

Quantification frameworks

'Frameworks' for quantification

... depends on how you plan on collecting data.


Ad-hoc studies

- Commissioning studies for the purposes of a baseline
- Using existing academic, government or industry studies

Business voluntary reporting

- Businesses measure their own waste
- Report on a voluntary basis, e.g. to a food waste Public Private Partnership

Business mandatory reporting

- Businesses measure their own waste
 - Some/all businesses mandated to report their waste to government / agency
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Overview: Build estimate from ad-hoc and modelling

National estimate of food-service food waste

Estimates for sub-sectors

Hotels

Restaurants / cafes

Events

Hospitals

School canteens

...

Total size of hotel sector, e.g. meals served, employees, turnovers
From national statistics, data from trade bodies ...

X

Food waste per meal served, employee, unit turnover
Individual studies measuring food waste in hotels

For tracking, need to repeat study in country with sufficient sample size every four years
For approximate estimate, could use proxy data



Approximate estimates

- **Use existing studies in sector**
- **Need to check suitability of method**
 - Measurement method
 - Sample size
 - Representativeness of country
 - Year of study
- **Need to scale data to make national estimate**

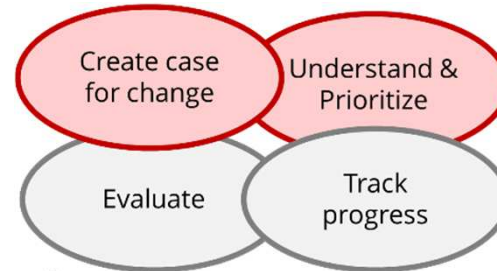


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Example: USA food service

- Literature review of existing studies of food waste generation rates
- Identifies generation factor (e.g. weight of FW/meal)
- Takes average factor from comparable studies, scales with appropriate data
- For some sectors, multiple method used: sector estimate is average of two(+) methods

See more: [methodology scoping memo](#) and [2018 wasted food report](#)



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Example: USA food service

Generation factor unit	Studies identified	Scaled by
Lbs/employee/year	3	Data on # employees
Tons/facility/year	4	Data on # establishments
Lbs/thousand \$ revenue	1	Data on sector revenue

Restaurants

- Study data ranges from 2002 – 2015 (for 2016 estimate)
- National generation estimate ranges from 8.34 – 24 million tons
- Average of estimates = 16.89 million tons

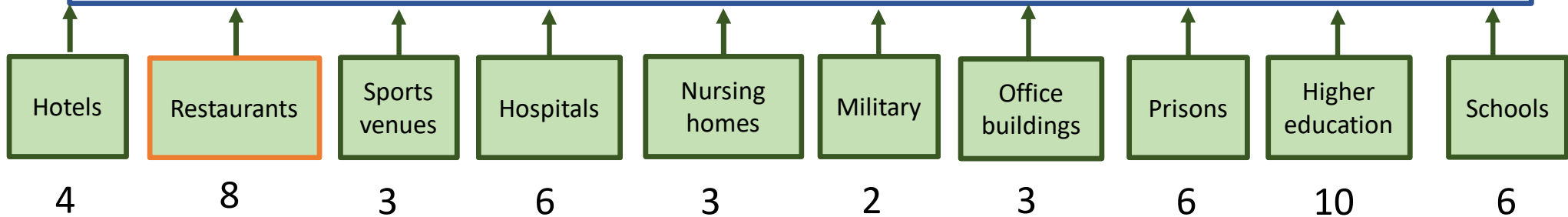
See more: [methodology scoping memo](#) and [2018 wasted food report](#)



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Example: USA Food service

National estimate of food-service food waste



- Informed by 51 studies

Strengths

- Multiple methods of scaling may counteract biases
- Average of large number of studies likely more accurate
- Wide subsector coverage

Limitations

- Inclusion of older studies (>10 years old) makes tracking changes in waste (rather than size of sector) more difficult
- Requires lots of data to scale – less replicable



