Industrial waste valorization as a mean to sustainable growth in Greece

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ANTIPOLLUTION SA
To protect & contribute to a cleaner and sustainable environmental inheritance for the future generations

The leading Greek company in the field of port reception facilities, marine environmental protection services and waste management services

Since 1940 we provide services on a 24/7 basis at more than 40 ports in Greece

We emphasize on the importance of recycling, valorization and alternative management of waste and strive for providing the most optimal and environmental sound solutions
VASSILIADES GROUP OF COMPANIES

ENVIRONMENT
ENERGY

ANTI POLLUTION
ENVIRONMENTAL PROTECTION SERVICES

KAFSIS

GREEN
GLOBAL ENVIRONMENTAL SERVICES

- Non Hazardous and Hazardous Waste Management
- Waste Recycling and Valorization
- Remediation of polluted sites
- Production of RDF

- Oil spill response services
- Port Reception Facilities for MARPOL Waste and Cargo Residues
- Distressed cargo management worldwide
ANTIPOLLUTION S.A.- VEOLIA FIELD SERVICES UK

- Joined forces to create a new global power serve the needs and requirements of the demanding shipping industry.
- Emergency response services as well as shall manage distressed / damaged cargoes on global level.
Collection, transportation and processing of ship generated waste - MARPOL waste and cargo residues according to Waste reception and handling plan of each port

Currently operating at more than 40 ports in Greece and globally
WASTE MANAGEMENT SERVICES

• Separation, Recycling and Recovery of materials (paper, plastic, metal etc.)
• Production of RDF at Antipollution SA with annual production capacity of 20,000 T
AWARDS

Environmental Awards 2014
Category “Port Management - Eco Port–Technologies for Sea Water Renewal”

Entrepreneurship Award 2014
Category Development and Innovation

Health and Safety Awards 2014
Silver award in the category “Industrial Waste Management”

European Business Awards 2014/15
National champion in the category “The business of the Year Award with Turnover €0-25m”

Piraeus Port Authority Award for high quality of services on environmental issues
Non Hazardous Waste Processing / Recycling centers

Hazardous Waste Temporary storage facility for hazardous waste
Antipollution ANE has successfully completed the refloating and removal of RoRo “Panagia Tinou” from Piraeus Port in the context of an open competition conducted by Piraeus Port Authority SA (PPA SA).
Innovate and invest in human resource development.

EU Funding Proposal – Programs

- Horizon 2020
- Life Environment
- EASME Funding

- Call: H2020-IND-CE-2016-17 (Industry 2020 in the Circular Economy)
  Topic: New models and economic incentives for circular economy business –
- Call: BG-7-2017 – Blue green innovation for clean coasts and seas
MOVING OVER HERE WITH PARTNERS

- PRODUCTION
- DISTRIBUTION
- RAW MATERIALS PRODUCER
- SORTING, RECYCLING, & RECOVERY
- ENERGY RECOVERY
- COLLECTION
- WASTE
- PRODUCT USAGE
- COLLECTION
- ENERGY RECOVERY
- PRODUCTION
- RAW MATERIALS PRODUCER
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- PRODUCT USAGE
PROVIDE OUR CUSTOMERS

- Production
- Distribution
- Raw materials producer
- Sorting, recycling, & recovery
- Energy recovery
- Collection
- Waste
- Product usage

ANTIPOLLUTION
Environmental Protection Services
New targets municipal - waste landfilling

- By 2030: max 10% landfilling of MSW
- 5 years derogation for the same 7 MS as for the recycling rate
- Review clause (2025) to consider more stringent targets

New targets municipal - waste recycling

- Separate collection extended to biowaste
- One calculation method by 2025
- Time extension for 7 MS recycling less than 20% in 2013
- Review clause (2025) to consider more stringent targets

New targets - packaging waste recycling

- Clarification on measuring (same as for municipal waste)
- Repeal of the recovery and max recycling targets
- New target for aluminium
Among many waste-to-energy strategies, refuse-derived fuel (RDF) is a solid recovered fuel that can be used as a substitute for conventional fossil fuel.

Cement manufacturing has been selected as one of the most environmentally challenged industries and as a potential destination for RDF to replace a portion of conventional fossil fuels with less energy-intensive fuel.

Refuse Derived Fuel (RDF) is produced from combustible components of solid waste. The waste is shredded, dried and baled and then burned to produce electricity, thereby making good use of waste that otherwise might have ended up in landfill.
WORLD CEMENT DEMAND

<table>
<thead>
<tr>
<th>Cement demand (mtons)</th>
<th>2010</th>
<th>2020</th>
<th>Growth (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>World cement demand</td>
<td>2,896</td>
<td>3,000</td>
<td>4.7</td>
</tr>
<tr>
<td>Western Europe</td>
<td>236</td>
<td>250</td>
<td>2.2</td>
</tr>
<tr>
<td>North America</td>
<td>250</td>
<td>200</td>
<td>2.9</td>
</tr>
<tr>
<td>Other regions</td>
<td>500</td>
<td>600</td>
<td>4.7</td>
</tr>
<tr>
<td>Asia</td>
<td>1,500</td>
<td>2,200</td>
<td>5.2</td>
</tr>
</tbody>
</table>

Source: Madlool et al. (2011)

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Wastes

<table>
<thead>
<tr>
<th>Wastes</th>
<th>Energy (MJ/kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Used tire</td>
<td>23.03</td>
</tr>
<tr>
<td>Husk</td>
<td>19.93</td>
</tr>
<tr>
<td>Industrial plastic</td>
<td>18.21</td>
</tr>
<tr>
<td>Waste oil</td>
<td>14.65</td>
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<tr>
<td>Scrap paper</td>
<td>14.23</td>
</tr>
<tr>
<td>Contaminated waste</td>
<td>14.23</td>
</tr>
<tr>
<td>RDF plastic</td>
<td>11.72</td>
</tr>
<tr>
<td>Sewage sludge</td>
<td>8.37</td>
</tr>
</tbody>
</table>

Source: Akcansa (2010)
SUGGESTIONS

• Cover local needs for alternative fuels used in cement production by national producers
• Create new waste to energy facilities
• Limit waste imports from other countries
• Serve national waste management plan and hierarchy for waste diversion
• Improve licensing procedures for waste utilization
• Implement minimum distance criteria to facilitate local authorities
Thank you!