

# **Hospitality Food and Drink Waste Hierarchy**

## **Explanatory Paper re. Food Waste Management (including Fat, Oil and Greases)**

### **Overview**

**The evolution of the Hospitality Food Waste and Fats, Oils and Grease Hierarchy is in response to the need for a focused representation of what is practical for the hospitality sector as a whole whilst meeting UK Government objectives.**

It has been designed so that it is relevant to every foodservice site in the UK based on current activity and best practice. It recognises the need to refuse, reduce, reuse, repurpose and recycle – the 'Five R's' (in that order). Use of the Hierarchy means that no waste becomes landfill. The only way that waste can escape the hierarchy is if it is co-mingled with other waste streams (cardboard, electrical equipment, glass, plastics etc.) which have their own specific requirements. Comingling waste is unacceptable and must be prevented.

As a result of the use of the hierarchy, more to food waste and FOG will be collected or processed, as more foodservice sites (Annex 1) will use it than currently is the case. It builds on the established Food and Drink Hierarchy (see Annex 2) used in Europe and the UK, to give a defined approach to the specification and selection of the appropriate technology to meet the needs of Government collection objectives, and the foodservice site.

In this document the installation; the management of the systems; and equipment use by sites is linked to Target, Measure, Act objectives (WRAP). This is underpinned by, and recognises the need for adherence to the 5 R's.

The Hierarchy has been developed through extensive discussion and collaboration with key stakeholders, including government, enforcement authorities, operators, kitchen designers and consultants, equipment manufacturers, project managers and contractors.

Whilst it is dealt with under a separate hierarchy, Fats, Oil and Grease (FOG) is considered as food waste for the purposes of its management, as stated by a DEFRA official.

Further input is welcomed and the hierarchy can be amended and adjusted over time in line with policy needs. A 'one size fits all approach' of kerbside collection to support Anaerobic Digestion cannot work in all foodservice sites, nor does the rural /urban differentiation to support this.

The implementation of a granular approach provides greater penetration across foodservice sites with an authoritative and relevant food waste management programme that the industry supply chain can adopt. This relevance can maximise the effective management of food waste

whilst preventing ANY waste from being subject to inappropriate treatment. Food waste would only escape the reporting or management requirements if there was operator abuse.

### **About the Author**

The Foodservice Equipment Association has been influential in this important area over many years. This has been with European & UK policy, standards and operational levels. The FEA membership includes the leading equipment providers who have considerable practical experience and knowledge relating to food waste and FOG management.

This document and the development of the Hierarchy has been in collaboration with other key stakeholders such as industry consultants, kitchen designers, non-governmental organisations, policy makers, equipment companies, operator organisations.

FEA is an inclusive organisation and wishes to be a proactive partner in the development of effective legislation in order to achieve net zero carbon by 2050. The foodservice sector is only three kitchens away from this key point in time, given that the average lifetime of a commercial kitchen is 10 years. FEA is committed to supporting the transition to net-zero 2050 in terms of energy, water and waste management for the foodservice sector, as one of the strategy objectives.

In relation to food waste – the application of the Hierarchy should apply to all sites at the same time. The location, size and customer footfall of a group operated site and an independent site are similar, as is their food waste types and volumes. They co-exist together across the UK, as the photograph below shows:



It follows then that if the food waste output is similar, then the responsibilities to manage food waste effectively are the same regardless of the site ownership status.

This paper should be read in conjunction with respective annexes.

### **Understanding the Foodservice Operator Market – Annex 1**

The context of the foodservice operator market is important to understanding the need for a relevant approach to food waste management.

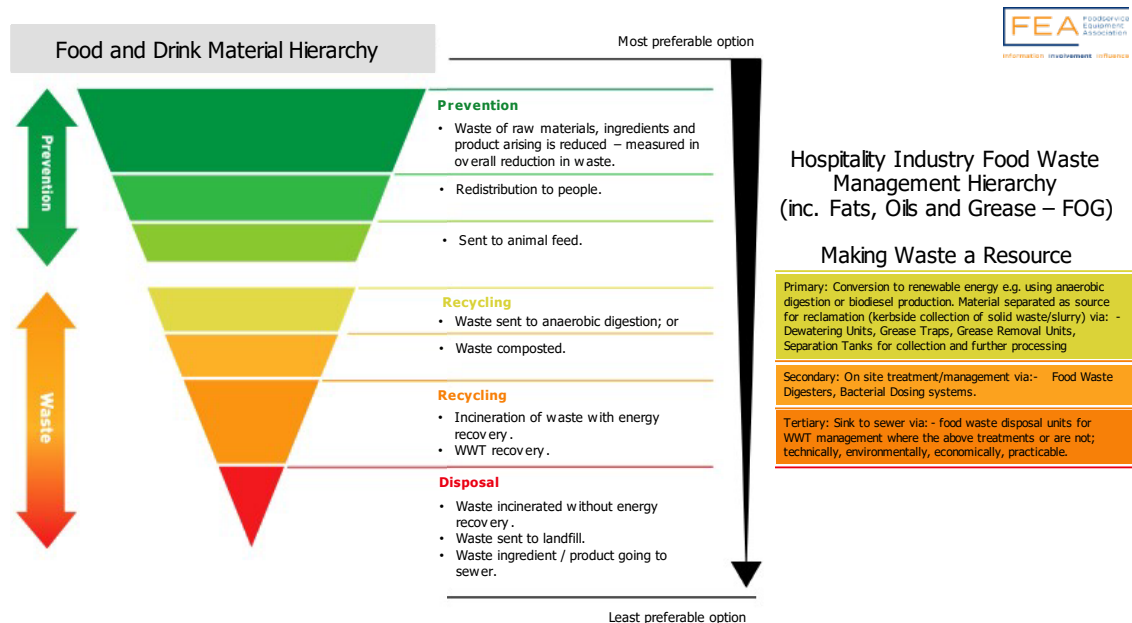
The market comprises two key sectors:

