



RECOVERING RESOURCES FOR ALL

Integra North
Energy Recovery Facility



Integra North Energy Recovery Facility (ERF) was the first of its kind to be built in Hampshire and one of the leading examples of best environmental practice for waste treatment.

The waste produced by residents of the North Hampshire Districts is dealt with here. This ERF provides a long term sustainable solution for waste disposal. It recovers heat energy from the waste to produce steam, which is used to generate electricity and in turn this is supplied to the National Grid.

Strict environmental controls and proven operating experience ensure the Integra North ERF is a centre of excellence and a benchmark for the industry.



Recovering Energy from Waste



Project Integra - the waste solution

At the end of the 1980s it became evident that Hampshire was facing a waste disposal crisis. Landfill space was rapidly running out, incinerators built in the 1970s were not going to meet EU emission regulations and waste levels were continuing to rise.

The search for a realistic alternative was required.

From 1993 the public were involved in looking at the problem of Hampshire's growing waste mountain and what the options were. The outcome led to the confirmation of an ambitious strategy.

In 1995 the Hampshire Waste Strategy was adopted. It is the most progressive integrated waste management system in Britain and provides sustainable waste management for all the domestic waste in the county.

Project Integra is a unique partnership between Hampshire County Council, the two Unitary Authorities of Southampton and Portsmouth, the 11 District Councils and Veolia Environmental Services.

Hampshire was hailed as an example of good practice for its partnership approach to waste management in the 2002 government strategy report 'Waste Not Want Not'. In addition, in 2000-2001, Project Integra was attributed 'Beacon Council Status' in the first year of the awards, in the category 'sustainable development – dealing with waste'.

Since Project Integra was adopted, significant progress has been achieved.

Project Integra was formed on the basis of the following seven point action plan

1. Action on waste minimisation
2. Action on composting
3. Action on recycling
4. Support for anaerobic digestion
5. Use of recovery technologies, including incineration
6. Three to five waste processing facilities (not exceeding 200,000 tonnes per annum)
7. Residual waste to landfill



The first steps

The 'Integra North Contact Group' was set up from a cross section of people from local residents to interest groups. Members of the group became involved in the waste issues from the preliminary stages of the project design, right up to the formal submission of the planning application.

Through consultation with the public, the needs and concerns of the local community were taken into account. This allowed the best possible final proposals to be produced.

Communication is an integral part of our day to day business. We maintain our relationship with the local community by a continuous and strategic approach to communication. This is achieved via:-

- The development of Liaison Groups in connection with major developments and changes to facilities
- Initiatives and campaigns to raise awareness to target audiences
- Presentations to interest groups, community groups and schools
- Visits to our facilities
- Sponsorship and donations for local community projects
- Raising the profile of key issues through the media
- Information sources, such as our website and publications



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Design considerations

One of the major design considerations was to ensure Integra North was as unobtrusive as possible in its surroundings.

The technological and operational advances of today have allowed this facility to become a benchmark in the energy recovery of tomorrow.

It has been designed to meet the latest legislation regarding environmental impact, with tight controls being placed on emissions, noise and odour.

This state of the art ERF not only provides an alternative to landfill, but also for the sustainable production of energy through the disposal of waste.

A benchmark in design

- Architectural design led-project
- Special materials
- Light reactive cladding
- Significant landscaping scheme
- Use of curves and colours to soften impact



For many people environmental issues are at the top of their agenda and we all have a role to play in ensuring the use of renewable resources is maximised.

The awareness and importance of recycling waste has increased and people are keen to contribute. Many of us take the trouble to recycle, either via the kerbside collection system, Household Waste Recycling Centres (HWRCs) or via the 1600 recycling bank sites in Hampshire.

What happens to waste that isn't recycled?

Traditionally household waste has been landfilled. Instead of landfilling, three Energy Recovery Facilities have been developed in Hampshire, the first being Integra North.

The combined capacity of the ERFs has been designed to deal with the large volume of waste produced whilst maximising recycling.



