

Calling Out Bioenergy Myths,
Facing Realities:
How the UK Can Save Forests, the
Climate, and Piles of Money

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Partnership for Policy Integrity

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Biomass energy as a “Carbon Con”

Bioenergy impacts on:

- Forests and their ability to act as carbon sinks
- Our ability to deploy clean renewable energy
- Our ability to fight climate change

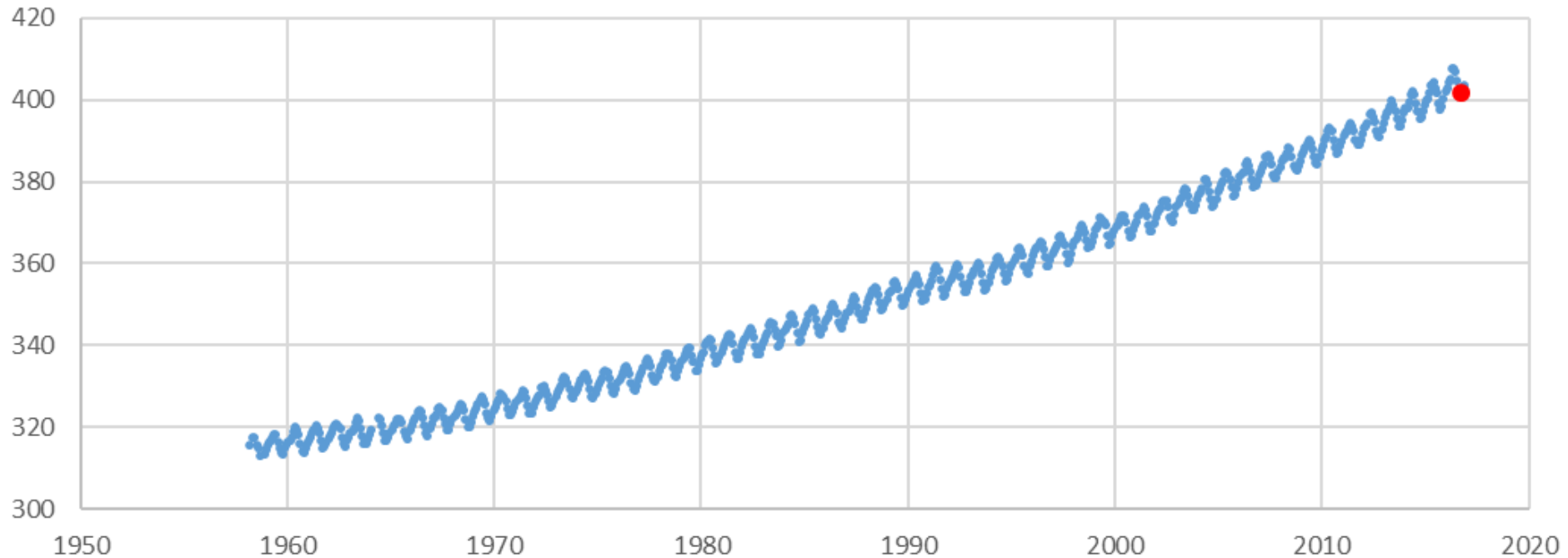
Can the UK fix the EU’s bioenergy policy mistakes? (and in the process, save billions of pounds?)



THE CLIMATE CONTEXT

A Milestone for Carbon Dioxide in the Atmosphere

CO2 concentration in the atmosphere (parts per million)

