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Beth yw'r opsiynau?

Trwy'r ymarfer profi'r farchnad mae nifer o gwmnïau sy'n cynnig amrywiaeth o ddatrysiadau technolegol gwahanol wedi dangos cryn ddiddordeb yn y bartneriaeth. Gellir rhannu'r datrysiadau hyn yn fras i ddwy adran, prosesau biolegol a phrosesau trin â gwres, ond fel y dangosir yn yr opsiynau isod, gellir cyfuno'r rhain.

Triniaeth Thermol Pellach (TThP) – Pyrolisis a Nwyeiddio

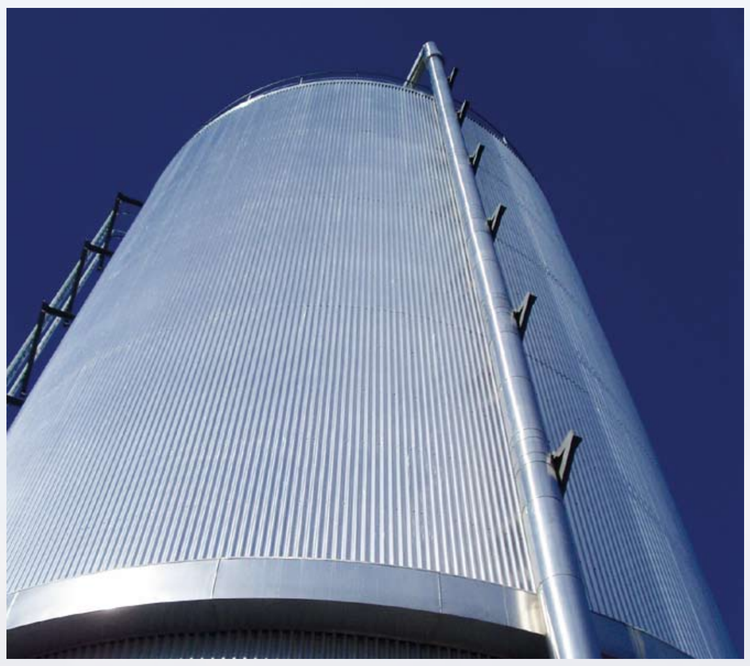
Mae Pyrolosis yn trin gwastraff ar dymheredd rhwng 300 ac 850 gradd Celsius yn absenoldeb ocsigen i greu 'syna-nwy' y gellir ei ddefnyddio i greu trydan. Cynhyrchir gwastraff solid, a elwir yn 'Olosg' weithiau. Mae hwn yn 'wastraff peryglus ond gellir ei ddefnyddio yn lle glo mewn rhai hylosgwyr neu fel deunydd porthiant nwyeiddiwr.' (Rhaglen Cefnogi Technolegau Newydd DEFRA 2007)
Mae nwyeiddio yn digwydd ar dymereddau uwchben 650 gradd Celsius, ychwanegir ocsigen ond dim digon i'r tanwydd ocsideiddio'n gyfan gwbl. Cynhyrchir 'syna-nwy' y gellir ei losgi i gynhyrchu trydan, y cynnyrch arall a gynhyrchir yw gweddillion solid (sorod neu ludw). Mae yna farchnad botensial i ailgylchu'r cynnyrch hwn yn agreg ar gyfer y diwydiant adeiladu.

What are the options?

Through the market testing exercise, the partnership has received a great deal of interest from a number of companies offering different technological solutions. These solutions can be broadly split into two sections, biological processes and heat treatment processes, though as the options below indicate these can be combined.

Advanced Thermal Treatment (ATT) – Pyrolysis and Gasification

Pyrolysis treats waste between 300-850 Degrees Celsius in the absence of oxygen to produce a 'synagas' that can be burned to generate electricity. A solid waste is produced, which is sometimes known as 'Char'. This is 'hazardous waste but could be used as coal replacement in certain combustion applications or as a gasifier feedstock material' (Defra new Technologies Supporter Programme 2007).
Gasification operates at a higher temperature above 650 Degrees Celsius. Oxygen is added but the amounts are not sufficient for the fuel to completely oxidise for full combustion to occur. A 'synagas' is produced that can be burned to generate electricity, the other product produced is a solid residue (slag or ash). There is a potential market to recycle this product into aggregate for the construction industry.



