

Levenseat are building a waste treatment facility at, Levenseat, by Forth to process commercial and household waste



Work is well underway on Levenseat's new waste treatment facility.

The facility will process waste from households and commercial customers in Scotland. High quality recyclates are recovered by our materials recycling facility and the remaining waste is prepared and transformed into a fuel for our Power Plant. The new facility allows us to maximising diversion from landfill and contribute to Scotland renewable energy targets.

Local community members will know that we have been working on this project for the past few years and have experienced a longer than anticipated build schedule. This information brochure is designed to provide you with an update on progress to date and an estimated timeline for completion.

We have also included background information for anyone who is new to the area, or who is unaware of our plans and information on how you can keep up to date with progress.

WHO WE ARE

Levenseat Limited is a family owned Recycling & Resource Management company based in Central Scotland. Over the last 30 years, Levenseat has established a reputation for reliability, accessibility and innovation.

As a leading regional operator, we are committed to developing new solutions to recover the best resources and provide customers with environmental and economic solutions.

Based at Levenseat, near Forth in Lanarkshire, with our new Materials Recovery Facility & Power Plant together with the wider established site, we are delivering to the market Scotland's largest integrated facility providing treatment and recovery for a wide range of waste materials.



Recycling



Organics



Energy



Products



Community



BACKGROUND

Did you know that on average every household in Scotland produces over one tonne of waste per year? New and tighter regulations and legislation from Government and Europe have meant that Scotland can no longer continue to send the majority of its household rubbish to landfill.

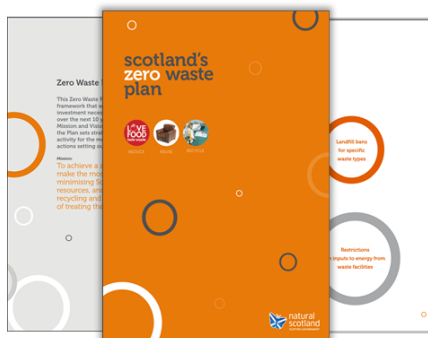
In an effort to manage and dispose of waste in a more environmentally friendly and cost-effective manner, Levenseat investigated alternatives to Landfill. Along with waste reduction and recycling, energy recovery is an essential part of the solution.



Scottish waste landfilled accounted for 42.9% of all waste managed in 2018”

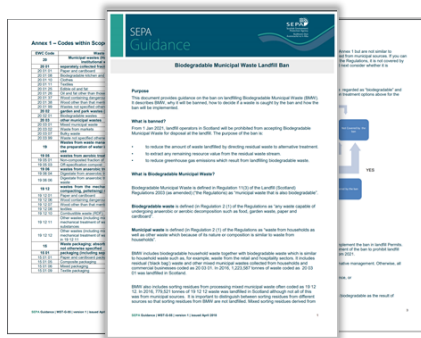
Source: SEPA, Household waste Summary

POLICY DRIVERS



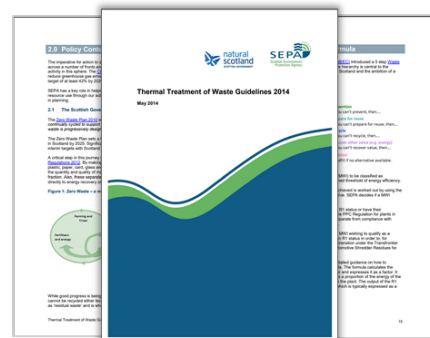
SCOTLANDS ZERO WASTE PLAN

Sets out Scotland's vision of waste as a resource with real world value



SCOTTISH LANDFILL BAN

The landfill ban is part of the Scottish Governments Zero Waste Plan, which aims to achieve a nationwide recycling rate of 70 % by 2025



THERMAL TREATMENT OF WASTE GUIDELINES

Sets out SEPA's approach to permitting thermal treatment of waste facilities and their role as a statutory consultee of the land use planning system

INSIDE THE WASTE TREATMENT FACILITY

Our new waste treatment facility consists of an Material Recovery Facility (MRF) and a Combined Heat and Power Plant.

