Waste Management in Iceland

Geography and population
The territory of Iceland is 103,125 km$^2$ and the number of inhabitants 290,490 (2003). In the period 1994-2003, the population of Iceland increased yearly by around 1% on average. Average population density is 2.8 inhabitants/km$^2$. 62% of the entire population live in the greater Reykjavik area, which is why the population density in rural areas is smaller still.

Waste management in Iceland 1970-2004
Since the 1970s Iceland has made considerable progress regarding waste management issues. The main treatment option in the 70’s was open-pit burning, resulting in open dumps smoking on many places, short from settlements (see figure below).

In the 1990’s the obvious disadvantages of widely spread uncontrolled open-pit burning had been recognised. Instead, many municipalities raised burning-cisterns, typically concrete “boxes”, preventing waste to blow away, but still incorporating relatively low incineration temperatures. Also landfilling became more common (see figure below).
Until 2000 open-pit burning was gradually stamped out as being not acceptable any longer. Instead, landfill became the most general way of treatment, but also some (small) incineration plants had been built, some of which with energy recovery. Furthermore, recycling options became more and more an option, especially when municipalities increased their cooperation (see figure below).

From the above may be clear that waste management in Iceland has gradually become a business activity subject to licensing laws and a collection system and sites have been established so that the public and business are able to dispense of their waste. Cooperation between local authorities on the disposal of waste is increasing. The disposal sites are fewer than earlier and those remaining have increased in size. However, despite an almost two-fold increase in the recovery of waste over the past 10 years, the quantity of waste bound for permanent landfills has not diminished. Around 70% of municipal waste is still going to landfill, only around 3-4% is
incinerated, almost all with energy recovery, and 24% is recycled or recovered by other means than incineration with energy recovery.

**Waste amounts generated**
Until 2004 the amounts of waste generated in Iceland were roughly estimated, being based mainly on data from SORPA, the biggest waste treatment facility in Iceland, servicing the capital area of Reykjavik and covering ca. 62% of the Icelandic population. In 2004 the amounts of waste generated in 2002 were assessed in a more detailed way, e.g. by using more concise definitions of waste streams and inclusion of more waste-types, such as agricultural waste, industrial waste and construction & demolition waste. It became clear that waste amounts were in fact significantly higher than previously estimated and therefore needed to be revised accordingly. In the table below the revised waste amounts for 1995 and 2002 are given.

**Table: Generation and treatment of municipal and industrial waste, 1995 and 2002 (revised figures 2004)**

<table>
<thead>
<tr>
<th>Waste generation</th>
<th>1995</th>
<th>2002</th>
<th>Periodic change (% of total)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of inhabitants</td>
<td>267,806</td>
<td>288,202</td>
<td>+7.6</td>
</tr>
<tr>
<td>Produced waste in kgs per capita</td>
<td>1,422</td>
<td>1,578</td>
<td>+11</td>
</tr>
<tr>
<td>Total produced waste</td>
<td>380,721</td>
<td>454,703</td>
<td>+19.4</td>
</tr>
</tbody>
</table>

**Waste treatment methods:**

<table>
<thead>
<tr>
<th>Method</th>
<th>1995</th>
<th>2002</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Landfilling</td>
<td>80%</td>
<td>70%</td>
<td></td>
</tr>
<tr>
<td>Incineration</td>
<td>3.5%</td>
<td>2.5%</td>
<td></td>
</tr>
<tr>
<td>Recovery, other than by incineration with energy recovery</td>
<td>10%</td>
<td>24%</td>
<td></td>
</tr>
<tr>
<td>Other treatment methods</td>
<td>6.5%</td>
<td>3.5%</td>
<td></td>
</tr>
</tbody>
</table>

**New legislation**
A new Law 55/2003 on Waste Management was set to address the more stringent demands on nowadays waste-management. The objective of the law is to decrease the quantity of waste generated considerably, increase recycling and recovery and reduce the quantity of waste deposited in landfills.

Based on law 55/2003, 3 new regulations were issued, no. 737/2003 on treatment of waste, no. 738/2003 on landfill of waste and no. 739/2003 on incineration of waste, implementing the landfill directive (1999/31/EC) and incineration directive (2000/76/EC) completely.

The Waste Management Law 55/2003 and Regulation 737/2003 on waste treatment transpose the following EU targets:

(a) to reduce the total weight of organic household waste to be landfilled by 25% by no later than 1 January 2009, by 50% by no later than 30 June 2013, and by 65% by no later than 30 June 2020
(b) to reduce the total weight of other organic waste, such as biodegradable organic waste to be landfilled, by 25% by no later than 1 January 2009, by 50% by no later than 30 June 2013 and by 65% by no later than 30 June 2020

(c) to recover packaging waste by between 50% as a minimum and 65% as a maximum by weight, to recycle between 25% as a minimum and 45% as a maximum by weight of the totality of packaging materials contained in packaging waste, with a minimum of 15% by weight for each packaging material, all on a yearly basis

(d) to reuse and recover end-of-life vehicles by no later than 31 December 2005 by 15% as a minimum, and to reuse and recover the average total weight of vehicles by 20% as a minimum.