Treulydd Anaerobig Sych
Dry Anaerobic Digesters

Treuliad Anaerobig (TA) a chynhyrchu bio-nwy

Dyma'r broses lle torrir deunydd bioddiraddiadwy i lawr heb ocsigen mewn cynhwysydd caeedig. Wrth i'r deunydd gael ei dorri i lawr, cynhyrchir 'bio-nwy' a adferir ac yna gellir ei losgi i greu gwres a/neu drydan. Ar gyfartaledd, mae'r broses hon yn gweithredu ar dymheredd rhwng 30 a 60 gradd Celsius, yn diybnnu ar natur y treuliad anaerobic, 'sych' ynteu 'wlyb'. Dim ond i brosesu deunydd organig y gellir defnyddio'r broses hon, ac nid deunyddiau synthetig.

Anaerobic Digestion (AD) + Bio Gas Production

Is the process where biodegradable material is broken down without exposure to oxygen in a closed container. As the material breaks down, 'biogas' is produced which is recovered and then can be burnt to produce heat and (or) electricity. Depending on whether 'dry' or 'wet' anaerobic digestion is used the average temperature that this process operates is between 30-60 Degrees Celsius.
This process can only be used to process organic matter and not man made materials.

Ynni o Wastraff (YoW) gyda gwres a phŵer cyfunol

Hylosgi gwastraff dros 850 gradd Celsius yw hyn gyda digon o ocsigen i ocsideiddio'r tanwydd yn llawn. Yr ymdriniaeth arferol ar gyfer adfer ynni o losgi yw defnyddio gwres yr hylosgi trwy foeler i gynhyrchu stêm. Gellir defnyddio'r stêm i gynhyrchu pŵer trwy dyrbin stêm a'i ddefnyddio i gynhesu a/neu i greu pŵer.
Cynhyrchir dau waddod, y lludw gwaelod (20%-30% o'r pwysau gwreiddiol a roddwyd mewn i'r ffatri) y gellir ei ailgylchu yn agreg, a gwaddod llygredd aer rheoledig (2%-6% o'r pwysau gwreiddiol a ddaeth mewn i'r ffatri) a ystyrir yn beryglus ac mae angen ei waredu mewn safle tirlenwi gwastraff peryglus.

Energy from Waste (EfW) with combined heat and power

This is the combustion of waste over 850 Degrees Celsius with sufficient quantity of oxygen to fully oxidise the fuel. The standard approach for the recovery of energy from incineration is to utilise the combustion heat through a boiler to generate steam. The steam can be used for the generation of power via a steam turbine and used for heating and power.
There are two residues produced, the bottom ash (20 to 30% of the original weight of the waste put into the plant) can be recycled into aggregate and air pollution control residues (2 to 6% of the weight of the waste entering the plant) is classed as hazardous and needs to be to be disposed of at a hazardous landfill site.

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Beth yw'r opsiynau?

Portsmouth Exterior: V Energos Dorset
Astria in Bordeaux

'Ffatri gyfunol gwres a phŵer yw'r opsiwn mwyaf effeithlon ar y cyfan ar gyfer defnyddio ynni a adferir o wastraff trwy foeler stêm.' (Rhaglen Cefnogi Technolegau Newydd DEFRA 2007)
'Yn y DU rhaid i'r holl ffatrïoedd llosgi gwastraff gydymffurfio â'r Gyfarwyddeb Llosgi Gwastraff (CLIG). Mae'r gyfarwyddeb hon yn gosod y rheoliadau llymaf ar allyriadau ar gyfer prosesau thermol a reolir yn yr Undeb Ewropeaidd.' (Rhaglen Cefnogi Technolegau Newydd DEFRA 2007)

Triniaeth Fiolegol Fecanyddol (TFF)