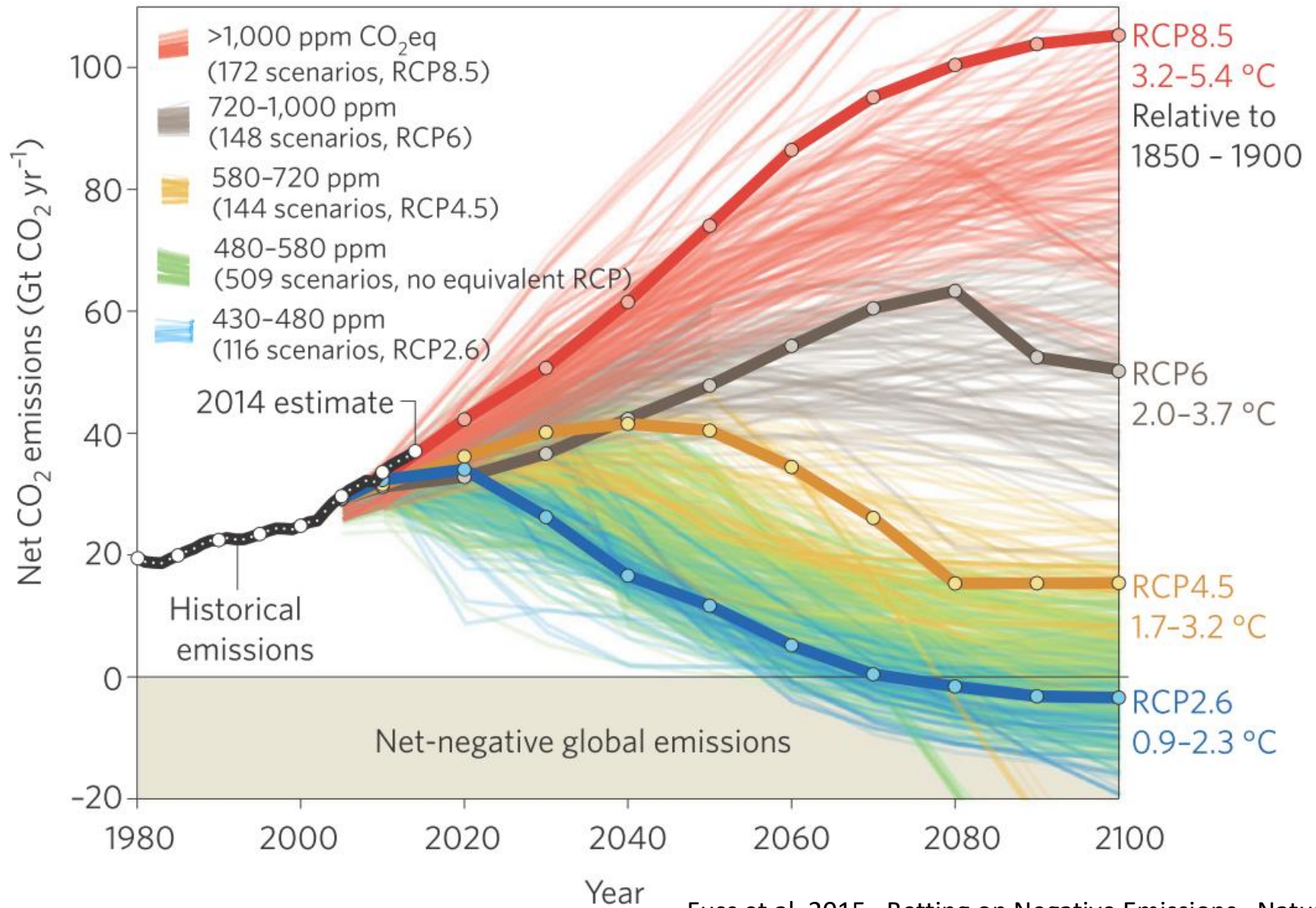


September 2016:

The yearly low for CO2 is now higher than 400 ppm.

Emissions keep increasing, but the carbon sink hasn't.

To keep temperature rise below 2 C, we need negative emissions – requires increasing forests



Article 5, Paris Climate Agreement: *Parties should take action to conserve and enhance, as appropriate, **sinks and reservoirs of greenhouse gases** as referred to in the Convention, **including forests.***



US forests help offset carbon pollution

U.S. GHG Emissions and Sinks by Sector (million tons CO₂ equivalent)

Sector	1990	2005	2011
Energy.....	5,806.2	6,891.2	6,333.6
Industrial Processes.....	348.4	364.6	359.9
Solvent and Other Product Use.....	4.9	4.9	4.9
Agriculture.....	456.2	491.9	508.7
Land Use, Land-Use Change and Forestry.....	15.1	28.0	40.3
Waste.....	185.0	150.9	140.8
Total Emissions.....	6,815.9	7,931.5	7,388.0
Land Use, Land-Use Change and Forestry (Sinks)....	(875.8)	(1,099.9)	(997.6)
Net Emissions (Sources and Sinks).....	5,940.0	6,831.5	6,390.4

$997.6 \div 7,388 =$ the equivalent of **13.5 %** of US emissions re-sequestered

The US “Intended Nationally Determined Contribution” (INDC) includes carbon uptake by forests as part of emissions reduction plan.

But meanwhile...

Forest harvesting for wood pellet manufacture degrades US forests



Photo courtesy Dogwood Alliance



Enviva pellet plant, Ahoskie, North Carolina

Photo: Dogwood Alliance (www.dogwoodalliance.org)



BIOENERGY MYTHS V. REALITY

Biomass industry misinformation and propaganda

To counter obvious impacts, the biomass industry claims

- Biomass is “carbon neutral” or “low carbon”
- “Biomass is ‘sustainable’ (and the word ‘sustainable’ means something)
- Biomass helps forests

These industry- generated talking points are repeated by policymakers.

