



**Material Inventory and Efficiency Techniques – Including Water**

Envar COmposting Cambridge – March 2025

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# Raw Materials Inventory and Efficiency Techniques

As part of our environmental permitting obligations and wider commitment to sustainability, Envar Composting has implemented a robust strategy for monitoring, managing, and optimising raw material usage. Our operations are aligned with the principles of Best Available Techniques (BAT) and the Environment Agency's Appropriate Measures guidance, and our activities are designed to ensure responsible and efficient use of all materials.

## Raw Materials Inventory

The table below presents the estimated use of key raw materials on both a total annual and per-tonne treated basis. These estimates are based on a maximum throughput of 100,000 tonnes per annum at our Cambridge composting facility for biodrying.

| **Raw Material** | **Purpose/Use** | **Annual Use** | **Per Tonne Treated** | **Source/Notes** |
| --- | --- | --- | --- | --- |
| Electricity | Powering fixed infrastructure | 1,517 MWh | 15.17 kWh | 100% renewable grid supply + on-site solar |
| Diesel (red/white) | Fuel for mobile plant and equipment | 270,000 litres | 2.7 litres | Monitored by asset tracker and usage KPIs |
| Water (non-potable) | Compost moisture correction | 4,600,000 litres | 46 litres | 100% rainwater or leachate reuse |
| Potable Water | Emergency only (not used in practice) | 0 litres | 0 litres | Potential fallback: up to 46L/ton if needed potable should harvest run out |
| Hydraulic/Gear Oils | Machinery lubrication | 1000 litres | 0.01 litres | Managed via scheduled maintenance systems, appropriate service and maintenance at required timescales including recycling of used oils |
| AdBlue | Diesel emissions reduction | 2160 | 0.0216 litres | Supports NOx reduction |

No hazardous substances are used in the composting process. All materials are stored and managed in compliance with relevant CIRIA guidance and industry standards.

**Material Hazards**

Diesel, Oil, Adblue SDS attached. All of these materials are stored in oil regulations compliant containers and tanks which are fully internally bunded with appropriate spill procedure in place and spill kits available with drain covers on a fully sealed surface.

**Justification**

Diesel -

Mobile plant machinery is specified to be the most efficient load carrying capacity which we can safely use, unfortunately at the current time there is no alternative for heavy plant

Oil -

As above, use of appropriate oil ensures longevity of the plant and is required for efficient operation. All used oil is recycled.

AdBlue -

Required to ensure emissions from mobile plant are reduced to comply with engine emissions standards.

Water -

Water is only used from a potable source when it is not possible to get from other sources or recycle harvested rainwater. It is required to ensure the material biology can function to power the drying process.

## Efficiency Techniques and Monitoring

Envar deploys a suite of operational techniques to minimise raw material use and environmental impact while maximising productivity. These include both strategic investments and day-to-day good practice measures.

A major efficiency focus is on reducing the double handling of materials. Site layout and traffic flow are optimised to ensure that incoming feedstocks are delivered directly to the point of shredding or blending with minimal unnecessary movement. This not only cuts diesel consumption but also reduces equipment wear.

Machinery is selected and operated for maximum capacity and efficiency. Our screening, shredding, and handling equipment is sized to process full loads, and operators are trained in optimal usage to reduce idle time. Fuel use is further minimised by investing in newer, more efficient mobile plant, replacing outdated machines with lower-emission, lower-consumption alternatives.

To ensure machinery operates within peak efficiency parameters, we use an online asset tracker and maintenance scheduling platform. This system monitors run times, fuel burn, load factors, and service intervals. Alerts are issued for abnormal usage, and performance KPIs are regularly reviewed to identify areas for intervention.

Training is a cornerstone of our efficiency strategy. Staff are trained in:

* Effective blending to ensure optimal airflow through composting windrows, reducing the load on blowers and minimising electrical consumption.
* Recognising overuse of plant, improper movement techniques, and inefficient material movements.
* The environmental impact of each operational activity, building a culture of resource stewardship.

