ARE NORTH LINCOLNSHIRE COUNCIL'S OWN CARBON EMISSIONS REALLY ON A PATHWAY TO REACH NET ZERO IN 2030?

By Mark Bannister

The Council's Climate Targets

In its 'Green Futures' strategy [1], North Lincolnshire Council says **"every day we will leave the environment in a better state than we find it."** Fine words, but meanwhile facts show that this is patently not true: Local Green Party research shows that North Lincolnshire's carbon emissions are still increasing each year instead of the required reductions of more than 14% each year to meet even the 1.7deg limit to global heating.

Perhaps what is even worse than this statement not being true is that it leads the reader into thinking that everything is fine. The council surely must have everything in hand. This is not leadership.

Will the Council Achieve 'Net Zero' by 2030?

In its 'Green Futures' strategy [1], North Lincolnshire Council says "*The council has a strong track record of reducing carbon emissions, achieving significant reductions since 2009. But we are still directly responsible for putting around 12,200 tonnes of CO2 into the atmosphere every year. By 2030 we end this*"

and

"*..... We will source all our energy from renewable sources.*"

Are North Lincolnshire Council's own emissions really on a pathway to reach net zero in 2030 as claimed?

A significant number of council-owned buildings are heated using biomass boilers, which are claimed by the council to be near-zero carbon with only supply-chain emissions counted, combustion emissions considered as non-existent.

In the council's document 'Planning for Renewable Energy Development', it says:

"*Biomass is the combustion of wood and other plant materials in a stove or boiler to produce heat which can be used to generate electricity or other processes. Although biomass combustion gives off carbon dioxide, this represents release of the gas that was absorbed when the plant material grew, and thus biomass fuels are regarded as carbon neutral."*

The argument in favour seems obvious: wood, a renewable resource, must be better than burning fossil fuels. But studies [2,3,4] show wood emits more carbon dioxide per kilowatt-hour than the natural gas it generally replaces. Therefore, the first impact of wood bioenergy is to increase the carbon dioxide in the atmosphere, worsening climate change. But the situation is even worse: As the figure from [2] below shows, if the forest had not been cut to produce the wood pellets, it would have continued to grow, removing additional carbon from the atmosphere. Carbon losses from the soil due to harvesting are also substantial and ongoing, typically for decades. Compared to allowing the forest to grow, cutting it for bioenergy therefore increases carbon dioxide emissions and worsens global warming for at least 50 years and possibly over 100 years depending on forest composition and climatic zone – time we do not have to reach net-zero emissions and avoid the worst harms from climate change.

