



Department
for Environment
Food & Rural Affairs

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Refuse derived fuel market in England

Summary of responses to the call for evidence

December 2014



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Any enquiries regarding this publication should be sent to us at

Residual Waste Team
Defra
Area 2B, Nobel House
17 Smith Square
London
SW1P 3JR

Introduction

The summary of responses sets out numbers of responses received, and the types of organisations who responded by sector, but does not attribute specific comments to individuals or organisations. It is organised by question.

47 responses were received to the call for evidence. 15 responses from waste management companies, 5 responses from businesses with an interest in RDF, 7 responses from trade associations and professional/ regulatory bodies, 2 responses from processors and exporters of RDF, 7 responses from consultants/ advisers, 7 responses from Government/ Local Authority bodies, 2 responses from educational establishments and 2 responses from other respondents (an individual and a lobby group).

Question 1 A): What evidence do you have on how fully the production and use of RDF respects the waste hierarchy?

Who responded?

35 responses. 13 waste management companies, 6 consultants, 5 businesses with an interest, 4 trade associations and professional/ regulatory bodies, 3 Government/ LA bodies, 2 RDF processors/ exporters, and 2 other respondents

How they responded

Waste management companies (13 responses)

The majority of respondents were of the view that the production and use of RDF fully respects the waste hierarchy. Two respondents raised concerns about poor quality RDF being exported that failed to respect the waste hierarchy.

Consultants (6 responses)

Respondents were of the view that the production and use of RDF respects the hierarchy, provided that as many recyclates as possible are removed.

Businesses with an interest (5 responses)

Respondents noted that the RDF exported under the transfrontier shipments process had to comply with the waste hierarchy as this was a requirement.

Trade associations and professional/ regulatory bodies (4 responses)

3 respondents stated that RDF production respects the waste hierarchy but this depends on the quality of the RDF produced and the end user. One professional/ regulatory body noted that some end users of RDF now extract recyclates just before incineration.

Government/ LA bodies (3 responses)

Respondents noted that RDF production respects the waste hierarchy by diverting waste from landfill and offsetting fossil fuels that would have been burnt to generate the energy.

RDF Processor/ user (2 responses)

The respondents noted that high quality RDF is produced with the waste hierarchy in mind.

Other respondents (2 responses)

Respondents stated that burning RDF in inefficient plants undermines the waste hierarchy and the use of RDF reduces the scope for recycling and re-use.

Question 1 B): What evidence do you have that there are beneficial environmental outcomes relative to alternative waste management routes for RDF?

Who responded?

33 responses. 15 waste management companies, 5 consultants, 4 businesses with an interest, 3 trade associations and professional/ regulatory bodies, 2 RDF processors/ exporters, 2 Government/ LA bodies and 2 other respondents.

How they responded

Waste management companies (15 responses)

Several respondents stated that the RDF is produced from waste that would probably otherwise have gone to landfill. RDF is generally exported to plants abroad that produce heat and electricity, which is better than burning the waste in electricity only plants. Burning RDF offsets the use of fossil fuels in energy production.

Some respondents stated there are no beneficial environmental outcomes, particularly when RDF comes from commercial & industrial waste where fewer recyclates tend to be extracted. Effective collection of landfill gas and green investment through landfill taxes means there is little difference in carbon footprint between landfill and RDF production.

Consultants (5 responses)

Two respondents referred to studies showing that high quality RDF provides benefits in terms of environmental performance. Another respondent stated that transporting RDF to facilities abroad increases its carbon footprint.

Businesses with an interest (4 responses)

Respondents stated that exporting RDF to the continent for energy recovery is preferable to landfill.

Trade Associations and professional/ regulatory bodies (3 responses)

Two waste trade associations stated that that RDF is better than landfill in terms of the environment, especially when used in cement manufacture. One professional/ regulatory body noted that exporting RDF to plants abroad generally provides more efficient energy recovery as the heat generated is often used in heat networks. However, the export of RDF represents a lost contribution to the UK's national renewable energy portfolio.

RDF Processor/ user (2 responses)

Both respondents noted that the use of RDF was preferable to landfill as it offsets fossil fuel use in energy production.

Government/ LA Bodies (2 responses)

One respondent stated that it is environmentally preferable to export RDF to high performing facilities abroad. However, another respondent stated that export of RDF increases the UK's reliance on gas imports for electricity production.

Other respondents (1 response)

The respondent stated that recycling is better than energy from waste in carbon terms for paper, card and plastics and that anaerobic digestion is more effective than incineration for food waste.

Question 1 C): What evidence do you have on the need for some form of Government intervention in the RDF market?

Who responded?

36 responses. 14 waste management companies, 6 consultants, 5 trade associations and professional/ regulatory bodies, 4 Government/ LA bodies, 3 businesses with an interest, 2 RDF processors/ users and 2 other respondents.

How they responded

Waste management companies (14 responses)

13 respondents supported some form of intervention with 8 respondents calling for more robust enforcement to address storage issues, the abandoning of RDF and poor quality RDF. They called for a shorter timeframe for the Authorities to investigate and address illegal activity. One respondent did not support any form of Government intervention as this would interfere with the free flow of goods and services between Member States.

Consultants (6 responses)

6 respondents supported some form of Government intervention in order to improve the quality of RDF, address storage issues and address price volatility resulting from an emerging market. One respondent called for RDF exports to cease by 1 January 2020 in order to encourage investment in UK infrastructure.

Trade associations and professional/ regulatory bodies (5 responses)

Waste trade associations called for the Government to tighten up permitting requirements, address storage issues and combat illegal activity. They called for a formal definition for RDF and the introduction of a financial guarantee/ insurance. RDF production should also be linked with an end-user to prevent abandoning of waste. The professional/ regulatory body called for incentives to ensure that valuable material remains in the UK although a few of its members felt that any form of intervention was unnecessary.

Government/ LA Bodies (4 responses)

Respondents supported some degree of Government intervention to address the storage and quality of RDF and illegal activity.

Businesses with an interest (3 responses)

Respondents called for more robust enforcement and monitoring using permitting as a basis. They also called for operators to be educated on the dynamics of exporting RDF and the introduction of a requirement for an operator to demonstrate an outlet for the RDF before production.

RDF Processor/ users (2 responses)

One respondent felt that intervention is unnecessary as RDF production responds to a market need. The other called for a standard for burning material and recommended an increase in landfill tax to drive more waste out of landfill and increase potential feedstocks.

Other respondents (2 responses)

Respondents called for the Government to pursue policies that encourage a circular economy and penalise residual waste production. Government intervention is needed to tackle fires and the apparent lack of effective regulation.

Question 2 : What evidence and assumptions should we use in considering any action in relation to - i) the level of processing done prior to exporting RDF?

Who responded?

27 responses. 12 waste management companies, 5 consultants, 3 trade associations and professional/ regulatory bodies, 2 Government/ LA bodies, 2 RDF processors/ users, 2 business with an interest and 1 other respondent.

How they responded

Waste management companies (12 responses)

The majority of respondents noted that end-user specifications determine the level of processing. EU plants require fuel that needs relatively little processing and works most effectively at calorific values above 10MJ/kg. Particle size and moisture levels vary.

Consultants (5 responses)

Respondents noted that the level of processing was determined by the end-user.