**Primary Foodservice:** Hotels, Fine Dining Restaurants, Quick Service Restaurants (Fast Food), Leisure (Sports Stadia, Theme Parks Cinemas), Retail (Supermarkets, Department Stores, Pubs & Bars).

**Secondary Foodservice:** Central and Local Government, Military, Healthcare & Hospitals, Education (Schools, Universities, Colleges), Prisons, Staff Canteens, Restaurants.

The sectors and the sites types have different operating drivers associated with them and they also have differing constraints and opportunities relating to their abilities to manage food waste and FOG. This is further complicated by the fact that 60% of the overall market of 427,000 outlets is independently operated with contract catering spanning the two operating sectors.

## The need for a Hospitality Hierarchy – Annex 2



A universally defined Hierarchy will maximise food waste management and the effectiveness of policy because it can apply to EVERY site in the UK. This will be with the solution that is operationally, fiscally and sustainably achievable against an agreed criteria. The prescribed Hierarchy achieves separation at source and maximises the value of the waste at every stage of the process.

The only way in which food waste can escape the Hierarchy is if it is co-mingled with other waste. This requires operators staff training to prevent. The proposed Hierarchy uses equipment technologies which ensure separation at source thereby preventing co-mingling which compromises the food waste stream and the other waste stream(s) with which it has been co-mingled; meaning that it is likely to enter landfill or require costly intervention. Further intervention is against the legislation principles and unacceptable in the context of this paper.

The Hierarchy also draws on the Target, Measure, Act principles which demonstrate to operators an understanding of volume, type and source of waste in order that it can reduce or better manage its approach to the issue.

The methods of treatment and management must be part of the reporting requirement as per the technologies in the Hierarchy. This will allow policy makers to futureproof management methods based on objective reporting of data which is relevant to current practices. This will allow policy to be adjusted as required to meet agreed targets whilst ensuring that future technology or product innovation in managing food waste can be incorporated when required.

This reporting and alignment will mean that the Hierarchy can futureproof the policy and operational aspects of food waste management for years to come.

### **UK national perspective**

There is a need to harmonise the implementation of a definitive food waste hierarchy across the whole of the UK in order that operators are able to implement the same agreed principles in each country or region in which they operate. This can be achieved by having a UK national set of operating principles for site evaluation.

The development of a hospitality specific hierarchy for foodservice may also mean that it could also be used internationally in line with Sustainable Development Goals.

The Hierarchy recognises the primary objective to capture and use the value of the food waste to provide feedstock for Anaerobic Digestion (AD).

### **Parameters for evaluation.**

Existing requirements have been incorporated into the Hierarchy to ensure alignment, relevance and practicality of use.

The Primary Evaluation ensures that food waste is considered for use in AD via kerbside collection. Only when this opportunity has been exhausted through the use of a decision tree approach can it be considered for other management solutions. This ensures that the current regulatory frameworks and policy objectives are met.

## **Practicalities associated with storage and management food waste. (Annex 3)**

### **The Primary Evaluation - Technical Practicalities**

THIS SECTION EXPLORES THE CRITERIA FOR EVALUATING THE SUITABILITY OF COLLECTION, FOR USE IN ANAEROBIC DIGESTION.

#### **– Volume related**

It has been identified that there is a gap in the existing Food and Drink Waste Hierarchy, the operation of the hospitality industry, and the enforcement of principles in EA RPS 229.

<https://www.gov.uk/government/publications/treating-food-waste-where-the-food-was-served-and-consumed-rps-229/treating-food-waste-where-the-food-was-served-and-consumed-rps-229>

The Hospitality Food Waste Hierarchy ensures that these gaps are covered. For example RPS 229 comes into force for up to 20 tonnes of food waste production per day. This figure relates more to centralised food processing industries than it does for foodservice operators.

