

RES Biomass Power Station Proposal for Alexandra Dock, Port of Liverpool – Local and wider threats

What are the plans?

RES has put forward plans for a large 150 MW biomass power station which would be burning wood – most of it imported. At least 1.5 million tonnes of fresh wood will be needed every year to run a power station that size¹. This would be 12% of all the wood produced annually across the UK, including for paper, furniture, construction etc.

RES's proposal is one of dozens of biomass power station plans across the UK. If all those plans go ahead then they would lead to some 90 million tonnes of wood being burned every year – ten times more than is produced in the UK. Companies such as RES will thus have to ship in most of the wood from overseas. RES have not said where the wood will come from. If they get planning permission then they will be able to burn wood from anywhere in the world.

So far, most wood imported for bioenergy in the UK comes from Canada and the US, where biodiverse forests are being logged and often clearcut to make pellets for power stations. In future, companies are looking to increasingly import wood from tropical regions including Brazil, Central and West Africa, where forests, grasslands and farmlands are being turned into fast-growing monoculture tree plantations.

The location of the site is ideal for large-scale wood imports but not for making any use of the heat produced. As an electricity-only biomass power station, it will likely be 30% efficient at best which means that for every three trees cut down more than two will be wasted entirely as uncaptured heat.

Locally, the most serious impacts will be on air quality and thus public health in nearby areas and on fish and fisheries in the Mersey Estuary and along the Mersey.



McNeil biomass power station in Vermont – half the size of what RES want to build at Liverpool Port, Photo: Chris Matera, Massachusetts Forest Watch

¹ RES cite a figure of 1.2 million tonnes of woodchips, pellets and briquettes, but each tonne of pellets is made from two tonnes of wood.

What would the power station mean for forests and the climate?

Biomass power stations emit 50% more CO₂ per unit of energy than coal-fired power stations do. Companies argue that those massive carbon emissions should be ignored because they will be absorbed again by new trees in future. However, it takes minutes to burn a tree, decades for a new one to grow to the same size – and there is no guarantee that with evermore intense logging for biomass and escalating climate change that will actually happen at all. And if carbon-rich natural forests are turned into fast-growing tree plantations to serve power stations, much of the carbon lost will stay in the atmosphere effective forever.

This is confirmed by a large and growing number of scientific studies which show that cutting down trees to burn in power stations results in more carbon emissions than the fossil fuels that might be replaced for a period of several decades or even centuries². Yet climate science shows that carbon emissions must be cut back rapidly if we are to have any hope of avoiding the worst impacts of climate change.

So far, most of the wood imported to be burned in UK power stations comes from North America. Companies often claim that they will burn ‘residues’ but the supply of genuine residues is limited and largely used for other purposes (e.g. by the wood panel industry) already. There is clear evidence that wood pellets exported from the southern US to the UK are made from trees cut down for that purpose³. Southern US forests at risk from UK and other biomass power stations are home to 130 species of trees, 585 species of birds, 246 species of mammals (including black bears and bobcats), 197 species of reptiles and 170 species of amphibians⁴.



I'on Swamp, South Carolina, at risk of being logged for a new pellet plant which will export to Europe and likely the UK
 Photo: Dogwood Alliance

Clearcut in Green Swamp, North Carolina, where logging rates are expected to dramatically increase due to a new pellet plant which is expected to export to the UK
 Photo: Dogwood Alliance

In the future, more biomass is expected to be imported from the global South, especially from Brazil, West and Central Africa. A report published by the European Parliament warns: “*The rising demand for woody biomass energy is likely to raise the global price for wood, thus adding pressure on forests and other ecosystems and driving land use conflicts. More specific risks include deforestation when natural forests are replaced by monoculture plantations and long term impacts on local food and energy security.*”

2 For a list of relevant studies, see <http://www.biofuelwatch.org.uk/resources-on-biomass/>

3 <http://www.dogwoodalliance.org/2012/11/new-report-discredits-uk-energy-company-claims-that-pellets-come-from-wood-waste/>

4 <http://www.seesouthernforests.org/discover-southern-forests/benefits/biodiversity>

What would the power station mean for air quality and the health of nearby residents?

Power stations that burn virgin wood have been shown to emit 79 different pollutants, some of them in very significant quantities, even if 'best available technique' to reduce emissions is used.⁵

The main pollutants include small particulates (PM10 and PM 2.5), nitrogen dioxide (NO₂) and Volatile Organic Compounds, all of which are associated with respiratory and heart disease. Other toxins, such as dioxins, are linked to cancer and birth defects. RES say that they might also burn some recovered wood, which commonly includes chemically treated wood which would result in even more different pollutants and in higher emissions of dioxins and dangerous heavy metals.