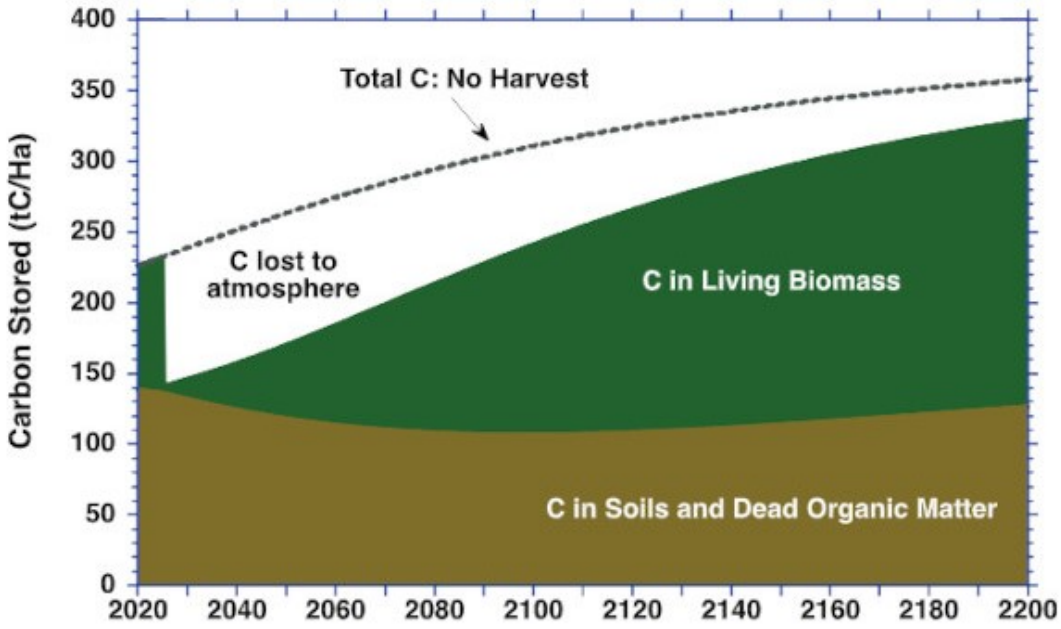

Figure reproduced from ref [2] 'Does wood bioenergy help or harm the climate?', Bulletin of the Atomic Scientists, 78:3, 128-138. Showing how carbon (C) remains in the atmosphere long after being burnt in biomass boiler system

The harms caused by that additional warming are not undone even if the carbon debt from wood energy is eventually repaid by new tree growth: The Greenland and Antarctic ice sheets melt faster, sea level rises higher, wildfires become more likely, permafrost thaws faster, and storms intensify more than if the wood had not been burned. Eventual full forest recovery will not replace lost ice, lower sea level, undo climate disasters, put carbon back into permafrost, or bring back homes lost to floods or wildfires. The excess warming from wood bioenergy increases the chances of going beyond various climate tipping points that could lead to runaway climate change: emissions "pathways that overshoot 1.5°C run a greater risk of passing through 'tipping points,' thresholds beyond which certain impacts can no longer be avoided even if temperatures are brought back down later on" (IPCC 2018, 283). Carbon neutrality is not climate neutrality.

Arguments used in the past for the use of wood in biomass boilers such as using short-rotation coppice where the harvested woody mass grows back within a few years, or the use of saw mill waste where perhaps justified a few decades ago when demand was low. This is unfortunately not the case now, with Europe's largest power station (Drax) having been converted to wood pellet biomass. The Chatham House report [4] noted:

"*Many of the models used to predict the impacts of biomass use assume that mill and forest residues are the main feedstock used for energy, and biomass pellet and energy companies tend to claim the same, though they often group 'low-grade wood' with 'forest residues'. Evidence suggests, however, that various types of roundwood are generally the main source of feedstock for large industrial pellet facilities. Forest residues are often unsuitable for use because of their high ash, dirt and alkali salt content…...mill residues can also be used for wood products such as particleboard*".

It is not as if there are no alternatives to biomass- there are more effective ways to cut greenhouse gas emissions already available and affordable now, allowing forests to continue to serve as carbon sinks and moderate climate change.

What is the Council's target for reducing its own emissions?

In the North Lincolnshire Carbon Management Strategy (2017), the council outlines how it will meet its target of reducing its own carbon emissions by at least 25% from:

18,200 tCO2 per year in 2015/16 to

13,617 tCO2 per year by 2020/21

An emissions reduction target of -4,583 tCO2 per year (-25%).

How Much Carbon Emissions Are Actually Released by the Council's Biomass Boilers?

The data on the number of biomass boilers used by North Lincolnshire Council and what carbon emissions are actually produced by them can be found from the following sources:

- Using the published NLC data on its supplier payments [5], the total yearly cost of the biomass wood pellets/wood chips purchased over the year (2021/22) was £189,000. Assuming a representative cost per tonne of £230 over the period, this gives an estimated total of 820 tonnes of wood pellet and wood chip biomass used.
- Using the average CO2 emissions per tonne of wood biomass from both [3,4], we can come to the estimate of:

Estimated actual biomass boiler emissions = +2,200t CO2 per year

Given that the council was aiming to reduce its carbon emissions by -4,583t CO2, this means that even if it claims to meet this target, in reality, emissions will actually have been reduced by only:

Actual emissions reduction = -2,383 t CO2 (-13%) per year

(-4,583 tCO2 + 2,200 tCO2 = -2,383 tCO2)

i.e. half the target claimed.

