

INTRODUCTION

The Sunderland Renewable Energy Centre (REC) is a proposal for a facility that will create renewable energy, in the form of heat and electricity, fuelled by residual waste after recycling has taken place.

The proposed plant will use a proven, safe and clean process called gasification to generate energy from Refuse Derived Fuel (RDF), which is produced from waste left over after the recycling process, Municipal Solid Waste (MSW), black bin back waste, and commercial and industrial waste.

When up and running, the plant is capable of generating heat for local use and up to 27MW of electricity, enough to power the equivalent of 45,000 homes.

The facility will be developed by Rolton Kilbride, a company with established expertise in energy and civil engineering.



ILLUSTRATIVE DESIGN CONCEPT



BACKGROUND

Although recycling performance in the UK has improved tremendously, it is not practical or possible to recycle all waste. At the same time, there is a need to generate renewable energy from non-fossil fuels and reduce carbon dioxide emissions (CO₂).

Combined Heat and Power plants (CHP) are being strongly encouraged by the Government as they are widely recognised as being one of the most efficient methods of generating energy.

The country's future energy security is also an important issue and another reason why CHP plants are a significant part of the UK's current energy policy, to create a 'mix' of technologies operating across the UK.

Facilities like this are widespread across Europe and the far east, having been used successfully in urban locations for many years. Countries with strong environmental reputations such as Sweden, Denmark, Japan and Germany use gasification to generate energy for many local communities.



THE TECHNOLOGY

Gasification describes the process by which material is converted into a synthetic gas. The process is similar to that used for making town gas from coal, which has been done for decades.

The Refuse Derived Fuel (RDF) is placed into a low oxygen environment and exposed to high temperatures from an external heat source, to create a synthetic gas known as 'syngas.' This syngas is combusted in a high efficiency boiler and the heat generated is used to raise steam for a turbine, generating electricity.

Some heat from the syngas combustion process is then recirculated to heat up the incoming RDF to create more syngas. This means only a small amount of fossil fuel (usually natural gas) is required to kick-start the process. The remaining heat can be used externally either as steam or very hot water, often supplying heat to neighbouring users.



WHAT COMES OUT OF THE PROCESS?

- Electricity
- Heat

The process also produces three solid residues:

- Small fragments of metal, which are entrained in the RDF; these rarely exceed 3% by weight of the incoming waste fuel
- An inert residue, which is the non-combustible element of the waste fuel. This is generally about 15-18% by weight of the incoming fuel, and emerges from the process as a vitrified inert solid. It is commonly recycled into secondary aggregates, typically for use as sub-base in the construction of roads, or a similar purpose. Although the regulations refer to this material as 'ash', it has a granular appearance, resembling grit
- A much smaller volume of residue from the flue gas treatment process called 'fly ash'. This consists of smaller solid particles extracted from the process, and spent lime which has been used to neutralise any acidic components in the flue gas. This is generally about 4% by weight of the incoming waste fuel, but half of this amount is spent lime. This material is dusty but is always kept enclosed in the process and removed from the plant in secure tankers. It has a high pH due to the alkaline qualities and is typically sent to chemical waste treatment plants in other parts of the country to be reused as a neutralising agent for acidic waste streams from other industries, such as metal finishing. The reuse of fly ash reduces the use of virgin alkali

Therefore almost all the solid residues from the process are recycled or put to work in another way, to benefit the environment.



TRACK RECORD OF TECHNOLOGY

Gasification has been used for many years including in this country where it was used to make town gas.

Over the last 20 – 30 years it has been used extensively in Scandinavia and Japan where many plants have been built to provide energy for communities and industry.

It is widely recognised as a safe, clean and proven process that makes good use of waste that would otherwise be sent to landfill.



BENEFITS OF THE TECHNOLOGY

Gasification is a highly efficient and safe process with very low emissions that can use household and commercial waste as a resource to create energy.

It is a naturally low Nitrogen Oxide (NO_x) process and also produces less Carbon Dioxide (CO₂) than burning fossil fuels. Being able to use Refuse Derived Fuel (RDF) instead of fossil fuels such as oil, gas and coal is known as 'offsetting' and is recognised as an effective way to reduce the impact on the environment through climate change.

Gasification allows energy to be generated from non-recyclable waste instead of sending it to landfill. RDF is waste left over after all recycling has taken place. Not all waste can be recycled as it is simply not practical or possible to do so. Examples of materials that cannot be recycled are plastic films like the ones that cover ready meals, salad bags, some types of textiles, many laminated materials (such as certain types of crisp packets), paper and card contaminated with food.