Trade Associations and professional/ regulatory bodies (3 responses)

One trade association noted that in their experience both RDF for export and for domestic use undergo the same levels of processing.

Government Bodies/ LA Bodies (2 responses)

Respondents stated that any standard should require the operator to demonstrate how the waste has changed to become a fuel. A compositional standard for RDF would not sit easily with the range of end-user specifications.

RDF Processors and users (2 responses)

One respondent stated that in their experience all waste is treated to the same environmental standards irrespective of destination.

Businesses with an interest (2 responses)

One respondent noted that the UK has not adopted some of the more advanced treatment practices that exist on the continent.

Other respondents (1 response)

The respondent noted that the level of processing is dependent on consumer demand.

Question 2 : What evidence and assumptions should we use in considering any action in relation to- ii) the waste streams and codes being put into RDF?

Who responded?

22 responses. 11 waste management companies, 4 consultants, 3 trade associations and professional/ regulatory bodies, 2 Government/ LA bodies and 2 RDF processors/ users.

How they responded

Waste management companies (11 responses)

Four respondents noted that RDF can be made from any mixed municipal waste and commercial & industrial waste provided that materials are non-hazardous and suitable for energy recovery.

Consultants (4 responses)

One respondent stated that RDF should include only those materials for which it is environmentally the best management option. Another respondent called for mandatory electronic reporting of waste going into RDF to ensure robust data capture. A third respondent thought it likely that commercial & industrial waste will increasingly be used for RDF production.

Trade Associations and professional/ regulatory bodies (3 responses)

Two trade associations noted that the cement industry requires waste with a high calorific value content. One professional/ regulatory body noted that waste codes 20 03 01, 19 12 12 and 19 12 10 are present in RDF.

Government/ LA bodies (2 responses)

One respondent noted that any materials suitable for energy from waste can be used for RDF production.

RDF Processors/ Users (2 responses)

Both respondents stated that RDF could be produced mainly from commercial & industrial waste

Question 2 : What evidence and assumptions should we use in considering any action in relation to – iii) the number of facilities and the total amount of RDF produced?

Who responded?

19 responses. 11 waste management companies, 3 consultants, 2 Government/ LA bodies, 1 trade association and professional/ regulatory body, 1 business with an interest and 1 other respondent.

How they responded

Waste management companies (11 responses)

Three respondents noted that the economic benefits of exporting RDF has stimulated RDF production but the cost of equipment keeps the volume of production in check. One respondent noted that most RDF is produced at former waste transfer stations and smaller volumes are produced by dirty mixed recovery facilities (MRFs) and microbiological treatment (MBT) facilities. Volumes of RDF produced match outlet capacity.

Consultants (3 responses)

Two respondents noted the difficulties with providing accurate data on the number of facilities and the total amount of RDF produced.

Government/ LA bodies (2 responses)

One respondent noted that data on commercial & industrial waste is difficult to obtain.

Trade associations and professional/ regulatory bodies (1 response)

The respondent noted that no official data on RDF production is available.

Business with an interest (1 response)

The respondent called for more commercial & industrial data to be available.

Other respondents (1 response)

The respondent noted that some 4 kilo tonnes of microbiological treatment capacity is available for RDF whilst more than 1,028 kilotonnes per annum of cement kiln capacity is dedicated to RDF.

Question 2 : What evidence and assumptions should we use in considering any action in relation to – iv) the causes of recyclates entering the stream, the cost implications and how this might be addressed?

Who responded?

27 responses. 12 waste management companies, 5 consultants, 3 trade associations and professional/ regulatory bodies, 2 Government/ LA bodies, 2 RDF processors/ exporters, 2 other respondents and 1 business with an interest.

How they responded

Waste management companies (12 responses)

Nine respondents noted that the commercial & industrial waste sector is largely driven by economics while municipal waste is influenced by other factors e.g. EU targets. Many operators are reluctant to invest in technology to remove additional recyclates due to cost, meaning that RDF plants often have limited processing capabilities. Recyclates may also enter the RDF stream because they are contaminated. Operators might be reluctant to remove recyclates that would reduce the calorific value of the RDF and affect compliance with the end-users' specifications.

Some respondents called for increased segregation of recyclates during collection. The re-screening of waste at the RDF production facility could reduce the amount of recyclates in RDF. Other solutions could be more legislation, greater incentives for recycling and improved packaging design.

Consultants (5 responses)

Respondents stated that it was sometimes impractical or uneconomic to segregate recyclates at collection. Contaminated recyclates may be rejected from the recycling process and enter the residual waste stream. One respondent called for a tax on waste that contains a significant proportion of recyclates either at the point of use or export.

Trade Associations and professional/ regulatory bodies (3 responses)

Both respondents felt that a lack of segregation upstream explained the presence of recyclates in RDF and called for mandatory separate collections of recyclable waste. The professional/ regulatory body thought that the new segregated collection Regulations within England and Wales from 1 January 2015 should help address this.

Government/ LA bodies (2 responses)

The respondents called for improved collection practices for recyclates. Commercial & industrial waste is often shredded and baled with minimal sorting.

RDF Users/ Producers (2 responses)

Respondents noted that the scales of recycling operations make it inevitable that a fraction of recyclable material will enter the residual stream. Once this happens, it is often not worth extracting them as they are of low value.

Other (2 responses)

The respondents called for the Government to provide more support to Local Authorities to address the lack of segregated collection of recyclates.

Businesses with an interest (1 response)

The respondent noted that where RDF is a by-product of the production of 'fines' for landfilling, the quantity of recyclates in the RDF is of little concern.

Question 2 : What evidence and assumptions should we use in considering any action in relation to – v) the content of exported RDF?

Who responded?

20 responses. 9 waste management companies, 6 consultants, 2 RDF processors/exporters, 1 Government/ LA body, 1 business with an interest and 1 other.

How they responded

Waste management companies (9 responses)

Respondents noted that the content of exported RDF depends on end-user specifications, which specify composition, calorific value, shred size, moisture content, chlorine content and biogenic content. Four respondents noted that biogenic content varies according to feedstock and location but is generally between 50% and 60%.

Consultants (6 responses)

Respondents noted that composition and calorific value depend on the requirements of the end-user. The biogenic content of the RDF depends on the ratio of paper, card, food waste and plastic. RDF for export varies seasonally, between different routes of collection and demographics.

RDF User/ processor (2 responses)

One respondent noted that in their experience approximately 75% of the constituent material of RDF is paper or plastic based packaging that is not economical to extract. There is little biogenic content due to odour and liquid spillages.

Government/ LA bodies (1 response)

The respondent noted that end users had their own preferences for the composition, calorific value and biogenic content of RDF.

Other (1 response)

The respondent noted that the content of RDF for export is based on the end-user requirements. Where a higher calorific value is required, the RDF is likely to contain greater amounts of plastics, paper and card.

Business with an interest (1 response)

The respondent noted that plants in the Netherlands have technology to extract paper and plastics from the RDF received. The UK does not tend to have this technology.

Question 2 : What evidence and assumptions should we use in considering any action in relation to – vi) the reason for the difference between notified the amounts of RDF notified and exported?

Who responded?

22 responses. 11 waste management companies, 4 consultants, 2 Government/ LA bodies, 2 RDF processors/ exporters, 1 trade association and professional/ regulatory body, 1 business with an interest and 1 other respondent.

