



UNITED KINGDOM WITHOUT INCINERATION NETWORK



***Climate Change Impacts of
Waste Incineration in the UK***

UK INCINERATION IN NUMBERS

1 NATIONAL ORGANISATION
DEDICATED TO CAMPAIGNING AGAINST
WASTE INCINERATION IN THE UK

60+ INCINERATORS
CURRENTLY OPERATING
OR UNDER CONSTRUCTION

100+ INCINERATORS
PREVENTED IN THE UK
OVER THE LAST DECADE

80+ INCINERATORS
IN THE PIPELINE THAT
NEED TO BE STOPPED

150+ ANTI-INCINERATION GROUPS
SUPPORTED BY UKWIN WITH CRUCIAL
INFORMATION, ADVICE AND GUIDANCE

£30,000 A YEAR
REQUIRED TO MAINTAIN
UKWIN SERVICES

FOR MORE DETAILS VISIT THE UNITED KINGDOM
WITHOUT INCINERATION NETWORK WEBSITE

[HTTPS://UKWIN.ORG.UK/](https://ukwin.org.uk/)



ANTI-INCINERATION CAMPAIGNING IN THE UK

- Planning refusal / stricter conditions
- Stricter permitted emissions limits
- More recycling in local / national strategies
- Finance – Incineration tax, no green money for incineration, and holding investors to account
- Gov't support - renegotiate / exit contracts
- Moratorium on new capacity
- Influencing the discourse - within mainstream (MPs, TV, newspapers) and in trade press, as well as amongst environmentalists (climate)

UKWIN CLIMATE CHANGE REPORT



<http://ukwin.org.uk/climate/>

The report explores:

- Direct CO₂ emissions from mixed waste incineration
- CO₂ released per unit of electricity generated
- Relative CO₂ emissions compared to landfill
- Recyclability of the feedstock
- Unpaid climate cost to society

WHY BURNING WASTE RELEASES CO₂

- CO₂ is one carbon atom and two oxygen atoms
- On average, around 27% of residual waste used for incinerator feedstock is carbon (C)
- When burned, that carbon (C) combines with the oxygen (O) in the air to produce CO₂
- Because oxygen is heavier than carbon, 1 tonne of carbon results in 3.66 tonnes of CO₂
- Plastic is around 52% carbon, so burning a tonne of plastic releases 1.9 tonnes of CO₂