3,960 MW Drax coal plant, Yorkshire, UK

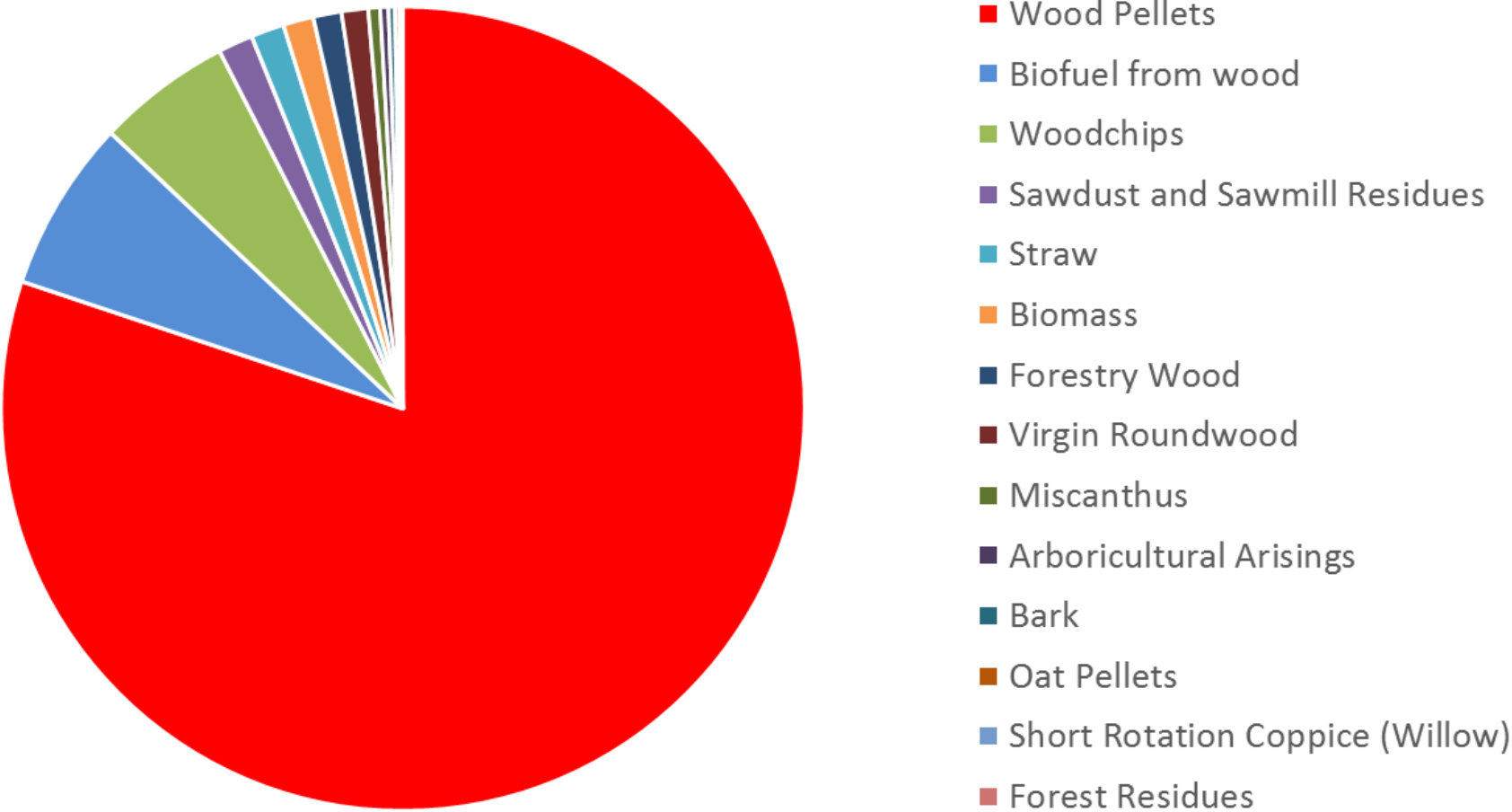
3/6 units burn biomass



2015: Drax burned **5.9 million tons of biomass**, ~95% wood pellets, mostly from US and Canada

* Data from UK Office of Gas and Electricity Markets (OFGEM)

Most of the biomass burned in the UK is wood pellets (FY 14/15)



The reality of emissions at Drax: Burning biomass emits more carbon pollution per megawatt-hour than burning coal

	Actual CO ₂ (t calculated)	EUETS CO ₂ (t calculated)
Coal and Petcoke	20,089,607	20,089,607
Biomass	2,799,391	0

CO₂ emissions rate

Coal: **862 kg/MWh**

Biomass: **965 kg/MWh**

Drax generation		2013	
Coal	TWh	23.3	88%
Biomass	TWh	2.9	12%

Drax's persistent, pernicious myth

80%

At Drax the use of biomass saves more than 80% of the carbon dioxide emitted when compared to the use of coal

Drax annual report, 2015

How can Drax claim biomass “save” CO₂ emissions when it actually *increases* stack emissions?