The facility will treat waste as a resource and recover materials that can be reused or recycled. Waste that is not able to be recovered will be used as a fuel to generate a partially renewable energy.

Waste accepted at this facility is only black bin waste, otherwise known as residual waste i.e. waste that householders have deemed to be non-recyclable.



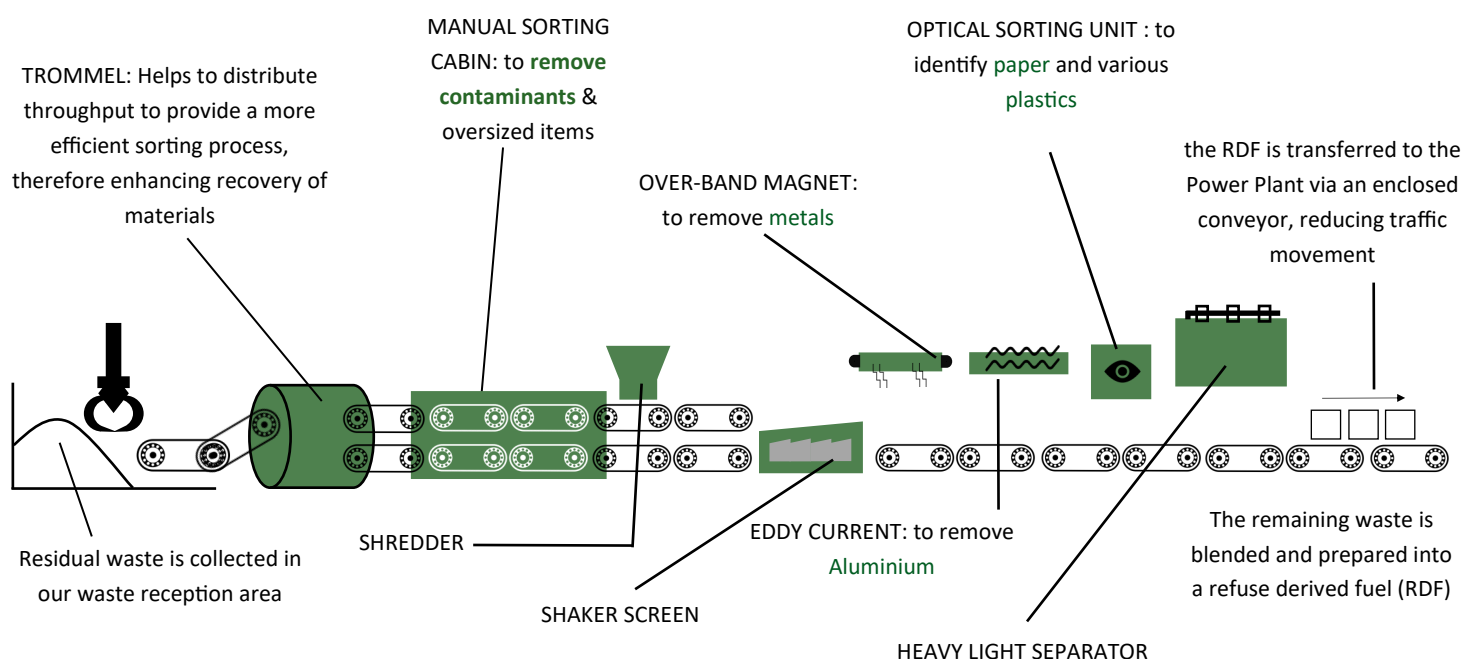
“ WILL SAVE 1.3 MILLION TONNES OF CO2 EMISSIONS”

1 MATERIALS RECYCLING FACILITY (MRF)

Our MRF reached completion in Q4 2017, and uses state of the art automated technology to recover high levels of recyclates such as wood, cardboard, metals, plastics and paper.

