

[Home](#) / [Environment](#) • [News](#) / What's up with biomass gasification?

WHAT'S UP WITH BIOMASS GASIFICATION?

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Almuth Ernsting from the campaign group Biofuelwatch looks at biomass gasification and how ‘developer friendly’ planning, permitting and incentives can lose investors millions, while blighting local people’s lives.

[Biofuelwatch](#) has been working with local communities since 2008 to try to stop biofuel and biomass power stations that threaten forests and the climate, as well as community health through air pollution. Over the past two years, a strange new trend has emerged: a growing number of the biomass power plants being opposed by communities are ones which are virtually guaranteed to fail. They rely on pyrolysis and gasification technologies, which have either never been used successfully to produce electricity anywhere (pyrolysis), or have only worked in a few instances worldwide, following lengthy periods of frequent shut-downs and costly repairs and modifications. The developers behind these schemes are often start-ups that have never successfully delivered such plants, and seem to have little prospect of doing so in the future.

These schemes pose no genuine threat to forests because the prospects of them ever running long enough to burn (or rather gasify) large quantities of wood are slim. But they do pose a threat to the health of local

residents: a plant that is undergoing a continuous cycle of short-lived start-up attempts, followed by technical problems and shut-downs is a very bad neighbour indeed.

In Scotland, a (now bankrupt) company called [Scotgen](#) tried to operate a waste gasifier from the end of 2010, until a major fire in July 2013 finally forced the plant's closure. During this period, the Scottish Environmental Protection Agency (SEPA) recorded 64 noise complaints, 88 'by-pass stack activations' (incidents where pressure was building up inside the gasifier, leaving the company with no option but to vent the toxic gas straight into the atmosphere to prevent an explosion), more than 200 breaches of air emission limits, eight breaches of the emission limit for dioxins, and an [explosion](#). SEPA only withdrew the plant's environmental permit after Scotgen failed to remove flammable waste following the latter. Throughout this period, Scotgen did not succeed in generating any electricity.

Generous renewable electricity subsidies available for waste and biomass gasification have probably helped some companies attract private investment. But since none of these plants have succeeded in generating much or even any electricity, they have received virtually no renewable energy subsidies. Despite this, the mounting number of failed projects of this type seems to have done nothing to deter new proposals and investments, [including by the Green Investment Bank](#).

A [report by Biofuelwatch](#), published in June 2015, found nine plants with at least 1MW capacity had been built, and eight of them had been officially shut down. Two were later re-opened but are still not operating successfully. None of the plants ever generated more than a minuscule proportion of the electricity they had been designed for. Those that had generated any electricity only did so for short periods. Nonetheless, at least four more biomass gasifiers obtained planning consent in 2015 and another development attracted enough investment for construction to start.

The story is much the same in the waste gasification/pyrolysis sector. A [recent article in an industry magazine](#) described recent major failures of waste gasification schemes, but also remarked that these experiences are not denting investments in new projects.

Why do companies promote these hopeless schemes, and how do they manage to win planning consent, gain support from policy makers, and attract private sector investment? There are at least six cases of the Green Investment Bank supporting waste and biomass gasification schemes, for example. One can only speculate about the motivations of company directors, but a closer look at three case studies might offer some answers.

Rejected as 'hot air' in Cyprus, welcomed in Wales: High-tech biomass power plans for Milford Haven

When the Murco oil refinery shut in November 2014, nearly 300 people in the small Pembrokeshire town of Milford Haven lost their jobs. Little surprise then that local politicians are pleased a company [has offered to invest £685 million](#) in a "clean energy plant" that would create around 560 jobs. A start-up called Egnedol is initially seeking planning consent for a 50MW gasification plant that would use 400,000 tonnes of wood per year, but they plan to scale up the plant seven-fold. No purpose-built biomass power station of a similar vast size exists anywhere in the world, let alone a biomass gasifier. Most of the jobs, according to [Egnedol](#), will be created through their planned downstream activities: a warm water fish farm, a prawn farm, greenhouses, a cheese factory and possibly a mushroom farm, all of which would depend on waste heat from the plant. All of these activities would therefore rely on the plant operating continuously at high capacity, which, given the experience of other such plants, is unlikely.

