

# Submission to the BEIS CCUS Consultation on the Industrial Carbon Capture Business Model (May 2022)



## About UKWIN

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**What is your name?**

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**What is your email address?**

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**What is your organisation?**

United Kingdom Without Incineration Network (UKWIN)

**Please tell us which sector your organisation fits into:**

Other: Environmental group

**Are you happy for your response to be published?**

Yes

**Would you like to be contacted when the consultation response is published?**

Yes

## Section A: All Projects

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**Q1. To what extent does the ICC business model represent an investable proposition in the context of known HMG policies, stated ambitions, and the Net Zero commitment?**

**Q2. To what extent do you consider the ICC Contract will incentivise development of low carbon industrial production that has the potential to operate subsidy free at the end of the ICC Contract term?**

**Q3. Does the business model as described in this document and accompanying updates published alongside this publication, create, risk the creation of, or through its approach unsuccessfully protect against the creation of, any perverse incentives for the creation of excess carbon?**

As set out below, if ICC funding is provided to Energy from Waste incineration projects that have not already been built or which will soon need refurbishment then there is a high risk that this would contribute to the creation / exacerbation of incineration overcapacity. This overcapacity could in turn be expected to impede the Government's goals to support waste minimisation and recycling and to deliver the lowest carbon treatment options for waste in the medium and long terms.

While the only way to completely de-risk such investments is to not provide any funding for CCS for waste incinerators, a practical measure that could be taken to reduce the risk is to limit investment to only newly built incinerators and to exclude older incinerators or plants that are not already built as those projects might otherwise, in the absence of CCS funding, not go forward or be decommissioned.

Allowing incinerators that might not otherwise have been rebuilt or refurbished to benefit from CCS funding support would risk any environmental gains that are hoped to be made from incineration CCS being overshadowed by environmental losses through material being lost to the circular economy, with recycling and waste minimisation being undermined due to incineration overcapacity. Such an outcome could result in the creation of excess carbon and could not possibly represent good value for money.

**Q8a. Included within the business model are proposals for the treatment of UK ETS Free Allowances. To what extent does the proposed treatment of Free Allowances within the business model operate effectively within the UK ETS framework (e.g. timelines, allocation processes etc)?**

It is important that UK ETS Free Allowances are not given to waste incinerators. It is already the case that the UK ETS would fail to cover the full adverse environmental impacts of incineration, and anything that further diminishes this would run counter to the 'Polluter Pays' principle.

## Section B: Waste ICC Contract

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**Q13. As explained in section 20 on the Waste ICC Contract impacts on waste hierarchy, we consider that the support proposed to be provided to waste management CCUS projects through the Waste ICC Contract is unlikely to create perverse incentives that undermine the waste hierarchy (for example, by creating perverse incentives to send waste that could have otherwise been used further up the waste hierarchy towards waste recovery processes such as EfW, ATT or ACT processes). Do you agree? If not, how do you consider that support provided through the Waste ICC Contract can mitigate this risk? Please set out any evidence behind your response.**

An unintended consequence of providing finance to CCS projects for EfW/ATT/ACT (i.e. waste incineration) is that it could result in increased incineration capacity, and therefore increased overcapacity.

The BEIS May 2021 Update on Business model for Industrial Capture stated:<sup>1</sup>

*"It is intended that support will only be provided to the most energy efficient waste management facilities (i.e. only those facilities with energy recovery included) and to plants that are existing or already fully committed to being established, so that this support does not encourage perverse outcomes such as incentivising the construction of new EfW facilities ahead of more environmentally friendly waste management methods." [emphasis added]*

The reality is that businesses and investors are increasingly being sceptical about investing in new waste incineration projects due to fears about feedstock security, and for good reason. This means that any form of 'Government backing' for projects that have not already been built runs the realistic risk of resulting in an incineration project going ahead when it might otherwise have been abandoned.

For example, the press release for PolicyConnect's *No Time to Waste* report, which was promoted by the waste incineration industry, noted how "*stronger policy signals from government*" could "*see UK energy from waste capacity increase*".<sup>2</sup> Providing new mechanisms for financial support towards new waste incinerators, even if it is only the CCS element of such proposals, could readily be interpreted and/or marketed as such a policy signal from Government that investment should be focussed at increasing incineration capacity.

