Biogas from Municipal Solid Waste: 
A new and sound technology for Argentina

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Complete Service from a single independent source

Consulting – Surveys
Planning – Project Management

GICON – a prospering enterprise

Turnover and staff development

GICON – a prospering enterprise

R & D expenditures

MA in VBE

Umsatz

Umsatz inkl. F&E

Forschungsaufwendungen

MA in VBE
The Argentine Project for the Treatment of Municipal Solid Waste*

Objectives:
- Up-dating and Modernisation of the Waste Management System
- Recovery of Energy and Valuables from Waste
- Minimization of Environmental harms
- Obtaining acceptance and participation by citizens

The Argentine Project for the Treatment of Municipal Solid Waste*

The Challenge:
- Waste (agricultural + industrial + municipal) meets the programme “probiomasa” and may produce 10% of the countries energy demand!
- Argentina turns to better sustainability
- Valuables will be extracted from Municipal Solid Waste and will become “secondary raw materials”
- Landfills become more environmentally friendly
- The technologies applied can be multiplied and exported to many other Latin American countries.

* Dirección Nacional de Articulación Institucional
Secreartaría de Ambiente y Desarrollo Sustentable
Modern conception: Cascade utilization of waste

Residues to valuables

The yield
Only the organic material produced by one person per day (without: human faeces, garden waste, restaurant waste etc.) can be converted into 0.125 kWh per day electrical energy.

Municipal Solid Waste generation in Argentina:
1 Person produces 1 kg of MSW per day
1 kg MSW contains 0.5 kg organic matter (biowaste)
1 kg organic matter (50% water) produces 0.085 m³ methane
1 m³ of methane generates 3.5 kWh electrical energy

Biowaste:
- to biogas
- to energy
- to valuables

http://de.123rf.com/lizenzfreie-bilder/kompost.html
Our contribution to meet the objectives

Biowaste (separately collected), commingled Municipal Solid Waste, yard trimmings, landscaping waste etc.

Food & restaurant waste, slaughter waste, organic residues from food production, organic slurries

Biogas crops, chicken, pig and cow manure

High solid, double stage fermentation (GICON Process)

Liquid fermentation in conventional single stage fermenters

Liquid fermentation in multi-stage fermenters

GICON Know-how: Tailored fermentation technologies for any biodegradable Material!
## Reference: “The Energy Garden” Vancouver (Ca)

<table>
<thead>
<tr>
<th>Project</th>
<th>Biowaste treatment Plant for 30,000 t/y food and garden waste. Produces electricity for more than 700 homes and delivers high-quality compost for local farms and gardens</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance</td>
<td>Technology</td>
</tr>
<tr>
<td>2.5MW furn. heat output 1 MW electr. power</td>
<td>GICON Process</td>
</tr>
<tr>
<td>Client</td>
<td>Location</td>
</tr>
<tr>
<td>FRSF</td>
<td>Vancouver, Canada</td>
</tr>
<tr>
<td>Period</td>
<td>TIC</td>
</tr>
<tr>
<td>2012/2013</td>
<td>confidential</td>
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</tbody>
</table>

**Part of GICON**
- Basic and detail engineering according to Canadian standards
- Construction supervision
- Commissioning, operational test-run, performance tests

*“The Energy Garden“ KPMG Award: One of the TOP100 Infrastructure Projects in 2012*
The GICON Biogas Technology for organic residues, biowaste from households, and Municipal Solid Waste

The Pro’s

- Extreme high stability – no process collapse so far!
- High performance, high gas quality!
- Very low energy consumption!
- Biogas generation is fully controllable!
- Solid residuals from hydrolysis are easily sortable for recovery and recycling!
- Full property damage coverage for GICON Biogas Technologies granted by a German insurance company!

and the Con’s

- The investment costs are slightly higher than a conventional single stage biogas digester.
- The technology requires qualified personnel.
Input MSW, digestion test with pilot plant in Cottbus (Germany)

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**Input „Waste 1“**

<table>
<thead>
<tr>
<th>Material</th>
<th>Sorting analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organic digestable</td>
<td>61.8 %</td>
</tr>
<tr>
<td>Organic non digestable</td>
<td>7.0 %</td>
</tr>
<tr>
<td>Paper, carton</td>
<td>7.0 %</td>
</tr>
<tr>
<td>Plastics</td>
<td>16.6 %</td>
</tr>
<tr>
<td>Glass</td>
<td>2.5 %</td>
</tr>
<tr>
<td>Metals</td>
<td>2.4 %</td>
</tr>
<tr>
<td>Rest</td>
<td>2.7 %</td>
</tr>
<tr>
<td>Total</td>
<td>100.0 %</td>
</tr>
<tr>
<td>Closed plastic bags</td>
<td>11.4 %</td>
</tr>
</tbody>
</table>

**Organic digestable fraction**

| Total solids (TS)         | 30.8 %           | 31.8 % | 30.0 % |
| Organic total solids (OTS)| 81.6 %           | 74.4 % | 85.0 % |
PPP: Extended Design-Build-Model

Public sector, municipalities, etc.

General Contractor

GICON

“Most wanted” for the Project!

<table>
<thead>
<tr>
<th>No. of inhabitants of Municipality</th>
<th>Estimated Investment* for the biogas plant</th>
<th>Electr. power generation</th>
</tr>
</thead>
<tbody>
<tr>
<td>50.000</td>
<td>3,5 Mio €</td>
<td>2.500 MWh/a</td>
</tr>
<tr>
<td>80.000</td>
<td>5,1 Mio €</td>
<td>4.300 MWh/a</td>
</tr>
<tr>
<td>100.000</td>
<td>6,0 Mio €</td>
<td>5.400 MWh/a</td>
</tr>
<tr>
<td>250.000</td>
<td>11,7 Mio €</td>
<td>13.400 MWh/a</td>
</tr>
<tr>
<td>500.000</td>
<td>20 Mio €</td>
<td>26.800 MWh/a</td>
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</table>

* Price Base: Germany, 2012
Thank you for your attention

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