



## Summary:

Orthios Group wants to build the world's largest biomass gasification plant, and the largest on-land aquaculture facility at Holyhead Port. It also proposes soil-less indoor vegetable farming (hydroponics) and an 'eco packaging' plant pioneering a novel technology. Plans for generating energy from waste tyre and plastic, as well as from wind have also been mentioned by the company.

Orthios plans to apply for a Contract for Difference in 2017. Contracts for Difference are long-term guarantees of high levels of subsidies for electricity that is classed as 'low carbon'. Those subsidies are paid through a surcharge on everybody's electricity bills. Without a Contract for Difference, Orthios

could not finance the power station.

If successful, the power plant would likely burn pellets and/or woodchips made from 3 million tonnes of wood every year. By comparison, the UK's total wood production is only 10.8 million tonnes annually, and more wood than that is being burned in UK power stations already. Orthios would rely on imports, likely from North America. All three power station operators importing or planning to import pellets to the UK at present have supply agreements with Enviva, the largest US pellet producer. Many of those pellets are sourced from clearcut biodiverse coastal wetland forests in the southern US. This is disastrous for biodiversity and for the climate.

However, there are serious doubts about the credibility of Orthios Group's proposal.

Technically, the proposal is highly challenging. So far, eleven biomass gasification plants have been built in the UK and have failed to operate successfully. There is no evidence of any successful biomass or waste gasification power plant in this country. There are a few such plants elsewhere in the world, but they have required long-term investments to fix problems, as well as collaborations between different companies and/or researchers with significant expertise in gasification. Nobody in the team has any such expertise, and there is no evidence that Orthios has partnered with any other company that has

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**Biofuelwatch, February 2017**

successfully delivered gasification projects.

Orthios Group is a hardly transparent, complex set up of at least 28 companies, all of which have one and 27 of which have two directors in common. Orthios had been boosted by a partnership with an asset management company, and by a Chinese investment promise of £2 billion. However, the

asset management company pulled out of Orthios Group in September 2016, and the Chinese investment deal has collapsed.

Orthios Group claims to have found an alternative source of funding, but has not disclosed any details. Firm investment deals would usually require full planning consent, which

Orthios has not so far got.

If Orthios managed to get a Contract for Difference, it could well attract alternative finance. This would likely result in a large experimental power station with significant public health risks, but with a little chance of successful long-term operation.

## What is Orthios Group's Holyhead proposal?

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[Orthios Group](#) wants to build the world's first ever "Combined Food and Power™" development at Holyhead Port. This would comprise the world's biggest biomass gasification power plant, as well as the world's biggest on-land prawn aquaculture facility, the world's first plant to produce packaging which can be composted at home, a large indoor soil-less vegetable growing site (hydroponics) and a research and development centre.

The **biomass plant** would consist of five gasifiers which would burn – or rather gasify – a total of 1.5 million tonnes of wood a year. The plant would have a

capacity of 299 MW of electricity, which is bigger than any existing purpose built biomass power station in the world, and far bigger than any operational biomass or waste gasifier.

Heat from the power plant would be captured and used for a large **Recirculation Aquaculture System**, breeding prawns, and later also Dover sole, in a record-size indoor aquaculture facility. Edible seaweed will be grown in greenhouses, and an indoor, soil-less **hydroponics** development will produce vegetables for sale. Furthermore **home-compostable fibre packaging** will be produced for retailers,

food processors and airlines.

In addition, there will be a **Research & Development centre**, collaborating with research institutions in Wales. One [industry magazine article](#) reports that carbon dioxide emissions from the power plant would be captured, which, if true, would make this UK's first ever commercial **Carbon Capture and Sequestration** (CCS) project, and the world's first ever CCS project with biomass.

On 9 March 2017, [Orthios publicly mooted plans](#) for an additional energy from waste plant using tyres and plastics, as well as for wind turbines

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Biofuelwatch, February 2017

## How far advanced are those plans?

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In 2011, Anglesey Aluminium obtained planning permission for a 299 MWe biomass power station at its site in Holyhead. Orthios has acquired the rights to the site. The original planning consent remains valid, however Orthios's plans differ significantly from the approved ones. The

company has [said that it will consult on its proposals during spring 2017](#), followed by a detailed planning application.

Orthios Group further states that it will apply for a Contract for Difference, i.e. for large long-term subsidy guarantees during 2017.

Without subsidies for renewable electricity (paid through a surcharge on electricity bills), the scheme would not be financially viable. Successful applicants for such subsidies are chosen in a secret auction, in which only financial costs, not sustainability or other merits are considered.

## What would such a large power station mean for forests and the climate?

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UK power stations already burn far more wood than the UK produces every year.

Orthios Group says that its plant would gasify 1.5 million tonnes of wood a year. Experience with existing biomass power stations suggests that a 300 MWe plant would require around 3 million tonnes of green wood, which would produce 1.5 million tonnes of pellets, in line with Orthios's prediction.