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<sup>1</sup> <https://www.gov.uk/government/publications/carbon-capture-usage-and-storage-ccus-business-models>

<sup>2</sup> <https://www.fccenvironment.co.uk/wp-content/uploads/2020/07/EFW-news-release-FINAL-VERSION.pdf>

In May 2022 Tolvik warned that: *“Care is also required to ensure policy avoids driving additional (and probably unneeded) EfW capacity in those geographies with access to future CCS solutions”*.<sup>3</sup> [emphasis added]

Chris Preston, Defra's Deputy Director for Resources and Waste, told EFRACOM on the 10<sup>th</sup> of May 2022 that:<sup>4</sup>

*“We are looking to publish a waste infrastructure road map later this year, which will help us assess what capacity we need in order to deliver the recycling rates that we want to achieve, but also to look at the broader range of waste infrastructure that we have in England...We are really keen that waste treatment facilities lower down the waste hierarchy—energy from waste and landfill—do not drive waste away from being recycled or reduced in the first place.”*

It would be prudent to, at the very least, hold off providing any additional funding towards unbuilt incinerators until after the outcome of this assessment has been published.

We are aware that Defra is currently investigating the issue of incineration capacity up to 2035 within the context of the timeframe of packaging reforms.

However, when looking at incineration capacity it is important to consider what the level of residual waste will be in 2042 when the proposed halving of residual waste will have taken place as it would be counterproductive to allow new capacity to be built now when this new capacity would undermine or make more difficult the achievement of the proposed 2042 target (to halve residual waste sent to landfill or incineration relative to a 2019 base year).

On the 16<sup>th</sup> of March 2022 the UK Government announced a target for “halving the waste that ends up at landfill or incineration by 2042”.<sup>5</sup> The Government makes clear on pages 28–30 of their ‘Consultation on Environmental Targets’ document that reducing the incineration of waste is desirable, stating:

*“Tackling residual waste reduces the environmental impacts of treatment, including air, soil, and water pollution, and unnecessary energy use. It is more sustainable to prevent waste completely and, where waste is unavoidable, to recycle it...The proposed target can drive both waste minimisation and recycling of unavoidable waste...”*

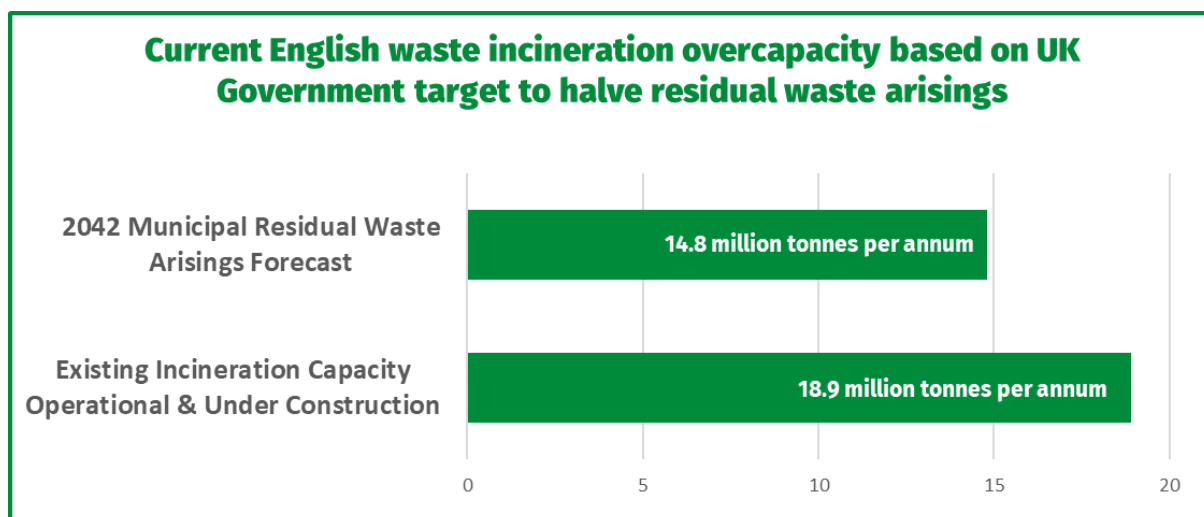
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<sup>3</sup> [https://www.tolvik.com/wp-content/uploads/2022/05/Tolvik-UK-EfW-Statistics-2021\\_Published-May-2022.pdf](https://www.tolvik.com/wp-content/uploads/2022/05/Tolvik-UK-EfW-Statistics-2021_Published-May-2022.pdf)