The estimated volume of food waste from spoilage, food preparation and customer waste is as follows:-

- Fine Dining Restaurants - 0.5 kg per meal serviced
- Other restaurants 0.125kg - 0.25 kg per meal served

We cannot foresee that any food service operator come close to producing 20 tonnes per day. Up to that point sites should be required to use the Hierarchy so that this gap is filled with a defined approach to its management,

Where food waste is produced it can be dewatered to reduce mass and volume, meaning that it becomes a more manageable volume for the operator to be able to send it to AD, via kerbside collection. This is a means of enabling more sites to be able to meet the kerbside collection need if they do not have the physical capabilities to store larger volumes of food waste.

## Equipment and systems which support the primary evaluation for managing the volume of food waste:-

### Dewaterers

These reduce the mass volume by squeezing water from the food waste.

## Dewaterers

- Located adjacent to the kitchen
- Self contained
- Separation at source
- Centrifuge or Archimedes screw versions
- Dewatered is 80% less weight and is easier to store/manage/handle
- Output can be used in composting or AD

Cost c. £9k-£22k



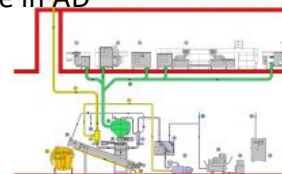
### Pump and Vacuum Waste System:

For effective on site storage for subsequent collection, pump and vacuum waste systems are suited to larger sites. The food waste is collected in a storage vessel in readiness for collection as required.

## Pump and Vacuum Waste System

- Located adjacent to the kitchen
- Self contained
- Separation at source
- Waste is macerated and pumped/sucked to a central management system for storage prior to use in AD
- Suited to larger premises, centralises collection from multiple facilities in a building
- Output can be used in composting or AD

Cost c. £50k+



RPS 229 States:

- only treat the waste using specialised equipment which macerates, grinds, liquefies, dewateres, separates, screens, digests or composts food waste

### **Vermin related issues**

This can be from insects, rodents or birds and is directly related to the capabilities to store food waste. Vermin related issues affect food safety and the effective operation of the kitchen. If food waste cannot be stored in vermin safe/free conditions alternative management is required.

RPS 229 states:

- store the waste in containers that are fully enclosed and leak-proof to prevent and minimise odour, stop liquids escaping and prevent access by vermin and pests

### **-Fiscal issues**

The food waste collection industry does not have universal coverage across the UK. Therefore collection volumes and timings vary depending on the location of the foodservice site. This inevitable affects the cost of collection.

It would be financially unfair to require mandatory collection where it is not economically viable. The hospitality sector is under a significant contraction in revenue as a result of covid and now with UK and global inflationary pressures on food and energy costs in addition to suffering wage inflation due to the staff shortages

It will be important that this parameter is based on what is a sensible level to allow operators the opportunity to use other food waste management technologies where kerbside collection is cost-prohibitive.

### **-Sustainability related issues**

There are inevitably 'Scope 3', Carbon related emissions from businesses collecting waste from foodservice sites. There needs to be a criteria to evaluate the potential benefit of capturing the value of the food waste, against the carbon cost of the food waste being collected for subsequent processing. This includes such things as vehicle emissions. Net Zero principles should apply here, a simple calculation can be made to set the parameters for this evaluation. This will change over time as it relates primarily to vehicle emissions and to 'Scope 3' Carbon in the AD supply chain.

This is again an example of the future proofing value of the Hierarchy as the metrics can and will change over time as vehicle fleets decarbonise in line with other Government legislative requirements i.e. the move to electric or hydrogen vehicles.

The Technical, Economic and Environmental principles above use similar characteristics and principles to those placed on local authorities for the management of waste streams. It therefore appears logical to use a similar structured approach for the management of food waste at its source.

## The Secondary Evaluation

ONLY WHERE THE CRITERIA OF THE PRIMARY EVALUATION CANNOT BE MET, AGAINST THE AGREED CRITERIA, CAN THE SECONDARY EVALUATION BE CONSIDERED.

These technologies include:-

**AD to Power:** – on site AD for the local generation of heat and power to produce hot water for use by the site. The food waste produces hot water for re-use in the kitchen



Food Waste Digesters:

## Digesters

- Located adjacent to the kitchen
- Self contained
- Separation at source
- Bacteria 'eat' the waste
- Output is 'grey water' which can be managed as required by Fats, Oil and Grease equipment, Dosing, Grease Removal Units, Grease traps
- Units can measure volume managed or waste can be weighed prior to loading.



Cost c £12-£20k



## In vessel Composters:

# In-vessel Composters

- On site food resource management
- Located outside the kitchen
- Separation at source
- Enclosed composting takes place in a temperature controlled climate
- Macerated food enters the compost chamber
- 90% reduction in volume
- Produces usable compost that can only be used on-site
- Meets Animal By-Products Regulation

Cost c. £14k -£28k



## The Tertiary Evaluation

ONLY WHERE THE PRIMARY AND SECONDARY CRITERIA CANNOT BE MET AGAINST THE AGREED CRITERIA, CAN THE TERTIARY EVALUATION BE CONSIDERED.

Sink to sewer disposal demonstrates separation at source and is 'closed loop recycling' in that the food waste will arrive at the Waste Water Treatment plant where it aids the decomposition processes. This is also where the solids can also be used for AD by the processor or the deposits used for the capture of base elements such as phosphates for use as fertiliser for crops.