The Renewable Energy Centre will be equipped with modern technology that maximises environmental efficiency and effective use of the RDF.



IS IT INCINERATION?

No, the two processes work differently.

Incineration works as open combustion, burning waste in an oxygen (O₂) rich environment. In the gasification process, the Refuse Derived Fuel (RDF) is broken down through a high temperature process in a low O₂ environment to create a synthetic gas. Although the two processes work differently, they both have to comply with the same stringent regulations set out in the Industrial Emissions Directive (IED).

Incineration purely on its own is classified as waste disposal technology as it does not recover any energy. However, incineration and gasification facilities equipped with an efficient energy recovery system are classified as recovery facilities as energy is generated for use.

The term 'Energy from Waste' (EfW) is usually used to describe facilities with an energy recovery system; this also includes gasification facilities using energy recovery technology.



WHY WAS THIS SITE CHOSEN?

The site is located on land at Hillthorn Farm, an area identified for development in an industrial setting large enough to accommodate the proposed Renewable Energy Centre.

The area of suitable locations for the facility was limited to sites within proximity to major industrial companies with a high energy demand that could receive the energy generated from the facility, in particular Nissan.

Sites in the wider area to the Nissan plant were not considered appropriate. The land to the north and south is designated Green Belt and residential areas are located to the east and west.

The site selection process was undertaken on locations within close proximity to the Nissan car plant. 11 potential sites were identified initially, and an assessment of each demonstrated that none were more appropriate for this development than the chosen site. The majority was not appropriate for reasons such as size, likely unacceptable environmental impacts and availability.

The chosen site:

- Is identified for development in planning policy
- Has Enterprise Zone status
- Is readily accessible from the strategic highway network
- Does not have any features or designations, which would mean development here would be likely to be considered immediately unacceptable in environmental or planning terms

DESIGN AND VISUAL IMPACT

The facility has been designed to minimise the potential noise and visual impact and to take into account the existing buildings and structures.

Design has been an ongoing process and we have made adaptations throughout the consultation and planning processes. The designs have now been finalised and reflect the final scheme on which our planning application will be submitted.



ILLUSTRATIVE DESIGN CONCEPT



THE ENVIRONMENT

Planning consent will not be given unless the Local Planning Authority is satisfied that our proposals will not have a significant adverse impact on the environment.

As part of this process we have undertaken a thorough Environmental Impact Assessment (EIA). The potential environmental effects have been systematically studied and include visual impact, traffic, air quality, noise, dust, odour, the effect on human health and flood risk to the site (amongst others).

The design of the scheme has been amended to mitigate potential adverse effects identified through the EIA process. Further measures are expected to be required from Sunderland City Council to mitigate impacts.

Once the application is submitted to Sunderland City Council, the Local Authority then consults with organisations such as the Environment Agency, Highways Agency and Public Health England to ensure they are satisfied that the plant will comply with every appropriate standard.



SAFETY – is the facility safe?

Yes. The facility must have a valid Environmental Permit from the Environment Agency in order to operate. Without it, the plant will not be allowed to operate.

To receive the permit, the plant has to meet strict environmental and operating conditions. It will only be issued if the Environment Agency is sure that local people and the environment will not be harmed.

Securing the environmental permit will involve a separate application and consultation process that is yet to take place. We'll inform you when the Environmental Permit application is ready to be submitted.

The facility must also adhere to the strict emission limits set by the Industrial Emissions Directive (IED) (2010). If a facility cannot comply with these limits, it will be shut down by the Environment Agency.

More information can be obtained from the Environment Agency website:

<https://www.gov.uk/guidance/waste-environmental-permits>

AIR QUALITY

Emissions created during the process are passed through a filtering system to remove pollutants, ensuring that the emissions from the facility meet the strict standards of the Industrial Emissions Directive (IED).

The IED is a set of strictly enforced standards that all Energy from Waste plants must comply with, or they cannot operate. The standards were determined after years of intensive research, considering academic and health studies into the impacts of emissions on health and the environment.

These standards are regulated by the Environment Agency, which uses very tough environmental permitting regulations to control and monitor operations and emissions. A plant has to have an Environmental Permit to operate. If it cannot satisfy the Environment Agency that it will meet the IED standards – or any other environmental condition, it cannot get a permit, and it cannot operate.