<sup>4</sup> <https://committees.parliament.uk/oralevidence/10190/html/>

<sup>5</sup> <https://www.gov.uk/government/news/delivering-on-the-environment-act-new-targets-announced-and-ambitious-plans-for-nature-recovery>

The significance of this target can be clearly seen by comparing national (English) capacity (existing and under construction) with anticipated municipal waste arisings:



As is apparent from the above chart, halving residual waste would reduce 'black bag waste' arisings to less than 15 million tonnes. Given that there is already around 19 million tonnes of English incineration capacity that is either operational or under construction, it is clear that no new incineration plants should be supported. The Annex below provides the full calculations and methodology.

In light of the above, the Government should cease providing any form of support for new incinerators so as to avoid sending a misleading market signal regarding the need for, and desirability of, such plants.

We know that incineration competes with recycling<sup>6</sup>, a point recently acknowledged by the Scottish Incineration Review which notes that:<sup>7</sup>

*“Lock-in is where the development of residual waste treatment infrastructure with a long operational life, such as incineration, limits the treatment of waste further up the hierarchy. This can come about nationally if more capacity is built than, over time, is needed as an economy moves towards a more circular model...*

*The Review received some stakeholder contributions that suggested there is a potential for lock-in effects, including examples where rising rates of incineration were accompanied by declining rates of recycling...*

*One evidence contribution provided the results of some unpublished analysis of English data showing the relationship between rates of incineration and rates of recycling over the past ten years (a period of significant growth in incineration capacity in England). For most combustible materials, this shows an inverse*

<sup>6</sup> [https://ukwin.org.uk/btb/BtB\\_Incineration\\_Harms\\_Recycling.pdf](https://ukwin.org.uk/btb/BtB_Incineration_Harms_Recycling.pdf)

<sup>7</sup> <https://www.gov.scot/publications/stop-sort-burn-bury-independent-review-role-incineration-waste-hierarchy-scotland>

*relationship (that is, recycling is dropping and incineration is growing) which might be an indication of the impact of lock-in.*

*...given the risks that incineration poses to human health and the environment, and the risk of lock-in, Scotland should not construct more capacity than it needs and only some of the currently planned capacity should be built...”*

The Government has made it clear that the top tiers of the Waste Hierarchy are superior to incineration, stating in their *Environment Act Targets Impact Analysis: Waste Reduction* (April 2022) that:<sup>8</sup>

- *“Government intervention will aim to divert waste **away from landfill and incineration.**”*
- *“Reducing the levels of waste being disposed of via these residual waste methods will lead to an **increase in the reuse, repair and remanufacture of materials** and move England’s waste system to a **more circular economy.**”*

When it comes to CCS and value for money, investing in the exacerbation of waste incineration overcapacity would offer poor value for money due its potential to come at the expense of recycling and waste minimisation, and furthermore funding CCS for new incinerators would not provide a very useful ‘proof of concept’.

It would not be for several years that new incinerators would be able to demonstrate the efficacy (or otherwise) of CCS. This means that, even if the technology was proven to be successful in capturing significant quantities of CO<sub>2</sub>, such ‘demonstrator projects’ would be unlikely to inform the design of new incineration projects at an early enough stage of development to benefit from this knowledge as by that point we can expect to have little or no demand for new incineration capacity to be built.

As such, if the Government does choose to go down the CCS route for incineration it would make more sense to focus on demonstrating the viability (or non-viability) of retrofitting CCS for the existing incinerators with the longest expected lifespans in the most appropriate locations.