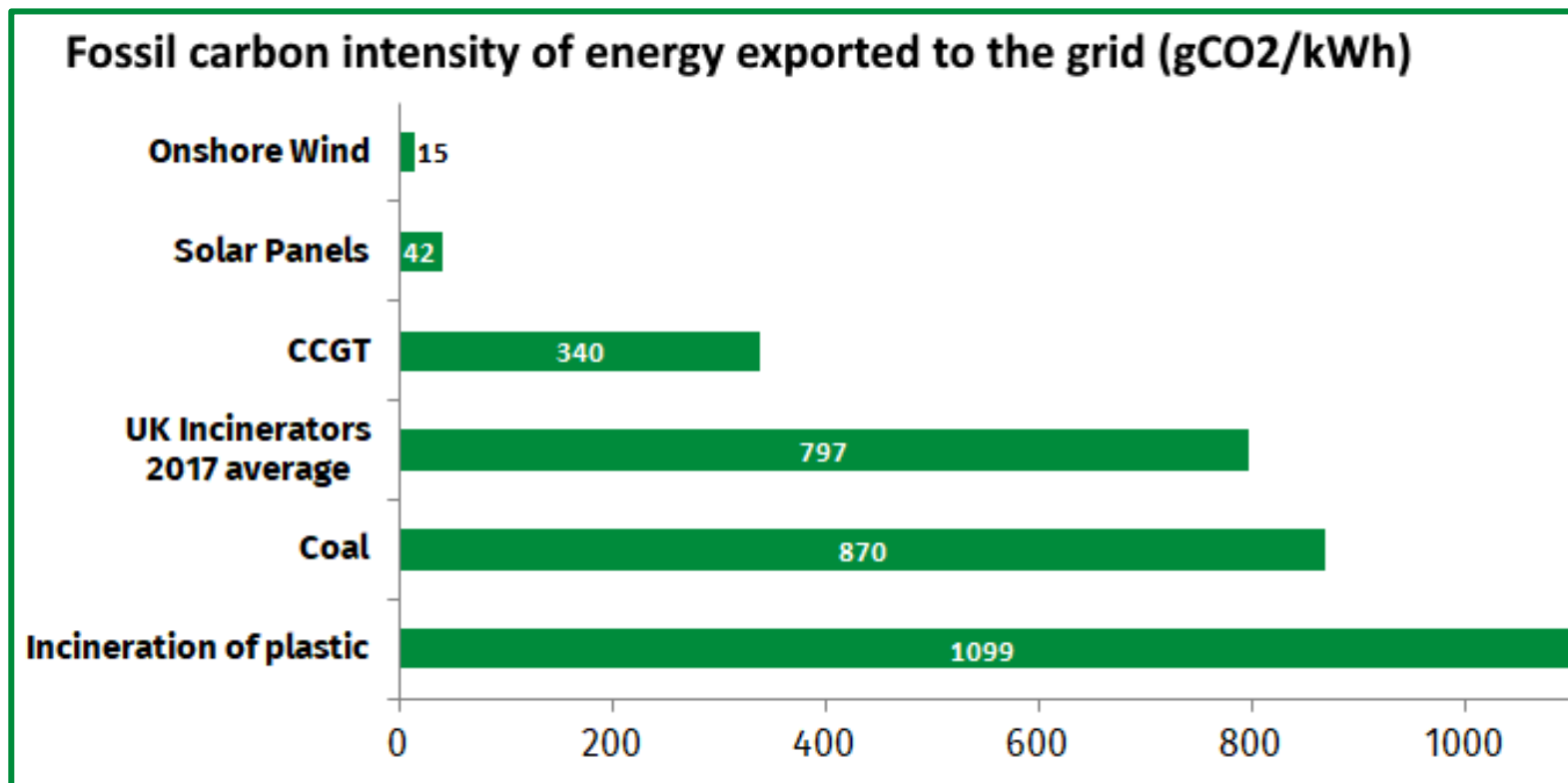
QUANTITY OF DIRECT CO₂ EMISSIONS

- Because conventional plastic is derived from petroleum it is a fossil fuel (so the CO₂ from plastics is called 'fossil CO₂')
- CO₂ from organic matter is called 'biogenic CO₂' - for some purposes these biogenic emissions are not included in calculating incinerator emissions, but many argue it should be
- In the UK around 1 tonne of CO₂ is released per tonne of waste burned
- Around half is 'fossil CO₂' and half is biogenic

UNPAID COST TO SOCIETY OF CO₂

- The release of CO₂ from incinerators makes climate change worse and comes with a cost to society that is not paid by those incinerating waste.
- Update: In 2018 UK's 42 incinerators released a total of nearly 11.5 million tonnes of CO₂, more than 5 million tonnes of which were from fossil sources such as plastic.
- The 5 million tonnes of fossil CO₂ released by UK incinerators in 2018 resulted in an unpaid cost to society of around **£350 million**.
- Over the next 30 years the total cost to society of fossil CO₂ released by UK's current incinerators would equate to more than **£25 billion** pounds of harm arising from the release of around 205 million tonnes of fossil CO₂.