The UK's total wood production is [10.8 million tonnes annually](#), so this power station alone would (if successfully operated) gasify the equivalent of 28% of all the wood produced in

the UK, for decades to come. The company would thus depend on imported wood.

The vast majority of UK wood imports for power stations come from North America, especially from the southern US. Right now, the UK's only power station burning imported wood is Drax, which burns pellets made from over 12 million tonnes of green wood annually.

Two large import-reliant biomass plants are under development and all three developers (Drax, EPH, MGT Power) have entered into supply agreements with North America's biggest pellet producer, Enviva. Many

of Enviva's pellets are sourced from clearcut coastal wetland forests in the southern US. This is because hardwood from native forests makes particularly high-quality wood pellets – and because the vast wood demand by UK power stations cannot possibly be met from residues.

The UK Government classes all biomass burning as 'carbon neutral'. In reality, cutting down trees, turning them into pellets, shipping them across the Atlantic and burning them for electricity is no more 'climate friendly' than burning coal.

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Biofuelwatch, February 2017



Cypress wetland forests in the southern US are targeted by pellet producers

Photo: Dogwood Alliance

All or most of the clearcut wood went to an Enviva pellet mill

Photo: Southern Environmental Law

## HOW TO FIX CLIMATE CHANGE IN 4 EASY STEPS! \*

① Cut down mature, oxygen-producing forests.

② Burn forests as wood pellets overseas to make industrial-scale electricity, and call it "green energy".

③ Plant trash tree plantations as crop. Wait 3-5 years.

④ REPEAT

\* "What's the best way to get more carbon absorbed? Cut it down. Replant. Young trees absorb more carbon than older trees." - John Keppler, CEO of Enviva

**This is MADNESS! Say NO to Drax, Enviva, and industrial biomass!**



Cartoon: Dogwood Alliance

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 Biofuelwatch, February 2017



## What might the local impacts be?

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Orthios's site is the former Anglesey Aluminium site at Penrhos Works, close to the Penrhos Nature Reserve/Penrhos Country Park. This [nature reserve](#), set inside an Area of Outstanding Natural Beauty, contains 200-year old woodland which is home to rare plants, as well as sandbanks and mudflats which are home to a large variety of seabirds, ducks and grebes. Despite significant local opposition, [planning consent](#) for a Leisure Park and residential housing has been granted at Penrhos.

Biomass power stations result in similar levels of [air pollution](#) as coal power stations of the same size. Most of the pollution consists

of small particulates and nitrogen dioxide, which can cause or aggravate respiratory and heart disease. Nitrogen and ammonia emissions pose threats to local biodiversity.

Emissions from [biomass gasification](#) plants depend on the technology used – and Orthios Group has revealed no details about that so far. Some types of gasification plants have much lower emissions during successful, continuous operation, but much higher emissions when things go wrong.

In Scotland, [a company attempted to operate a waste gasifier from December 2009 until July 2013](#), without ever managing to operate it

successfully. During this period, there were hundreds of breaches of legal air emissions limits, dozens of noise complaints, and at least 88 'bypass stack activations'. These are incidents in which toxic gases are vented straight into the atmosphere without any clean-up, to prevent an explosion. After an explosion and a fire at the plant, the company's operating permit was finally withdrawn.

Once the detailed planning application has been published, the potential impacts on public health and biodiversity – from the gasification plant as well as from the aquaculture and hydroponics facilities – will be easier to assess.

## How credible is this proposal?

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### Gasification:

There are no established technologies for generating power from biomass gasification. Various gasification technologies have been developed, but all of them are highly

challenging and failure-prone.

At least [eleven biomass gasification power plants](#) built in the UK since 2001 have failed to operate successfully.

There is no published evidence of any gasification power plant having worked for more than a few weeks or months in the UK.

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Biofuelwatch, February 2017

A small number of biomass gasifiers for electricity generation are being successfully operated in other countries. Those have generally relied on partnerships between companies with different sets of expertise and, often, with research institutes. Most have taken a year or longer before problems could be overcome, requiring

substantial long-term investments.

None of the Orthios Group companies – nor any of their directors – have any experience with biomass gasification. They have not announced any partnership with a company with experience in developing biomass gasification systems.

Orthios Group has published no details about the gasification technology which it wants to use. The planning permission for the site is for a conventional biomass combustion plant, but Orthios is submitting a new detailed planning application which it expects to be published [in spring 2017](#).

### Aquaculture, hydroponics and eco-packaging:

Orthios Group's aquaculture and hydroponics proposals depend on the successful, continuous operation of the

gasification plant. Technical failures and unexpected shutdowns – especially if those affected all or most of the five gasifiers – would

cut off the heat source for the aquaculture and the hydroponics facilities. This could kill all the prawns, fish and vegetables.