Because the EU/UK “sustainability” rules only count CO₂ emissions from fossil fuels burned during manufacturing and transport of biomass...

NOT EMISSIONS FROM BURNING THE BIOMASS AT THE POWER PLANT.

Reality:

Total carbon pollution is even greater than
smokestack emissions

Lifecycle carbon emissions also include:

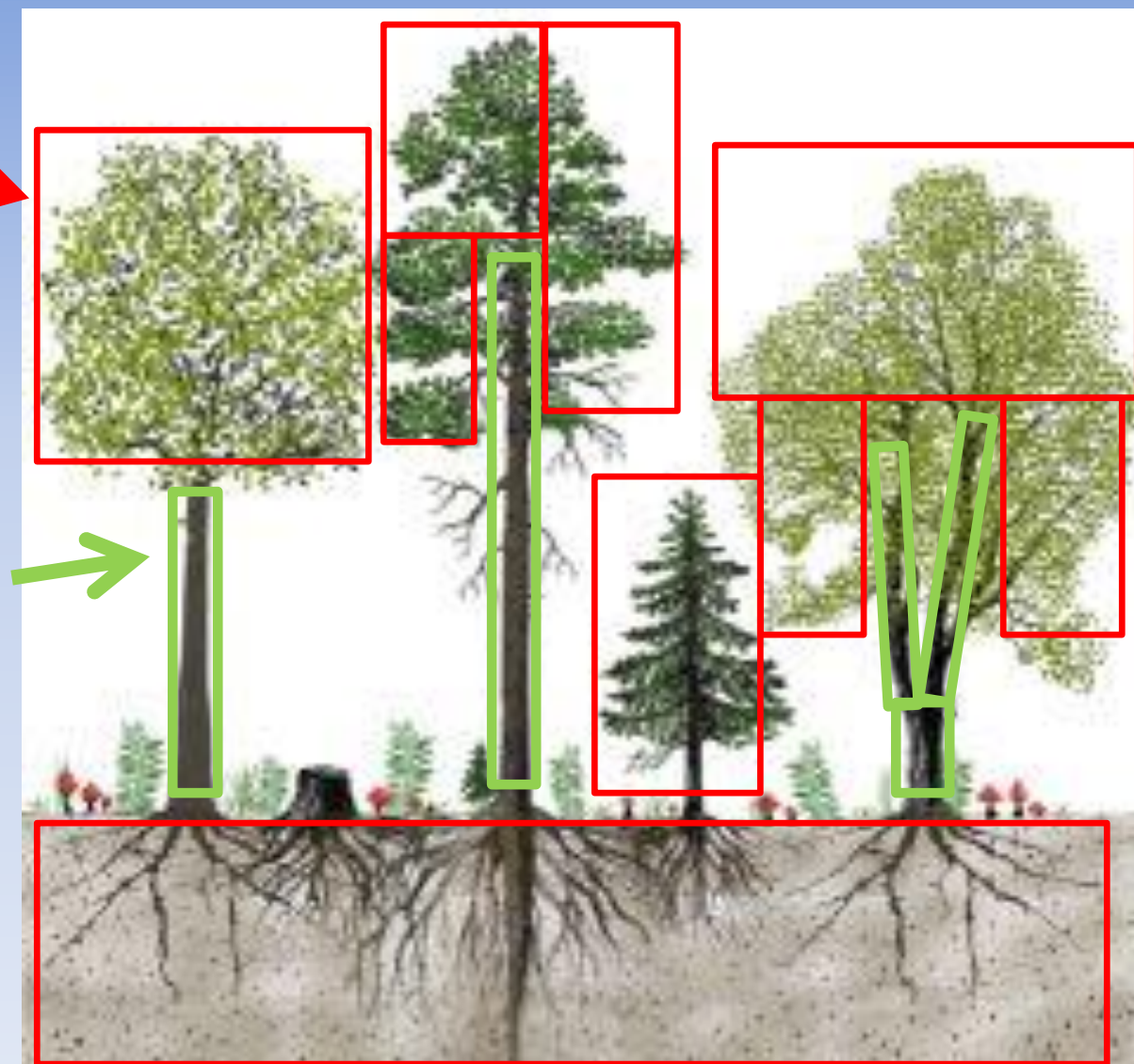
- Carbon from fossil fuels burned during biomass manufacturing and transport (the only emissions accounted for in UK "sustainability" reporting)
- Carbon from wood wasted and burned in pellet manufacturing
- "Foregone sequestration" – the carbon that would have been taken up by forest growth had forests been left to grow
- Soil carbon loss – potentially very important

