6.5</td>
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<tr>
<td>Al</td>
<td>0</td>
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<tr>
<td>Plastics</td>
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</tr>
</tbody>
</table>
Indicative analysis : ROI

- Prices in Euro per kg
- Cu-4,20
- Al- 1,30
- Fe- 0,115
- Au-25,00
- Ag-0,38
- Pl-34,80
- Pd-7,93
- Plastic- 0,05
Indicative Analysis on Profit

- Processing cost in Euro: 291.687
- Total Incomes: 364.899
- Profit: 53.212
- There are other costs included in processing cost not discussed because of time.
Japan Style- EPR

- Extended Producer Responsibility is a drive that is working in Japan on e-waste management and globally.
- Each Manufacturing company are to establish their recycling plant or commission a local recycling plant to fulfill their obligation
Here in Nigeria

- We are willing to explore the EPR –approach under the Lagos State Scheme (LASEPA)
- Though the Japan companies have shown high interest in Nigeria, especially Lagos State and discussion are going on now,
- The Head of Hazardous Waste Management in LASEPA Mrs Yahya recently visited Japan and their responses were very encouraging.
PROJECT BENEFITS

- Partnership for a cleaner, greener environment in line with the government’s avowed commitment to partnering with the private sector.
- A veritable means of generating revenue for the State Government.
- Reduction in the negative impact of hazardous waste on the Lagos Environment.
- Elimination of threats to public health, safety and welfare, and the environment.
- Provision of long term protection of the public health, safety and welfare.
- Encourage pollution prevention, including the reduction of hazardous wastes at the source.
- Encourage the considerations of ecosystem impacts in developing and implementing hazardous waste management strategies.
- Encourage a conservation of natural resources and the recovery of materials.
- Represent a consensus among the public, regulated parties, and engineering and scientific professionals.
- Collaborate with research centres especially on material science and engineering.
- Support higher institutions in Lagos State in area of students industrial training, employment opportunities and exposure to global state art-of infrastructure that is eco-friendly.
- Provides for the assessment of risks to public health and the environment and the analysis of cost and benefits in determining management standards and priorities.
- Promotion of scientific and engineering research and technology development to continuously improve e-waste management.
- Generates employment for all people involved in the e-waste value chain processes.
Programmes Since 2006

- **2006** - Research and Laboratory work on the e-waste issues and its effects in the environment.


- **2007** – Paper advert on national newspaper (Punch and Guardian) on the e-waste inventory list submission and for public enlightenment.

- **2007 till date**: Organise several seminars and workshops.

- **December 2008** – A team of LASEPA staff came for site verification and inspection along Sagamu Ikorodu road, Ogijo (take-off site).

- **2009** - Inauguration of e-waste stakeholders forum (e-waste generators) {comprises of corporate organisations, informal sectors, individuals etc} by LASEPA.
Programmes since four years ago

- **2009-** Project presentation to Waste to wealth team of Lagos State Government

- **March 2009-** Business visit to the office of ICD in Jeddah (International Bank)
- **22nd of May 2009-** Factory visitation to Cimelia in Singapore in lead by LASEPA General Manager (see the attached picture)

- **Oct. 2009** Construction of warehouse to stockpile the e-waste materials collected

- **Nov. 2009** ICD representative (from Islamic Development Bank was hosted for verification visit and bilateral talk on the project
- **January 2010-** Commencement of Evacuation of e-waste in Lagos state

- **May 2010-** A team of expatriates led by a consultant from Northampton University, Reclaim Appliances® waste recycling company) based in UK, a representative of a recycling company from Hong-Kong, African representative of HP (Hewlet Packard)
Programmes since four years ago

- **August 2010** - A team of Consultant from Ecomation Oy from Finland came for business discussion and site inspection of the project.

- **November 2010** - Visitation to China to inspect the recycling machines for the e-waste materials.

- **December 2010** – A team led by Andreas from Germany with Basel Action Network (on (Tran boundary of Hazardous Materials and others related activities) representative who came for site inspection along Sagamu Ikorodu road, Ogijo (take-off site).

- **December 2010** – A team of LASEPA staff came for site inspection along Sagamu Ikorodu road, Ogijo (take-off site) to see the progress made at the site.

- **2010** - Construction of administrative offices complex at the e-waste site.
Programmes since four years ago

- Currently going on - Expansion of the warehouse to stockpile more materials

- Currently going on - Construction of the e-waste machinery plant house.