The MRF is not just a recovery facility, it is also designed to remove potentially polluting material such as batteries, PVC and metals.

The remaining waste, is then prepared into a fuel known as Refuse Derived Fuel (RDF). This fuel is made to a specific, detailed standard to ensure a clean and efficient conversion process and to minimise production of ash and other by-products.



*Simplified diagram illustrating major components of the MRF, for more details click [here](#)

2 POWER PLANT

Our plant uses a gasification process to produce energy; gasification is the process that transforms a carbon based material (in our case RDF fuel) into energy without actually burning it in a conventional manner. This is achieved by reacting the material at high temperatures ($>850^{\circ}\text{C}$), without combustion, with a controlled amount of oxygen. Gasification, converts the solid waste material into a synthetic gas known as syngas.

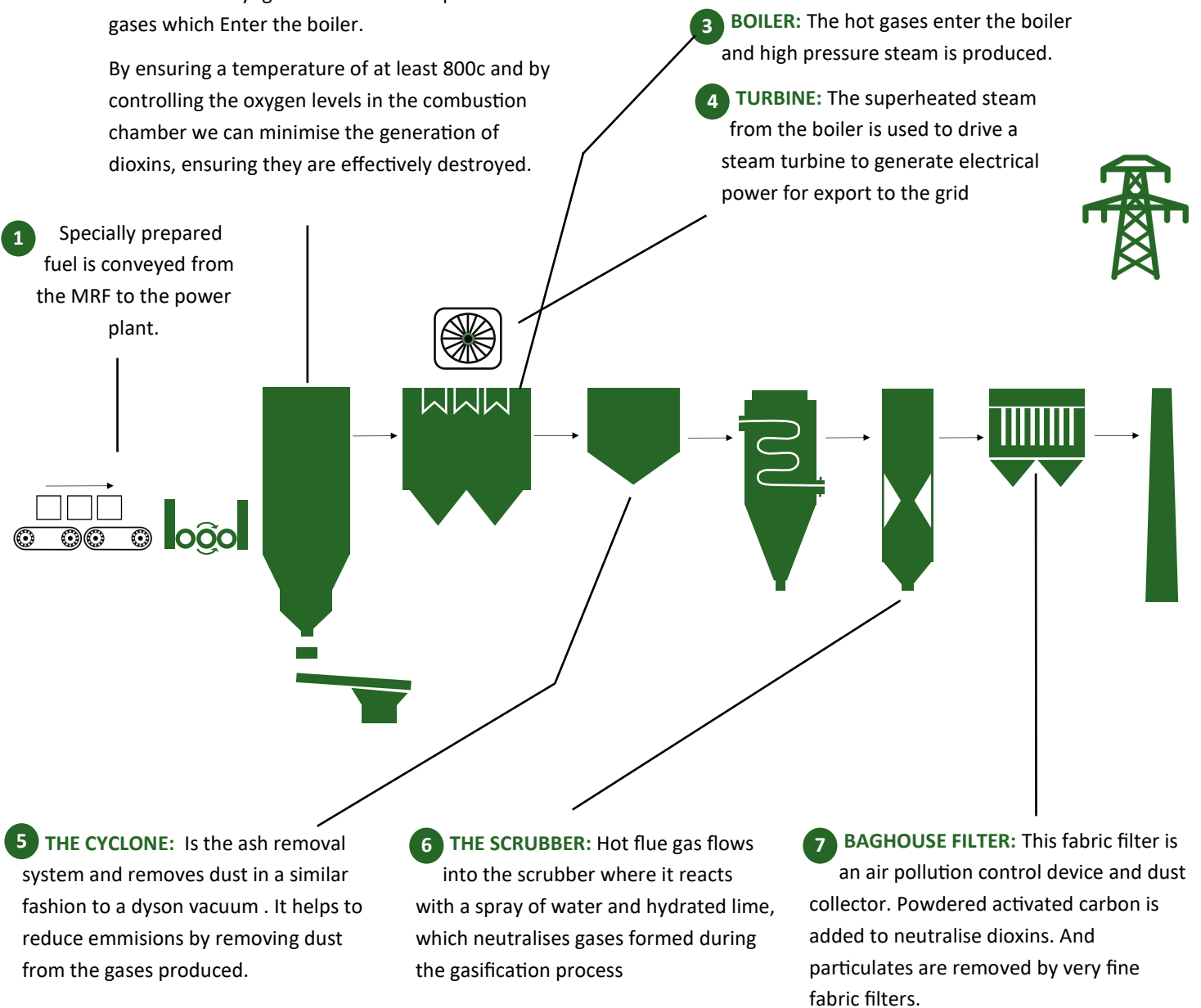
The syngas is combusted to generate high pressure steam through a boiler system. The steam drives a turbine to generate electricity which is exported to the grid and then distributed to households and other consumers.