How they responded

Waste management companies (11 responses)

The majority of respondents noted that when applying for notifications, operators tend to state the maximum amount of tonnage they could potentially ship to give them more commercial flexibility. A further respondent stated that many RDF producers will cover exports to more than one outlet when applying for notifications to minimise commercial risk but are likely to only export to one outlet. Other reasons include the RDF being of insufficient quality to be exported, failure of a contract, and illegal activity where the RDF is abandoned rather than exported.

Consultants (4 responses)

The respondents stated the difference is caused by the lengthy application process for obtaining a notification and the associated costs. Operators apply for notifications in advance and are uncertain of the quantities they will actually produce. They overestimate production to give themselves flexibility.

Government/ Local Authority bodies (2 responses)

Respondents noted that operators give themselves flexibility when stating estimated exports in their notifications. Unscrupulous operators may apply for a notification in order to appear legitimate but then abandon the RDF having only exported a fraction of the quantities they applied for.

RDF Producers/ Users (1 response)

The respondent noted that operators apply for a larger quantity for export in order to cover all eventualities. A change in economic circumstances e.g. an increase to the gate fee at the destination plant could result in exports not going ahead.

Trade Associations and professional/ regulatory bodies (1 response)

The respondent noted that operators may apply for extra quantities in case there is a problem with their preferred export route. Unscrupulous activity could also explain the difference.

Businesses with an interest (1 response)

The respondent noted that an operator may have two notifications in place with one being a contingency in case there are problems with supplying RDF to the primary facility. If there are no problems at the primary facility, the second licence will remain unused.

Other respondents (1 response)

The respondent noted that the difference could result from the RDF produced not being exported to the end user because it is unsuitable or of poor quality.

Question 2 : What evidence and assumptions should we use in considering any action in relation to – vii) the main users of higher quality fuel on the domestic market?

Who responded?

15 responses. 9 waste management companies, 2 Government/ LA bodies, 2 RDF processors/ exporters, 1 business with an interest and 1 other respondent.

How they responded

Waste management companies (9 responses)

All respondents noted that there was a limited domestic market for RDF. Five respondents felt there will be a potential market for highly processed RDF as advanced conversion technologies are developed

Government/ LA bodies (2 responses)

The respondents noted there are very few users of RDF on the domestic market. However, if there was spare energy from waste capacity available in domestic plants, it is unlikely that operators would produce RDF to fill this.

RDF Processor/ User (2 responses)

The respondents were unaware of any significant domestic users of RDF.

Business with an interest (1 response)

The respondent was not aware of any availability for RDF on the domestic market.

Other (1 response)

The respondent noted that the cement industry uses higher quality RDF in its cement kilns.

Question 2 : What evidence and assumptions should we use in considering any action in relation to – viii) how the composition of waste/ RDF are changing over time?

Who responded?

17 responses. 9 waste management companies, 3 consultants, 2 Government/ LA bodies, 2 RDF processors/ exporters and 1 other respondent.

How they responded

Waste management companies (9 responses)

A number of respondents stated that greater extraction of recyclates and food waste would change RDF composition over time, especially municipal waste. Improved kerbside collection and source segregated municipal collections should improve the quality of RDF over time. More recycling at source is likely to increase the moisture and organic content of residual waste and lower the recyclable content. Changing packaging and material preferences are also likely to change the overall composition of waste. The commercial & industrial waste stream is likely to decrease in volume, contain fewer organics and recyclates and be drier.

Consultants (3 responses)

Respondents noted that there was likely to be less biogenic waste in RDF and a reduction in high calorific value materials.

Government/ LA bodies (2 responses)

Respondents noted that changing market values for commodities and separate collections for recyclates would influence the composition of the residual waste stream from commercial & industrial sources. The composition of RDF derived from municipal waste is linked to measures that affect the composition of waste e.g. the Packaging Directive and these would have an impact.

RDF Processors/ users (2 responses)

The respondents stated that greater clarity on which waste materials can be used as a fuel would create more certainty for waste users and result in greater investment.

Other respondents (1 response)

The respondent stated that changes to the composition of RDF will depend on the source of the residual waste. Where composting and anaerobic digestion is well established the proportion of non biogenic elements in RDF are likely to increase.

Question 2 : What evidence and assumptions should we use in considering any action in relation to – ix) the reason for storing large quantities of RDF for long periods, the impact on quality and how this could be prevented?

Who responded?

24 responses. 13 waste management companies, 4 consultants, 3 Government/ LA bodies, 2 RDF processors/ exporters, 1 trade association and professional / regulatory body and 1 other respondent.

How they responded

Waste management companies (13 responses)

Respondents stated that operators may store or stockpile RDF until there is sufficient quantity to make a shipment economically viable, because of delays in the transfrontier shipments process or where RDF has been produced on a speculative basis and the operator is awaiting favourable market conditions for export. Storage or stockpiling might also arise from the failure of a contract, variation in seasonal demand or through illegal activity where RDF is abandoned.

Problems associated with storage include deterioration of the plastic wrapping affecting the structure of the bale and causing problems with transportation. The stock itself might start to degrade resulting in odour, pests and leaching. The degree of degradation depends on the organic content and the quality of the bale and wrapping. Several respondents stated that improved regulation could address storage issues with a time limit imposed on storage. The Environmental Permitting Standards could be used as a basis for this. There were suggestions that storage should only be permitted in controlled environments or where the purpose is to act as a buffer for a particular plant

Consultants (4 responses)

Respondents noted that an operator might store RDF for commercial reasons, as a result of seasonal variance or planned or unplanned shutdown of the end-user facility. Much RDF is stored as a result of speculative activity. Two respondents noted that long term storage causes odour and leaching and associated environmental impacts. The issue could be addressed by storing RDF undercover.

Government/ LA bodies (3 responses)

Two respondents noted that municipal waste was less likely to be stored than commercial & industrial waste. Some small operators produce RDF on a speculative basis that involves storage of RDF pending suitable export market conditions.

Respondents noted that the quality of RDF in storage will depend on its composition. Baled material with high organic content can self-combust and poses a potential fire risk. Licenses for RDF storage sites should include conditions on containment, handling and physical infrastructure .

RDF Producers/ Users (2 responses)

Two respondents saw no genuine business case for RDF storage beyond holding it at a quay-side awaiting a vessel. It should be a requirement that exporters are clear from the outset about the end destination for the waste.

Trade Associations and professional/ regulatory bodies (1 response)

The respondent stated that persistent stockpiling of RDF could indicate a poor operation. Legitimate reasons for stockpiling might include an operator building up enough stock to export a shipload of RDF, a response to a problem with the end-user or variations in overseas demand for RDF.

Other respondent (1 response)

The respondent stated that storage or stockpiling resulted from the speculative production of RDF or customers wishing to maintain 'buffer' stocks. RDF storage should only be permitted for very limited periods and only with strict conditions.

Question 2 : What evidence and assumptions should we use in considering any action in relation to – x) the extent to which policy changes and actions are likely to affect the production, composition and marketing of RDF?

Who responded?

20 responses. 10 waste management companies, 4 consultants, 2 Government/ LA bodies, 2 RDF processors/ exporters, 1 trade association and professional/ regulatory body, and 1 other respondent.