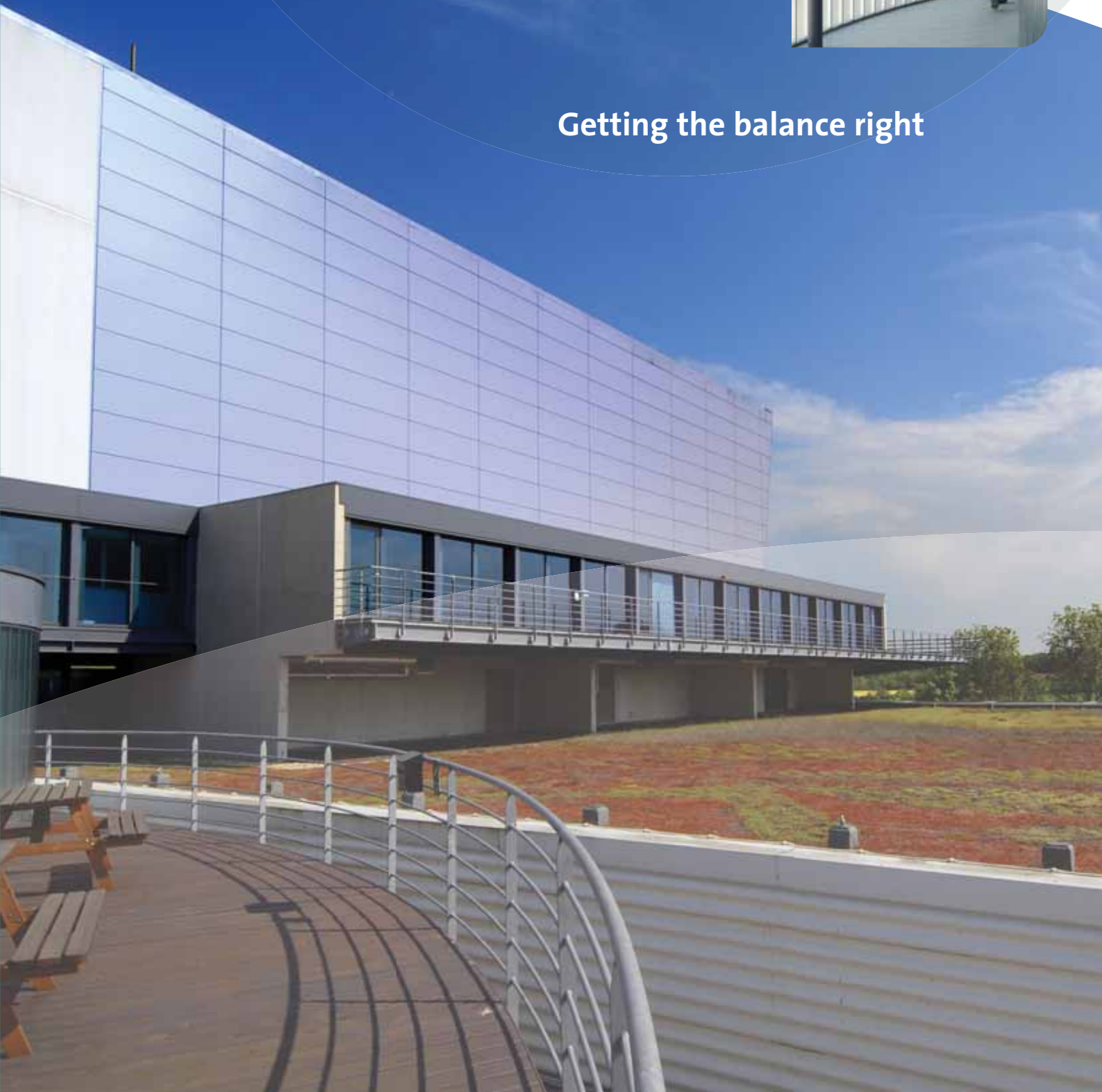
Integra North is capable of processing 90,000 tonnes of waste per year and recovers heat energy from the waste to produce steam. This is used to generate up to 8MW of electricity which is supplied to the National Grid. This is sufficient to power 8,000 local homes for the life of the facility.

Recovering Energy from Waste





Getting the balance right



The way forward

The integrated waste management strategy relies on handling waste in a four pronged approach: waste minimisation, recycling (including composting), energy recovery and finally as a last resort, landfill.

The vast majority of households in Hampshire have access to kerbside collection of recyclable materials. These include newspapers and magazines, cardboard, junk mail, food and drinks cans and plastic bottles. These are taken to a Materials Recovery Facility (MRF) to be separated, sorted and sent for reprocessing.



The network of bank sites cater for other materials, including clothes, books and glass bottles and jars. The 26 Household Waste Recycling Centres (HWRCs) throughout Hampshire take bulky materials.

The Materials Recovery Facility (MRF) at Portsmouth opened in 1998 and in its first year recovered nearly 32,000 tonnes of material, with capacity now reaching 72,000 tonnes per year.

Such is the demand for recycling, an 85,000 tonnes per year facility at Alton started operation in early 2004.

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The journey of your waste



Integrated waste management

There are three ERFs in Hampshire: Integra North at Chineham near Basingstoke, Integra South West at Marchwood near Southampton and Integra South East at Portsmouth.