## Who is behind Orthios Group?

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What this briefing refers to as "Orthios Group" is a complex and not entirely transparent set up of at least 28 different companies<sup>1</sup>. Sean McCormick is director of all of those companies, and Edmund Everson is director of 27 of those (all except for Corona Capital Consulting Ltd). Sean McCormick is also director of an

architecture company, [McCormack Architecture Ltd](#), which has developed the design of the site. Another three associated companies – Eco Villages Corporate and Lateral Eco Parks Hull Ltd, have been dissolved.

According to Company Check, which analyses and presents data from Companies House records, the companies

of which [Sean McCormick](#) is a director have current net liabilities of £10 million between them. The companies of which [Edmund Everson](#) is a director have total net liabilities of £9.8 million<sup>2</sup>.

Those liability figures refer largely to the same

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<sup>1</sup> Based on Companies House records.

<sup>2</sup> Details current as of 14<sup>th</sup> February 2017.

companies and should thus not be added up.

Orthios Group's financial credibility was greatly – albeit temporarily – boosted by two developments:

Early on, Orthios Group won support from Best Asset Management Ltd, and asset management company which founded subsidiary companies as investment vehicles for the Holyhead development. [According to Best Asset Management:](#) *“Best International have been involved in the project since the outset, structuring and administering the Eco Park Corporate Bonds.”*

However, Best Asset Management and its director(s) resigned from all companies associated with Orthios Group in September 2016, transferring directorship to Sean McCormick and Edmund Everson.

***Orthios Group's partnership with Best Asset Management thus seems to have come to an end.***

In October 2015, a Chinese company called [SinoFortone announced that it would invest £2 billion](#) to enable Orthios Group develop their plans at both Holyhead and Port Talbot. This was part of a wider investment package, with SinoFortone also offering to fund an [amusement part in Kent](#) and several [infrastructure developments in Scotland](#). The British [media reported](#) that SinoFortone had the backing of the Chinese government. Yet none of SinoFortone's promised investments materialised. In February 2017, it became known that all those investment deals had collapsed: SinoFortone had neither held nor raised the

promised funds.

According to an [article in The Times](#): *“the only purchase Zhang [SinoFortone's Managing Director] appears to have completed is the Plough at Cadsden, the pub where David Cameron and Xi drank pints of Greene King ale in October 2015”.*

Orthios Group nonetheless [pledged to go ahead](#) with at least the Holyhead development and to seek alternative investment. So far, however, it has merely started demolishing the former Anglesey Aluminium buildings on the site. On [9<sup>th</sup> March 2017](#), Orthios Group announced that it has found a new funder, however the company has disclosed no details. It would be highly unusual for an investor to commit funding before planning permission has been granted.

Lateral Ideas Ltd

Lateral Power Ltd

Corona Capital Consulting

Orthios Aquaculture Ltd

Orthios Eco Parks Ltd

Orthios Eco Parks (PT) Ltd

Pure Energi Developments Ltd

Pedl Bond I Ltd

Orthios Water and Energy Supplies Ltd

Eco Parks VII Bonds Ltd

Eco Parks VI Bonds Ltd

Eco Parks HNW Ltd

Eco Parks V Bonds Ltd

Orthios Eco Parks (Anglesey) Ltd

Eco Parks IV Bonds Ltd

Lateral Eco Parks II Bonds Ltd

Orthios Group Holdings Ltd]

Orthios Logistics Ltd

Lateral Eco Parks Bonds Ltd

Orthios Carbon Solutions Ltd

Orthios International Ltd

Orthios Power Anglesey

Corona Capital Consulting Ltd

Orthios Power Ltd

Orthios Distribution (Anglesey) Ltd

Orthios Distribution Ltd

Orthios Hydroponics Ltd

? (identity not declared)

Lateral Eco Park Bonds III Ltd

Please note that parent companies are to the left of subsidiaries.  
Shares in companies without a parent company are owned by their directors. Sean McCormick holds shares in each of the stand-alone and parent companies.

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## Is this Orthios Group's only proposal?

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Orthios Group proposes an even bigger, 350 MWe biomass gasification plant in Port Talbot, again with large indoor aquaculture and hydroponics facilities and with a research and development centre. A now bankrupt company called Prenergy previously obtained planning consent for such a large biomass power station in Port Talbot. However, Orthios Group has not so far acquired any rights to

that site, unlike the one in Holyhead. The company states that the Holyhead site would be developed first.

The company has also mentioned a [possible future development in Belfast](#), without giving any details.

In 2013, one of the companies associated with Orthios Group, was granted [exclusive negotiating rights with Hull City Council](#) for

developing a biomass power plant with associated aquaculture and agriculture units at the Hedon Airfield site in Hull. A subsidiary company set up to develop this scheme, [Lateral Eco Parks Hull Ltd](#), was dissolved in September 2015.

This leaves Holyhead as the only site where Orthios Group is actively pursuing a development at present.