How they responded

Waste management companies (10 responses)

Respondents noted that the landfill tax escalator has encouraged more recyclates to be removed from the residual waste stream. The Code of Practice for Material Recycling Facilities is also likely to have an impact on RDF production. The introduction of the Producer Responsibility Note, which allows materials to be increasingly drawn from RDF processing facilities, has also had an influence. RDF production is likely to be influenced by stricter recycling targets.

Consultants (4 responses)

Respondents noted greater efforts to re-use and recycle waste should reduce the amount of material available for RDF production. The assessment of the quality of co-mingled waste might have an impact on RDF production as would the outcome of the EU review of waste regulation and targets.

Government/ LA bodies (2 responses)

Respondents stated that landfill tax has encouraged recyclable material to be removed from the residual waste stream whilst the Packaging Directive will also have an impact.

RDF Processor/ User (2 responses)

Respondents noted that actions to improve the quantity and quality of recycling are likely to have an impact.

Trade Associations and professional/ regulatory bodies (1 response)

The respondent noted that the proposals in the Welsh Government's White Paper for an Environment Bill for Wales could have an impact on outlets for RDF across the UK.

Other respondent (1 response)

The respondent stated that composition of RDF will be affected by policy changes in England and EC Directives on recycling and recovery.

Question 2 : What evidence and assumptions should we use in considering any action in relation to – xi) the composition and quality of RDF from commercial & industrial waste and need for action in this area

Who responded?

19 responses. 11 waste management companies, 3 consultants, 2 Government/ LA bodies, 2 RDF processors/ exporters, 1 trade association and professional/ regulatory body.

How they responded

Waste management companies (11 responses)

A number of respondents noted that commercial & industrial waste generally contains more recyclates than municipal waste. There are fewer incentives to divert materials from commercial & industrial sources into recycling. Respondents called for businesses to be required to separate as much waste as possible for recycling. There should also be a more structured approach to the gathering of commercial & industrial waste data. Four respondents noted that commercial & industrial waste tends to be drier than municipal waste with a higher calorific value, a smaller proportion of biological material and a higher packaging waste content.

Consultants (3 responses)

Respondents noted that commercial & industrial waste is often used to produce solid recovered fuel as it generally has less contamination and a higher calorific value than municipal waste.

Government/ LA bodies (2 responses)

Respondents noted that commercial & industrial waste is likely to contain more recyclates.

RDF Processor/ User (2 responses)

The respondents noted that RDF produced from commercial & industrial waste is generally of better quality because it generally contains less organic/liquid contamination. One respondent stated that there was no reason for any particular action in this area.

Trade associations and professional/ regulatory bodies (1 response)

A trade association noted that some of its members felt that the quality of RDF from composition of commercial & industrial waste is homogenous. Other members felt that more should be done to remove valuable recycle.

Question 2 : What evidence and assumptions should we use in considering any action in relation to – xii) sources of data on RDF

Who responded?

11 responses. 7 waste management companies, 2 Government/ LA bodies, 1 consultant and 1 RDF processor/ exporter.

How they responded

Waste management companies (7 responses)

Respondents noted that the Environment Agency could provide data on export licences and tonnage commitments. They called for the Environment agency to have an open book register of RDF shipments as exists in some other European Member States. International data could be obtained from other European Competent Authorities and the European Environment Agency. Alternatively, data could be obtained directly from producers or plant operators.

Government/ LA bodies (2 responses)

Respondents noted that WasteDataFlow provides some detail on municipal derived RDF tonnages and end use. There is very little information on commercial & industrial data but the Environment Agency would be the best source for any data that does exist.

Consultant (1 response)

The respondent stated that the Government should be responsible for the production of quantitative data and a mandatory system of electronic reporting should be implemented.

RDF Processor/ User (1 response)

The respondent stated that the Environment Agency holds the data.

Question 3 A): What specifications are domestic and foreign buyers of RDF putting on its quality and composition?

Who responded?

28 responses. 14 waste management companies, 5 consultants, 4 trade associations and professional/ regulatory bodies, 2 Government/ LA bodies, 2 RDF processors/ exporters and 1 business with an interest.

How they responded

Waste management companies (14 responses)

7 respondents noted that the specification usually includes a minimum and maximum calorific value, a shred size of approximately 300mm, and a maximum moisture and chlorine content. Most European plants require RDF that is as close as possible to untreated municipal waste. Advanced conversion technology plants prefer smaller particle sizes, lower moisture content and higher calorific value.

Consultants (5 responses)

All respondents noted that the specifications depend on end user technology type and may include dust content. A calorific value of between 8 and 12 MJ/ tonne is preferable. End-users abroad tend to have lower requirements than domestic users but have additional requirements in the form of bale size, density and wrap quality.

Trade Associations and professional/ regulatory bodies (4 responses)

One respondent noted that foreign buyers are becoming less tolerant of 'lower' quality materials. The professional/ regulatory body noted that some foreign buyers require RDF that is of a low calorific value, which they then blend with local municipal waste

Government/ LA bodies (2 responses)

One respondent noted that specifications are based on calorific value, moisture content, chlorine content and mercury content.

RDF Processor/ User (2 responses)

One respondent noted that plants in Scandinavia have high specifications for RDF. This contrasts with many other plants on the continent where specifications are relatively low.

Business with an interest (1 response)

The respondent noted that RDF is produced with a calorific value averaging between 8 and 11 Mj/kg. The value never exceeds 12.5 Mj/kg. The particle size must be within the boundaries for bailing.

Question 3 B): Do you have any experience of the export of RDF affecting availability of RDF on the domestic market?

Who responded?

30 responses. 15 waste management companies, 5 consultants, 3 businesses with an interest, 3 trade associations and professional/ regulatory bodies, 2 RDF processors/ exporters, 1 Government/ LA body and 1 other respondent.

How they responded

Waste management companies (15 responses)

The majority of respondents did not think that exports of RDF are directly affecting the domestic market. It was more influenced by a lack of capacity/ demand, the cost of investment and confidence in the energy and renewable incentives markets. Two respondents thought that RDF will migrate back to the UK as competitive thermal treatment and advanced technologies become available. Four respondents felt that RDF exports are directly affecting RDF availability on the domestic market and hampered its development. One respondent noted that that some public procurement contracts actively encourage exports of RDF while planning restrictions hamper development.

Consultants (5 responses)

Two respondents stated that RDF exports had not affected the availability of RDF on the domestic market as the market is so small. However, competition with the export market could make the financing of domestic merchant energy from waste facilities more difficult. One consultant called for a tax to be introduced on RDF export that contains significant amounts of plastics or other recyclates.

Businesses with an interest (3 responses)

Two respondents were of the view that the export of RDF is not the cause of problems in the domestic market. The UK market lacks outlet capacity for residual waste and exports of RDF are simply a solution to the problem. However, two respondents were of the view that RDF exports do have an impact on the domestic market as facilities are unable to compete with the lower gate fees abroad and this undermines investor confidence.

Trade Associations and professional/ regulatory bodies (3 responses)

The respondent noted that economic drivers ultimately determine the final destination for RDF. Some countries in Europe are actively seeking feedstocks and offer a lower gate fee. This impacts on the ability of domestic investors to raise debt finance and demonstrate 'bankability'. The second respondent noted that changes to policies, new regulation or intervention could result in exports being less competitive. The professional/ regulatory

body noted that the UK market is affected by a lack of capacity and planning restrictions. However, when more UK capacity comes online, it is likely that RDF producers will supply these facilities due to ease of transport.

