



JEC SOLUTIONS

sustainable environmental options

Waste to Energy

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Environment & Ecosystem

The population of the world is rapidly growing. Advances in medicine are enabling people to live longer, and the increased availability of food through modern farming methods means that death rates are much lower than birth rates in developing countries.

The increasing population compounded by lifestyle changes, is putting ever greater demands on natural resources and the environment. There is a greater demand for raw materials, renewables and non-renewables, which in turn is producing more waste and pollution.

Environmental pollution is the contamination of air, water and land from man-made waste. Toxic elements introduced into the natural environment cause instability, disorder, harm, and discomfort to the ecosystem. Pollution leads to depletion of the ozone layer, global warming, and climate change.

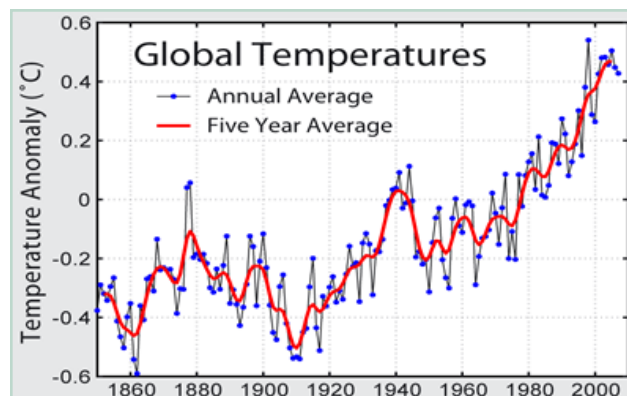
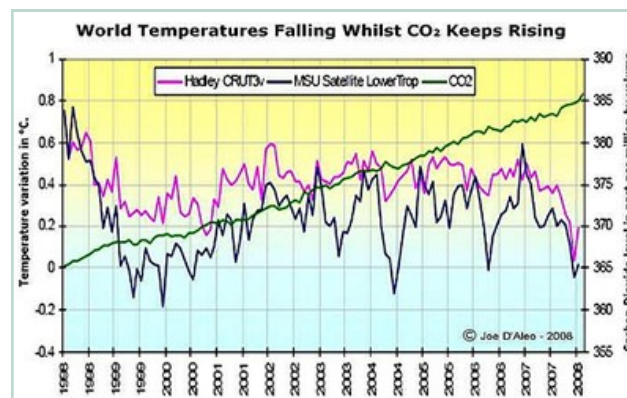
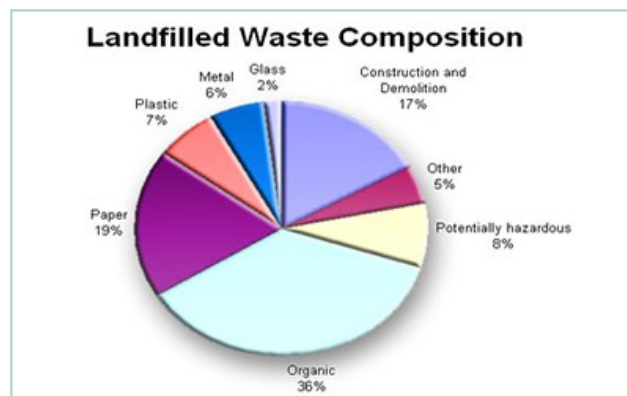
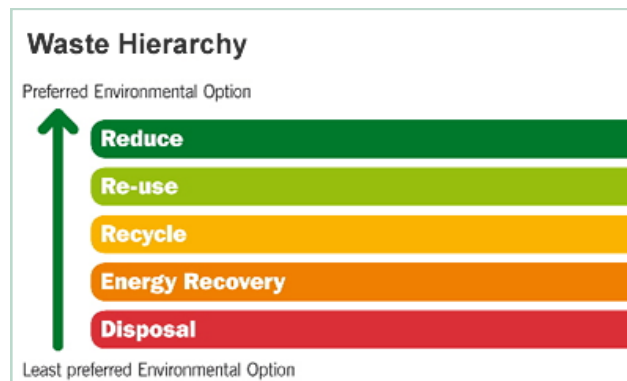
Waste pollution is one of the biggest threats facing our environment today. Whilst waste collected from homes, offices, and industries may be recycled or burnt in incinerators, a large amount of rubbish is bypass these processes and is rather sent to landfill sites.

The demand for these landfill sites is becoming more and more acute, especially in the developing countries. The rising standards of living also mean that we are throwing more away, which is increasing the quantity of solid waste.

Many governments around the Globe are adopting a Zero Waste Plan which aims to change how waste is viewed and managed.

Zero Waste means making the most efficient use of resources by minimising demand on primary resources, and maximising the reuse, recycling and recovery of secondary resources instead of treating them as waste. The Zero Waste aspiration will also help governments to achieve climate change goals and assist in sustainable financial growth.

