

## Solutions at a Glance: THE ALCHEMY OF INCINERATION – FROM WASTE TO RESOURCE

*“The waste of plenty is the resource of scarcity.” – Thomas Love Peacock*



The SYSAV waste incineration plant in Malmö, Sweden.

### The Challenge

Simply put, we generate a lot of garbage. In 2001, 20 municipal solid waste landfills accepted 9,050,038,000 pounds of waste generated by Washington State. Of this amount, 2,351,906,000 pounds were exported, making it a bigger out of state export than apples. Waste generation is already growing at a faster rate than population growth, and the Washington State Department of Ecology predicts that both population and waste generation in Washington State will continue to increase substantially.

### The Solution

For every three tons of garbage, the new super-efficient incinerator operated by SYSAV in Malmö, Sweden extracts the equivalent energy of one ton of oil. Nine municipalities, with a total of 500,000 inhabitants, jointly own SYSAV, which is the regional waste service company serving southern Sweden. In addition to burning its own wastes, Sweden has become a waste importer. Revenue is generated in two ways: by providing the service of waste incineration and by selling the energy and heat produced by incineration. This is the alchemy of waste incineration:

Waste = Energy = Revenue.

There are now two waste incineration plants in an industrial area of Malmö less than five miles from the city center. The new state of the art facility manages some 200,000 tons of combustible household and industrial waste per year in a plant that is spotlessly clean, odor free, and architecturally designed. Energy is produced through combustion as electricity and hot water and is supplied to the district heating system. Combined with the 1973 waste-to-energy plant still in use, the combined output per year is 1 TWh of energy from 840,000,000 pounds of waste. (TWh is the term for

1,000,000,000 KWh or the amount of energy produced by a 114 MW generator over the course of a year.) The waste is incinerated 24 hours a day, 365 days a year. Most people who look into the 900-centigrade fire find it fascinating – it provides a pretty good idea of what hell would look like.

After incineration, SYSAV must deal with the remaining waste material, which is called slag. Slag contains large amounts of scrap metal. The scrap metal is sorted with the aid of magnets and the remaining material is used for a variety of purposes, including as a substitute for natural gravel in road building. What can't be dealt with in any other way goes to the landfill. In Sweden, only 10% of the waste ends up this way.



A glimpse of hell in a waste incineration plant furnace

Waste incineration produces highly polluted flue gasses. Prior to the gasses leaving the stack, the various

pollutants are extracted and either stabilized or converted to a benign substance in a step-by-step process. Dangerous toxins like Dioxin, once a significant bi-product of waste incineration, have been reduced substantially and are now close to zero. All the plants in Sweden meet the EU standards regarding Dioxin.

allows us to indulge in our wasteful habits without guilt. In European conferences on waste management, the debate is frequently over whether to recycle or to incinerate, with both sides claiming that their preferred method is better both environmentally and economically. This is why there are legitimate

During this trip, they were taken on a tour of the SYSAV waste incineration plant in Malmö, Sweden.

*Produced by Patricia Chase, International Sustainable Solutions ([www.i-sustain.com](http://www.i-sustain.com)). International Sustainable Solutions encourages the implementation of sustainability practices and products by facilitating the sharing of knowledge and the creation of market opportunities.*

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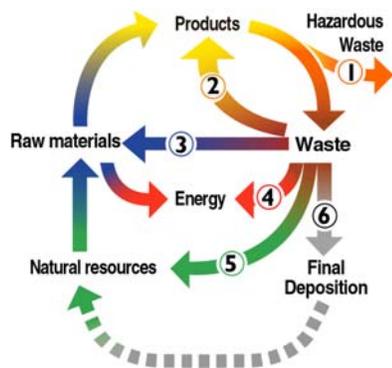
	Recycling	Incineration	Landfill	Composting
Washington (2001)	37%	10%	47%	6%
Sweden (2002)	31%	40%	20% (Reduced to 10% as of 2004)	9%

Waste Management Comparison -- Washington State to Sweden. Note: In 2002, the Tacoma waste incineration plant was closed. This plant accounted for 45% of Washington's incineration in 2001.

Background

Sweden's waste management philosophy is based on the concept of the eco-cycle. Incineration is seen as another form of recycling in which the energy used in the material is recycled rather than the material itself. It is illegal to landfill combustible materials.

concerns about waste incineration even by those who understand that it is a good alternative to landfills, particularly with its energy producing capabilities. It is the easy way out – the hassle free solution – which could put into question the important and significant efforts at recycling and reuse. In Sweden, waste incineration is part of an integrated solution that also includes making producers responsible for the disposal and recycling of their products and packaging, general efforts to recycle and reuse, and reclamation of raw materials such as metals and phosphorous. Waste incineration should be considered in addition to reduction, reuse and recycling, but not as a substitute for them.



Eco-cycle model, provided by SYSAV

The problem with waste incineration is that it is inherently seductive. It's like eating potato chips with olestra, which markets itself as the "no fat cooking oil with full fat flavor." It

The 2004 Urban Sustainability Study Group to Sweden and Denmark

In March 2004, a group of architects, engineers, developers and others from Seattle, Washington and Portland, Oregon went to Sweden and Denmark to look at advanced urban sustainability projects.