RDF Processor/ User (2 responses)

One respondent noted that enough material still goes to landfill to supply both the domestic and the export RDF markets.

Government/ LA bodies (1 response)

The respondent called for domestic energy from waste plants to increase their scale and efficiency in order to attract the waste that is currently exported as RDF

Other respondent (1 response)

The respondent was not aware that exports of RDF are having an impact on the availability of RDF on the domestic market.

Question 4A): Can you provide evidence on the reasons for the production of RDF with no end user?

Who responded?

28 responses. 12 waste management companies, 6 consultants, 3 businesses with an interest, 3 trade associations and professional/ regulatory bodies, 2 Government/ LA bodies, 1 RDF processor/ exporter and 1 other respondent.

How they responded

Waste Management Companies (12 responses)

Several respondents were of the view that such production resulted from either market speculation or illegal activity. One respondent noted there are financial incentives (potential earnings of £10 - £60 per tonne) for operators to produce RDF for money and then abandon it before having to pay for export. Two respondents stated that pressure to divert waste from landfill and landfill tax encouraged operators to switch to RDF production before they have entered into agreement with an end-user. A further respondent noted that some RDF producers may unwittingly produce a fuel for which an end-user cannot be found because it is unsuitable for both mass burn plants in Northern Europe and specialist domestic plants.

Several respondents saw no justification for producing RDF with no end user and called for the regulatory authorities to address this. However, one respondent stated that it should be permissible to produce RDF in advance of a contract being agreed, provided that the RDF remains on a permitted site until arrangements with an end-user have been finalised.

Consultants (6 responses)

Two respondents noted that there might be cases where a producer genuinely fails to find an end-user for their RDF. However, some operators deliberately produce RDF on a speculative basis in order to maximise profit. Two respondents called for it to be a condition of permit that an operator has an end-user contract/ transfrontier shipment notification in place before they can produce RDF.

Businesses with an interest (3 responses)

The respondents stated that an operator may fail to meet an end-user specification due to technical problems and store the product until an end market is found. This should be addressed by targeted enforcement that does not burden legitimate operations.

Trade Associations and professional/ regulatory bodies (3 respondents)

Both trade associations that responded referred to unscrupulous operators that obtain a transfrontier shipments notification at the dockside while far larger amounts of material are stockpiled abandoned at an alternative 'processing' site where no pre-determined

destination is sought. The public purse has to pick up the clean-up costs. The professional/regulatory body noted that RDF could end up with no end-user as a result of a ship leaving with a part load as the remaining RDF was not supplied in time or the original buyer terminating a contract due to oversupply.

Government/ LA bodies (2 responses)

One respondent noted that the practice should generally be counted as a waste crime with certain exceptions. The second respondent noted that speculative production of RDF tended to involve waste from commercial & industrial sources produced by small scale, less scrupulous operators.

RDF Processor/ exporter (1 response)

The respondent stated that there is no legitimate reason for producing RDF without an end outlet.

Other (1 response)

The respondent stated that RDF should not be produced where it has no realistic prospect of finding an end user.

Question 4B): What evidence do you have on the amounts of RDF being stockpiled and the quality of this RDF?

Who responded?

23 responses. 11 waste management companies, 3 consultants, 3 Government/ LA bodies, 3 businesses with an interest, 2 RDF processors/ exporters, and 1 other respondent.

How they responded

Waste management companies (11 responses)

Respondents pointed to evidence of warehouse fires in and bales of 'RDF' being abandoned in fields in designed to resemble straw bales. Three waste management companies stated that precise figures were not available but there could be several millions of tonnes being stored illegally.

Consultants (3 responses)

Respondents noted that stockpiling of RDF arose in countries where landfill bans were implemented and alternative treatment was being developed, such as in Austria.

Government/ LA bodies (3 responses)

One respondent stated that the spate of recent long-running fires at sites producing or storing RDF provide evidence of problems with storage.

Businesses with an interest (3 responses)

One respondent referred to photographic evidence of RDF stored at an airfield. A second respondent had encountered stockpiles of material filled with dry recyclables, with an estimated calorific value of around 15-17 Mj/kg.

RDF Processor/ User (2 responses)

Respondents noted that large amounts of waste without a clear destination are being stored for long periods. The RDF does not move extensively or frequently.

Other respondents (1 response)

The respondent stated that the incidence of fires within stored RDF suggests that substantial quantities are being stored but precise tonnages are unknown.

Question 5): Can you provide evidence on possible options for intervention in the RDF market?

Who responded?

28 responses. 11 waste management companies, 4 consultants, 4 businesses with an interest, 4 trade associations and professional/ regulatory bodies, 2 Government/ LA bodies, 2 RDF processors/ exporters and 1 other respondent.

How they responded

Waste Management Companies (11 responses)

A number of waste management called for regulatory enforcement to be tightened up to address production, storage and export with a focus on poor operations. Financial guarantees should be introduced to cover potential clean-up costs and producers should be required to produce to a specific end user. Three respondents specifically called for the introduction of minimum standards for the production of RDF. A clearer definition of RDF would also benefit waste management operators and regulators. Other respondents called for the withdrawal of all unused transfrontier shipments permits, intervention to encourage advanced conversion technology or heat recovery, taxation on the storage of RDF for export and for UK authorities to allow residual municipal solid waste to cross borders without treatment.

Two respondents were less supportive of Government intervention, noting that the RDF market was working and provided cost effective residual waste outlets for many small businesses and Local Authorities.

Consultants (4 responses)

Respondents called for tighter enforcement to address the RDF issues and the introduction of a minimum processing requirement and a definition for RDF. One respondent called for an export ban on RDF to be introduced from 1 January 2020 and for landfill tax to continue to rise by £8 per tonne until 1 April 2016 as this would increase potential stocks for RDF and drive investment in domestic infrastructure. A further respondent called for the 'recovery (R1)' criterion to be tightened so that only facilities with high levels of energy efficiency could receive waste from the UK.

Trade Associations and professional/ regulatory bodies (4 responses)

Respondents stated that intervention should encourage the UK to grow its own circular economy. Waste management companies should have a duty of care to demonstrate that they have fully considered the waste hierarchy and export is the best practicable

environmental option. There were calls for additional permitting requirements for RDF production and export. Both trade associations and the professional/ regulatory body called for a definition of RDF with minimum treatment standards. The professional and regulatory body also called for more political and financial support to ensure that RDF remains in the UK with more data on commercial & industrial waste. There also needed to be intervention to encourage the greater use of heat networks.

Businesses with an interest (4 responses)

One respondent called for a ban on exports of RDF whilst another called for the Government to provide minimum gate fee guarantees at a level designed to underpin debt finance for new infrastructure. Respondents also called for more robust regulatory enforcement , including storage standards for RDF with a maximum storage period, tighter Duty of Care obligations, greater waste carrier and shipping controls and the enforcement of the Landfill Tax (Qualifying Materials) regulations 2011 in full. A further respondent called for RDF to be categorised in order to provide greater industry clarity.

Government/ LA bodies (2 responses)

One respondent did not think that intervention was necessary. The other respondent called for the introduction of treatment standards, time limited permits for the storage of RDF, increased levels of regulatory inspection and a greater focus on commercial & industrial waste.