(e) to collect and treat in an appropriate way an average of 4 kilos of WEEEs per capita annually

In addition, the regulation 738/2003 provides for the ban on landfilling of scrap metals including end-of-life vehicles, liquid wastes, hazardous waste, contagious and radioactive medical waste and tyres. The ban on landfilling of tyres will take effect from 16 July 2006, but until then it is allowed to landfill shredded tyres. By 16 July 2009, all landfill operators must either comply with the regulation or shut down their operation.

Regulation 737/2003 on treatment of waste makes the local authorities responsible for collection, handling and treatment of municipal waste. In several municipalities there are operated cooperative (regional) waste treatment facilities. In the capital area of Reykjavik this is SORPA, a company owned by several municipalities, covering around 62% of the total Icelandic population. SORPA also operates eight container parks and has bring-sites in city centres. The public and small operators can take a wide range of recyclable items to the bring sites free of charge. However, private individuals pay to drop off waste at the bring sites which is not collected by the municipalities, such as building waste, garden waste, rubbish arising during house purchase, waste associated with vehicle repairs, waste associated with pets, etc. From the bring sites, the material is taken to the collection and baling centre of SORPA in Gufunes where it is sorted for either recovery or disposal, typically for landfilling in Alfsnes. Larger companies may take their (bulky) waste directly to SORPA.

Companies that bring waste to the sorting centre in Gufunes have to pay a gate fee except for the items subject to the recycling levy, if properly separated, which can be dropped off free. Gate fees for companies delivering waste to the bring sites are different for each, but for the site at Gufunes, include (effective 1 July 2004): ISK 5.80/kg for sorted corrugated board and the same rate for newspapers and magazines, while it costs ISK 4.66 per kg to drop off graphic paper. The rate for mixed waste is ISK 8.48/kg

It may be expected that in response to the new waste law and regulations the costs of waste management will increase. To visualise increased costs, law 55/2003 provides for the setting up of a special Coordination Committee on the Implementation of Laws. The role of the Committee is, amongst other things, to monitor the fulfilment of
targets, assess the cost-effectiveness of the programme and, if necessary, ensure unimpaired funding for the programme in the future

**National Waste Management Plan 2004-2016**

Law 55/2003 also stipulates the National Environment and Food Agency (Umhverfisstofnun, shortly UST) to draw up a National Waste Management Plan (NWMP). The (first) NWMP was introduced in April 2004.

The main objectives of the National Waste Management Plan are:

- compliance with the “polluter-pays” directive
- obligation on local authorities to submit annual reports on quantity and composition of treated waste
- compulsory management of asbestos, hazardous waste and contaminated soil
- managing waste within national borders where it makes economic sense
- creating the most cost-effective conditions possible for the recycling of waste

The following is the timetable for the implementation of the Programme:

- from 1 January 2006, a minimum of 85% of all ELVs must be reused or recovered (in addition, a minimum of 80% of the average weight of the vehicles must be either reused or recycled)
- from 16 July 2006, ban on the landfilling of tyres
- from 1 December 2006, a minimum of 4 kgs of WEEEs per capita must be treated appropriately
- from 1 January 2009, organic household and industrial waste going to landfills must be decreased by 25%, compared to the amounts produced in 1995
- from 1 January 2015, the reuse and recovery of ELVs must be at least 95% (85% of the average weight of ELVs must be either reused or recycled)
- from 1 July 2020 organic household and industrial waste going to landfills must be reduced by 65%, compared to the amounts produced in 1995
- the Plan also includes the new provisions of the EU Directive 2204/12/EC of 11 February 2004 amending Directive 94/62/EC on packaging and packaging waste: the Icelandic government has to make provisions for the implementation of this directive before 2013 and is expected to give its waste management operators up to 3 years to meet the new requirements

In order to meet the targets of the National Waste Management Plan, the recovery of organic waste, packaging waste and WEEE has to increase significantly. Although it is feasible to recover organic waste by means of energy recovery, if the 6 relatively small incineration plants in Iceland continue to operate on current efficiency levels, recovery of organic waste will have to be increased by other means, e.g. by composting or anaerobic digestion.

**Regional Waste Management Plans**

Based on the NWMP, local authorities have to draw up and activate local (or regional) waste management plans (RWMP) by 1 April 2005, elaborating on how the municipalities will comply with the objectives of the national plan. In October 2004
the UST released framework guidelines to local authorities for making their local plans. The national plan and local programmes will be reviewed every 3 years.

The key factor in monitoring the success of the RWMP will be the collection of more reliable and accurate data on the quantity and quality of waste that is generated on a local (regional) level. Despite improvements in data collection over the past few years, there are big local differences in quality of data that hamper effective policy-making and regional co-operation. Therefore, the first regional waste management plans of 2005 would especially have to focus on data collection.