Do the suppliers of Biomass to North Lincolnshire Council claim their products are from saw mill waste or short-rotation coppice?

The two main suppliers of Biomass to North Lincolnshire Council for use in its boilers in 2021/22 were VerdeEnergy (Yorkshire) [6] and AMP Biomass Fuels Ltd [7]. Their own websites show that they do not claim their products to be solely from saw mill waste or short-rotation coppice:

From Verde Energy: *"Wood pellets are made as a bi-product of other timber production processes, often to reduce waste or to improve forest structures. All VerdEnergy pellets are from FSC sources, ensuring all the fibres, dust, chips and material used in manufacture are from sustainably harvested woodland."*

From AMP Biomass Fuels: *"We're also on the Government's official Biomass Suppliers List (BSL), which means that our pellets – which are made from sustainably sourced forest residues and thinnings – are fully eligible for the Renewable Heat Incentive (RHI)."*

The text “to improve forest structures” and “thinnings”, imply that the wood pellets are at least partly from trees that would otherwise be taking up CO2, not just sawmill or other waste. This supports the findings of the Chatham House report, mentioned earlier and its recommendations [4].

Does using Biomass pellets reduce North Lincolnshire Council reliance on Russian imports?

In the most recent Facebook live address by Rob Waltham [8] at 20:30 into the video, he claims that, in defence of biomass pellets, “shipping gas in from abroad is not great either....since Mr Putin has dipped into Ukraine... it is not a great place to be... vulnerable to the world for great chunks of our energy mix”. However, before the Russian invasion of Ukraine in 2022, approximately as large a percentage of wood biomass used by Europe was imported from Russia as was natural gas (c40%), so this argument makes no sense. In fact, since RHI certified imports of wood pellets from Russia, Belarus and Ukraine were suspended in early 2022, there has been a supply constraint similar to the one for natural gas, leading to a large increase in supply costs of wood pellets. A recent estimate from a supplier was £545/tonne for wood pellets – almost double the average costs of 2021!

What should be done?

The council policy that treats wood bioenergy as carbon neutral must end. The carbon dioxide emitted from burning biomass pellets should be counted in the same way as emissions from other fuels: fully, at the point of combustion and accounted for in the council’s own carbon emissions. We estimate this to be currently an additional 2,200 tCO2 per year.

No new wood-fuelled biomass heating systems should be installed and existing biomass systems should be replaced at the earliest opportunity. Existing low-carbon technologies such as energy efficiency, solar PV and air or ground source heat pumps should be used instead.

Notes:

tCO2 = tonnes CO2 (carbon dioxide)

[1] North Lincolnshire Council’s Green Futures Strategy
https://www.northlincs.gov.uk/your-council/a-green-future/our-strategy/

[2] Does wood bioenergy help or harm the climate?, Bulletin of the Atomic Scientists, 78:3, 128-138, John Sterman, William Moomaw, Juliette N. Rooney-

Varga & Lori Siegel (2022)
https://www.tandfonline.com/doi/full/10.1080/00963402.2022.2062933

[3] 'Range and uncertainties in estimating delays in greenhouse gas mitigation potential of forest bioenergy sourced from Canadian forests', Wiley Online Library, Jérôme Laganière,David Paré,Evelyne Thiffault,Pierre Y. Bernier
https://www.researchgate.net/publication/287337516_Range_and_uncertainties_in_estimating_delays_in_greenhouse_gas_mitigation_potential_of_forest_bioenergy_sourced_from_Canadian_forests

[4] Greenhouse gas emissions from burning US-sourced woody biomass in the EU and UK https://www.chathamhouse.org/sites/default/files/2021-10/2021-10-14-woody-biomass-us-eu-uk-summary.pdf

[5] NLC Supplier Payments https://www.northlincs.gov.uk/your-council/supplier-payments/#1629111375613-a59359dc-911a

[6] Verde Energy https://www.verdenergy.uk/about-biomass-wood-pellets/

[7] AMP Biomass Energy Ltd https://www.ampcleanenergy.com/biomass

[8] NLC Facebrook live video
https://www.facebook.com/northlincscouncil/videos/482037590741375