We all share responsibility for dealing with our waste.



Our Services

JEC supports waste to energy build projects and can deliver both the technical and financial resources. A single energy plants has the capability to provide a number of commercially valuable resources.

- Eliminates Solid and Liquid Waste
- Reduces Land Fill Volumes by 93%
- Consumes up to 172 Tons of Waste per Unit per Day
- Recovers Land Fill Sites for Development
- One Unit Generates 7 to 10Megawatts Continuous Power per Hour
- Distils approximately 53,000 Gallons of Drinkable Water per Hour
- Produces Inert Ash Solid for Commercial and Industrial Market

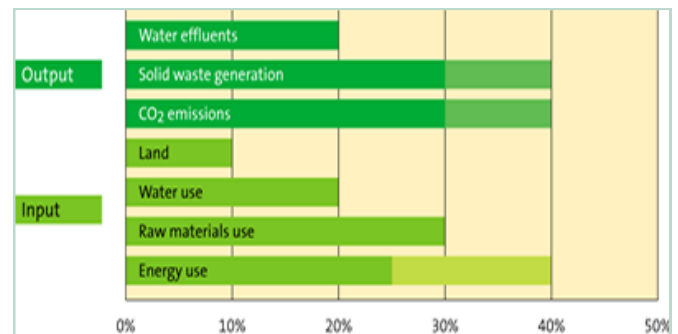
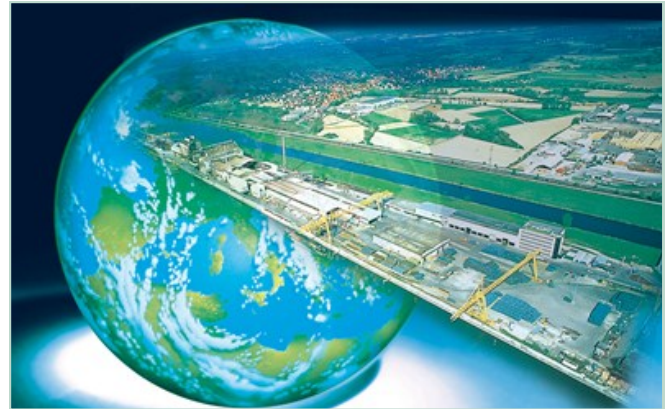
We are able to organise the construction of a waste to energy plant by bringing together the technology, construction capability and 100% of funding. In addition we will assist in the organisation of the on-going management functions.

To begin we would require the following items from the commissioning authority:

1. The provision of suitable land (approximately 2 to 3 hectares per unit)
2. A long term agreement for the purchase of the electricity produced
3. A bank guarantee issued by an internationally recognised Bank.
4. Contract for the provision of the required municipal waste per day.
5. A letter of intent together with a draft of the bank guarantee.

The revenue from the plant is expected to recover the original costs within 10 to 12 years from commissioning based on the current UK mean domestic energy retail price of 12 pence per KWH.

The bank guarantee is essential to ensure that the fund providers are repaid in full and that agreed repayment terms are met on the due date.



Financing

In today's economic climate, finding reliable funding sources can be frustrating. Fortunately, we are partnered with an investment fund that provides financing for alternative energy projects.

What are the benefits of doing business with us?

- We are not brokers, we work with a large, private lender;
- We won't waste your time--if we can't do your deal, we'll tell you so;
- We will do our best to get you funded, quickly and professionally.

What are our commercial financing programs?