The Icelandic Recycling Fund (2003)
The Icelandic government decided, for the time being, not to introduce landfill- and incineration taxes as widely elsewhere in Europe, as these are thought to merely increase the overall cost of waste treatment and not increase prevention, reuse, recycling and recovery of waste generated in the country. Instead, Law 162/2002 on Recycling Fees was passed, superseding Law 56/1996 on hazardous waste fee (and its amendments). At the beginning of 2003, it was followed by the setting up of the National Recycling Fund (Úrvinnslusjóður) and thus replacing the Hazardous waste Committee from 1996. A recycling fee is now being levied on the products itemised in the law, i.e. hazardous waste, end-of-life vehicles (also is levied a return fund), composite packaging (drinking cartons), farm silage films and tyres, in order to finance their collection, transport, recycling, recovery or disposal. The Recycling Fund is responsible for collecting recycling levies and disbursing them. Its aim is to achieve the recycling targets for the products subject to a recycling levy in the most cost-effective way possible. Funds levied thus will be used to improve efficiency in the recycling and disposal of the addressed waste sorts.

The Fund is managed by a board of 5 people, appointed for a 4-year term. The Environment Minister appoints the chairman, and the others are nominated by the Confederation of Icelandic Fisheries and Agriculture, the Confederation of Trade and Industry, the Retailers Confederation, and the Association of Municipalities respectively.

The items and the levies are set out in annexes to the Law, and include:

- Lubricating and fuel oils
- Photo chemicals
- Organic solvents
- Pesticides and herbicides
- Isocyanides
- Batteries and car batteries
- Halogenated hydrocarbons
- Solvent-based paint and printing ink
- End-of-life vehicles
- Used tyres
- Farm silage film
- Beverage cartons

If waste arising from products subject to the recycling levy is exported out of Iceland for recycling, then the exporter can claim back the recycling levy from the Fund, as set out in the Regulations. The Fund may also reach agreement with operators to refund the levy in respect of own-waste arising that they get recycled independently. More precise rules for the operation of the Recycling Fund were set out in Regulation 531/2003 (superseding 227/2003).

On the basis of current trends, it is foreseeable that more waste sorts will be added to this list in the future.
**Deposit system**
A deposit system on non-refillable aluminium, steel, plastic and glass packaging has been in place in Iceland since 1989 as stipulated by law 52/1989 and achieved a return rate of over 80% for refillable and non-refillable bottles, and cans.

Law 162/2002 says that a recycling levy for non-refillable alu, steel, plastic and glass packaging will take effect on 1 January 2008 (but does not set levy rates for these). On that date, law 52/1989 will be repealed, ie there will no longer be a deposit. Law 162/2002 says that the Recycling Fund may reach agreement with Endurvinnsla hf, which operates the deposit system, earlier than 2008 about switching from a deposit to the recycling levy.

The Recycling Fund has negotiated a contract with Endurvinnsla Ltd to operate the deposit system for non-refillable bottle and cans until 2008.

**End-of-life vehicles**
Apart from a recycling fee, a deposit system for end-of-life vehicles is also in force in Iceland since 2003, according to law 162/2002. The registered owner of a vehicle is responsible for paying a fee of ISK 520 per quarter, ie ISK 1,040 per annum. This fee is part of the vehicle registration fee and is levied from the time the car is first registered until it is officially de-registered. The vehicle must be formally de-registered at a testing station or vehicle registration office before the fee is no longer charged. For vehicles exempt from the vehicle registration fee this fee has not to be paid.

**Packaging and packaging waste.**
So far, data on the amounts of the different packaging waste sorts that arise in Iceland have been scarce, the best rough estimates, making reporting and policy-making difficult. Regarding Council Regulation 2150/2002/EC on Waste Statistics, a pilot study is being carried out to develop a methodology of monitoring packaging waste streams in Iceland, producing quantity-rows for the years 2002, 2003 and 2004 and making it possible to update data in the future in a reliable and efficient way.

An interim report of the study was presented to the financer of the project, Eurostat, 15 October 2004. The final report will be finished 15 October 2005. The amounts of estimated consumption, recycling and recovery of packaging are given in the table below.

**Table: Consumption, recycling and recovery of packaging in Iceland in 1995**

<table>
<thead>
<tr>
<th>Type of packaging</th>
<th>CONSUMPTION</th>
<th>RECOVERY</th>
<th>RECYCLING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glass</td>
<td>5.000</td>
<td>1.700</td>
<td>34</td>
</tr>
<tr>
<td>Plastic</td>
<td>16.300</td>
<td>1.810</td>
<td>11</td>
</tr>
<tr>
<td>Paper/board</td>
<td>19.800</td>
<td>2.580</td>
<td>13</td>
</tr>
<tr>
<td>Composites</td>
<td>2.800</td>
<td>55</td>
<td>2</td>
</tr>
<tr>
<td>Metal</td>
<td>3.800</td>
<td>1.200</td>
<td>32</td>
</tr>
<tr>
<td>Timber</td>
<td>11.300</td>
<td>4.610</td>
<td>41</td>
</tr>
<tr>
<td>Other</td>
<td>50</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>Total</td>
<td>59.050</td>
<td>11.965</td>
<td>20</td>
</tr>
</tbody>
</table>

* minimum
** average