The Environment Agency has legal powers to stop operators and prosecute any organisation that does not operate within the conditions set out in the IED and the facility's Environmental Permit. The permit includes strict controls to avoid any unacceptable environmental impacts.

HEALTH

The facility will have to comply with strict air quality limits set through the Industrial Emissions Directive (IED), 2010, which have been set below those considered to be harmful to human health. The limits were determined after extensive consultation, considering years of independent environmental and health research.

The limits in the IED are very low, in some cases close to background levels. However, the body in charge of health, Public Health England regularly reviews the scientific and health studies to ensure that the limits are safe. Its latest statement (2014) says:

“While it is not possible to rule out adverse health effects from modern, well-regulated municipal waste incinerators with complete certainty, any potential damage to the health of those living close-by is likely to be very small, if detectable.”

The latest study commissioned by Public Health England was published in July 2017; its position remains unchanged. More information is available on this on the www.gov.uk website - ask us for more details of where to visit.

TRAFFIC

A traffic assessment has been undertaken as part of the Environmental Impact Assessment (EIA) study for the facility. It is estimated that, once operational, there will be 110 HGV movements a day – or 55 journeys into the facility and 55 from site, including 9 deliveries and collections of processing materials and residues per day. This equates to one extra vehicle on the roads every 6.5 minutes.

The proposed delivery and collection times are:

Monday to Fridays – 7am to 7pm

Saturday – 7am to 2pm

Sundays – None

There will also be the car journeys associated with the staff travelling to work, although a travel plan will be in place to minimise any disruption or congestion.

The amount of extra deliveries and vehicle movements that the facility would potentially create has been studied very carefully by our highways consultant. It is considered that additional road traffic movements are unlikely cause an issue nor impact on the adjacent residential community.



ODOUR

Odour is often a concern for people as once waste is exposed to air, it can start to smell if organic (eg. food) material is in the mix. However, the facility has been carefully designed to control any odours.

The waste arrives at the facility in covered wagons and enters the building through roller doors which are kept open for the minimum duration. Waste is then unloaded straight into the tipping hall. No waste is stored outside. The building is maintained at a negative air pressure to contain any odours which are then dealt with as part of the waste treatment process.

Air from within the building is taken by a series of fans from the tipping hall into the gasification system, where any smells and odours are contained and burned as part of the process.

The air and any emissions from the plant are scrubbed clean through sophisticated filtering processes before being emitted through the stack.

It is expected that a condition of any planning permission would require an Odour Management Plan to be developed and adhered to at all times during the operation of the facility.

NOISE

A noise assessment was undertaken as part of the Environmental Impact Assessment (EIA) to look at what sort of noise levels the facility might produce. In general, gasification facilities are quiet and often any existing industrial surroundings will mask any noise that is generated.

The noise assessment has found that the facility will not increase background noise levels. There will not be any significant impact on the neighbouring community, as in this case the existing industrial setting will mask any sound generated by the energy centre.