South Sefton, where the power station would be located, already experiences very high levels of air pollution as well as ill health and high mortality rates from diseases which are worsened by poor air quality. According to the local authority "*Mortality rates are above average in south Sefton with particularly high premature death rates from heart disease, respiratory illness and cancers, especially lung cancer*"⁶.

EU legal limits for NO₂ are already being exceeded at various sites close to the proposed power station – in Bootle, Seaforth, Litherland and Waterloo. Even with mitigation equipment, the biomass power station would push up already excessive NO₂ levels further, as well as levels of small particulates (PM2.5 and PM10).

Existing PM10 levels are being monitored at just four locations in Sefton and at each of them they significantly exceed the limit recommended by the World Health Organisation for protecting human health – though the World Health Organisation emphasises that there is no safe limit at all for the smallest of those particulates.⁷ However, legal limits in England and Wales are twice as high as those recommended by the World Health Organisation. Even so, those legal limits were breached at sites close to the proposed power stations in previous years and pollution will get worse from other sources, such as already approved new developments at the Port which will result in significantly more heavy vehicle traffic in future.

Five Air Quality Management Areas have been declared in Sefton. All of those relate to excessively high NO₂ levels, some also to high PM10 levels. Pollution levels must be reduced in Air Quality Management Areas because legal limits are or risk being breached. A highly polluting new biomass power station clearly undermines this requirement.

Potential fish-kill caused by the power station

RES plan to use a 'once-through' cooling system for the power station. This means that large quantities of water will be continuously extracted from the Mersey, used to cool the power station, have biocides added and then be returned to the Mersey at a temperature 12°C higher than the surrounding waters. This is the cheapest and most energy efficient type of cooling system – but the deadliest for fish.

It is estimated that 300-500 million fish larger than 3cm and 100x100 billion smaller fish, larvae and eggs are killed by being sucked into such power station cooling systems around the UK every year.

5 <http://planethazard.com/phmapenv.aspx?mode=topten&area=state&state=VT> (data for McNeil power station in Burlington)

6 Recent air quality data has been summarised at <http://www.sefton.gov.uk/PDF/2012%20USA%20Part%201a.pdf> .

7 The World Health Organisation recommends a maximum annual mean concentration of PM10 of 20 40 µg/m³, whereas recorded annual mean PM10 levels in Sefton range from 24.6 to 29.8 µg/m³.



*Herring killed by a power station in the US with the same type of cooling system RES want to use,
Photo: Riverkeeper*

Fish are also being killed by the discharge of warm water. Fish are killed by 'thermal shock' if their water temperature suddenly changes by 3 °C or more. Even lower sudden temperature changes of 1-2 °C can kill fish because oxygen levels are suddenly reduced which affects their breathing, encourages local algal growth (which can further lower oxygen levels), disrupt their breeding cycle and make them more susceptible to disease. Fish can be further harmed by the biocides which are added to the water.⁸

Impacts on fish are of particular concern in this case because water would be abstracted from and discharged into the Mersey Estuary. The Mersey Estuary supports a wide range of fish, including ones which are commercially important – sea bass, flounder, sprat, sole, dogfish, rays, mackerel, conger eel and Atlantic salmon. Salmon migrate up the Mersey where they are thought to be breeding⁹. Salmon have recently returned to the Mersey after 200 years of absence, due to high pollution levels. Fish kill caused by a power station of the type proposed by RES could constitute a significant new pressure on salmon numbers.

The biomass power station would be less than 2.5 km from protected nature sites, including the Sefton Coast Special Area of Conservation and the proposed Specially Protected Area and proposed RAMSAR site, the North Wirral Foreshore.

What can you do about these plans?

Given the size of the power station, a planning application will be decided by the Secretary of State, following consideration and a recommendation by the Planning Inspectorate. Sefton Council will not make the final decision – but as an important consultee their response will still be important.

A summary of how the planning process works can be found at <http://infrastructure.planningportal.gov.uk/application-process/the-process/>

So far, RES have completed the initial stages of the planning process, called 'Scoping'. This means they have been advised on what information they must include in a full planning application. The Planning Inspectorate expects RES to submit a full application in the first quarter of 2014.

Currently, RES are assessing the commercial viability of the project, looking into possible fuel suppliers and other aspects that determine the project's overall viability. A public consultation will then begin before a full application is submitted, which will include things like drop-in presentations in community centres in the local area. Once a full application is submitted, the timescale for responding will be tight. However, there is clearly still plenty of time to speak out against those proposals and at least two companies have withdrawn plans for large power stations in the face of strong local opposition.

⁸ See for example <http://www.rivercenter.uga.edu/education/watershed/thermal.htm>, <http://www.scribd.com/doc/21978985/Effects-of-Effluent-Discharge-on-Water-Ecosystem> and <http://www.dec.ny.gov/animals/32847.html>

⁹ http://www.merseyestuary.org.uk/index_files/Estuary.html