## Summary

- The use of the Primary, Secondary and Tertiary evaluations will prevent landfilling of food waste unless this is a result of co-mingling.
- This approach complements and builds on the content of RPS 229 and maximises the effective management of food waste that is not used for AD.
- Existing sites which use either the secondary or tertiary equipment and systems are required to reevaluate these by re-evaluating if the Primary Evaluation measures can be used. This will bring the whole of the hospitality industry into alignment with the principles by a particular date.

## **References: Existing UK Installations by product type**

There is clearly a gap that needs to be filled between Government policy objectives and EA RPS 229. Discussions in Q1 2020 with the EA illustrated the market estimates on the use of difference technologies by operators

## Market Statistics

	Units in use. Industry estimates	Ave. Cost of unit	% Foodservice Market penetration (of 413k)	Food waste per unit per day - capacity
Food Waste Disposal Units	50,000	£3k	6% - (ave. 2 per site)	200kg
Digesters	700	£15k	0.16%	300kg
Dewaterers	9000	£13k	2.2%	AD / Composting resource
Pump/Vacuum Waste Systems	c. 20	£30k-£80k	neg.	AD resource
In- Vessel Composters	120	£18k	0.02%	Output repurposed

## **Explanatory Paper re. Fat, Oil and Grease (FOG) Management – Annex 4**

### **Overview.**

Fats Oils and Grease is widely considered to be Food Waste, however it needs to be considered in its own right as a waste stream for it to be managed effectively.

Each foodservice establishment (FSE) produces waste FOG as part of its daily activities, regardless of its menu or cooking style. FOG can come from oils, meat, fish, dairy products – and many more sources. It is produced in nearly all types of food preparation and cooking, such as the oil used to cook food and the melted animal fat released as food is cooked. FOG is also present in leftover food in the kitchen and on customers' plates.

The UK has around 427,000 FSEs and each will produce FOG that needs treatment. However, a recent study found that only 12% of FSEs use FOG management equipment, while only around 0.15% complied with FOG management best practice.

As a result, FOG is washed down FSEs' sinks or drains on a daily basis – whether deliberately by pouring unwanted oil down drains or inadvertently during the process of cleaning used dishes, cutlery and kitchenware.

FOG can melt or become liquid when mixed with warm water. While FOG may seem harmless in liquid form, neither animal fats or vegetable oils dissolve in water. As they cool, they can set and harden. In liquid form, FOG can travel through the network before this happens. This means problems can happen anywhere along the drainage system – from a clogged kitchen sink, blocked pipework and further along the sewer network; fatbergs or a damaged wastewater pumping station. FOG is found at every stage in the wastewater cycle: at source

(in the kitchen), in drain or sewer blockages, at pumping stations, or at the wastewater treatment works.

Often FSEs will suffer routine drain problems but are unaware this is caused by FOG – or they simply may not know what they can do to address it. Even using detergents or bleach only helps for a short time, as the mixture soon turns back to thick or solid fat in the drainage network.

The requirement to undertake measures to remove FOG from foodservice wastewater is understood and as a result there are technologies and systems in place to address this. Legislation can address the gaps in regulation but until that time systems and equipment can be used to effectively manage and reduce to opportunity for FOG to cause problems in the sewer

The variety of guidance documents provided by interested parties has led to the need for a single document that is widely supported by water companies, consultants, contractors, designers, installers, equipment suppliers, operators, site owners and landlords and foodservice operators. This Superguide is expected to be published in November 2022. For a full evaluation the document will be supplied when published.

The Fats Oils and Grease Critical path follows similar evaluation structure as is required for Food Waste,

The removal of FOG for reprocessing is key to achieving Circular Economy Principles and to realising its value as an energy source such as bio fuel.

### **FOG management equipment and Systems**

The composition of FOG and wastewater generated by each FSE will vary with the food offering and cooking methods. When choosing an equipment solution, please seek advice from a competent contractor and follow the manufacturer's guidance relating to products used.

While the challenge of FOG management and disposal is important to every business, the practical requirements vary for each site. Every kitchen is different and needs to be individually assessed for the purposes of FOG management, just as it does for all elements of kitchen planning, installation, workflow and maintenance. However, some common elements need to be considered before any FOG solution is put in place.

Whichever system or combination of FOG management systems is to be used, the starting point for any installation is an up-to-date drainage plan, or the proposed drainage plan for a new build.

Those responsible for reviewing, designing, specifying and recommending FOG management systems and/or supplying and installing the equipment should visit the site to carry out an assessment, or review a plan of the site if it is a new build. All kitchen areas from where FOG can be discharged must be identified and details of the drainage arrangement understood in relation to the catering activity undertaken.

Even where direct drainage is unavailable, such as on shopping centre concession stands, waste must still be disposed of responsibly and managed using a robust FOG management strategy.

The two distinct FOG treatment technologies are Mechanical and Chemical.