Emissions are cleaned up through a series of absorption, scrubbing and filtration processes to fully meet the EU emissions standards and the strict standards detailed in our environmental permit.

2 ADVANCED STAGE GASIFIER: STAGE 1: the fuel is converted into a syngas by heating it up in a low oxygen environment.

STAGE 2: The Syngas is combusted to produce hot gases which Enter the boiler.

By ensuring a temperature of at least 800°C and by controlling the oxygen levels in the combustion chamber we can minimise the generation of dioxins, ensuring they are effectively destroyed.



**Simplified diagram illustrating major components of the Power Plant, for more details click [here](#)*

POWER PLANT DURING CONSTRUCTION



PLANT LAYOUT

▲ SCRUBBER UNIT

◀ BAGHOUSE FILTER



Building Complete

THE FACTS

WILL PRODUCE ENOUGH
ENERGY TO POWER
25,000
HOMES



ENERGY RECOVERED
FROM WASTE IS
PARTIALLY RENEWABLE
& WILL CONTRIBUTE
TO SCOTLAND'S
RENEWABLE ENERGY TARGETS



WILL SAVE
1.3 MILLION
TONNES
OF CO2
EMISSIONS



WILL DIVERT OVER
5 MILLION
TONNES
FROM
LANDFILL



WILL CREATE
OVER 70 JOBS
FROM TECHNICAL
& MANAGERIAL TO
OPERATIONAL &
APPRENTICESHIPS



RECOVERS A RANGE
OF RECYCLATES
FOR REMANUFACTURE



EMISSIONS CONTROL

Emissions are monitored directly by our Continuous Emissions Monitoring System (CEMS). This system is fitted inside the stack so it monitors the flue gas before it is released into the atmosphere.

The information from the CEMS will be published on our website when the Power Plant is fully operational.

In addition to providing information to SEPA for regulatory compliance, the CEMS also allows the Power Plant team to monitor the processes. The data provided by the monitoring systems gives useful feedback on how the processes are operating, thereby allowing the team to safely and efficiently run the plant.

We control our emissions in line with the limits set by SEPA's Thermal Treatment of Waste Guidelines. Bellow we explain a little more about our emissions and state the limits set by SEPA. **Our plant is designed to operate well below these limits.**

Dust Particulates

Particulates is the term used to describe tiny particles in the air, made up of a complex mixture of soot, organic and inorganic materials having a particle size less than or equal to 10 microns diameter. Natural sources include volcanoes and dust storms.

Particulates are captured by the bag house filter.

EU limit 10mg/m³

Total Organic Carbon

Total Organic Carbon is a measure used to indicate overall emissions of volatile organic compounds. The liquids easily vaporise at room temperature and many are colourless and odourless.

Paints, natural gas, petrol, road transport and industrial processes are the major sources of these compounds, and they are also produced by natural biological processes.

EU limit 10mg/m³

Sulphur Dioxide

Sulphur dioxide is man-made and naturally occurring colourless gas.

Sulphur dioxide is produced by burning coal and oil. Releases from domestic open fires can also affect local concentrations. Sulphur dioxide is also found naturally in the air at low concentrations from natural releases such forest fires.