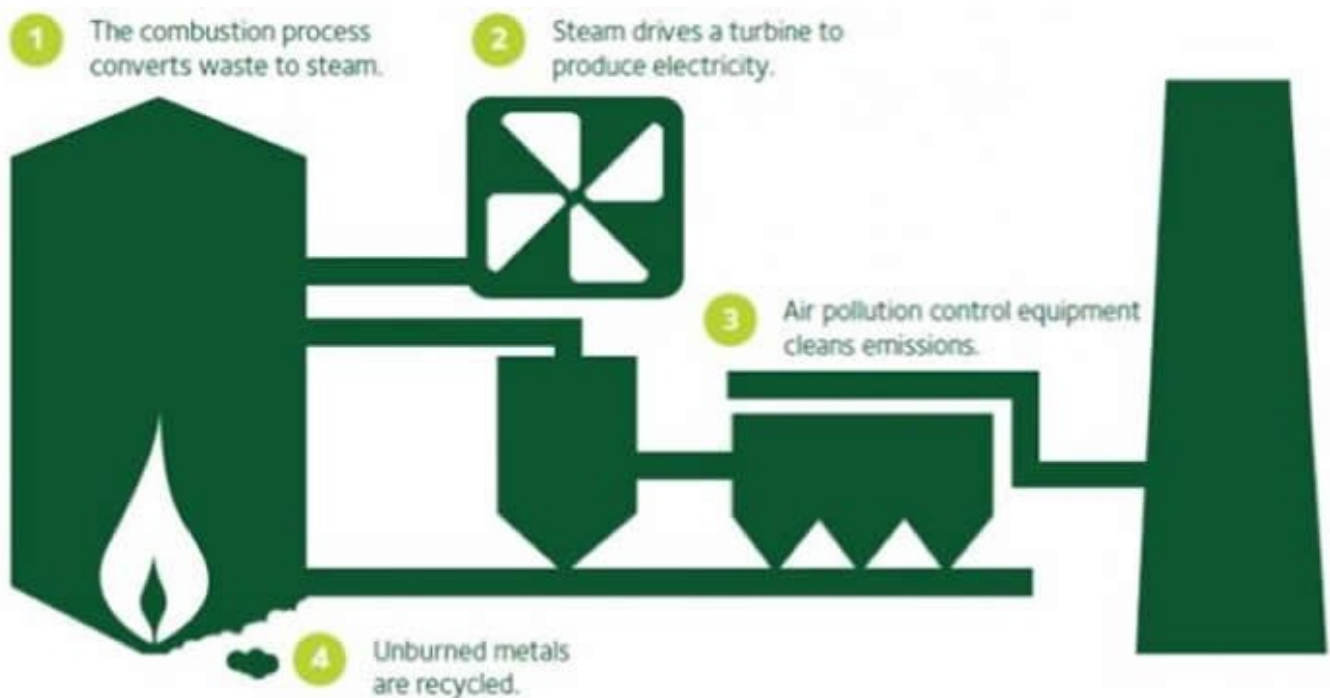
- **100% Joint Venture Equity Financing.** This program provides 100% equity financing for large-scale development projects that require a joint venture partner;
- **Large-Scale Debt Financing (£10 million and up).** This traditional debt financing program provides loans for new development, refinancing and acquisition at competitive rates.
- **Small Balance Financing (less than £10 million).** This program is also a traditional debt-style funding model providing loans for projects that are less than £10 million in size.

Technology

Waste to energy conversion is an increasingly recognised approach to resolving two issues in one, waste management and sustainable energy. Waste as an increasingly important fuel source, also has important environmental benefits. It can not only provide a safe and cost-effective way of waste disposal but can also help reduce carbon dioxide emissions.

Whilst energy can be derived from waste by burning Landfill gas, there are also alternative methods to generate energy from waste. When waste is incinerated in large amounts, the heat energy can be recycled and used to heat factories, hospitals and other large buildings. Alternatively, the heat can be used to generate electricity. This is done by using the steam created by combustion to drive a steam turbine. Waste-derived fuel can also be burnt in boilers as an alternative to coal.

Any energy that is recovered from biological waste can be regarded as renewable. It comes from plant material (either directly, or in the case of animal waste, paper or card, indirectly). As plants grow they absorb carbon dioxide from the atmosphere. When biomass is used as fuel, this carbon dioxide is returned to the atmosphere, making the process carbon neutral.