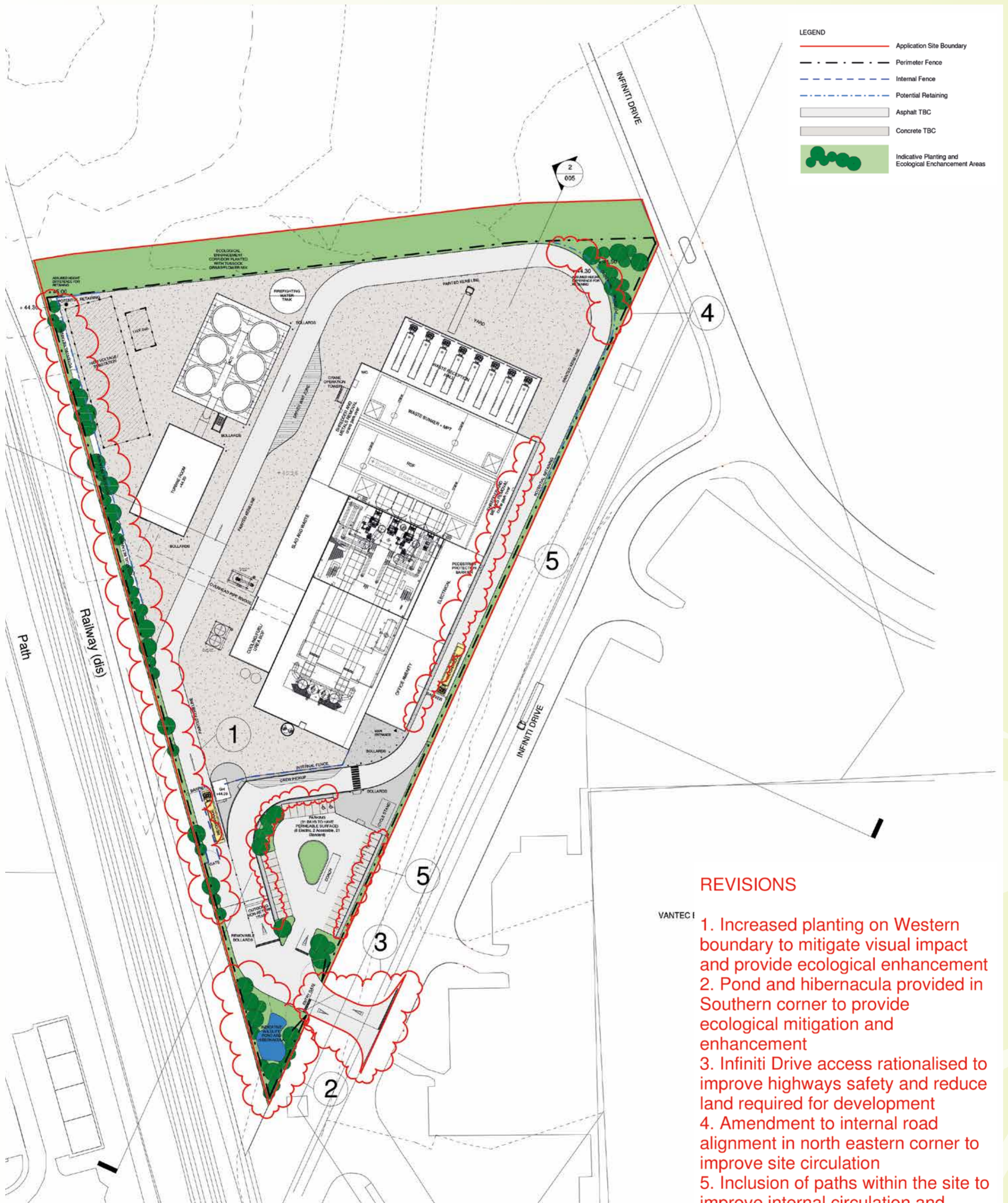
Noise will always be kept to a minimum during construction and the application is likely to be conditioned which will assist in reducing noise and lessen any impacts both in construction and operational phases.

MONITORING

The Environment Agency is responsible for monitoring and enforcing the safety standards throughout the lifetime of the facility.

The Environment Agency carries out regular checks on the facility, some of them unannounced. It also has the power to shut the facility down if it believes it is not being operated correctly, which it has done elsewhere in the country.

The system is monitored continuously and the resulting data must be collected as part of the conditions of the Environmental Permit. If the emissions level starts to rise, the facility control system will automatically make adjustments to the plant to reduce them again. In the unlikely event this does not work, the plant will automatically shut down. This safeguarding system is built into the plant, and is a compulsory feature of the control process.



SITE LAYOUT

REVISIONS

VANTEC I

1. Increased planting on Western boundary to mitigate visual impact and provide ecological enhancement
2. Pond and hibernacula provided in Southern corner to provide ecological mitigation and enhancement
3. Infiniti Drive access rationalised to improve highways safety and reduce land required for development
4. Amendment to internal road alignment in north eastern corner to improve site circulation
5. Inclusion of paths within the site to improve internal circulation and safety for pedestrians

SITE LAYOUT AND DESIGN

The site layout has been carefully developed to ensure safe and easy operation, screening and compliance with safety standards.

The site will consist of the Renewable Energy Centre main building, with the turbine hall and a gatehouse. There will be other ancillary structures located next to the main building with space for safe lorry movements and adequate turning circles, plus a parking area for staff and visitors.

A number of design and layout changes have been made following the previous consultation to improve the proposals and respond to comments and assessment work. These changes are shown on the annotated site layout plan and elevations.

The height of the chimney stack at 57m has been determined by the air quality modelling analysis and will be set to ensure that the emissions from it are dispersed safely to comply with the strict regulations governing air quality. The height of the main building has been reduced since the previous consultation by 1.5m to 36m, to limit visual effects as far as possible, while still accommodating the required plant and machinery.



ILLUSTRATIVE DESIGN CONCEPT



COMMUNITY BENEFITS

The Renewable Energy Centre represents an investment of £135 million into the local economy.