Business self-reporting

- **Requires:**

- Clear guidance on measurement requirements & minimum standards
- Support for measurement and enforcement for non-compliance
- Resource to process data received by businesses and form national data
- Potential challenges related to costs for businesses

- **Coverage required?**

- Generally >50% of sector needs to be covered, but need to be sure not systematic differences between those who report and those who don't



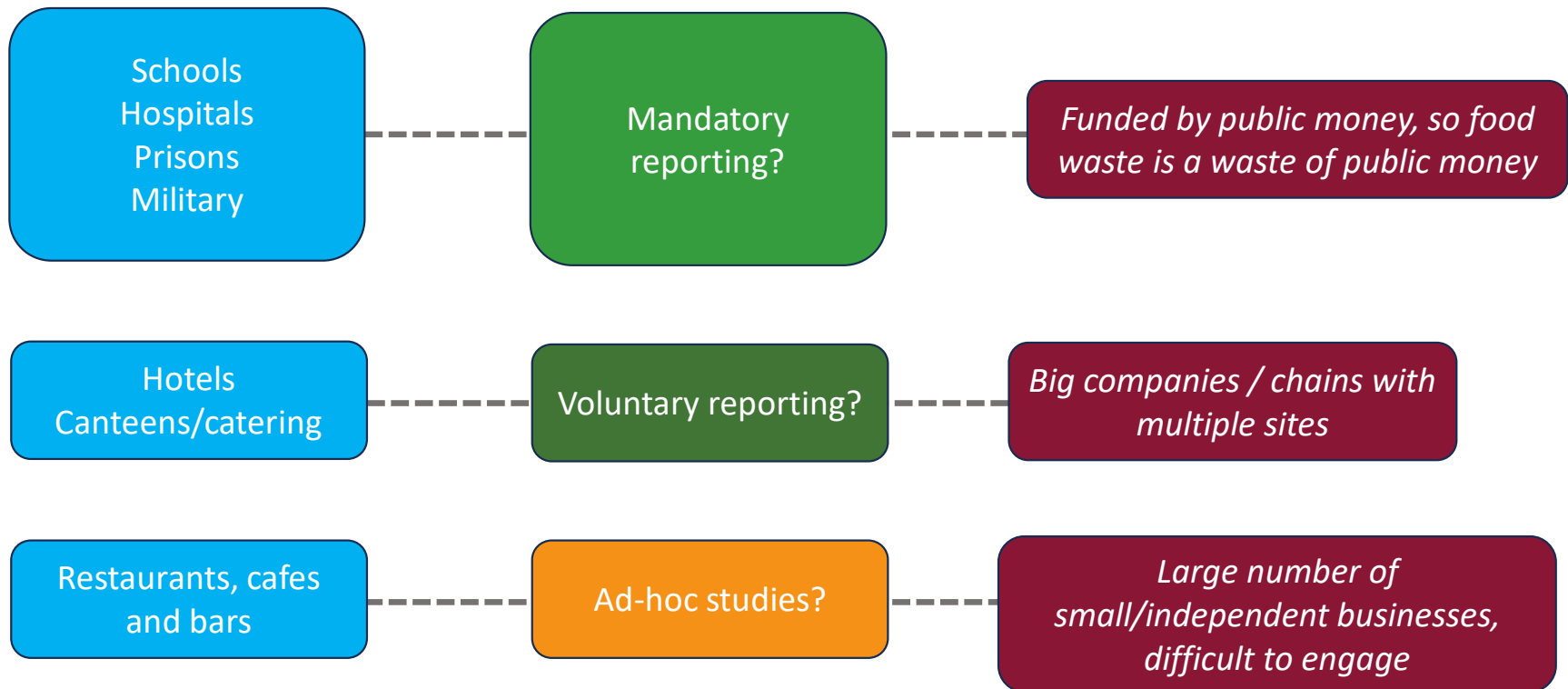
Overview of Quantification ‘Frameworks’