Energy use is significantly offset by our on-site 364 kW peak solar array, which feeds power to composting systems and site buildings. This array, along with a 9.4 kW system on the office roof, reduces our demand from the grid and exports excess renewable electricity when possible.

We exclusively purchase electricity from certified renewable sources. As a result, our Scope 2 emissions are effectively zero, and Scope 1 emissions (linked to diesel use) are actively managed through the above efficiency initiatives.

Water efficiency is also paramount. Our composting process uses zero potable water when possible. All moisture correction is achieved using harvested rainwater and internally captured leachate, stored in lagoons and applied in line with composting moisture needs. If potable water were required, up to 46 litres per tonne might be used, but in practice, this is fully substituted by harvested sources unless there is a significant dry period. Envar have applied for planning to increase storage.

Our performance is tracked annually through our verified Planet Mark Carbon Reduction Plan, which includes emissions per tonne treated, allowing us to benchmark progress. In the last reporting period, normalised emissions dropped by 10%, reflecting the positive impact of our operational efficiency programme.

Through integration of technology, operator behaviour, renewable energy investment, and best-practice infrastructure design, Envar ensures that raw material use is efficient, sustainable, and fully aligned with our commitment to continuous improvement.

The table below outlines how Envar comply to the EA-Recognised Raw Material Efficiency Techniques which are Already in Use at Envar. These references are derived from BAT and Appropriate Measures.

## BAT and Appropriate Measures

### Alignment with Environment Agency Raw Material Efficiency Techniques

Envar Composting has adopted a wide range of operational and strategic practices that align closely with the Environment Agency's Appropriate Measures for Biological Waste Treatment and the Best Available Techniques (BAT) for Waste Treatment. These practices ensure that raw materials such as energy, water, diesel, and operational inputs are used in a responsible, efficient, and environmentally sustainable manner.

The table below summarises key raw material efficiency techniques identified by the Environment Agency and demonstrates how Envar is implementing each one in practice:

| **Technique** | **EA/BAT Reference** | **Envar Implementation** |
| --- | --- | --- |
| Substitution of raw materials with waste-derived alternatives | BAT 22 | Envar uses leachate and harvested rainwater instead of potable water for composting process moisture control. |
| Monitoring of raw material (diesel, electricity, water) use | BAT 11 | Envar deploys a live asset tracking system and performance KPIs to monitor and evaluate diesel, electricity and water use. |
| Online tracking and proactive maintenance | BAT 11, 23 | An asset tracker is used alongside scheduled maintenance to ensure machinery runs efficiently and avoids unnecessary use. |
| Reuse of water in the process (harvested/rainwater, leachate) | BAT 19, 35 | Zero potable water is used in process operations; all water is supplied from reused or harvested sources. |
| Use of renewable energy | BAT 23 | A 364 kW solar PV system on site provides clean electricity, supported by a 100% renewable electricity supply contract. |
| Energy and carbon efficiency planning | BAT 23 | A verified Planet Mark Carbon Reduction Plan is used to review energy and emissions per tonne treated annually. |
| Use of modern, fuel-efficient plant | BAT 23 | Older mobile plant has been replaced with more efficient alternatives to reduce diesel use and emissions. |
| Staff training on environmental performance and efficient material handling | BAT 1, 5, 11 | Site staff receive ongoing training on blending, efficient plant operation, and sustainable site practices. |
| Site layout to reduce unnecessary movements | BAT 4 | The site layout is optimised to minimise double handling and reduce diesel consumption. |

### Conclusion

Through proactive monitoring, staff training, and integration of renewable technologies, Envar Composting is fully aligned with the Environment Agency's expectations for raw material efficiency. These measures not only reduce environmental impact and operational cost but also ensure that the facility operates at the highest standards of sustainability and compliance. Envar’s approach reflects a deep commitment to continuous improvement and demonstrates how industry best practice can be embedded into day-to-day operations.