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<sup>8</sup> <https://consult.defra.gov.uk/natural-environment-policy/consultation-on-environmental-targets/>

**Q14. What methodologies do you consider would be most appropriate to monitor the waste compositions and volumes being processed at waste management facilities receiving a Waste ICC Contract? The purpose of such monitoring would be to ensure that data is collected on waste composition and volumes to help monitor whether there is any unintended impact on these as a result of any support provided by Waste ICC Contracts. How frequently do you think any monitoring and reporting of waste compositions should occur? Please explain the rationale behind any methodologies you consider to be appropriate and the frequency of monitoring and reporting you consider to be most appropriate.**

As set out in more detail in our Good Practice Guidance for Assessing the GHG Impacts of Waste Incineration available from <https://ukwin.org.uk/files/pdf/UKWIN-2021-Good-Practice-Guidance-for-Assessing-the-GHG-Impacts-of-Waste%20Incineration.pdf> and our submission to the Scottish Incineration Review available from <https://ukwin.org.uk/files/pdf/UKWIN-Submission-to-Scottish-Incineration-Review-February-2022.pdf> a significant proportion of the current residual waste stream includes material that could be recycled, composted, or substituted.

Defra's August 2020 'Resources and Waste Strategy Monitoring and Evaluation Report' – available at <https://www.gov.uk/government/publications/resources-and-waste-strategy-for-england-monitoring-and-evaluation> - found that only 8% of England's residual waste from household sources was "*Difficult to Recycle or Substitute*", concluding that the majority of England's residual waste was readily recyclable.

According to Defra's Report:

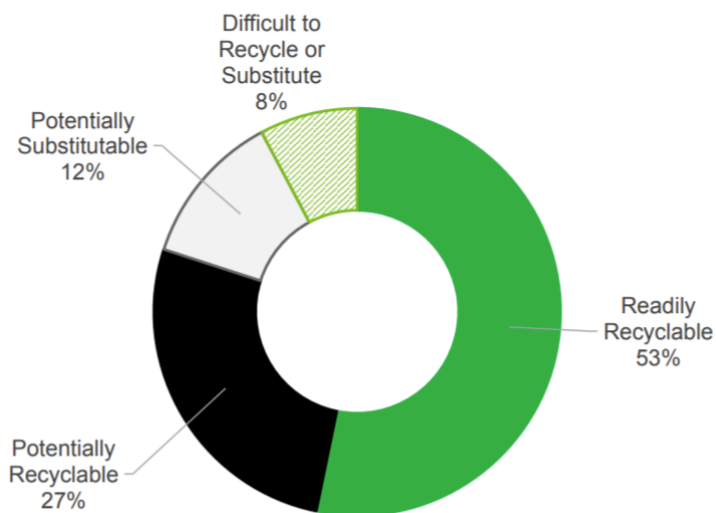
*"The large amount of avoidable residual waste and avoidable residual plastic waste generated by household sources each year suggests there remains substantial opportunity for increased recycling...The message from this assessment is that a substantial quantity of material appears to be going into the residual waste stream, where it could have at least been recycled or dealt with higher up the waste hierarchy."*

*"Of total residual waste from household sources in England in 2017, an estimated 53% could be categorised as readily recyclable, 27% as potentially recyclable, 12% as potentially substitutable and 8% as difficult to either recycle or substitute."*