These cutting edge facilities, represent an investment of over £130 million and process waste that would otherwise go to landfill. The energy is recovered as electricity with up to 37MW feeding the National Grid.

Green garden waste, such as grass and plant cuttings, is separated at the HWRCs and collected from some households. This material is composted at three facilities in the county. The green waste undergoes a process which takes nearly six months and after this time a new product is born: Pro-Grow, an organic soil conditioner which is now sold across the UK.

How does the plant work?

The management and staff of Integra North ERF are among the most highly qualified and experienced in the sector.

Household waste is sent to an Energy Recovery Facility where it is tipped into a bunker. A crane grabs the waste and places it into the feed hopper. It then drops down a feed chute onto the grate. The action of the grate turns the waste to allow it to burn fully. The burnt-out ash passes through the ash discharger onto an ash handling system, which extracts metal for recycling.

The remaining ash is sent for recycling or disposal. Hot gases produced in the combustion process pass through a water tubed boiler where they heat the water to become steam. A turbo-generator uses the steam to produce electricity for export to the National Grid. The gases from the boiler go through an extensive flue gas cleaning process which starts with the gas scrubber where lime milk is injected to neutralise acid gases.

Activated carbon is added to remove dioxins, urea is added to treat oxides of nitrogen and finally a bag filter takes away remaining particulates. The resulting material known as Air Pollution Control Residue is used to neutralise other wastes at a licensed site. The cleaned gases are finally released into the atmosphere through the chimney.

Recovering Energy from Waste



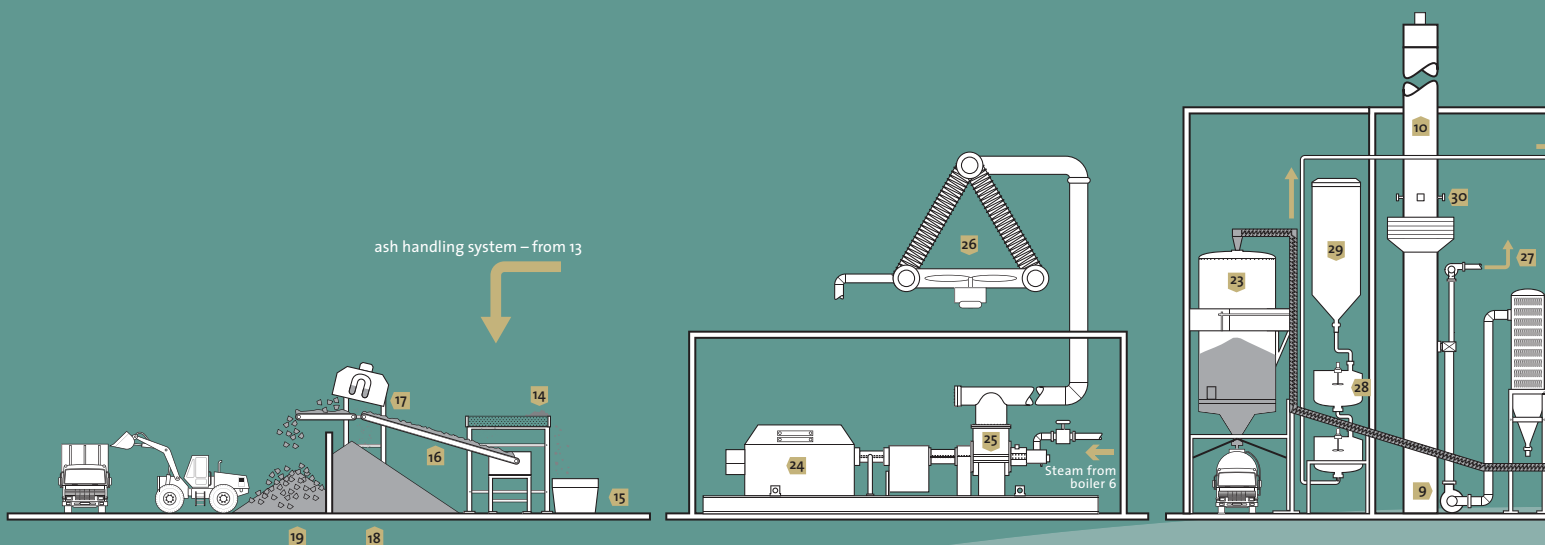
How the power is generated

The output steam from the heat recovery boiler is fed into the steam turbine. It enters the turbine at high pressure (45 bar and 400°C) and leaves the turbine at partial vacuum.

After the turbine, the vacuum steam condenser turns the steam back into water (condensate), which is recycled back into the boiler.

The output shaft of the turbine is connected to the generator via a reduction gearbox. The generator is water cooled and specifically designed for minimal maintenance. The electricity flows through an underground cable at 11,000 volts to Basingstoke substation.

