= Teesside EfW plant =

Teesside Energy from Waste plant (also known as Teesside WTE power station or Haverton Hill incinerator) is a municipal waste incinerator and waste @-@ to @-@ energy power station , which provides 29 @.@ 2 megawatts (MW) of electricity for the National Grid by burning 390 @,@ 000 tonnes of household and commercial waste a year . It is located on the River Tees at Haverton Hill , east of Billingham in North East England . Operated by SITA UK since its conception , the plant replaced the Portrack Incinerator and opened in 1998 .

The station is one of the most modern incinerators operating in England ; it is noted for its innovative operation . In 2009 , an extension was completed at the station , with the construction of an extra furnace line and a rail head . This increased the capacities of the plant from 19 @.@ 2 MW and 250 @,@ 000 tonnes of waste per year to its current levels . The plant initially burned only waste from Teesside , but this was extended to include Northumberland with the 2009 extension . A second plant , the North East Energy Recovery Centre (NEERC) , has planning permission to be built on land adjacent to the current plant . If built , this will extend the plant 's catchment to include waste from south Tyne and Wear .

= = History = =

= = = Replacement for Portrack = = =

See also Portrack Incinerator

Between 1975 and 1996 , the Portrack Incinerator on the River Tees burned 200 @,@ 000 tonnes of Teesside 's waste every year , generating 20 megawatts of electricity in doing so . In November 1996 , the plant was closed down after it failed to meet emission regulations ; it was then demolished in stages between 1998 and 2000 . Following the closure of the Portrack plant , a new facility to burn Teesside 's refuse was constructed . Teesside Energy from Waste plant was opened in May 1998 as a collaboration between SITA UK (the station 's operator) and the local authorities of Stockton @-@ on @-@ Tees , Middlesbrough , Hartlepool and Redcar & Cleveland .

= = = Third incineration line = = =

In December 2006 , SITA UK signed a 28 @-@ year private finance initiative contract worth £ 70 million with Northumberland County Council , to provide them with waste management services and to reduce the county 's reliance upon landfill . This included the construction of an extra incineration line at the Teesside plant . Civil construction of the extension began in April 2007 , with heavy erection beginning that November . Von Roll was the general contractor for the entire extension . In May 2009 , the third line , which cost £ 70 million to build , was brought into operation . It was officially opened on 8 October 2009 by former MP Hilary Armstrong , SITA UK Chief Executive David Palmer @-@ Jones , and Northumberland County Councillor Jeff Reid . At various times , between 60 and 100 people were employed in building the third line , and an additional 20 full @-@ time jobs were created for its operation once open . Built on time and within budget , the extension surpassed expectations in its first year of operation . A year after the opening of the third line , only a fifth of the amount of waste that was being sent to landfill in Northumberland prior to its opening was still being sent there .

= = Design and specification = =

The plant is a large metal @-@ clad building . The metal is finished in the colour ' Goosewing Grey ' , accented in ' Solent Blue ' and ' Petra Red ' . The plant 's clean , clear lines and colours are said to " contrast favourably " with the nearby industrial buildings .

Until 2009 , the station had two operating furnace lines , which together were capable of burning a

total of 250 @,@ 000 tonnes of waste per year , and generated 20 MW of electricity . However , in May 2009 a third line was brought into operation . The plant currently burns 360 @,@ 000 tonnes of waste a year and generates 29 @.@ 2 MW of electricity . This is enough electricity to power 60 @,@ 000 homes .

The original plant uses Babcock & Wilcox Volund boilers to provide steam for a single Ansaldo turbo generator rated at 19 @.@ 2 MW . The third line uses a Von Roll Inova reciprocating grate to burn the waste , and generates electricity using a single Von Roll Inova three @-@ pass steam generator , rated at 10 MW .

= = Operations = =

The station operates constantly , burning municipal household waste from the local councils of Stockton @-@ on @-@ Tees , Hartlepool , Middlesbrough , Redcar & Cleveland , North Tyneside and Northumberland . When there is a shortfall in household waste , non @-@ hazardous industrial and commercial waste are used to make up capacity . The station burns only residual waste , which is material left over after recycling . The incinerator operates 24 hours a day , seven days a week .