Levels of all gases are monitored constantly and lime (alkaline) is added at various stages to neutralise the acidic gases.

EU limit 50mg/m³

Carbon Monoxide

Carbon monoxide (CO) is both a common naturally occurring chemical and is manufactured by man.

CO levels are kept low as we use a refined fuel designed to break down completely in the sand bed within the gasifier. Secondary air is added to the process to ensure complete combustion of all gases. Temperatures and oxygen levels are monitored constantly also.

EU limit 50mg/m³

Nitrogen Oxide

The term 'nitrogen oxides' (NOx) is usually used in reference to two gases - nitrogen monoxide (NO) & nitrogen dioxide (NO2)

NOx are formed whenever any substances is combusted in the air, as the air we breath includes both nitrogen and oxygen. Major man-made releases of nitrogen oxides are primarily from fuel combustion (including vehicles). We manage levels of NOx by controlling the temperature and oxygen levels in the gasifier. Following the gasification process, urea is added to chemically change the NOx to nitrogen, oxygen and water.

EU limit 200mg/m³

Hydrogen Chloride

Hydrogen chloride is both a naturally occurring chemical and is manufactured by man. It is a colourless, chemically reactive gas .

Levels of all gases are monitored constantly and lime (alkaline) is added at various stages to neutralise the acidic gases.

EU limit 10mg/m³

Dioxins

Dioxins' refer to a group of chemical compounds that share certain chemical structures and biological characteristics . They are formed as a result of combustion processes such as burning coal, oil or wood. Cigarettes smoke also contains small amounts of dioxins.

EU limit 0-1 ng/m³

COMMISSIONING UPDATE

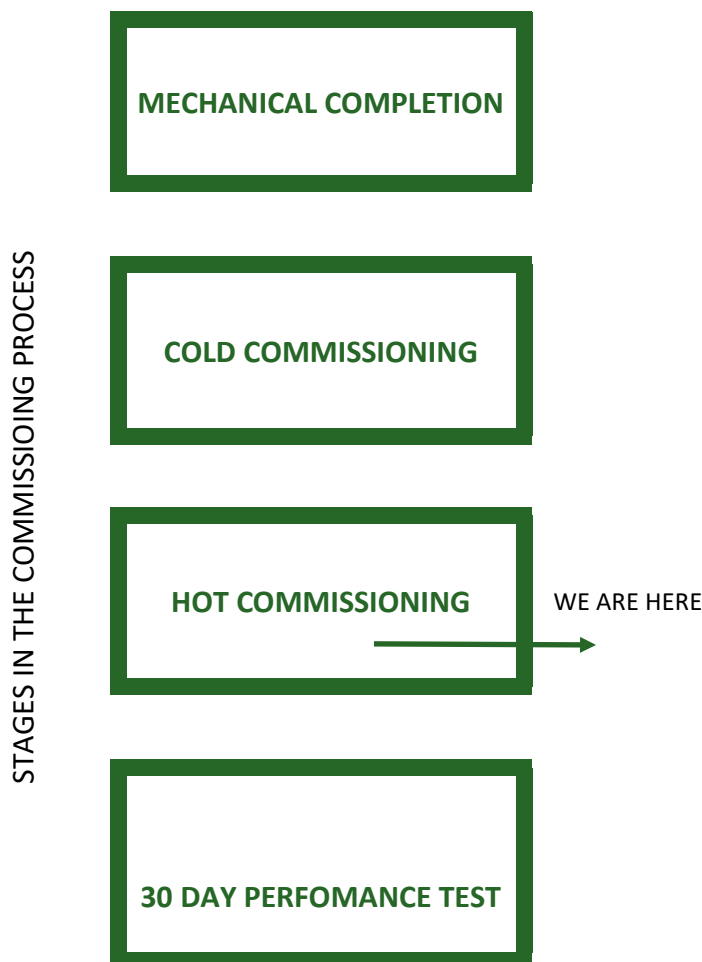
We are currently going through Hot Commissioning for the Power Plant, which is the last stage of the commissioning process.