CO₂ PER UNIT OF ELECTRICITY

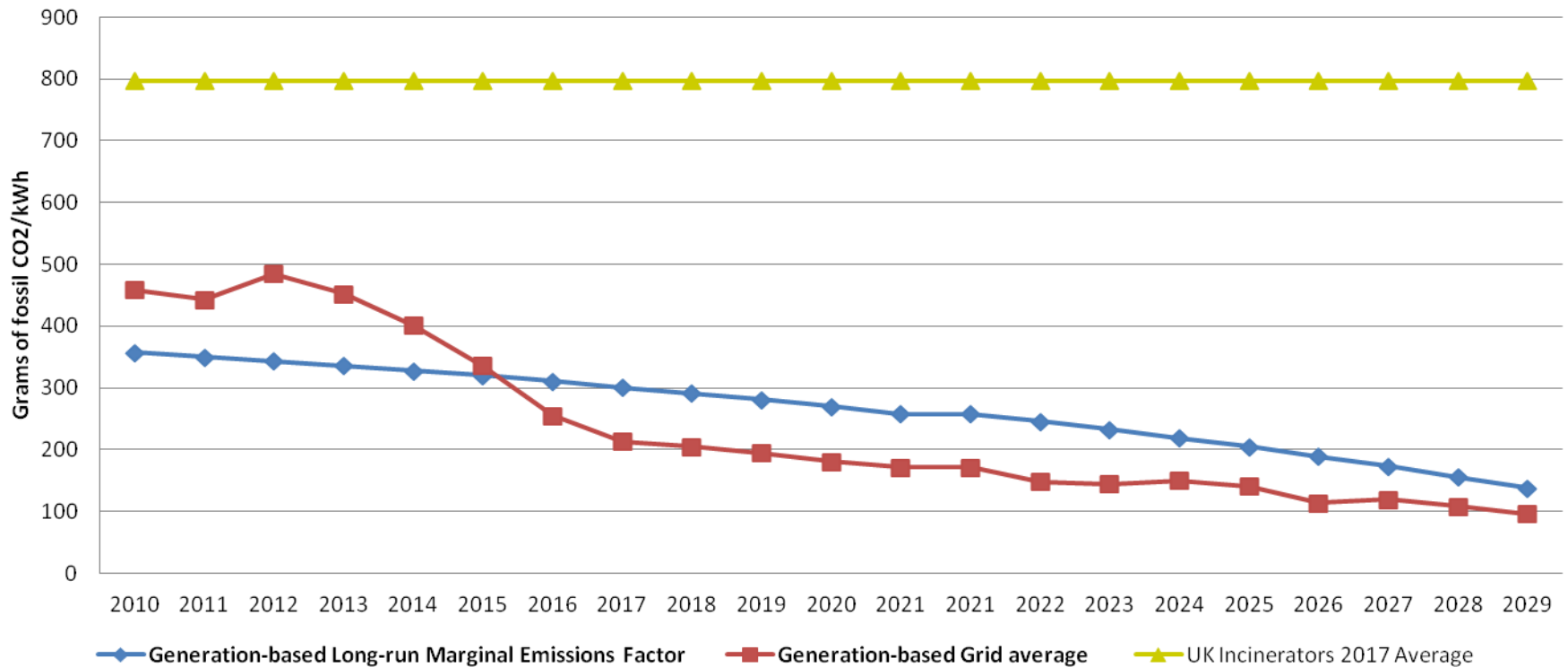


“The ‘[fossil] carbon intensity’ of energy produced through waste incineration is more than 23 times greater than that for low carbon sources such as wind and solar; as such, incineration is clearly not a low carbon technology.”

– UKWIN Climate Change Report

THE 'MARGINAL ELECTRICITY MIX'

Incineration compared to decarbonised UK electricity supply



"For estimating changes in emissions from changes in grid electricity use, analysts should use the (long run) marginal grid electricity emissions factors in data table 1"

-HM Treasury Green Book on appraisal and evaluation of energy use and GHG emissions

INCINERATION VS LANDFILL

We compared sending 265ktpa to incineration and untreated to landfill – the modelling showed incineration emitting more CO₂e than landfill.

The model uses Defra carbon report defaults, with additional work to account for:

- 2020 Marginal Electricity Mix
- Variations in feedstock
- Biogenic carbon sequestration

Excludes biogenic CO₂ on both sides of the model, except biogenic carbon sequestered in landfill. This stored carbon would be released as CO₂ if incinerated.

BASE CASE (DEFAULT WASTE COMPOSITION)	Incineration	Landfill	Relative net
Direct emissions (Methane & Fossil CO ₂ but not bio CO ₂)	92,088	66,224	25,864
Electricity offset	-50,271	-3,392	-46,879
Biogenic carbon sequestration		-72,955	72,955
TOTAL	41,817	-10,123	51,940

REDUCED PLASTIC	Incineration	Landfill	Relative net
Direct emissions (excluding bio CO ₂)	59,890	71,365	-11,475
Electricity offset	-44,361	-3,657	-40,704
Biogenic carbon sequestration		-78,626	78,626
TOTAL	15,529	-10,918	26,447

REDUCED FOOD, GARDEN & SOIL	Incineration	Landfill	Relative net
Direct emissions (excluding bio CO ₂)	119,542	62,726	56,816
Electricity offset	-57,346	-3,207	-54,140
Biogenic carbon sequestration		-77,778	77,778
TOTAL	62,196	-18,259	80,455

“...in comparative assessments between processes, it cannot be valid to ignore biogenic CO₂ if the different processes deal with biogenic CO₂ in different ways...”

- Eunomia report for the European Commission

IMPACTS OF AVOIDING INCINERATION

- Report estimates around half UK 'residual waste' is readily recyclable – incineration competes for feedstock with recycling and composting
- Report did not quantify CO₂ benefits of dealing with waste at higher tiers of waste hierarchy, nor with moving to a more circular economy (e.g. redesign, reuse, repair)
- Comparing incineration with landfill understates incinerator climate and environmental damage
- Report did not quantify CO₂ benefits of other ways to manage residual, e.g. Bio-stabilisation prior to landfill to reduce methane emissions
- Had the report quantified these CO₂ benefits, incineration would have been shown to be even worse for the climate