Waste is delivered to the station by road , using up to 100 waste collection vehicles . Up to 2 @,@ 800 tonnes of waste a week or as much as 1 @,@ 000 tonnes of waste a day , can be delivered at the plant . A rail head was also built on the railway sidings adjacent to the site in 2009 . This allows for waste to be delivered to the plant by rail , rather than just by road . This is more sustainable as it reduces the amount of traffic on local roads . In December 2011 , it was announced that the rail head would be used to receive up 500 @,@ 000 tonnes of residual waste per year from Merseyside via a rail waste transfer facility at Knowley Industrial Park , Kirby , in a contract worth £ 400 million .

Waste arriving at the plant is checked in and weighed , before being delivered to the plant 's reception hall . The large reception hall allows the vehicles to dump their waste safely . Air for the combustion of the waste later in the plant is drawn from the reception hall so that odour and dust doesn 't pollute the building 's surroundings . From the hall waste is tipped into a large concrete bunker . Here the feedstock is homogenefied by a crane operator , who mixes and removes unsuitable waste . A grab crane then manoeuvers waste from the bunker to the hoppers that feed the furnace . This crane is operated from a control room . This room also monitors the equipment in the plant , the combustion gases and maximises the efficiency of the plant .

From the hoppers , the waste falls onto the furnace @-@ charging chute and from there onto the incinerating grate . Here it is burned at a temperature in excess of 1 @,@ 200 ° C. This heat is then converted into super heated steam through the plant 's boilers . This in turn powers steam turbines , much in the same way as a conventional thermal power station . Electricity is generated at 11 kilovolts . After exiting the turbines , the steam is condensed back to water . For the original two incinerating lines use river water from the Tees as a cooling medium , whereas in the third line , water is condensed through air cooled condenser . The cooled water is treated and reused in the boilers .

Gases from the furnace are cleaned using selective non @-@ catalytic reduction (SNCR) , spray absorbers and active carbon injection . These processes remove nitrogen oxides , acidic gasses , dioxins and heavy metals from the plants emissions . The remaining gases are passed through fine @-@ fabric bag filters to remove and solid particles , before it is released from the chimney . Each incineration line has its own independent stack in the chimney , and the flue gases are continuously monitored before being released . This information is relayed to the control room . The remaining fly ash from the filters contains particles from the incineration , lime from the spray absorbers , salt and carbon dust , and so is stored in a sealed silo until it is taken from the site for disposal . Incinerator bottom ash left on the incineration grate after the burning is moved by converyor to a bunker . Whilst on the conveyor , a magnet removes ferrous metal from the ash for recycling . The remaining ash is then used as an aggregate in the construction industry .

A recycling centre operates next to the plant , which opened in December 2001 . In 2006 a composting facility was opened .

= = Environmental impact = =

Waste to energy plants are strictly monitored , and the plant has achieved various ISO external certificates . The plant is seen to be at the forefront of sustainable energy production and waste disposal . The plant not only reduces the amount of waste sent to landfill , but displaces the burning of depleting fossil fuels , and makes significant contributions to meeting the North East region 's waste recovery and recycling targets .

= = The future : North East Energy Recovery Centre = =

In 2008 , it was announced SITA had plans to build another EfW plant adjacent to the current one , named the North East Energy Recovery Centre (NEERC) . SITA UK began consulting key partners , stakeholders and local residents on these plans in April 2008 , before submitting a formal planning application that summer . Permission for the plant 's construction was granted on 15 October 2008 . On 17 September 2010 , it was announced that SITA had signed a contract with the South Tyne and Wear Waste Management Partnership for their waste to be burned at NEERC once the plant was completed . Construction is expected to begin in early 2011 , in time for a 2013 completion date .

NEERC is expected to be capable of handling up to 190 @,@ 000 tonnes of waste per year . This waste will be burned to generate electricity for the National Grid and cogenerate to provide heat for local industries in the form of steam . NEERC will have two processing lines , capable of generating 21 MW of electricity , enough to provide for 37 @,@ 500 homes . This means that over the two facilities , 640 @,@ 000 tonnes of waste will be burned annually , and over 50 MW of electricity generated . This would make Teesside the largest operational EfW centre in the UK outside London . The plant will be a mirror image of the current one , and will create 160 jobs ; 25 in South Tyne and Wear , 100 in the construction of the plant , and the rest once the plant is operational .

In August 2010 , SITA teamed up with Sembcorp UK to build another waste @-@ to @-@ energy facility in the Teesside region . Wilton 11 on the Wilton International complex is to burn a further 400 @,@ 000 tonnes of waste in the region whilst generating 35 MW of electricity . The plant is expected to be operational by 2015 .