- **December 2010** - Visitation to Japan (ITPO of Japan via UNIDO) by the Head of Hazardous Material Management (HMM) on e-waste.
## SUMMARY OF INVESTMENT COSTS

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<td>N’000</td>
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<td><strong>Investment in Fixed Assets</strong></td>
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<tr>
<td>Plant &amp; Machinery</td>
<td>A</td>
<td>1,869,500</td>
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<td>Land &amp; Infrastructures</td>
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<tr>
<td>Building</td>
<td>C</td>
<td>157,000</td>
<td>1,019</td>
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<tr>
<td>Motor Vehicles</td>
<td>D</td>
<td>118,000</td>
<td>766</td>
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<td>Furniture &amp; Fittings</td>
<td>E</td>
<td>10,000</td>
<td>65</td>
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<td>2,504,500</td>
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<td><strong>Working Capital</strong></td>
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<td>Administration and Staff Costs</td>
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<td>594,054</td>
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<td><strong>GRAND SUMMARY</strong></td>
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<td>Total</td>
<td></td>
<td>3,098,554</td>
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FINANCIAL FEASIBILITY

• The MSC e-waste project is considered financially viable. The project has been subjected to appraisal using 4 popular investment appraisal techniques, all of which support a-go-ahead with the project.

• The MSC e-wastes projects require an initial cash outlay of N3.098m ($18.78m)

1. PAY BACK PERIOD (PBP)
   • This is the length of time by which the investment costs will recouped by the investors. In respect of the MSC e-wastes project, the payback period is 4 years.

2. RETURN ON CAPITAL EMPLOYED (ROCE)
   • This is a measure of the projected return which an investor can receive from the capital he has invested in the project. It is a measure with which the investor justify his choice between a “safe” investment with little/no risk and how much more he can hope to get from an investment with some inherent risks. For the MSC e-wastes project, the ROCE is between 29% - 35% with in the first 5 year of the project.

3. ACCOUNTING RATE OF RETURN (ARR)
   • This is the rate of return from the investment of the capital in-house. For MSC e-waste project, the ARR for the 5-year period is 31%
4. NET PRESENT VALUE (NPV)

This appraisal technique was used to determine the present value of the project. There is positive net present value of N1,290m ($7.8m) at the end of the 5th year of the project. Based on the investment appraisal criteria, the project is considered viable.

RECOMMENDATIONS

From the above 4 (four) observations, it is considered necessary and advisable that the management of MSC Maintenance System Consultants Limited can partner with state government in managing E-waste.
OTHER BENEFIT

ECONOMIC DEVELOPMENT OF A NATION

Typical case study of E-WASTE Company visited in Singapore shows their trading and statement of affairs in which revenue grows from $92.1m to $159.9m form 2006 – 2007 which is equivalent to 24.4 Billion naira. Singapore has about six of this plant which translates to N147 Billion naira. Singapore has the same land mass of about 3.4 million populations. Though active in business than Lagos. Lagos state has similar characteristic like Singapore especially area of business potentials.

TECHNOLOGY DEVELOPMENT AND TRANSFER

Technology development shall be an advantage when we manage our electrical electronic waste by our self. This waste is generated by people here and can serve as raw materials for the electrical and electronic companies in Lagos or in any part of Nigeria at large.

Though the operation of e-waste equipment shall encourage indigenous Technology. This is a great challenge to Technology acquisition as a Nation which NOTAP is working over.
General Information

- **RESEARCH AND SURVEY ON RECYCLING COMPANY IN LAGOS STATE:**
- The Indian, China and other Asian Citizen has taken the opportunity of our non organize in the area of industrialization of the Nation to their own advantage. (Generally)

- The have set up medium and Mega Recycling Industries/Plant at the extreme end of Lagos Ikorodu Shagamu road axis. The survey shows an estimated of Recycling facilities of Scrap metal, Plastics, Aluminum, Lead ingot and the likes of about 100 Billion Naira. The expatriate monopolize cheap land, raw materials and labour to attract their foreign fund at minimal (single digit interest rate) whereas the industrial sector in Nigeria borrow at high interest rate of about 28% non long term loan. These make it difficult for indigenous recycling facilities to succeed.
On Behalf of LASEPA

- LASEPA hereby recognize and appreciate the support of following organizations who have supported the evacuation process and submitted their e-waste as follows:
  - UACN, NLGN, SHNEIDDER, MDS LOGISTICS, DIAMOND BANK, ACCESS BANK, STERLING BANK, MOBIL UNLIMITED, LAGOS STATE MINISTRIES, NETAN, DISCUSSIONS ARE ON WITH OTHERS.
Conclusion

CONCLUSION

• We urge the Generators of E-waste in the state especially Corporate, Manufacturing, Oil and Gas, Electronic companies and others to partner with the state government in making this public-private partnership initiative of Lagos State government on E-waste management a reality as obtainable Abroad for the benefit of our economy and the citizens in Nigeria.

• LASEPA has evolve a road map to ensure environmentally sound treatment (clean line of operation) in compliance with best global practice.

• Thanks and God Bless