To operate successfully, the plant will require about 30-35 full time employees with a range of skills. Where possible it would be the intention to recruit and train employees from the surrounding area where possible.

The construction and maintenance of the plant will also create local jobs and supply chain opportunities for local businesses, in areas such as civil engineering, materials, maintenance, etc.

An education facility will be incorporated into the scheme, and will help visitors and students understand the value and importance of waste management and recycling.



ECONOMIC AND ENVIRONMENTAL BENEFITS

Energy in the form of electricity and/or heat could be routed to nearby businesses, helping to reduce their operating costs. It will also safeguard jobs by helping the businesses to maintain competitiveness and profitability, opening up the potential for growth. Thriving businesses help maintain a healthy economy with a wide range of employment opportunities, and helping to attract new investment.

The facility will assist in the reduction of greenhouse gas emissions (when compared to fossil fuel energy generation), assisting in combating the effects of climate change. It will meet the European and national targets for renewable energy generation.



COMMUNITY LIAISON GROUP

As part of our commitment to the community we will set up a Community Liaison Group (CLG). This group will be made up of representatives from the community in order to both understand any concerns but also to pass information back to local residents.

The CLG will also take responsibility for the community fund. This will be set up to provide small grants for projects in the local community that benefit the area. The group will assess applications and award grants as necessary.

We have found that CLGs have been welcomed on other projects elsewhere. During construction the CLG can act as a channel to pass through questions, concerns or even compliments to the site team so that any problems can be addressed quickly.

WHO WILL FINANCE, BUILD AND OPERATE THE FACILITY?

The proposal is backed by a £24 billion infrastructure and investment fund from project sponsors, Legal and General.

Rolton Kilbride is the project developer and has been appointed by Legal and General to develop and manage the site throughout the planning and development phase – this includes the preparation of the planning application.

If the proposals are granted planning permission, specialist construction companies and plant operators will be contracted to build and operate the plant. The companies will have an established track record of building and operating similar energy generating plants using waste fuels such as RDF.

Due to the number of similar facilities now operating in the EU and worldwide, there is no shortage of such companies and interest in the operating contract.



CONSTRUCTION

Subject to planning permission being granted, it is expected that construction works will commence Autumn 2018 and expected to take approximately 30 months, finishing in Spring 2021.

A Construction Environmental Management Plan (CEMP) will be developed to include the following measures:

- Construction Traffic Management Plan
- Dust Management Plan
- Noise Management Plan
- Pollution Prevention and Control
- Precautionary Ecological Surveys and Monitoring
- Monitoring of excavations for presence of contamination

Contractors and site operatives will be required to undertake the construction in accordance with the CEMP, ensuring adverse impacts are limited as far as possible.



INDICATIVE PROJECT TIMELINE

- First public consultation: **July 2016**
- **Second public consultation: September 2017**
- Planning application submitted: **Autumn 2017**
- Planning permission granted: **Spring 2017**
- Construction commences: **Autumn 2018**
- Environmental Permit application: **Autumn 2018 – Spring 2021**
- Construction completed: **Spring 2021**
- Plant commissioning: **Summer 2021**
- REC fully operational: **Autumn 2021**



WHAT HAPPENS NEXT

This consultation is to enable local residents, businesses and members of the public to look at our updated proposals and give us their feedback. We will be finalising the project, concluding the Environmental Impact Assessment (EIA) and refine the design ahead of submitting our planning application in autumn 2017.

Once Sunderland City Council has reviewed our application and is satisfied it is complete, the council will undertake its own consultation on the proposal. The statutory period for determination (or decision) is 16 weeks, although it can take longer than this as more information may be needed or clarifications sought. The application is put out for comment to a list of statutory consultees (such as the Environment Agency), as well as being made available for comment by other consultees and members of the public (it will be available online).

Should the proposals be granted planning permission, the Environment Agency will then undertake a separate consultation to grant the facility an Environmental Permit. The facility must have a valid environmental permit from the Environment Agency to operate. Without it, the plant will not be permitted to function.

HAVE YOUR SAY

You can provide your feedback and make suggestions on how to improve the proposals by visiting the website, emailing or in writing. You can also contact Sunderland City Council or use the feedback forms provided at the exhibition. The closing date for comments on this exhibition is: 12th October 2017.

Visit: www.roltonkilbride.co.uk

Email: sunderlandrec@coastmarcoms.co.uk

Write to: **Sunderland REC, PO Box 359, Saltash, PL12 9AS**