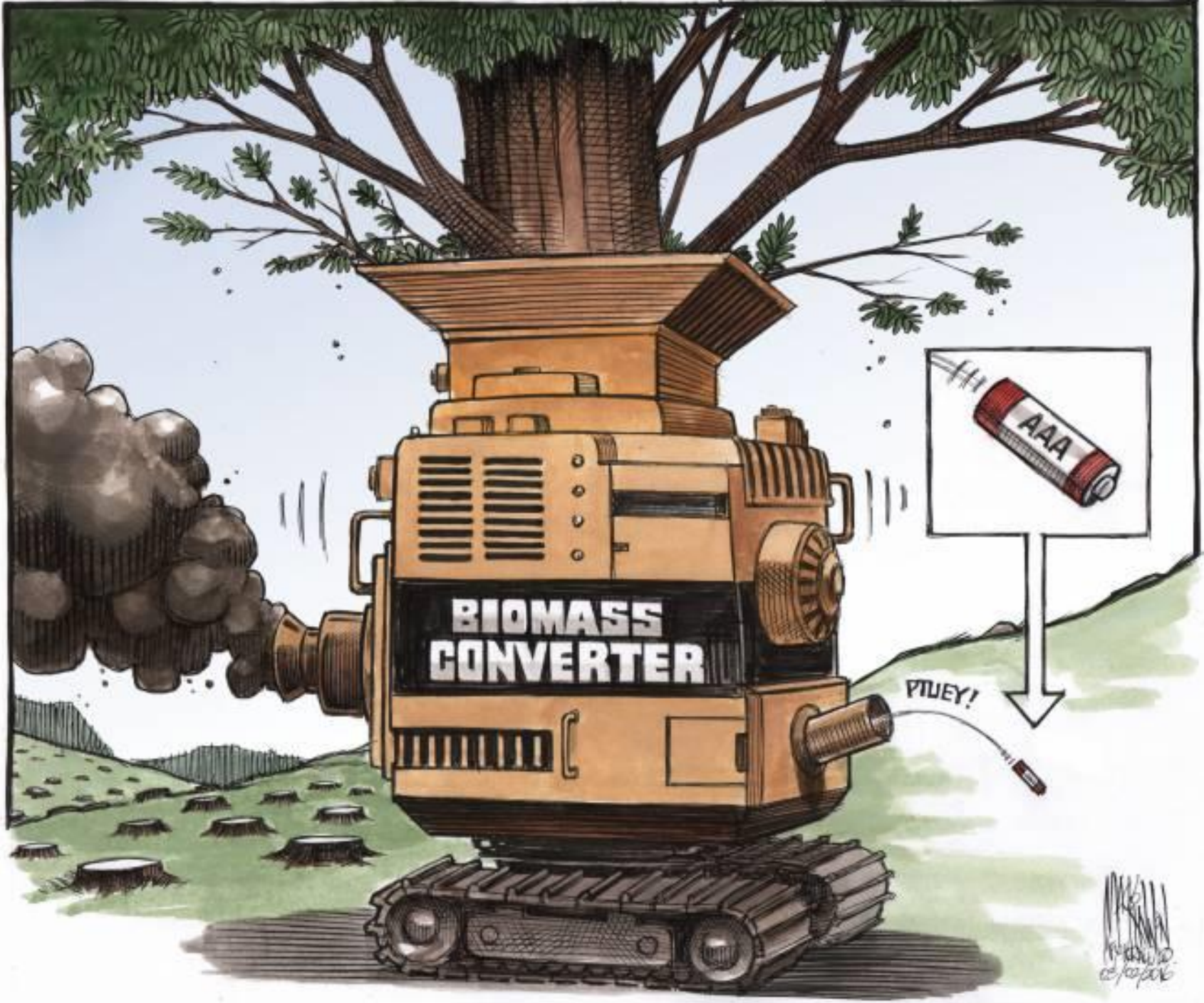
A tonne of wood pellets represents ~2.85 tonnes of green wood lost or burned during harvesting and processing – all representing CO₂ emissions (~1:1)

Biomass that is harvested and burned for process heat, or left onsite to decompose

Large-diameter roundwood suitable for pellet manufacture (but not bark)

~ 16 m tonnes of CO₂ directly emitted from Drax's biomass use in 2015





**BIOMASS
CONVERTER**

AAA

PTUEY!

M. K. 10/06

Reality: Hardwood forests are being cut for biomass.