During this phase we check the processes are working as they should and meeting all the safety, efficiency, reliability and performance standards required. We also use this phase to optimise the performance of the plant.

During hot commissioning we test the plant using refuse derived fuel (RDF). The hot commissioning process is part of the testing procedure that the facility must undergo before it becomes fully operational. The final stage is the 30-day test, where we will demonstrate that the plant operates normally and uninterrupted for a period of 30 consecutive days.

Whilst the facility is commissioning you may notice steam and condensation coming from the plant via the main stack. These are normal releases and will reduce as we progress through the hot commissioning phase.

We do not anticipate any issue or disruption for local residents from the hot commissioning process, should anyone have any concerns please give us a call on 01501 773119 or email pamelakw@levenseat.co.uk



PREVIOUS ARTICLES ON COMMISSIONING

[Community Update on Commissioning](#)

[Commissioning Update](#)

[Power Plant Enters Commissioning Phase](#)

[Materials Recycling Facility Now Open](#)

NEXT STEPS:

We continue to invest in our facility and are promoting a number of developments that are consistent with wider government objectives of reducing waste and stopping landfill.

PHASE TWO

Phase two of the Levenseat Renewable Energy project includes plans to build a second power plant and an extension to our existing materials recycling and fuel preparation facility. Phase two was granted planning permission in 2015 and we have subsequently notified West Lothian Council of our intention to amend the permission because the plant and technology now being considered could change the format of the building enclosing it.

A variety of technologies are being considered for the power plant, including moving grate and fluidised bed processes. Fluidised bed systems use a bed of heated sand on which to gasify the refused derived fuel. The bed of sand is referred to as a fluidised bed, within this two types of fluidised bed have been considered.

1. Bubbling fluidised bed (BFB) or vibrating bed technology, air is blown up through the sand.
2. Circulating fluidised bed (CFB) where fans are used to throw the sand up into the space above the sand bed. Fine particles of partly combusted RDF, ash and bed material are carried along with the flue gases to the upper areas of the furnace and then into a cyclone. In the cyclone the heavier particles separate from the gas and fall to the hopper of the cyclone. This returns to the furnace for recirculation. Hence the name Circulating Fluidized Bed combustion.

Details of the Changes Proposed: The proposed changes relate to the specific technical process and the building envelope. One of the technologies being considered is Circulating Fluidised bed (CFB) technology. As previously stated, with CFB, fans are used to throw the sand up into the space above the sand bed and therefore additional height is required.

Reasons for Change:

If granted, the increased in the dimensions of the building will allow us to consider Circulating Fluidised Bed (CFB) as an option. CFB provides the following key advantages:

MARKET NEED

With the current lack of alternatives to Landfill, the construction of a 2nd facility is essential for Scotland to meet the ambitious targets set out in the Scottish Landfill ban.

FLEXIBILITY ON FUEL

Highly adaptable to different refuse derived fuel types allowing for the plant to adapt to reflect the change in nature and composition of waste going

INCREASED EFFICIENCY

CFB is a more efficient process and provides better thermal capacity and electrical efficiency.

INHERENTLY LOW EMISSIONS

controlled in the range of 800-950 °C and thus destroy toxins and reduce the formation of pollutants. Resulting in less work to clean up emissions.

IMPROVED ECONOMICS

Improved economics as a result of point 3 & 4



USEFUL LINKS

[Lenenseat Renewable Energy Website](#)

[SEPA—Frequently asked Questions on Energy from Waste](#)

[Outotec website—our technology supplier and the company responsible for operating the plant](#)

[Energy from waste a guide to the debate](#)

CONTACTS

If you have any specific enquires about the Power Plant or our current planning application please email:
planningfeedback@lenseat.co.uk

GET IN TOUCH



01501 773 119



planningfeedback@lenseat.co.uk



www.lenseat.co.uk

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