## Mechanical Equipment

- BS EN 1825 grease separators
- Passive grease traps (that do not meet the requirements of BS EN 1825)
- Grease removal units (GRUs)

Grease separators, passive grease traps and GRUs all use gravity to separate FOG and food waste from wastewater. FOG has a lower density than water and floats to the top, while food debris has a higher density and sinks to the bottom. This allows the waste to be captured or directed elsewhere, while the water flows away.

## Chemical Treatment

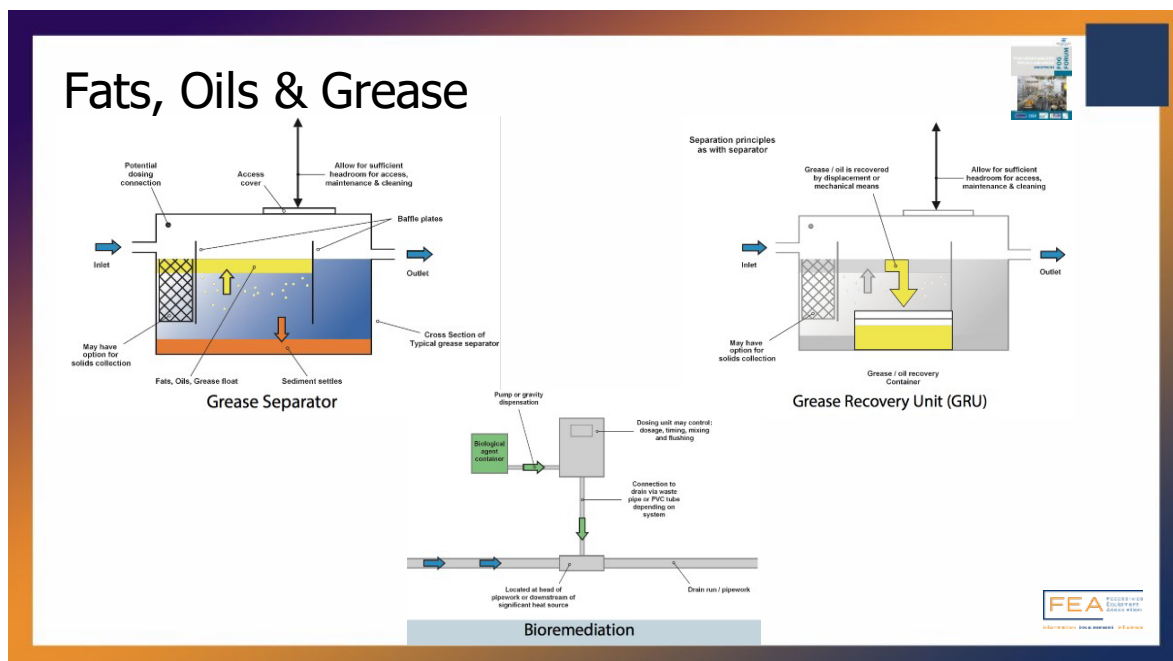
- Bioremediation or Bacterial Treatment

Biological dosing systems use safe, stable bacteria, microorganisms or enzymes designed to biologically and irreversibly break down the FOG in the drainage system. Naturally occurring microorganisms are part of the make-up of the dosing materials, which can be supplied as fluid, solid or powder, depending on the system used.

The differing systems available comprise: wall-mounted, pumped and preactivated dosing.

Ideally, dosing should be a secondary treatment measure to physical removal at the source of FOG. It should also be applied on each and every waste pipe that exits the kitchen. This provides treatment for any residual FOG that may enter the FSE's drains and sewers. Dosing is also an additional support option when paired with a Grease Separator (BS EN 1825), Grease Trap (non BS EN 1825) or Grease Removal Unit (GRU).

The following graphic illustrates the operational aspects of the equipment when installed:-



## **Accountability**

The critical path of decision making shows that prevention and repurposing are the key requirement prior to the management of the waste. This evaluation criteria must be approached in the prescribed order before moving to the next stage. A record should be kept of the decision not to install a particular equipment type with the reasons also given. This should be available for inspection by the relevant authority as required.

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## **Overall Conclusion for the effective management of Food Waste and FOG**

There is clearly a gap that needs to be evaluated between Government objectives, EA RPS 229, the installed base of equipment and operator understanding as the latest market statistics show.

The Hospitality Food and Drink Hierarchy for both food waste and FOG management fills this gap in the process or system evaluation. This will maximise the capture and effective management of food waste against a defined criteria which can be adjusted over time to meet the required targets.

For new sites, the hierarchy can be used to ensure compliance at the specification design and installation stages with all stakeholders understanding the requirements.

For existing sites the entry point is at the Primary Evaluation stage. This means that any existing systems or equipment must be evaluated in line with the Hierarchy. This has the effect of bringing all of the hospitality industry into alignment with a universal framework. Legislation could be for all sites to have done this by a set date and for the measurement and reporting (Target Measure Act) to be ahead of this date. This would provide a soft introduction to a future legislative reequipment of the implementation requirements, reflect the needs for reporting from sites, provide objectivity for the development of legislation. Liaison with the devolved administrations can support an improved collection and management regime, thereby building on current regulation.