**Forest following biomass harvesting for wood pellet manufacturing,
North Carolina**

Photo: Dogwood Alliance (www.dogwoodalliance.org)

Drax's principles

Our principles:

Never work in countries lacking proper regulation

Never cause deforestation

Never source from officially protected areas

Only source from working forests that grow back

Drax
We “*never cause deforestation*”



Photo courtesy Dogwood Alliance



We “only source from working forests that grow back”

Photo courtesy Dogwood Alliance

Wetland forests: “Enviva suppliers take extra care by using specialized harvesting equipment and techniques that minimize environmental impacts and protect soil and water quality”

<http://www.envivabiomass.com/faq-forests-fiber-sourcing/#wetlands>



Photo courtesy Dogwood Alliance

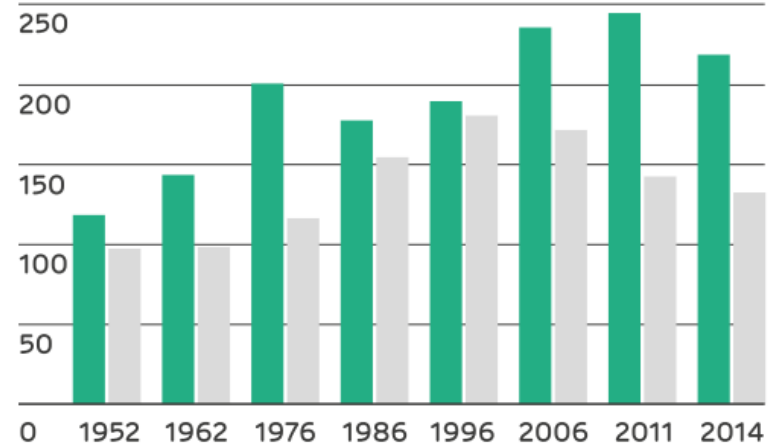
86m tonnes

In 2014, in working forests in the US South, 86 million tonnes more wood grew than was harvested

Drax annual report:
Data on “growth vs.
removals” for forests in the
US South

US South, growth vs removals

Million tonnes



■ Growth
■ Removals

Note:

Original data converted to dry tonnes using an assumed moisture content of 50%.

Source: USDA Forest Service

Myth/Fallacy: a positive growth-to-harvest ratio makes biomass “carbon neutral”

A Banking Analogy:

Forests	=	Capital
Forest growth and carbon uptake	=	Interest
Letting forests grow and offset carbon	=	Letting money accumulate
Harvesting equivalent of new growth	=	Spending down interest

Burning up the forest carbon sink

Projected demand in UK: Drax, Lynemouth, Teesside

~17.7 m green tonnes per year (9.7 m tonnes dry)