Integra North provides 8MW of electricity, enough to power 8,000 local homes.

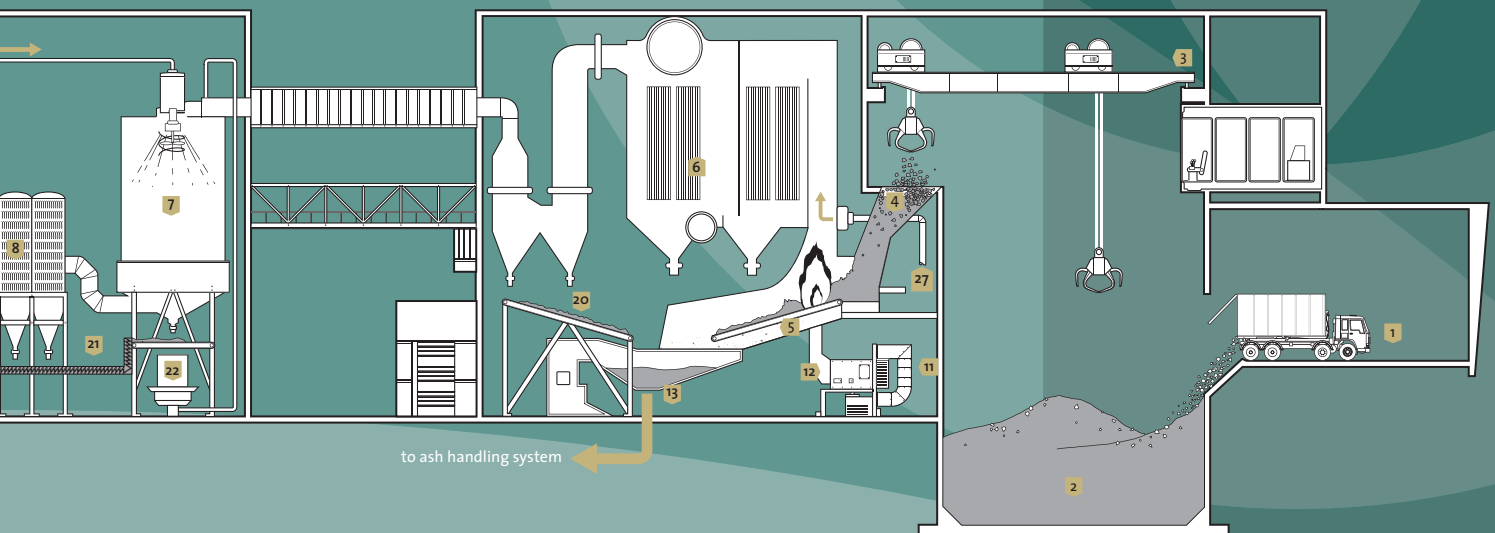


Key to the plant diagram

1. tipping hall
2. refuse bunker
3. refuse travelling crane
4. feed hopper
5. grate
6. boiler
7. gas scrubber
8. bag house filter
9. induced draught fan
10. chimney
11. combustion air fan
12. air heater
13. ash discharger
14. oversize items grid
15. oversize items skip container
16. bottom ash conveyor
17. magnetic separator
18. bottom ash storage
19. ferrous scrap storage
20. boiler ash conveyor
21. APC residue conveyor
22. activated carbon injection
23. APC residue silo
24. generator
25. single stage steam turbine
26. condenser
27. flue gas recirculation fan
28. lime slurry preparation tank
29. lime silo
30. emission monitoring equipment

Technical details of the plant

- Refuse throughput - 90,000 tonnes per annum approximately 12 tonnes per hour.
- Storage capacity - four days full plant capacity
- Number of tipping bays - 5
- Steam output - 37.5 tonnes of steam per hour at 400°C and 45 bar
- Flue gas treatment - CNIM semi-dry lime scrubber followed by high performance bag filters, discharging into a 65 metre high chimney
- Energy produced - maximum generating capacity 8MW



Benefits of recovering resources for all

When household waste is burnt in a modern purpose-built Energy Recovery Facility, various environmental objectives are achieved. It is truly a win-win solution.

- Waste is managed in a sustainable manner
- Energy is recovered from the waste
- Dependence on landfill is reduced
- Release of methane from landfill is avoided (methane being a greenhouse gas many times more potent than carbon dioxide)
- The use of fossil fuels is reduced – a tonne of solid waste equates to one-third of a tonne of coal

The paper used in this brochure is manufactured from 80% waste fibre, with 20% from sustainable forests.

It is Totally Chlorine Free.

The water used in making this paper is recycled, purified and returned to source.

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