We welcome the opportunity to further develop the framework to ensure relevant and effective approached to delivering a food waste management strategy for the sector as a whole.

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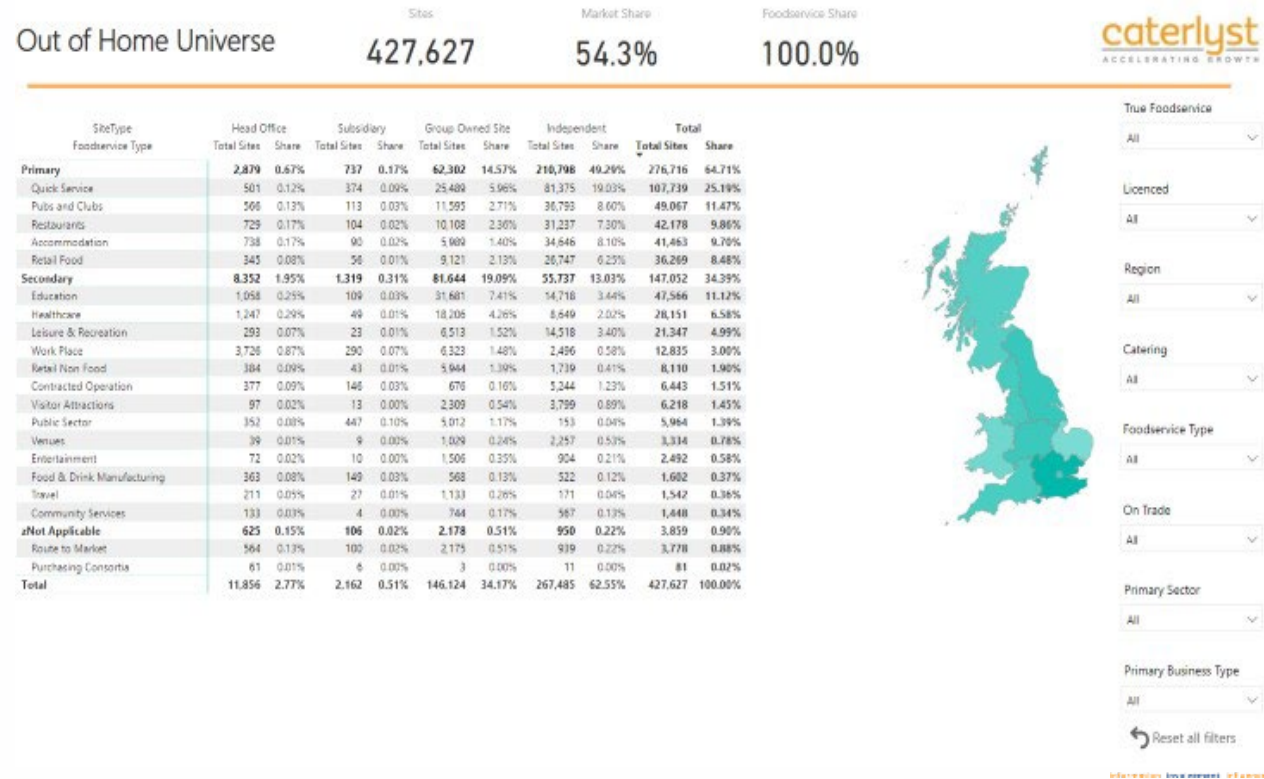
**Web:** [www.fea.org.uk](http://www.fea.org.uk)