RDF Producers & Users (2 responses)

Respondents called for a minimum standard of processing to be introduced along with benchmark environmental standards and binding EU Member State landfill reduction targets from 2020.

Other respondents (1 response)

The respondent called for RDF exports to be taxed and more incentives to encourage recycling. There should also be a stricter sorting of waste at source.

Question 6): Do you have any evidence which would suggest potential intervention in the market could lead to perverse outcomes?

Who responded?

25 responses. 11 waste management companies, 5 consultants, 3 trade associations and professional/ regulatory bodies, 2 businesses with an interest, 2 Government/ LA bodies and 2 RDF processors/ exporters.

How they responded

Waste management companies (11 responses)

3 respondents stated that restrictions on RDF exports and/ or a standard for RDF could restrict the amount of waste going into RDF, which could perversely result in more waste being deposited in landfill. Some respondents raised concerns that a domestic compositional standard for RDF could result in the production of RDF for which no end market exists because it does not comply with end-user specifications. It might also increase the incidence of stockpiling of RDF if operators had to await the results of compositional analysis before the RDF could be exported. A standard might not necessarily address unscrupulous practices but increase production costs and burdens for legitimate operators. There is also a risk that importing countries could mount a challenge to the UK if the standard affected the principles of the free market. However, three respondents did not think there would be any perverse outcomes if the intervention was well thought out and developed with stakeholders.

Consultants (5 responses)

Three respondents stated that introducing a requirement to remove all recyclates from the RDF waste stream could result in contaminated recyclates, which have no market value, entering landfill. The introduction of a standard for RDF could increase production costs for all RDF operators whilst doing little to address unscrupulous activity.

Trade Associations and professional/ regulatory bodies (3 responses)

Respondents called for intervention not to undermine legitimate export activity and place additional burdens on operators. A domestic standard for RDF could impede transfrontier shipments and the EU market for RDF. The professional/ regulatory body was concerned that a standard could interfere with operators' ability to meet end-user specifications.

Business with an interest (2 responses)

Both respondents noted that imposing restrictions on export could limit the waste management options available to businesses in the UK and increase gate fees at UK incinerators.

Government/ LA bodies (2 responses)

One respondent stated that limiting exports would result in more RDF with no end-user being produced. Countries that import RDF might challenge the UK's interpretation of the Waste Framework Directive or the obstruction of free trade within the EU.

RDF processors/ exporters (2 responses)

Respondents stated that restricting exports of RDF or the materials permitted in RDF could lead to an increase in landfill. It could also affect the fuel mix and impact negatively on the RDF market.

Question 7A): Can you provide evidence that shows that some form of standard would address the issues around RDF production and use?

Who responded?

29 responses. 12 waste management companies, 6 consultants, 3 trade associations and professional/ regulatory bodies, 3 businesses with an interest, 2 Government/ LA bodies, 2 RDF processors/ exporters and 1 other respondent.

How they responded

Waste management companies (12 responses)

Several respondents saw no need for the introduction of a standard. Reasons included concerns that a standard would interfere with the calorific value of RDF and current end-user specifications.

A number of respondents did not support the introduction of prescriptive quality standards for RDF content as current end-user specifications made this unnecessary. Three respondents called for the authorities to check that RDF producers are producing against these end-user specifications rather than introduce a new standard.

Three respondents called for a clearer definition of RDF whilst a standard would encourage investment in the sector, and improve the quality and consistency of RDF.

Consultants (6 responses)

Four respondents supported the introduction of a management/ treatment standard for the production of RDF. There were calls for the standard to recognise the importance of RDF export markets in the medium term, support domestic advanced conversion treatment and to include different gradings for RDF. One respondent commented that a standard would not address illegal activity in the RDF market.

Trade Associations and professional/ regulatory bodies (3 responses)

One respondent supported a processing standard for RDF but opposed a prescriptive compositional standard as this would interfere with end-user specifications and risked being inflexible under changing market conditions. Another respondent called for a measure that ensures uniformity in quality expectations along the lines of CEN Standard EN 15359 that exists for solid recovered fuel. The professional/ regulatory body noted that a standard would promote RDF as a valuable asset whilst a definition could help stabilise the costs of legitimate RDF production.

Businesses with an interest (3 responses)

Two respondents did not support the introduction of a standard. Another respondent opposed a compositional standard but called for a minimum treatment standard.

Government/ LA bodies (2 responses)

1 respondent stated that introducing a standard would conflict with end-user specifications for RDF. The second respondent noted that any standard introduced would need to consider the original waste characteristics and set out the degree of change that is required.

RDF Processors/ exporters (2 responses)

Both respondents supported the introduction of a treatment standard that incorporates environmental standards.

Other respondents (1 response)

The respondent called for a standard relating to the storage of RDF.

Question 7B): ...if so, can you provide evidence on how any standard might be applied and what should be included?

Who responded?

19 responses. 8 waste management companies, 3 consultants, 3 businesses with an interest, 2 trade association and professional/ regulatory bodies, 2 Government/ LA bodies, 2 RDF processors/ exporters and 1 other respondent.

How they responded

Waste management companies (7 responses)

Three respondents stated that existing standards (such as the CEN standard for solid recovered fuels) or the environmental permit could be used as a basis. Two respondents suggested possible technical specifications for a standard including the size of shred and the removal of metal and glass.

Consultants (3 responses)

Two consultants suggested basing a standard on existing standards.

Businesses with an interest (3 responses)

Respondents stated that any standard should ensure that the waste hierarchy is properly applied. RDF might be categorised in a similar way to the WRAP classification scheme.

Trade associations and professional/ regulatory bodies (2 responses)

The respondent was of the view that Defra should adopt existing standards or it could be based on industry best practice. The professional/ regulatory body called for a standard to limit the amount of biodegradable content and recyclates.

Government/ LA bodies (2 responses)

Respondents stated that a compositional standard must cover calorific value and moisture content and the degree of change required for the waste to be classed as RDF.

RDF Processors/ exporters (2 responses)

One respondent suggested that a benchmark could be introduced that limited harmful emissions getting into the atmosphere. Another respondent suggested linking the transfrontier shipments process with any treatment standard introduced.

Other respondents (1 response)

The respondent called for standards to address 'spontaneous' combustion.

Question 8): What evidence do you have on suitable intervention measures for addressing the issues regarding the stockpiling of RDF?

Who responded?

22 responses. 11 waste management companies, 2 consultants, 3 trade associations and professional/ regulatory bodies, 2 businesses with an interest, 2 Government/ LA bodies and 2 RDF processors/ exporters

How they responded

Waste management companies (11 responses)

Seven respondents called for permits to limit the volumes of RDF stored and the duration of storage. There should be stricter waste management licences for all sites handling waste and current exemptions for storing RDF should be ended. Two respondents stated that RDF production should not be permitted unless off take agreements and shipping contracts are in place before the RDF is produced. A further respondent noted that stockpiling should only be allowed at a dock or facility with a suitable waste management permit. Four respondents called for an insurance bond/ financial guarantee to be put in place to cover the removal and disposal of RDF in the event that RDF is abandoned.

A further respondent suggested relaxing the transfrontier shipments requirements for participants that have demonstrated a good record of compliance.

Consultants (2 responses)

Two respondents stated that the permitting system could address storage issues and suggested allowing a maximum period of 5 days for storage.