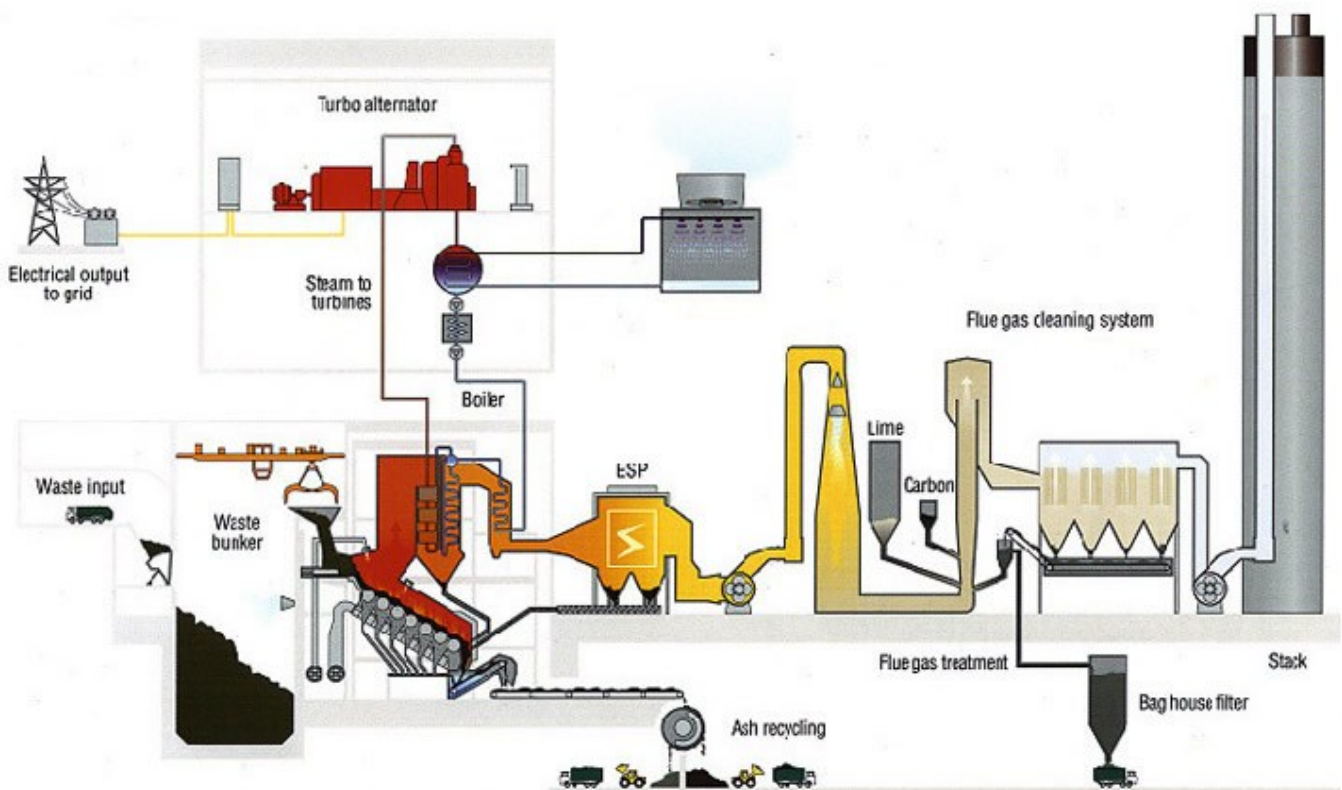


Waste to energy plants are built in modules with one or more processing lines in parallel to meet customer's requirements regarding energy production and fuel processing capacity. The energy content of the fuel is converted into electricity and/or heat delivery for local use, e.g. district heating or industrial applications. This low cost and secure source of energy directly replaces fossil fuels and can provide significant savings for local industry improving cost competitiveness.

Technology

Linked with modern combustion and steam turbine-generators, gasification is one of the most efficient, environmentally benign means available for producing electricity from various feed stocks. While natural gas combined cycle systems exceed gasification systems in power generating efficiency, the relatively high price and declining availability of domestic natural gas resources make gasification increasingly attractive as a power generation option for power producers.

In the power production process (see simplified diagram below), purified syngas from the gasification side of the plant or “Gasification Island” is supplied to the power side of the plant or “power island.” The syngas is mixed with air and ignited to drive the combustion turbine directly in a combined thermal and mechanical process that is converted to electrical power by the generator. The electrical power from the generator then is fed to the electrical grid for distribution.



Waste heat from the combustion turbine is then used to boil water in the heat recovery steam generator and create the steam to drive a steam turbine with its own generator set. Combined cycle operation makes possible an energy conversion efficiency that is about one-third greater than that possible using a gas turbine only.

When combined with an efficient Materials Recycling Facility the plant can be used as part of an overall integrated waste management strategy. Typical installation offers two standardised single-line plants for low and high calorific waste. JEC can also offer two standardised double-line plants, with double the capacity of single-line plants.

The plant can be built to various configurations with options for high calorific value and mixed waste streams.

Technology

Environmental benefits

- Low and stable carbon monoxide (CO) and nitrogen oxide (NOx) emissions
- Average NOx emissions are typically 25-39% of the EU limit
- Very low dioxin emissions typically 1% of the EU safe limit
- Low carbon content in the bottom ash (less than 3% TOC)
- Independent leaching tests demonstrate that carbon leaching is only 10% of standard EFW processes
- A local solution offers minimised transportation and therefore reduced emissions from refuse vehicles
- In many cases total emissions from sites using the energy may decrease, improving local air quality
- The building footprint is small and it's overall height low, reducing the visual impact of the plant

Operational benefits

- The technology is proven
- The proprietary control system ensures that emissions are consistently low and stable
- Low NOx, CO and TOCs - world-leading combustion efficiency
- No compromise on emissions performance in the event of plant turndown
- No ammonia or urea storage or handling issues
- No de-NOx system is required
- Due to the flexible process, various waste streams can be processed, including Municipal Solid Waste (MSW), residual MSW, SRF/RDF and commercial waste. This flexibility is important as the composition of waste streams will change due to ever-improving recycling rates

Financial benefits

- The existing plants operate successfully on a commercial basis
- Renewables Obligation Certificates (ROCs) are issued for the biomass fraction of the waste when the plant produces electricity, enhancing the normal income streams
- Energy recovered from the biomass content is not subject to the Climate Change Levy (CCL)
- Low operating and maintenance costs

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