Egnedol are also proposing to produce biofuels from an algal farm. No company in the world has ever succeeded in doing this on a commercial scale, despite the millions in research and development that has been invested into these technologies since the early 1970s, particularly in the US. Egnedol even promise to capture some carbon dioxide from their operations and convert it into liquid fuel. Coming from an

inexperienced start-up company, this claim seems as outlandish as the claim that they can produce algal biofuels.

Egnedol's wood sourcing plans seem similarly far fetched. At a public consultation event in January, [Egnedol representatives advised](#) that half of the wood is to come from hybrid 'super-trees' grown in plantations in Morocco and Greece. Those, they claimed, would be supplied by a company called [Anagenesis Trees Corporation](#), who [claim to have developed](#) a hybrid Trifolia (otherwise called Paulownia) tree which "grows in almost any climate at record speeds", requires little water, and leaches no nutrients from soils. In Western Australia, large numbers of investors have [reportedly lost their life-savings](#) because of Paulownia plantations that have not lived up to the promises made of them.

In April, Biofuelwatch was informed in writing by the CEO of Anagenesis Trees Corporation saying that the company had "no awareness of collaboration with Egnedol or any of its members" and that Egnedol had no permission to use those patented Trifolia trees.

Egnedol is clearly no paragon of transparency. Four closely linked Egnedol companies are registered at two different addresses in Wales. Previously, a company called Anagenesis Bioenergy Corporation (Wales) Ltd was registered at one of those addresses. Their shares were owned by a company registered in Cyprus, even though Anagenesis Corporation itself is based in New Jersey. Egnedol (Wales) Ltd is owned by another Egnedol company, registered in Cyprus. All of which makes it virtually impossible for anyone in the UK to find out where their money comes from.

When Egnedol presented their plan to the Welsh government they were quickly chosen as the [preferred bidders](#) for the former oil refinery site. Pembrokeshire's Council Leader [called the plans](#) "exciting", and praised the "high quality, forward thinking, innovative new jobs" on offer.

Yet in Cyprus, the company has faced a very different response. There, Egnedol offered to build a highly efficient waste gasifier that would generate electricity and be at the centre of a larger development with fish-farms and a cheese factory. They were bidding for a contract for a waste-to-energy scheme which would allow the government to avoid an EU fine over a breach of the Landfill Directive. Talks quickly collapsed. The Interior Minister [was scornful](#): "These investors presented hot air. When we pressed them for specifics, they had no answers."

Egnedol's application will be among the first to be considered under a [new planning procedure](#) introduced by the Welsh Assembly Government for energy projects that would previously have been decided upon by local authorities. The official purpose of the new procedure is to "speed up the planning process for infrastructure projects". This, together with language about "encouraging economic growth" suggests that the planning procedures under which Egnedol's proposal will be decided will be even more biased in favour of developers – and thus against concerned residents – than previous ones. As of late April 2016, Egnedol is consulting on their Environmental Impact Assessment, the basis for the application. The next stage will be a full application, with a five week public consultation. Local residents can expect to find it very difficult to get their real concerns taken into account. The Environmental Impact Assessment assumes a biomass gasifier that will be operating smoothly from Day One. Yet judging by other companies' past experience with the technology, and by Egnedol's total lack of any experience with it, residents can expect a malfunctioning plant which will breach emissions limits, present a high health and safety risk, and which is unlikely to produce much, if any, electricity. Whether or not the unproven nature of a technology is a material planning issue is currently being considered in a different planning inquiry. There are good arguments that it should be considered, but in practice it is extremely difficult for objectors to get such concerns heard. Residents concerned about Egnedol's plans in Milford Haven could soon find themselves in a very similar position to the residents of Grays, West Thurrock.

When common sense becomes off-limits: Residents' alarm over risky plans for a waste wood gasifier in West Thurrock

When residents of Grays, West Thurrock, first heard about plans for a waste wood gasifier in April 2016, many were alarmed. Thurrock has had more than its share of industrial pollution for many decades. But Grays' residents hadn't expected to face yet another polluting proposal on a stretch of land next to Procter & Gamble's factory. Back in 2009, [more than 1,200 new homes](#) had been approved on the site but the property company abandoned the scheme. More recently, it was expected that a [new free school](#) would be built there instead. It came as a shock to many when they learned in April 2015 that the land had been sold to Procter & Gamble to build a biomass plant.