	1: Ad-hoc studies / modelling	2: Businesses voluntary reporting	3: Businesses mandatory reporting
Potential issues	<p>Expensive if commissioning studies</p> <p>Otherwise reliant on secondary data / other studies</p>	<p>Time to set up voluntary system (PPP)</p> <p>Requires high market coverage for tracking – bias in businesses reporting?</p> <p>Requires businesses to measure accurately</p>	<p>Incurs cost for businesses: could be politically challenging</p> <p>May require new legislation</p> <p>Requires businesses to measure accurately</p>
Potential benefits	<p>Accurate</p> <p>Information by sub-sector</p> <p>Other useful data may also be obtained</p>	<p>PPPs can be a mechanism for supporting businesses to waste less food</p> <p>Low cost method for obtaining data</p>	<p>Measurement could be an important precursor to food-waste prevention</p> <p>Low cost method for obtaining data</p>
Circumstances when suitable for tracking	<p>Frequent studies with sufficient sample size required</p>	<p>If measurement is sufficiently accurate and covers enough of sector</p>	<p>If measurement is sufficiently accurate and covers enough of sector</p>

- May need to use more than one method...



Different subsectors, different methods...



Which approaches might work for key subsectors in your country?



Food service level 3

Level 3 reporting

- Share of parts which are edible
- Destinations of waste

Table F1: Food Waste Generation and Management

Line	Category	Unit	200
1	Total food waste generated (=2+3+4)	tonnes	
	<i>Amounts generated by:</i>		
2	Retail trade, except of motor vehicles and motorcycles (ISIC 47)	tonnes	
3	Food Service (ISIC 49-52, 55, 56, 84, 85)	tonnes	
4	Households	tonnes	
5	Total food waste generated: edible parts (=6+7+8)	tonnes	
	<i>Amounts generated by:</i>		
6	Retail trade, except of motor vehicles and motorcycles (ISIC 47)	tonnes	
7	Food Service (ISIC 49-52, 55, 56, 84, 85)	tonnes	
8	Households	tonnes	
9	Total food waste treated or disposed of (=10+11+13+14+15+16)	tonnes	
	<i>Amounts going to:</i>		
10	Codigestion / anaerobic digestion	tonnes	
11	Composting / aerobic process	tonnes	
12	<i>of which: by households</i>	tonnes	
13	Incineration / Combustion	tonnes	
14	Landfilling	tonnes	
15	Sewer	tonnes	
16	Other, please specify in the footnote	tonnes	
17	Food loss generated at Manufacturing level	tonnes	