Trade associations and professional/ regulatory bodies (3 responses)

The trade associations that responded called for the introduction of a financial guarantee requirement and a maximum storage period to be specified in permits to address stockpiling of RDF beyond relatively short periods. The professional/ regulatory body called for RDF storage at docks to be limited unless the producer can demonstrate a viable contract with a foreign buyer.

.Businesses with an interest (2 responses)

One of the respondents called for permits to include a limit on stock volumes allowed in storage. The second respondent called for improving industry awareness on environmental issues associated with RDF through education.

Government/ LA bodies (2 responses)

One respondent called for improved waste management licences to be introduced for all sites handling waste. The second respondent stated that stockpiling could be tackled through a standard, setting time limits for exporting RDF and introducing permits for storage. The authorities should have greater powers to prosecute operators.

RDF Processors/ Exporters (2 responses)

Respondents stated permits should not allow the stockpiling of RDF and the authorities should require operators to demonstrate an end market for the RDF before production commences.

Question 9): What evidence do you have on different approaches to delivering an intervention and the implications for delivery via that route?

Who responded?

23 responses. 11 waste management companies, 4 consultants, 3 businesses with an interest, 2 Government/ LA bodies, 1 RDF processor/ exporter, 1 professional/ regulatory body and 1 other respondent.

How they responded

Waste management companies (11 responses)

Some respondents called for guidance to ensure that all operators adopt a consistent approach. Several respondents called for increased site inspections on a risk basis. One respondent called for the export of untreated mixed municipal waste to be permitted through sites that have the appropriate waste management licence.

Consultants (4 responses)

Respondents called for guidance or legislation although there was a risk that unscrupulous operators would simply ignore this while other operators faced additional burdens.

Businesses with an interest (3 responses)

Respondents called for RDF producers to have an end-user contract in place before production commences. A standard would need to be enforced robustly whilst any moves to limit exports could raise domestic gate fees and increase costs for operators.

Government/ LA bodies (2 responses)

Respondents were concerned that a compositional standard could result in additional sampling requirements for producers and enforcement burdens for the authorities.

RDF Processor/ exporter (1 response)

The respondent called for new binding landfill targets for EU Member States to increase potential feedstocks for RDF

Trade association and professional/ regulatory bodies (1 response)

The trade association that responded called for the capabilities of the enforcement authorities to be considered for any type of intervention. Enforcement may be better on a

national basis in order to prevent inconsistencies between enforcement at the local level. Operators would need to be given a clear steer on their obligations, possibly through easy to access guidance.

Other respondent (1 response)

The respondent noted that the costs of intervention to improve RDF quality and address storage issues could exceed the environmental benefits generated.

Question 10A): Do you have any evidence to suggest you might be subject to additional burdens or costs if a standard for RDF or other intervention was implemented?

Who responded?

21 responses. 12 waste management companies, 4 consultants, 2 trade associations, 1 Government/ LA body, 1 RDF processor/ exporter and 1 business with an interest

How they responded

Waste management companies (12 responses)

Several respondents stated that there should be no additional burdens for businesses that are already compliant with the permit requirements and produce a good quality RDF. Five respondents felt that the introduction of a prescriptive compositional standard for RDF would place additional cost burdens on RDF producers. A further respondent noted that small businesses would face additional costs if they were forced to use domestic disposal facilities; RDF production and export kept costs lower.

Consultants (4 responses)

Two respondents were of the view that operators who produce good quality RDF should not face additional costs from any additional standards.

Trade Associations and professional/ regulatory bodies (2 responses)

Respondents stated that a standard would add burden to operators in terms of meeting the standard and record keeping. Less scrupulous operators would ignore the standard.

Government/ LA bodies (1 response)

The respondent noted that a compositional standard could result in significant additional burdens to operators and authorities.

RDF Processors/ exporters (1 response)

The respondent did not think there would be excessive additional burdens for RDF processors if a treatment standard was introduced.

Business with an interest (1 response)

The respondent stated that burdens on business would not be too severe provided any standard did not mandate a specification outside of their treatment capacity. Additional taxation could force operators to pull out of the market.

Question 10B): Do you have evidence of any specific burdens or costs that small and medium enterprises (SMEs) might face?

Who responded?

22 responses. 10 waste management companies, 6 consultants, 2 trade associations, 2 businesses with an interest, 1 Government/ LA body and 1 RDF processor/ exporter

How they responded

Waste management companies (10 responses)

6 respondents were of the view that SMEs would face higher costs through the need to undertake additional monitoring and analysis, invest in infrastructure, and carry out increased administration. These were likely to be passed on to waste producers. Three respondents did not think that SMEs would be affected by additional costs. SMEs charge the same prices as larger organisations and generally have a smaller cost base.

Consultants (6 responses)

Three respondents stated that SMEs would face additional costs but one respondent stated that the bulk of non-compliance generally lies with smaller operators. Two respondents were of the view that SMEs would be no more adversely affected than other businesses.

Trade Associations and professional/ regulatory bodies (2 responses)

Both respondents were of the view that the same regulatory standards should be applied to all operators, regardless of their size. RDF operators should have sufficient competence to meet the requirements and minimise impacts on the environment and to human health.

Business with an interest (2 responses)

One respondent stated that SMEs would not face additional burdens. Another respondent stated that for many SMEs, export is the only affordable current alternative to landfill and limiting this could add to their burdens.

Government/ LA bodies (1 response)

The respondent stated that any requirements for sampling and demonstration of compliance with duty of care could increase costs to SMEs.

RDF Processor/ exporter (1 response)

The respondent stated it was unlikely that SMEs would face any more burdens than other types of enterprise.

Annex A

Who is included in each sector category?

Waste management companies and waste brokers in this document refers to Associated Waste Management Ltd, Remondis Waste Solutions Ltd, Hills Waste Solutions Ltd, Shanks Waste Management Limited, Cory Environmental, Greenway Waste Recycling Ltd, SITA UK Limited, Biffa Waste Services Ltd, FCC Environment, AmeyCespa, Veolia Environmental Services, Viridor, New Earth, N + P Recycling Group and the waste broker Combineering A/S.

Business with an interest in RDF in this document refers to Energos Investments Ltd, Attero (Netherlands), Wheelabrator Technologies, SSE and Air Products

Trade associations and professional/ regulatory bodies in this document refers to Gafta, Dutch Waste Management Association, Mineral Products Association, Environmental Services Association, Renewable Energy Association, Trading Standards Institute and The Chartered Institution of Wastes Management

Processors and exporters of RDF in this document refers to Andusia Recovered Fuels Ltd and CEMEX UK Operations

Consultants/ Advisers in this document refers to Waste Transition Limited and LRS Consultancy, Babcock & Wilcox Volund, Impetus Waste Management, South East Waste Planning Advisory Group and the East of England Waste Technical Advisory Body, UK Environmental Law Association, Eunomia Research & Consulting Ltd and Biocentre Technology Ltd

Government/ LA bodies in this document refers to Public Health England, Mayor of London, City of Westminster, Greater Manchester Waste Disposal Authority, Merseyside Recycling and Waste Authority, North London Waste Authority and Hampshire County Council

Educational establishments in this document refers to Energy Research Centre of the Netherlands and Teeside University,

“others” refers to the “United Kingdom Without Incineration Network” and a member of the public.