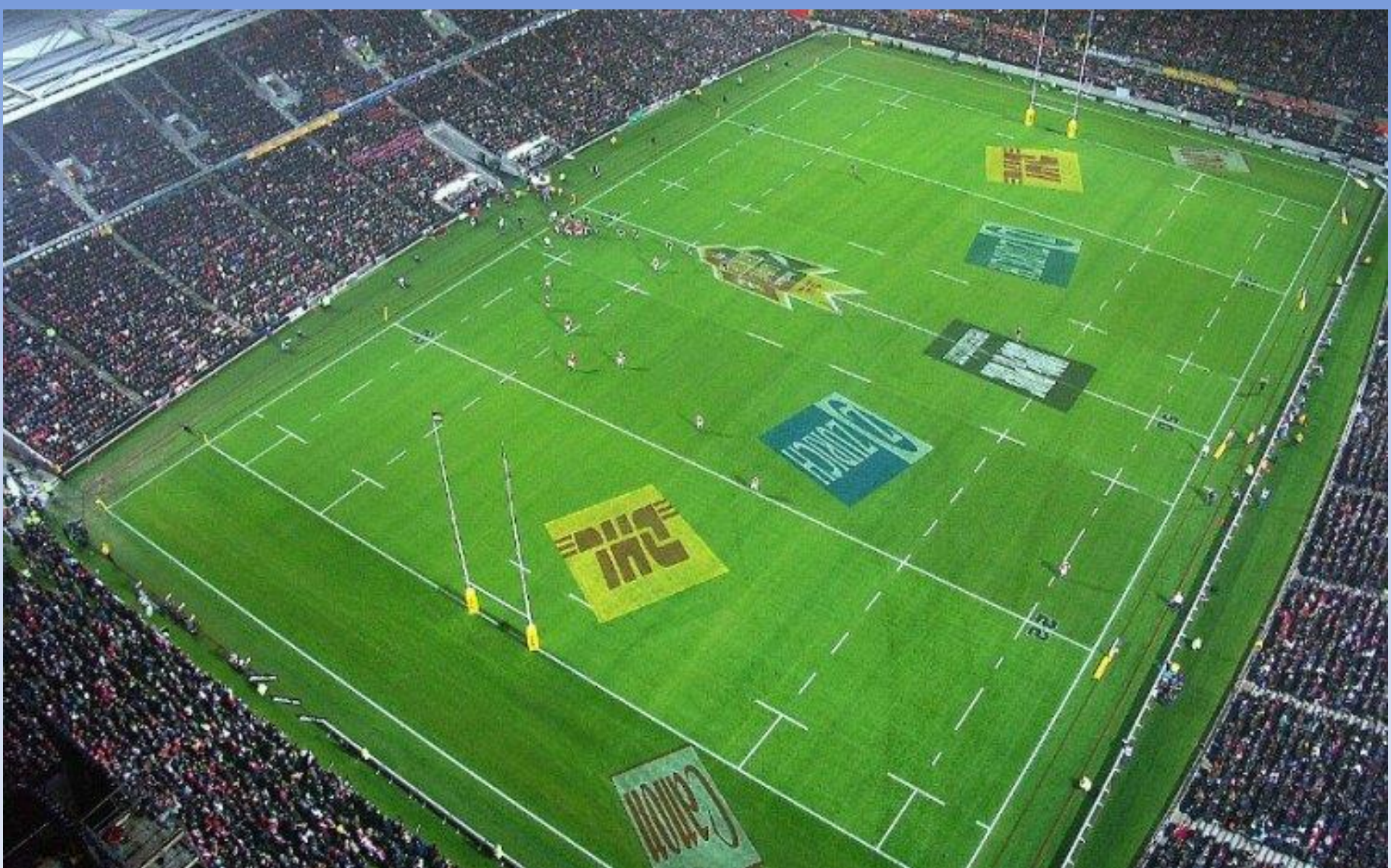
- Drax alone is consuming more than the total annual forest carbon sink of North Carolina on a yearly basis (growth minus removals = 6.4 m dry tonnes/yr)

~160,000 hectares per year

**Over 10 years of
subsidy allocation, 1.6
million hectares of
forests up smokestacks**



Rugby pitch = 1 hectare



Reality: UK DECC report calls for reforming biomass carbon accounting to acknowledge forest carbon loss

“If the carbon stored in a forest reduces, carbon dioxide (CO₂) is released to the atmosphere, whereas if the carbon stock of a forest increases, CO₂ is removed from the atmosphere and sequestered as biomass in the forest...”

These factors “need to be considered if we wish to understand the true GHG intensities of different bioenergy feedstocks and technologies.”

Stephenson, A.L., and MacKay, D.J.C. 2014. Scenarios for assessing the greenhouse gas impacts and energy input requirements of using North American woody biomass for electricity generation in the UK. Department of Energy & Climate Change, London, UK. At https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/349024/BEAC_Report_290814.pdf.



**THE UK'S SUSTAINABILITY POLICY IS OUT OF
STEP**

The UK government has promoted its sustainability policy as if it were protective

*“The UK is introducing some of the **toughest sustainability standards in the world.**”*

2014 DECC rebuttal of the Daily Mail article on biomass at Drax,
<https://www.gov.uk/government/news/response-to-daily-mail-article-on-biomass-at-drax>

UK sustainability policy failures

Doesn't fulfil carbon reduction requirements of 2012 UK bioenergy policy

- Bioenergy policies “should deliver genuine carbon reductions”

Doesn't meet IPCC and IEA definitions of renewability:

- “Energy from solar, geophysical or biological sources that is replenished by natural processes at a rate that equals or exceeds its rate of use.”

Not enforceable – esp. w scale of impacts

Ethically dubious – relies on self-reporting

- Industry's “Sustainable Biomass Partnership” certification scheme -chaired by Drax CEO, members are major industrial pellet producers and users

Sustainability policy disqualifies biomass sourced from converted forests: A distinction without a difference?



Reality: The IPCC does not treat bioenergy as carbon neutral

IPCC counts harvesting emissions in the land use change basket, not the energy basket

*“The IPCC approach of not including bioenergy emissions in the Energy Sector total **should not be interpreted** as a conclusion about the sustainability or carbon neutrality of bioenergy.”* (<http://www.ipcc-nggip.iges.or.jp/faq/faq.html>)

“If bioenergy production is to generate a net reduction in emissions, it must do so by **offsetting those emissions through increased net carbon uptake of biota and soils**”.