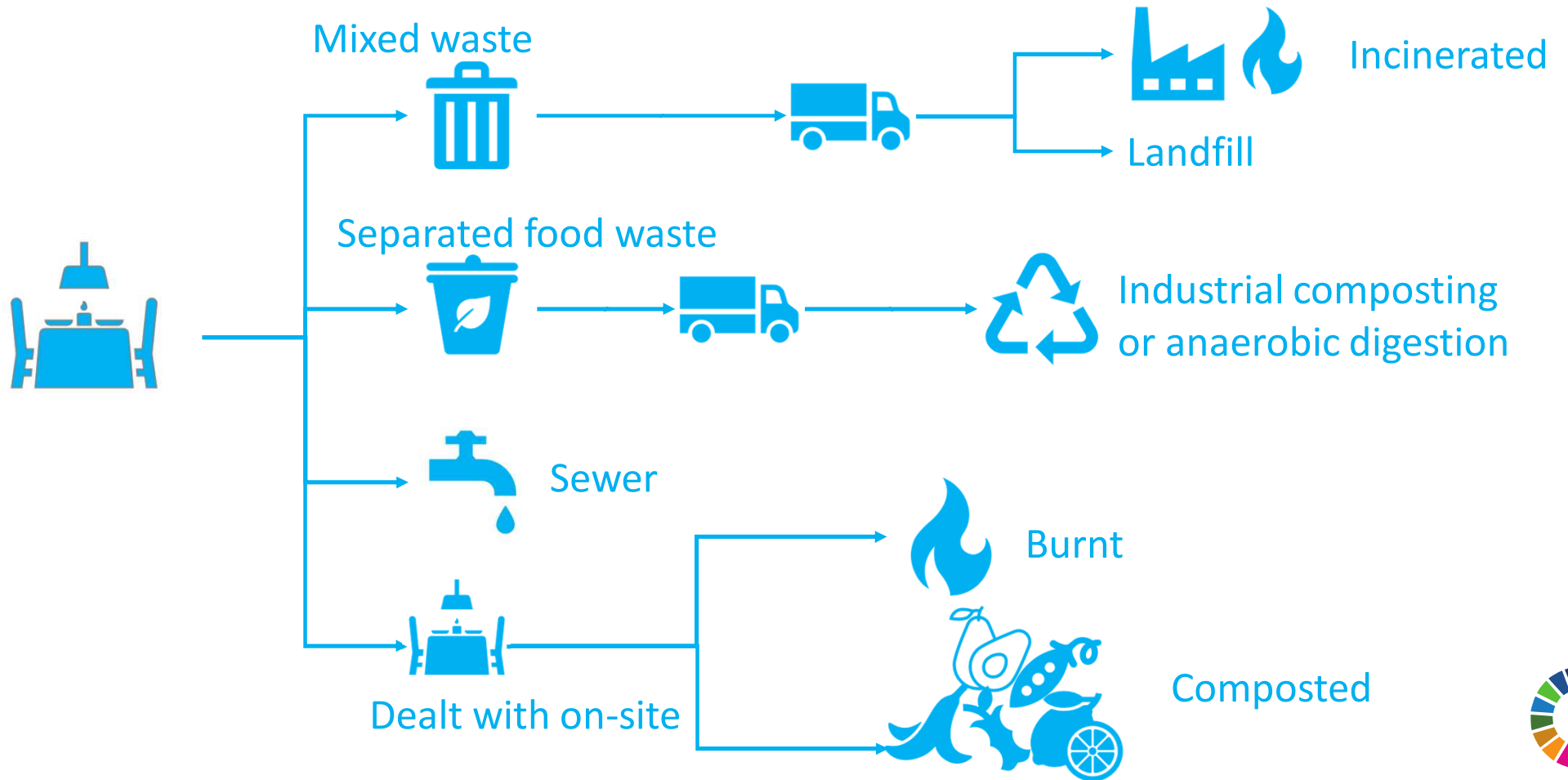
Edible and inedible waste

- **Same as for household sector**
 - 'parts intended for human consumption'
- **As with household, culturally-determined approach works for food service**
 - Complete survey / allocate 'borderline' parts to groups *before* studies of waste composition
- **Systematic differences in different stages (inventory/preparation/consumer)**



Photo by aaron Thomas on [Unsplash](#)