Annex B

Summary of quantitative/ empirical evidence

The information provided in this Annex does not represent any conclusions or recommendations from Defra. This Annex does not provide analysis or quality assurance of the data provided in response to the call for evidence on refuse derived fuel (RDF).

The evidence summarised below represents a sub-set of the overall empirical data provided in responses. This sub-set was selected on the basis that the data overviewed had been provided by more than one respondent and referred to the same parameters. Information referring to individual companies, sites or Local Authority arrangements is excluded for both confidentiality and commercial sensitivity reasons.

Evidence not included here has still been considered within the government's response to the call for evidence. Annex I provides a list of published reports referenced within responses.

RDF Specifications

1. A number of respondents provided details of the specifications for RDF produced or set by end-users. The range of figures provided for calorific value, moisture content, particle size and maximum percentages of specific chemicals are summarised below.

Fuel type	Calorific Value (Mj/kg)	Moisture content (%)	Chlorine content (%)	Mercury content (mg/kg)	Size (shred/particle) (mm)
Low grade RDF	<10 to max 20	<20 to max 30	<0.94% to max 2% Or <4% of all halogens	<0.05 to max 3.00	<300
High grade RDF	11 - 15	<12.5 to max 20%	<1%	<0.05 to max 3.00	<30
SRF/cement/lime kiln fuels	>15 - 20	<12.5 to max 20%	<0.5% of all halogens	<1.00	<50 and <5 - in one dimension – <80 in all dimensions

Table 1.0: Range of specifications provided for refuse derived fuel

Element	Maximum chemical content
S	<0.2 – 1 %
As	<10 mg/kg – 20 mg/kg
Be	<1 mg/kg – 40 mg/kg
Cd	<8 mg/kg – 50 mg/kg
Co	<6 mg/kg – 20 mg/kg
Cr	<120 mg/kg – 400 mg/kg
Cu	<400 mg/kg – 1250 mg/kg
Mn	<100 mg/kg – 800 mg/kg
Ni	<50 mg/kg – 400 mg/kg
Pb	<100 mg/kg – 1000 mg/kg
Sb	<30 mg/kg – 120 mg/kg
Se	<3 mg/kg – 5 mg/kg
Sn	<56 mg/kg – 400 mg/kg
Te	<3 mg/kg – 5 mg/kg
Tl	<0.6 mg/kg – 40 mg/kg
V	<5 mg/kg – 40 mg/kg

Table 2.0: Range of maximum chemical content provided for refuse derived fuel

Composition of RDF

2. A number of respondents submitted material composition analysis of RDF produced, the range of figures provided is detailed in table 3.0, below.

Material composition % (wt/wt)	
Paper	10-40
Plastics	10-40
Food	0-15
Wood	0-20
Textile	0-20
Metals	0-4
Glass	2-3
Fines	2-7
Other	2-20

Table 3.0: Range of composition provided for refuse derived fuel

Fires at RDF production/ storage sites

3. Public Health England (PHE) provided a summary of notifications with respect to fire incidents at RDF storage/production facilities between November 2010 and April 2014. There were 8 fires, with RDF quantities ranging from 500 tonnes to 20,000 tonnes. Burn duration ranged from a few days to approximately 6 weeks. Concerns had been raised with respect to the impact on public health of combustion products and 4 incidents had necessitated invoking national air quality monitoring procedures.

4. One respondent provided details of a written parliamentary answer that showed there had been an average of 355 fires at waste management facilities per year between 2001 and 2012. The number of these that would be classified as RDF facilities was not specified.

Other impacts of RDF processing/ storage

5. PHE provided further details of issues arising due to the production/storage of RDF at 5 different RDF storage sites. The maximum amount of RDF stored was 50-70,000 tonnes. Issues included dust, nuisance and health concerns.

RDF Market

6. Respondents' estimates of RDF exports in the calendar year 2013 ranged from 1.5 – 1.6 million tonnes, increasing to over 2 million tonnes when considering the period from 1 April 2013 – 31 March 2014. The range of comparable cost estimates for 2013 of the impact of exports on the UK economy, provided within respondents' analysis, is summarised in table 4.0, below.

Loss of UK business revenue	Loss of UK waste derived power	Loss of Gate Fees/tax revenue
£100 million	974 – 1,200 GW/h Power for 280,000 – 312,000 homes	£120 – 130 million

Table 4.0: Costs of RDF export provided by respondents

Appendix I – Reports referenced in responses

1. Eunomia bi-annual residual waste infrastructure review.
(<http://www.eunomia.co.uk/services/waste-recycling/treatment/rwir/>)
2. Visser H.J.M. 2013. RDF from plastic recycling as fuel and feedstock. 14th International Waste Management and Landfill Symposium, Sardinia 30 September - 4 October 2013
3. 'Energy Recovery for Residual Waste – A carbon based modelling approach'; Defra 2014
4. <http://www.zerowastescotland.org.uk/content/carbon-metric-technical-report-2013-0>
5. 'Wealth from waste'; The LGA local waste review 2013
6. 'Resource Security Action Plan: Making the most of valuable materials'; BIS 2012
7. Reference:
http://standards.cen.eu/dyn/www/f?p=204:32:0:::FSP_ORG_ID,FSP_LANG_ID:407430,25&cs=1E692895E0FA13AE68B9FA01D5A630ED7
8. 'Design and quality assurance for solid recovered fuel', *Karl E Lorber, Renato Sarc and Alexia Aldrian*; Waste Management & Research 30(4) 370–380
9. 'Economics of Waste and Waste Policy'; Defra 2011
10. 'Rammevilkar for energigjenvinning'; THEMA Rapport 2014-17; ISBN 978-82-93150-55-8)
11. 'Waste Crime – Tackling Britain's Dirty Secret'; Environmental Services Association Education Trust
12. Preventing fires at waste sites. August 2013.
<http://www.360environmental.co.uk/documents/EA%20Guidance.pdf>
13. Reducing fire risk at sites storing combustible materials: Technical Guidance Note (TGN7.01). 2013.
http://www.ciwm.org.uk/web/FILES/EA_Docs/TGN_7.01_Reducing_Waste_Fire_Risk_301013.pdf
14. 'Environmental analysis of processing British household waste in the Netherlands'; Delft, CE Delft; February 2012
15. MPA Cement Greenhouse Gas Strategy 2013
http://cement.mineralproducts.org/documents/MPA_Cement_2050_Strategy.pdf

16. 'Compensation for the indirect costs of the Carbon Price Floor and EU Emissions Trading Scheme (ETS)'; Call for Evidence, BIS; March 2012
17. 'A Classification Scheme to Define the Quality of Waste Derived Fuels'; WRAP http://www.wrap.org.uk/sites/files/wrap/WDF_Classification_6P%20pdf.pdf
18. Reference: <http://webarchive.nationalarchives.gov.uk/20140328084622/https://publications.environmentagency.gov.uk/ms/C7xJLZ>
19. 'Mind the Gap'; SITA UK
20. 'Research into SRF and RDF Exports to Other EU Countries'; CIWM
21. Reference: <http://www.epa.ie/pubs/advice/waste/municipalwaste/EPA%20viewpoint%20on%20EWC%20codes%20from%20WTS%20Oct%202012.pdf>
22. Alaim Grtenhuis; CIWM Journal; January 2014, pages 40-41