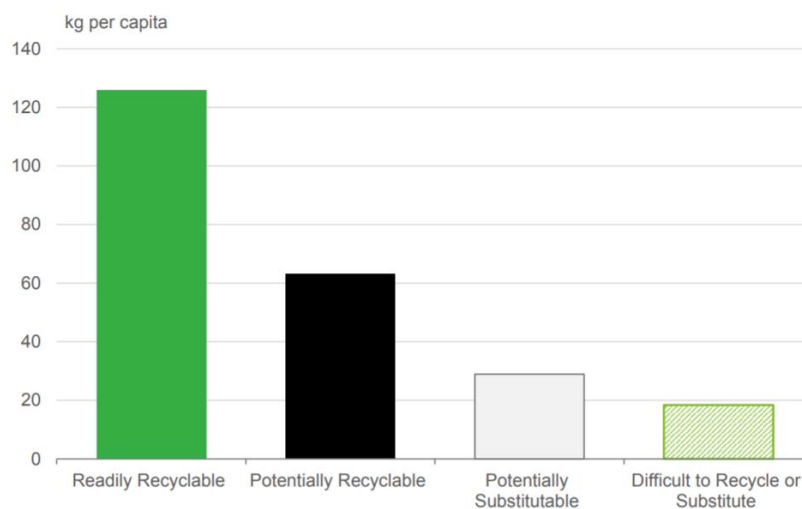
*"Of approximately 13.1 million tonnes of residual waste generated by household sources in England in 2017, around 7 million tonnes could be categorised as readily recyclable, 3.5 million tonnes as potentially recyclable, 1.6 million tonnes as potentially substitutable, and 1.0 million tonnes as difficult to recycle or substitute."*

*Charts from Defra's 2020 Resources and waste strategy monitoring report  
showing how much residual waste is considered avoidable*

**Chart 13. Avoidable residual waste from household sources, England, 2017, proportion of total residual waste, by category (WP2a)**



**Chart 15. Avoidable residual waste from household sources, England, 2017, kg per Capita (WP2c)**



It would be helpful if composition analysis could be carried out in a manner that allows for useful estimates of recyclability, compostability and substitutability be carried out in line with the approach taken to provide analysis for Defra's monitoring of the Resources & Waste Strategy.<sup>9</sup>

<sup>9</sup> <https://www.gov.uk/government/publications/resources-and-waste-strategy-for-england-monitoring-and-evaluation>



## Annex: Calculations for incineration overcapacity in England

### Basis for the 2042 Residual Waste Arisings Forecast for England

1. Start with the 27.8mtpa figure for municipal residual waste in 2016 set out on page 77 of the Government's Resources and Waste Strategy Evidence Annex.<sup>10</sup>
2. Halve this value to reflect the 2042 target, reducing it to 13.9mtpa.
3. Increase the value by 6.6% to take into account population growth, providing a resulting value of 14.8mpa.<sup>11</sup>

### Basis for the 18.9mtpa of existing incineration capacity existing and under construction

1. Start with the information on incinerators which are operational, in commissioning and under construction set out by Tolvik in UK Energy from Waste Statistics – 2020.
2. Update based on recent entries in the Government's Renewable Energy Planning Database (December 2021) and other sources.<sup>12</sup>
3. Separate capacity for unprocessed Municipal Solid Waste (MSW) from that for Refuse Derived Fuel (RDF) / Solid Recovered Fuel (SRF). Assume 50% split for facilities which take both feedstocks.
4. Increase the effective treatment capacity for RDF by 25% to account for dewatering as part of the RDF-generation process.<sup>13</sup>

Location	Facility	Operator	Status	Capacity (ktpa)
Halton	Runcorn	Viridor	Operational	1,238
Bexley	Riverside	Cory	Operational	785
Stockton-on-Tees	Tees Valley	Suez	Operational	756
Wakefield	Ferrybridge FM1	WTI	Operational	844
Wakefield	Ferrybridge FM2	WTI	Operational	844
Enfield	Edmonton	Council	Operational	620
Kent	Allington	FCC	Operational	560
Kent	Kemsley	WTI	Operational	688
Middlesborough	Wilton 11	Suez	Operational	500
Lewisham	SELCHP	Veolia	Operational	464
Slough	Lakeside	Lakeside	Operational	506

<sup>10</sup>

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/765915/rws-evidence-annex.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/765915/rws-evidence-annex.pdf)

<sup>11</sup> 6.6% increase in line ONS 2020-based interim national population projects for 2020-2045 as per <https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationprojections/bulletins/nationalpopulationprojections/2020basedinterim>

<sup>12</sup> <https://www.gov.uk/government/publications/renewable-energy-planning-database-monthly-extract> and <https://ukwin.org.uk/incinerators/>

