Assessment of Sustainable Lead Acid Battery Collection and Recycling Scheme

6th INTERNATIONAL CONFERENCE ON SUSTAINABLE SWM
NAXOS, JUNE 13-16 2018

EPTA Consultants - Engineers
Athens, Greece
www.epta.gr

Mostaqbal Engineering & Environmental Consultants
Amman, Jordan
www.mostaqbal.jo
ID of the project

**Project Partners** EBRD, Gov. of Jordan (MoE, MoF/PPP Unit)

**Project Deliverables ~380 pgs:**
- Waste Mapping (current situation)
- Technical Feasibility Report
- Financial Feasibility Report (PPP and Total)
- Policy Roadmap
- Environmental & Social Assessment
- Final Report with Sustainability Report for PPP

**Project Meetings/Discussions >15:**
- 3 Site Visits, 5 Face to Face Interviews with the Market
- Visits to the Ministries, Skype Meeting, Physical Meetings

**Project Team > 10 specialized international & local consultants**

**Project Duration ~9 months (Jun 17-Feb 18)**
Future projections of ULAB quantities in Jordan

<table>
<thead>
<tr>
<th>Years</th>
<th>Estimated Automotive ULAB Quantities (tn)</th>
<th>Estimated Portable ULAB Quantities (tn)</th>
<th>Estimated Industrial ULAB Quantities (tn)</th>
<th>Total Estimated ULAB Quantities (tn)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>17,551</td>
<td>300</td>
<td>1,755</td>
<td>19,606</td>
</tr>
<tr>
<td>2017</td>
<td>18,604</td>
<td>308</td>
<td>1,860</td>
<td>20,771</td>
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<tr>
<td>2018</td>
<td>19,720</td>
<td>315</td>
<td>1,972</td>
<td>22,007</td>
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<tr>
<td>2019</td>
<td>20,903</td>
<td>323</td>
<td>2,090</td>
<td>23,316</td>
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<tr>
<td>2020</td>
<td>22,157</td>
<td>331</td>
<td>2,216</td>
<td>24,704</td>
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<tr>
<td>2021</td>
<td>23,487</td>
<td>339</td>
<td>2,349</td>
<td>26,175</td>
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<tr>
<td>2022</td>
<td>24,896</td>
<td>348</td>
<td>2,490</td>
<td>27,733</td>
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<tr>
<td>2023</td>
<td>26,390</td>
<td>357</td>
<td>2,639</td>
<td>29,385</td>
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<tr>
<td>2024</td>
<td>27,973</td>
<td>366</td>
<td>2,797</td>
<td>31,136</td>
</tr>
<tr>
<td>2025</td>
<td>29,651</td>
<td>375</td>
<td>2,965</td>
<td>32,991</td>
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<tr>
<td>2026</td>
<td>31,430</td>
<td>384</td>
<td>3,143</td>
<td>34,957</td>
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</tbody>
</table>
Current ULAB management in Jordan
IMPROPER STORAGE
IMPROPER RECYCLING
PROCESS
DAMAGED INSTALLATIONS
SOIL CONTAMINATION
NO HEALTH & SAFETY for Lead (Pb)
Accumulates in the bones
Affects the nervous system
damages red blood cells
Affects kidney
Creates Mental disabilities
Permanent brain damage
High blood pressure
Heart disease
Main challenges in Jordan

1. Widespread operation of illegal collectors and smelters
   (areas, market share)

   - Public Health: immediate ~400 workers, communities neighboring to illegal plants
   - Environment (soil, water, air)

   - Legal (Recyclers, Exporters) Market Distortion: 50% illegal

   - State Financial loss 1-1.5 M JOD/yr (loss of VAT, corporate tax, exporting fees)

2. Institutional weaknesses
   even the fairly complete Legal Framework

   - Low level of compliance to legislation - insufficient control / auditing mechanism

   - Zero level of citizens awareness - Lack or insufficient adoption of best operating practices.

1 JOD = 0.845 EUR
Technical description of the proposed ULAB scheme
Proposed ULAB scheme - PPP scenario

Option 3

SPECIAL ACCOUNT for ULAB recycling

MINISTRY OF THE ENVIRONMENT

Recycling Division

Inter-ministerial Committee

Steering Committee for the PPP contract

MINISTRY OF FINANCE - PPP UNIT

Independent certified auditor
Fees/Tariffs flow in the proposed scheme

SPECIAL ACCOUNT for ULAB recycling

Producer fee

min. 0.2% of LAB price = 8 JOD/tn or 0.1 JOD/unit

max. 248 JOD/tn ULAB
PPP payment

Material recovery fee
max. 40% of LME price = 880 JOD/tn ULAB

PPP Special Purpose Entity for ULAB management

Collection/transport cost

Recyclers’ surplus for reinvestments in 3 yrs max.
880 JOD/tn

Registered manufacturers/recyclers

Exporters

Producers/Importers
incl. car
importers/WEEE, etc.