The announcement was almost instantly followed by a full planning application for a plant that would gasify 110,000 tonnes of chemically treated waste wood, in order to supply heat and power to Procter & Gamble's factory, and to sell additional electricity to the grid. Residents were worried about air pollution, traffic, and noise. Once they learned more about the experiences that other people had had with similar gasifiers, including with Canadian firm Nexterra, the company that would supply the gasifier in Grays, they became even more worried. Most people wouldn't choose to live next to an industry that, according to [European Commission guidelines](#), risks: "an increased hazard potential due to the fact that a potentially explosive, toxic and combustible gas mixture is produced and consumed. The producer gas and residues (ash, liquids, exhaust gases) may cause the following major hazards/risks: an explosion and/or fire and health damage to humans (poisoning, danger of suffocation, noise, hot surfaces, fire and explosion) and pollution of the environment and plant vicinity."

To make matters worse, an oil pipeline runs within the perimeter of the site, right next to where the gasification plant is to be built, and partly above ground. Next to it are large warning signs: "Highly Flammable" and "No Naked Flames". Yet the local authority's health and safety officers failed to object, arguing that the development doesn't fall into a category of those that need to be referred to the Health and Safety Executive (HSE). The HSE wrote to a resident stating that they won't get involved because "there is currently no work activity being undertaken". Yet work can only start if the developers obtain planning consent. By which time it will be very difficult to stop.

Health and safety concerns are being ignored despite the fact that the [largest biomass power station fire](#) in the UK happened within Thurrock Council's area, and despite councillors having been appraised of the serious explosion and fire risks associated with gasifiers. Councillors were also warned of Nexterra's rather disastrous record of previous attempts to build these plants.

Nexterra's website lists three much smaller gasifier power plant projects that the company has supposedly delivered, all of them in North America. The first was a small gasifier at the University of South Carolina. It was shut down after three accidents [described as](#) "potentially lethal". The second gasifier, at the University of British Columbia, failed early on – luckily without an explosion. The [third one](#) was supposed to be commissioned in early 2014 but Nexterra has had no progress to report for several years now.

Nonetheless, Nexterra succeeded in forging a partnership with Balfour Beatty in the UK. This has helped them to attract full investment for two gasification plants now under construction, and it has helped them win a planning appeal against Bristol City Council, who had rejected a similar proposal in Avonmouth over air pollution concerns.

Residents in Grays successfully convinced local Councillors not to back the proposal. In November 2015, Thurrock Council's planning committee unanimously rejected the plans, albeit not for the reasons of greatest concern to residents. Just as they had done in Avonmouth, the developers did not give in to the vote of the local council, nor to popular opinion in Grays. A decision on a planning appeal is currently pending.

Residents will be lucky if the Planning Inspectorate agrees to seriously consider their most urgent concerns about health and safety and air pollution. Under UK planning policy, planning authorities must assume that the Environment Agency will ensure that the plant complies at all times with air emissions regulations, even though compliance appears technically impossible. There is no precedent for any power plants or incinerators being shut down by the Environment Agency as soon as they breach emissions standards. Biofuelwatch could not find a single example of a gasifier proposal in the UK which has been refused because of the abysmal track record of the technology.

David Pike's 30+ gasifier companies

When we researched the many different companies involved in biomass gasification projects in the UK in early 2015, one name came up again and again: David Pike. According to the website www.companycheck.co.uk, Pike is a director of 22 active companies, at least 20 of which focus on biomass or waste gasification. He was a director of 16 companies that have been dissolved and he has resigned directorship of seven companies that are still active. The vast majority of his former directorships also relate to gasification. Some of these companies have been linked to each other through shareholdings or common names, but links between others can only be traced through their directors.

The first gasifier built by one of these companies was in Stoke-on-Trent. Between April 2009 and October 2011, it operated at a mere 0.6% of its capacity, before ceasing electricity generation entirely. According to the auditor's report of the company's latest accounts, published March 2015, they "incurred a net loss of £1,691,821 during the year ending 30 June 2014, and at that date, the company's current liabilities exceeded its total assets by £13,214,994, and it had net current liabilities of £14,909,434".