Didoli, yn fecanyddol, y gwastraff y gellir ei ailgylchu a'i gompostio. Gwneir hyn drwy ddefnyddio amryw o sgriniau a magnetau. Torrir y gwastraff gweddilliol trwy broses gompostio ac fe'i sychir. Y cynnyrch a geir ar ôl y broses hon yw 'allyriadau tebyg-i-gompost' (ATG). 'Bydd ansawdd yr ATG a gynhyrchir yn amrywio gyda gwahanol dechnolegau TFF... fel gwastraff, bydd angen cael ei eithrio o'r drwydded reoli gwastraff er mwyn cael ei ddefnyddio ar dir. Ar hyn o bryd, dim ond ar dir an-amaethyddol y gellir eu defnyddio a rhaid dangos eu bod o fudd ecolegol.' (Rhaglen Gefnogi Technolegau Newydd DEFRA 2007)

What are the options?

'A combined heat and power plant is the most efficient option overall for utilising recovered energy from waste via a steam boiler' (Defra New Technologies Supporter Programme 2007).
'In the UK all waste incineration plants must comply with the Waste Incineration Directive (WID). This directive sets the most stringent emissions controls for any thermal processes regulated in the European Union.' (Defra New Technologies Supporter Programme 2007).

Mechanical Biological Treatment (MBT)

Involves mechanical sorting to take out waste that can be separated for recycling and composting. This is done through a variety of screens and magnets. The remaining waste is then broken down through a composting process and dried out.
The product produced from this process is called 'compost-like outputs' (CLO). 'The quality of the CLO produced will vary with different MBT technologies… As a waste, these materials require a waste management licence exemption in order to be used on land. Currently they can only be used on non-agricultural land and must be shown to be ecologically beneficial.' (Defra New Technologies Supporter Programme 2007)

Hanoever MBT Dorset Stack
Lubeck MBT

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Beth yw'r opsiynau?

Triniaeth Fiolegol Fecanyddol (TFF) gydag Ynni o Wastraff

Gellir troi'r cynnyrch a gynhyrchir wedi prosesau mecanyddol a biolegol TFF yn 'danwydd sy'n deillio o sbwriel' a'i losgi trwy broses thermol i gynhyrchu trydan.

Awtoclaf
Autoclave

Triniaeth Gwres Fecanyddol e.e. Ffwrn aerglos stêm

Mae 'Triniaeth Gwres Fecanyddol' yn derm cymharol newydd. Fe'i defnyddir i ddisgrifio cyfuniadau o dechnolegau mecanyddol a thermol, gan gynnwys technolegau sy'n dibynnu ar stêm...Mae'r gwastraff yn cael ei osod mewn stêm o dan bwysedd uchel...neu wres allanol, a ddilynir gan ddidoli mecanyddol a gwahanau'r gwastraff diheintiedig.' (Rhaglen Cefnogi Technolegau Newydd DEFRA 2007)
'Nid yw Triniaethau Gwres Mecanyddol wedi'u defnyddio llawer ar draws y byd...mae'r dechnoleg yn cael ei defnyddio i ddiheintio peth gwastraff clinigol ac mewn rhai prosesau rendro gwastraff anifeiliaid, cyn ei anfon i safle tirlenwi. Mae ei ddefnyddio ar gyfer gwastraff dinesig solid yn flaengaredd diweddar, ac mae'r profiad masnachol yn gyfyngedig ar y deunydd hwn fel porthiant.' (Rhaglen Cefnogi Technolegau Newydd DEFRA 2007)

What are the options?

Mechanical Biological Treatment (MBT) with Energy from Waste

The product which is produced after the mechanical and biological processes of MBT can be made into a 'refuse derived fuel' and burnt through a thermal process to generate electricity.

Mechanical Heat Treatment e.g. Steam Autoclaving

'Mechanical Heat Treatment is a relatively new term. It is used to describe configurations of mechanical and thermal, including steam based technologies…The waste is subjected to steam under pressure… or externally applied heat, followed by mechanical sorting and separation of the sterilised waste.' (Defra new Technologies Supporter Programme 2007).
'Mechanical Heat Treatments have a limited track record worldwide… The technology is in common use for the sanitisation treatment of some clinical wastes and for certain rendering processes for animal waste, prior to sending to landfill. Its application to municipal solid waste is a recent innovation and there is limited commercial experience on this feedstock material.' (Defra New Technologies Supporter Programme 2007)

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