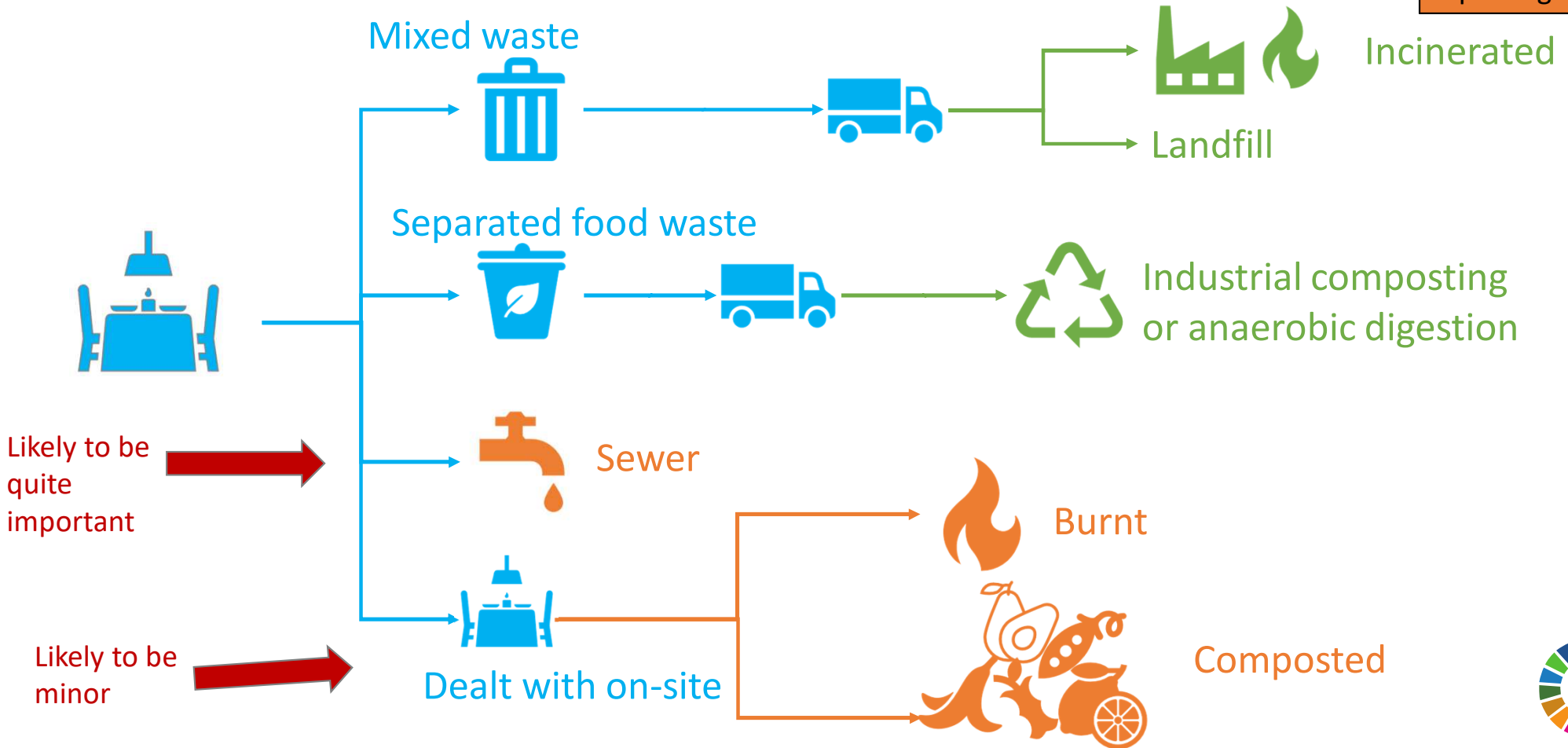
Destinations of food service food waste



Destinations of food service food waste

Level 2 reporting

Level 3 reporting



Destinations of food service food waste

- **Relative importance** of different destinations differs from household
- **Relative importance of destinations likely to vary between specific subsectors**
 - E.g. sewer more significant for drink-focused business (coffee shop; pub/bar)
- **Waste infrastructure will vary between subsectors and specific businesses**
 - E.g. restaurant in mall vs. standalone restaurant building ; street food service may not collect consumer waste
- **Are wastes collected by government or by private waste contractors?**



Specificities for food service

- **Importance of sewer waste**
 - Likely to be particularly important for certain subsectors
- **Used cooking oil**
 - May be a significant waste stream in some subsectors – also a valuable waste stream
- **Other single-stream, or close-to single-stream wastes**
 - Food service with one main item (coffee shops; bakery/sweet stalls)
 - May require less composition analysis – possibly more opportunities for upcycling



Questions on food service?