The next venture resulted in far greater losses. Two more companies that David Pike was a director of were awarded planning consent for a waste wood gasifier in Plymouth. Construction started but the plant was never commissioned. The company developing the plant, O-Gen Plymtrek Ltd, has been dissolved, with shareholders losing [more than £36 million](#) in 2014. It is impossible to discern from published records who many of the investors were. However, Biofuelwatch's [report](#) suggests that many may have been investing through the government's Enterprise Investment Scheme. This was set up to provide tax relief for buying shares in new high-risk companies (thus an indirect subsidy for companies like O-Gen). David Pike and his co-directors were luckier with a gasification scheme in Derby. They managed to sell the development early on to an unrelated start-up company and its subsidiary. Thus, when that plant failed in January 2013, the losses were incurred by the start-ups, both of which had to file for bankruptcy.

By early 2015, companies in the gasification sector of which David Pike had been a director had lost investments of more than £50 million, and none had delivered a successful project. This dire record did not deter the Green Investment Bank, who granted another of David Pike's companies a loan for a gasifier in Birmingham, which has been under construction since December 2013. Although the financial fall-out of the failures in Stoke-on-Trent and Plymouth had not been felt at the time the Green Investment Bank signed the loan agreement, the lack of success of previous plants was already obvious.

David Pike continues to be successful in attracting new contracts and partnership agreements. Thanks to limited liability, directors of multiple companies in the same field are protected against investment losses, failures, and even the bankruptcies of individual companies.

Gasification as a case study of 'developer-friendly' subsidies and de-regulation

The Coalition Government's '[Science and Innovation Strategy](#)' for the energy sector, published in 2012, set out three key principles for the support of 'innovative' energy technologies:

- Technology push is direct funding for demonstration and pre-commercial deployment.
- Market pull is indirect funding, through mechanisms such as the Renewables Obligation, Feed-in Tariffs and Emissions Trading;
- Barrier removal aims to address the areas which slow development down, such as planning and grid issues.”

For biomass and waste gasification and pyrolysis, the promise of “indirect funding” and “barrier removal” (i.e. deregulation) have been the main incentives. This is coupled with a heavy reliance on industry for policy advice, which removes any effective independent scrutiny. As a result, the government has simply been listening to the companies proposing to operate such plants, and has been clearly misled about the maturity of the technologies. In return, the companies have obtained guarantees for particularly large subsidies. This has enabled developers to attract financial investments, even though failure to generate electricity has meant that virtually no subsidies have ever been paid to them.

Ironically, a [peer-reviewed study](#) has been published about the failure of the very first biomass gasification scheme in the UK, in Eggborough. It concluded:

“Arguably, there was insufficient control and monitoring by the organisations and companies involved in Project ARBRE. This lack of control seems to have exacerbated the degree of technical errors and the failure to address these errors in sufficient time. Perhaps the key policy message to emerge from the case is that effective scrutiny and oversight of publicly funded demonstration projects is required throughout their development, especially when bodies that might usually be performing this function in a commercial setting (e.g. banks) are not involved in this capacity”.

Government policies aimed at promoting ‘innovative’ technologies thus end up aiding companies to put investment into ill-fated schemes, ensuring lucrative incomes for company directors, even if one scheme after another fails. Planning policies and permitting regimes have become ever more biased in favour of developers. Local authority planning departments have suffered some of the [deepest cuts](#) to any services. A local authority which rejects a company’s planning application puts itself at risk of having to try and defend that decision at a Planning Appeal and of being ordered to pay the developer’s expenses should the Secretary of State allow the company’s appeal. The right to appeal is confined to developers whose application has been rejected; it is not available to objectors in cases where planning applications are approved. This creates a strong financial incentive for local authorities to ‘play safe’ and essentially rubber-stamp planning applications, even if it means ignoring vital questions and concerns. Local residents, in the meantime, are paying the price through planning blight, air pollution and fear of explosions and fires linked to failing schemes.

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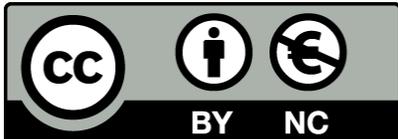
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