IPCC AR5 WG III 11.13.4 GHG emission estimates of bioenergy production systems, 2014

The EU is starting to acknowledge forest and carbon impacts

Environmental Implications of Increased Reliance of the EU on Biomass from the South East US

Directorate-General for Environment
Directorate B — Natural Capital
Unit ENV B1. — Agriculture, Forests and Soil

<http://bookshop.europa.eu/en/environmental-implications-of-increased-reliance-of-the-eu-on-biomass-from-the-south-east-us-pbKH0116687/>

1. Natural forests are being converted to plantations with loss of biodiversity and **“significant” loss of carbon**;
2. *“Logging residues are not a significant feedstock for industrial wood pellets.”* Hundreds of thousands of hectares of **whole trees** being harvested for feedstock;
3. High **biodiversity** forests are under **greater pressure**;
4. **More hardwood harvesting**; existing wood users of hardwoods and plantation pines displaced.

Bioenergy industry myths repeated at Secretarial level in the US: USDA Sec. Vilsack letter to Sec. Amber Rudd

“Independent analysis has consistently shown that demand for wood pellets promotes U.S. forest growth and reduces risks to U.S. forests.”

“Our latest inventory showed that the amount of forested land in the southern United States increased by 55 million acres (22.26 million hectares) from 2007 to 2012.”

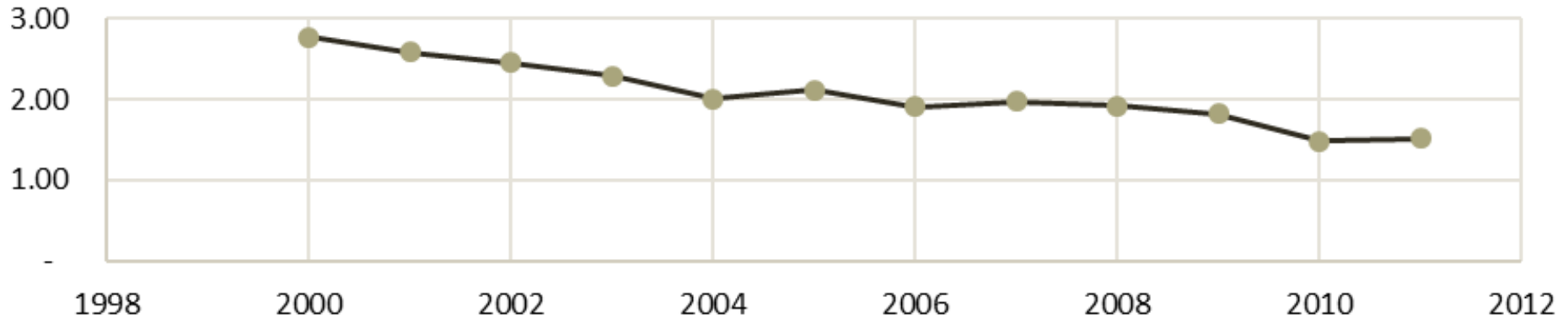
But USDA’s forest assessment tells a different story:

“The forest areas of Texas and Oklahoma are significantly higher than reported in previous national assessments. This is due to the nontimberland forests in the western portions of these States being estimated by FIA for the first time.”

<http://www.pfpi.net/usdas-promotion-of-tree-burning-undermines-the-administrations-climate-goals>

Myth: Data from Vilsack's own agency shows claim forests "expanded" by 55 million acres is misleading.

Average annual area of timberland planted in the South, 2000 -2011



UK ratepayers are paying a lot to be misled about the “benefits” of bioenergy

Drax’s subsidies 2015: £451,800,000

All biomass subsidies in 2016: ~ **£817,000,000**

Conservative estimate of ten year’s subsidies:
£8,170,000,000 (billions with a “B”)

“Pretty soon you’re talking about real money”

Better investments for renewable energy subsidies?

NRDC's recent "Money to Burn" report finds biomass is **more expensive than zero-emissions renewables** – even if carbon emissions not fully counted

- study didn't count health impacts of biomass burning, which also add to biomass costs

(<https://www.nrdc.org/resources/money-burn-uk-needs-dump-biomass-and-replace-its-coal-plants-truly-clean-energy>)

PFPI's analysis of renewable energy deployment modeling in US: treating biomass as carbon neutral **suppresses development of solar power**

(<http://www.pfpi.net/new-analysis-of-government-data-finds-burning-wood-for-electricity-will-undermine-clean-power-plan>)

How can the UK fix the bioenergy carbon con?

- **Count the emissions.** Fix carbon accounting to reflect carbon impacts of bioenergy. Use DECC's science.
- **Remove subsidies for bioenergy,** and direct funding to zero-emissions technologies – including efficiency. “Nega-watts” are best.
- **“Sustainability” should begin (and end) at home.** Source biomass locally, and don't burn up the international carbon sink.

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