<sup>13</sup> Tolvik has estimated moisture loss (reduction of mass) at MBT facilities in the UK to be on average around 20%, meaning incinerators in effect require around 1.25 times the quantity of source ('raw') waste relative to the headline incineration capacity (excluding material loss through recycling). The multiplication factor is based on the formula  $100 \div (100 - N)$  where N is the mass loss due to moisture loss.  $100 \div (100 - 20) = 100 \div 80 = 1.25$ . <https://www.tolvik.com/wp-content/uploads/2017/09/Tolvik-2017-Briefing-Report-Mechanical-Biological-Treatment.pdf>

<b>Birmingham</b>	Tyseley	Veolia	Operational	400
<b>S.Gloucestershire</b>	Sevenside	Suez	Operational	425
<b>Buckinghamshire</b>	Greatmoor	FCC	Operational	345
<b>Staffordshire</b>	Four Ashes	Veolia	Operational	340
<b>Oxfordshire</b>	Ardley	Viridor	Operational	326
<b>North Yorkshire</b>	Allerton Park	Amey	Operational	320
<b>Coventry</b>	Coventry	Council	Operational	315
<b>Croydon</b>	Beddington Lane	Viridor	Operational	347
<b>Bristol</b>	Avonmouth	Viridor	Operational	350
<b>Suffolk</b>	Great Blakenham	Suez	Operational	295
<b>Plymouth</b>	Devonport	MVV	Operational	265
<b>Sheffield</b>	Sheffield	Veolia	Operational	245
<b>East Sussex</b>	Newhaven	Veolia	Operational	242
<b>Cornwall</b>	Cornwall	Suez	Operational	240
<b>Worcestershire</b>	Hartlebury	Severn	Operational	230
<b>Southampton</b>	Marchwood	Veolia	Operational	220
<b>Portsmouth</b>	Portsmouth	Veolia	Operational	210
<b>Stoke-on-Trent</b>	Hanford	MESE	Operational	210
<b>Nottingham</b>	Eastcroft	FCC	Operational	200
<b>Lincolnshire</b>	North Hykeham	FCC	Operational	190
<b>Gloucestershire</b>	Javelin Park	UBB	Operational	190
<b>Leeds</b>	Leeds	Veolia	Operational	190
<b>Huddersfield</b>	Kirklees	Suez	Operational	150
<b>Gtr Manchester</b>	Bolton	Suez	Operational	120
<b>Wolverhampton</b>	Wolverhampton	MESE	Operational	118
<b>Hampshire</b>	Chineham	Veolia	Operational	110
<b>Dudley</b>	Dudley	MESE	Operational	105
<b>Shropshire</b>	Battlefield	Veolia	Operational	102
<b>Milton Keynes</b>	Milton Keynes ACT	Amey	Operational	118
<b>Hertfordshire</b>	Hoddesdon ACT	Bouygues	Operational	90
<b>Peterborough</b>	Peterborough	Viridor	Operational	85
<b>West Sussex</b>	Lancing	Enviropower	Operational	75
<b>Devon</b>	Exeter	Viridor	Operational	60
<b>NE Lincolnshire</b>	NewLincs	Tiru	Operational	56
<b>Hull</b>	Energy Works ACT	Engie	Operational	156
<b>C Bedfordshire</b>	Rookery South	Covanta/GIG	Operational	545
<b>Surrey</b>	Eco Park ACT	Suez	Operational	75
<b>Isle of Wight</b>	Isle of Wight	Amey	Operational	38
<b>Warwickshire</b>	Baddersley	Equitix	In Construction	125
<b>Merseyside</b>	Hooton Park ACT	BWSC/Cogen	In Construction	333
<b>Somerset</b>	Bridgwater	Equitix/Iona	In Construction	125
<b>Cheshire West</b>	Lostock	FCC	In Construction	600
<b>Leicestershire</b>	Newhurst	Biffa/Covanta/GIG	In Construction	350
<b>Derbyshire</b>	Drakelow ACT	Vital	In Construction	180
<b>Cheshire West</b>	Protos	Biffa/Covanta/GIG	In Construction	410
<b>Slough</b>	Slough	SSE/CIP	In Construction	480
<b>West Bromwich</b>	Kelvin	Enfinium	In Construction	395
<b>Total</b>				<b>18,899</b>