**Annex 1**

# Size and Shape of Market

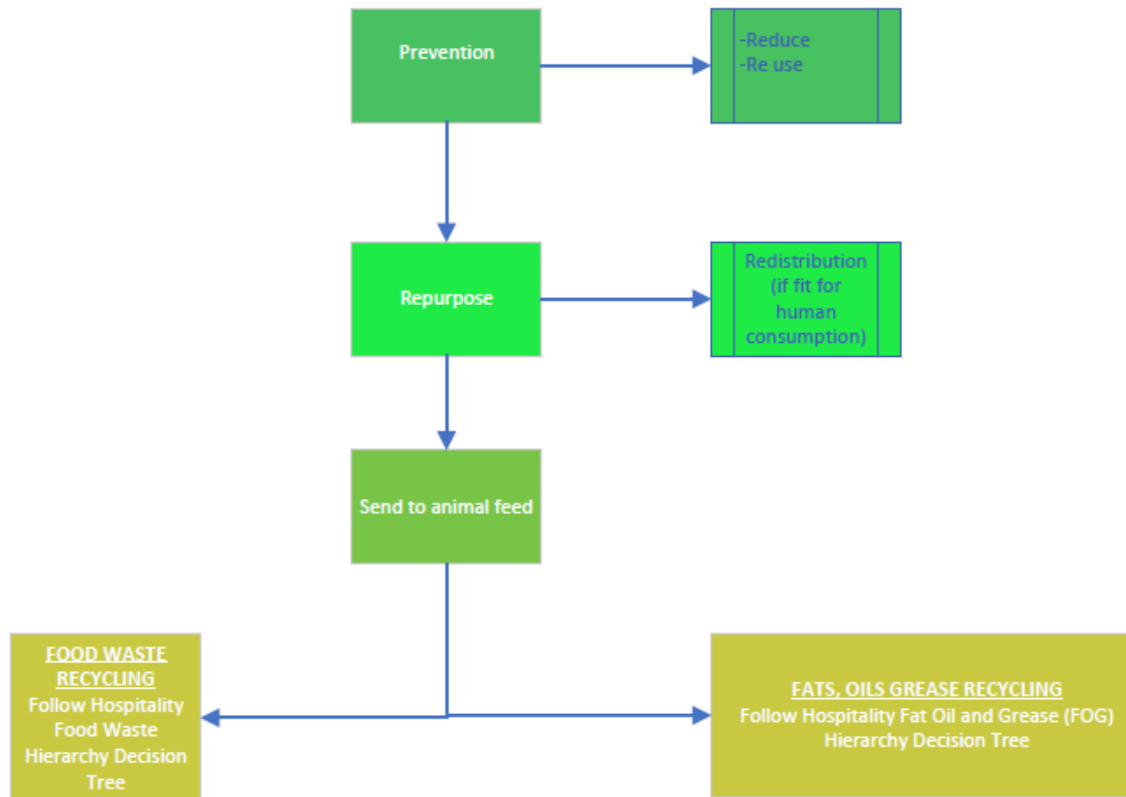
Market characteristics: -

- No 'typical' site
- Group and independent operators
- Varying size, shape and operating practices
- Predominantly independent sites, 62%