Licensed repair points etc.

Collectors/take back

State surplus max. 80 JOD/tn

1 JOD = 0.845 EUR
PPP obligations at a glance

- Ever repair shops: 8,000
- Retailers: 5,000
- Industries - large producers: 2,000

PPP
- Registered manufacturers, recyclers: 12
- Exporters: 13

30% of the total no. of Repair Shops
4 audits for each producer/exporter, importer & recycler/exporter

Public bodies: MoE, MoF, Customs
Private sector: producers/importers, repair shops/retailers, transporters, recyclers/exporters
People: through schools
Other private actor obligations

- Regarding **LAB importers and producers**, they **undertake partial financial responsibility** and are charged with a fee (producer fee) per LAB put on the market **which is symbolic at the beginning and later will be reassessed**.

- The **maintenance and upgrading (2nd phase)** of the existing recycling facilities and infrastructures is suggested, by **realizing new operational/capacity increase investments of about 3.5 M J oD**.

- Existing recycling facilities are charged with material recovery fee based on the lead amount exported/sold and they are audited in order to comply with the environmental standards by **realizing new environmental investments in 5 yrs max of approx. 8.5 M J oD**.
## Capital Cost of PPP

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>JOD</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Collection and Transfer Equipment</td>
<td>2,707,380</td>
<td>84.2%</td>
</tr>
<tr>
<td>2</td>
<td>Electronic registration system</td>
<td>101,400</td>
<td>3.2%</td>
</tr>
<tr>
<td>3</td>
<td>Initial Public environmental awareness plan</td>
<td>152,100</td>
<td>4.7%</td>
</tr>
<tr>
<td>4</td>
<td>Initial Education and Training Work Program</td>
<td>152,100</td>
<td>4.7%</td>
</tr>
<tr>
<td>5</td>
<td>Mobilization Costs (studies, administrative, SPE organization, bank guarantees, initial IC)</td>
<td>101,400</td>
<td>3.2%</td>
</tr>
<tr>
<td></td>
<td><strong>TOTAL</strong></td>
<td><strong>3,214,380</strong></td>
<td><strong>100.0%</strong></td>
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</tbody>
</table>

1 JOD = 0.845 EUR
Project IRR for the PPP

IRR for all Options' Scenarios

Options & Scenarios

<table>
<thead>
<tr>
<th>Scenario Type</th>
<th>Interest Rate</th>
<th>Interest Rate</th>
<th>Interest Rate</th>
<th>Interest Rate</th>
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</thead>
<tbody>
<tr>
<td>Quantities Collection</td>
<td>100%</td>
<td>85%</td>
<td>75%</td>
<td></td>
</tr>
<tr>
<td>Indicators at 100%</td>
<td>24.1%</td>
<td>16.1%</td>
<td>10.2%</td>
<td></td>
</tr>
<tr>
<td>Interest Rates Scenarios</td>
<td>7%</td>
<td>6%</td>
<td>5%</td>
<td></td>
</tr>
<tr>
<td>at 85% collection</td>
<td>24.1%</td>
<td>24.4%</td>
<td>24.6%</td>
<td></td>
</tr>
<tr>
<td>at 75% collection</td>
<td>16.1%</td>
<td>16.4%</td>
<td>16.7%</td>
<td></td>
</tr>
<tr>
<td>Interest Rates Scenarios</td>
<td>7%</td>
<td>6%</td>
<td>5%</td>
<td></td>
</tr>
<tr>
<td>at 75% collection</td>
<td>10.2%</td>
<td>10.5%</td>
<td>10.8%</td>
<td></td>
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</tbody>
</table>
State Benefits (1/2)

- The project is **financially attractive & feasible for all the official stakeholders**.
- Even though the State Treasury **will not finance the project**, it will have significant financial benefits:
  - directly linked to the scheme (special account surplus of 1 M JOD/yr)
  - other indirectly linked to the scheme, which are not included in the financial feasibility of a total value of 1 M JOD/yr, like corporate taxes and VAT, exporters fee
- Recyclers’ and Exporters’ Market will have improved and concrete financial and operational terms in comparison with current “free and non legal market” approach, which results in **better profitability with a mid term 5 yrs obligation to invest their surplus to modernize recycling installations for health/safety & environmental purposes.**
- The legal repair shops **will benefit from the collection fee** and from **not having fines imposed for non compliance.**
State Benefits (2/2)

- **Secure 100% Public Health and 100% Environment Protection**, both for the participants (illegal and legal) of the recycling process and for the citizens.

- The MoEnv **will not increase fees paid by citizens**, since the fee will be imposed to the producers/importers and not directly to the end users (citizens). This fee, if it transferred to the final LAB price, is **affordable for the citizens (0.2% at the beginning)** and it will not be foreseen as an increase, compared to the inflation rate.

- Creation of **~100 new sustainable green jobs**:
  - directly for the PPP scope = 44
  - indirectly to recyclers: extra approx. 55
Thank you for your attention!

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