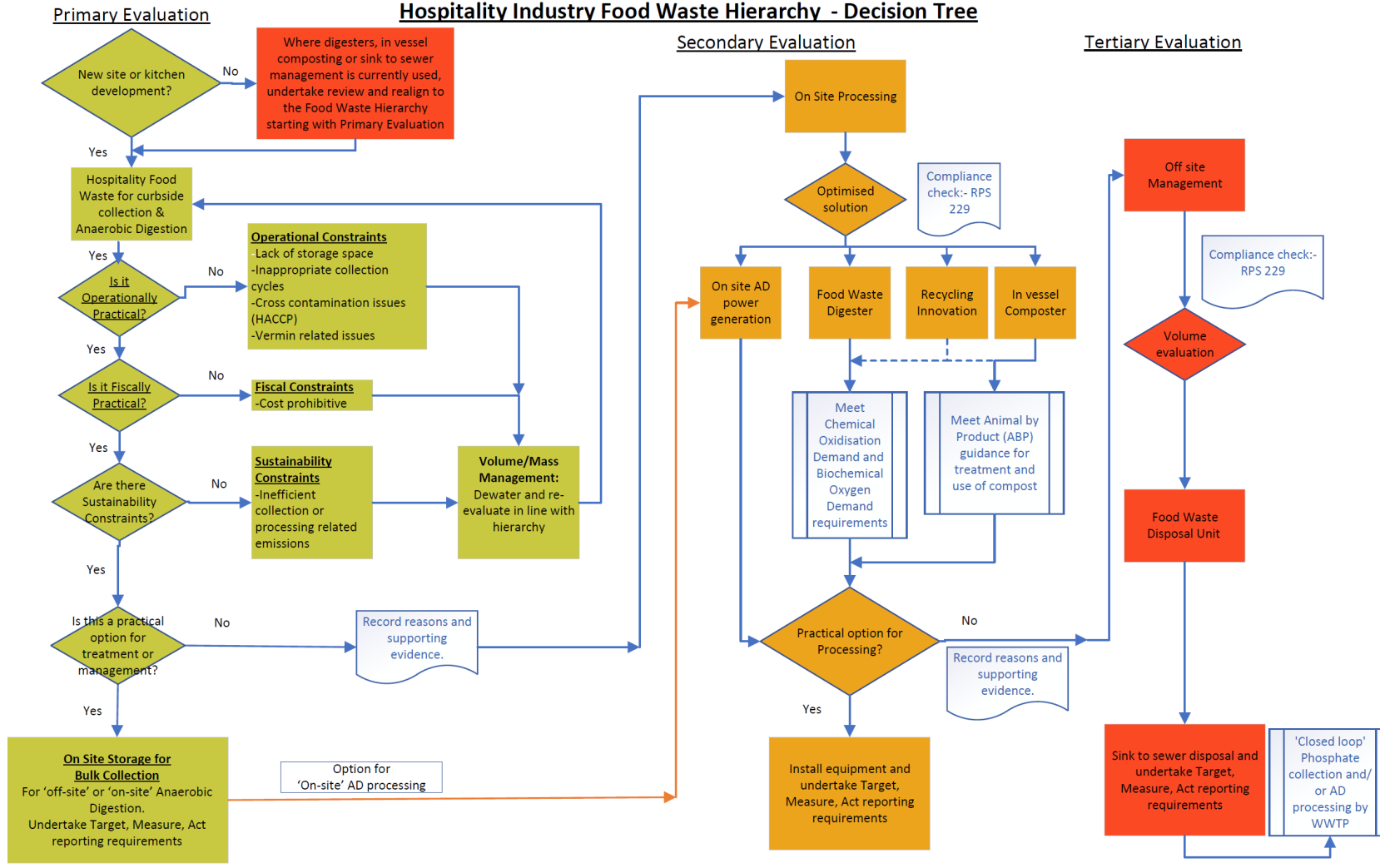
**Annex 2**

**Hospitality Industry Food Waste & Fat, Oil and Grease (FOG) Hierarchy - Decision Tree**



**Annex 3**

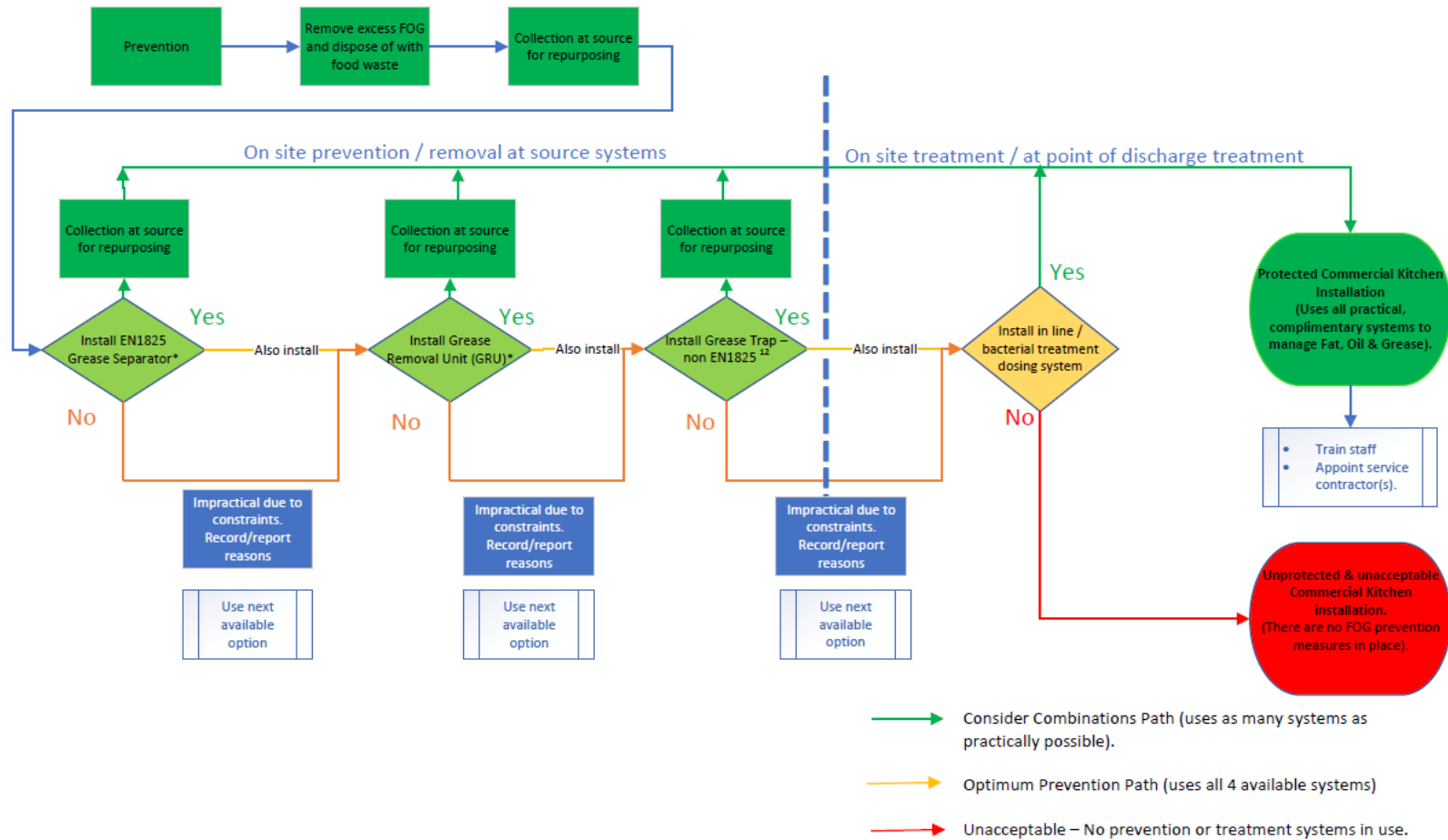
**Hospitality Industry Food Waste Hierarchy - Decision Tree**





**Annex 4**

**Hospitality Industry Fat, Oil & Grease Management – Critical Path Installation Guide**



<sup>1</sup> To meet flow rate requirements – refer to BS EN 1825 sizing requirements  
<sup>2</sup> To meet To the anticipated requirements of PAS 405 & PAS 406 when published (Summer 2023)

ends