

# Conclusions on BAT from the Energy Efficiency (EE) BAT Reference Document

## **READ ME:**

The Energy, Efficiency BAT Reference Document 'February 2009 is a horizontal BREF which addresses energy efficiency techniques regardless of the sector or industry.

In this case, you are required to identify the Conclusions on BAT, set out in section 4.2 of this document ('Best Available Techniques') relevant to your installation. Please use the 'Scope' box to describe the relevant activities/processes that come within the scope of this BREF and clearly identify the Conclusions on BAT (sections and subsections) that are 'Not Applicable'.

For each applicable BAT, in the following table, state the status; 'Yes' or 'Will be' as appropriate in the 'State whether it is in place or state schedule for implementation' box. The use of each of these terms is described below.

Information on compliance in the '**Applicability Assessment**' box should include, where applicable, the following:

- (i) Identification of the relevant process/ activity or individual emission points that the BAT requirement applies to at your installation.
- (ii) Where BAT is to use one or a combination of listed techniques, specify the technique(s) implemented/proposed at your installation to achieve the BAT; and
- (iii) A comment on how the requirements is being met or will be met, e.g., a description of the technology/operational controls/management proposed to meet the requirements.

Use of terms: (a) '**Yes**' – To be entered where the installation is currently compliant with this BAT requirement.

- (b) '**Will be**' – To be entered where a further technique is required to be installed to achieve compliance with the BAT requirement. In this case you must also specify the date by which the installation will comply with the BAT Conclusion requirement.

## Conclusions on BAT from the Energy Efficiency BAT Reference Document (extracts)

| 4.2 BAT for achieving energy efficiency at installation level  | Applicability Assessment (describe how this technique applies or not to your installation) | State is in place or state schedule for implementation |
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| <p><b>BAT 1.</b></p> <p>BAT is to implement and adhere to an energy efficiency management system that incorporates, as appropriate to the local circumstances., all of the following features (See Section 2.1. The letters (a), (b), etc. below, correspond those in Section 2.1):</p> <ul style="list-style-type: none"> <li>a) Commitment for top management (commitment of the top management is regarded as a precondition for the successful application of energy efficiency management</li> <li>b) Definition of an energy efficiency policy for the installation by top management</li> <li>c) Planning and establishing objectives and targets (see BAT 2, 3, and 8)</li> <li>d) Implementation and operation of procedures paying particular attention to:               <ul style="list-style-type: none"> <li>I. Structure and responsibility</li> <li>II. Training, awareness and competence (see BAT 13)</li> <li>III. Communication</li> <li>IV. Employee involvement</li> <li>V. Documentation</li> </ul> </li> </ul> | <p>Undertaken. An ISO:15001 Certified Environmental Management System is in place.</p>     | <p>In Place</p>  |

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| <p>VI. Effective control of processes (BAT 14)</p> <p>VII. Maintenance (see BAT 15)</p> <p>VIII. Emergency preparedness and response</p> <p>IX. Safeguarding compliance with energy efficiency-related legislation and agreement (where such agreement exist)</p> <p>e). Benchmarking</p> <p>f). checking performance and taking corrective active reviewing of EMS.</p>   |   |                 |
| <p><b>BAT 2.</b></p> <p>BAT is to continuously minimise the environmental impact of an installation on planning actions and investments on an integrated basis and for the short, medium, and long-term considering the cost benefits and cross media effects.</p>   | <p>Undertaken. As part of sustainability programme.</p> | <p>In Place</p> |
| <p><b>BAT 3.</b></p> <p>BAT is to identify the aspects of an installation that influence energy efficient by carrying out an audit. It is important that an audit is coherent with a systems approach.</p>   | <p>Undertaken. ISO:50001.</p>                           | <p>In Place</p> |
| <p><b>BAT 4.</b></p> <p>When carrying out at audit BAT is to ensure that the audit identifies the following aspects energy use and alternative sources or use of energy.</p> <ul style="list-style-type: none"> <li>• energy use and type in the installation and its component systems and processes</li> <li>• energy-using equipment, and the type and quantity of energy used in the installation</li> </ul> | <p>Undertaken. ISO:50001.</p>                           | <p>In Place</p> |

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| <ul style="list-style-type: none"> <li>possibilities to minimise energy use, such as: controlling/reducing operating times (Section 3.6, 3.7, 3.8, 3.8, 3.11)</li> <li>possibilities to use alternative sources of use of energy that is more efficient, energy surplus from other process/ systems (Section 3.3)</li> <li>possibilities to apply energy surplus to other processes and/or systems (Section 3.3)</li> <li>possibilities to upgrade heat quality (Section 3.3)</li> </ul> |   |          |
| <p><b>BAT 5.</b><br/>BAT is to use appropriate tools or methodologies to assist with identifying and quantifying energy optimisation.</p>  | Undertaken. ISO:50001. Energy usage is monitored through onsite systems | In Place |
| <p><b>BAT 6.</b><br/>BAT is to identify opportunities to optimise energy recovery within the installation between systems within the installation and/or with a third party (BREF 3.2-3.4).</p>  | Undertaken.   | In Place |
| <p><b>BAT 7.</b><br/>BAT is to optimise energy efficiency by taking a systems approach to energy management in the installations.</p>  | Undertaken.   | In Place |
| <p><b>BAT 8.</b><br/>BAT is to establish energy efficiency indicators by carrying out all the following: (Section 4.2.2.4).</p> <ul style="list-style-type: none"> <li>identifying suitable energy efficiency indicators for the installation, and where necessary, individual processes, systems and/or units, and measure their change over time or after the implementation of energy efficiency measures</li> </ul>  | Undertaken.   | In Place |

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| <ul style="list-style-type: none"> <li>• identifying and recording appropriate boundaries associated with the indicators.</li> <li>• Identifying and recording factors that can cause variation in the energy efficiency of the relevant process, systems and/or units.</li> </ul>  |                            |          |
| <p><b>BAT 9.</b><br/>BAT is to carry out systematic and regular comparisons with sector, national or regional benchmarks, where validated data are available.</p>   | Undertaken.                | In Place |
| <p><b>BAT 10.</b><br/>BAT is to optimise energy efficiency when planning a new installation, unit or system or a significant upgrade: (Section 4.2.3).</p> <ul style="list-style-type: none"> <li>• the energy efficiency design (EED) should be initiated at the early stages of the conceptual design/basic design phase</li> <li>• the development and/or selection of energy efficient technologies</li> <li>• additional data collection may need to be carried out to supplement existing data or fill gaps in knowledge</li> <li>• the EED work should be carried out by an energy expert</li> <li>• the initial mapping of energy consumption should also address which parties in the project organisation influence the future energy consumption and should optimise EED of the future plant with them.</li> </ul> | All undertaken. ISO:50001. | In Place |
| <p><b>BAT 11.</b><br/>Optimise the use of energy between more than one process or system within the installation or with a third party.</p>   | Undertaken. ISO:50001.     | In Place |

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| <p><b>BAT 12.</b><br/>Maintain the impetus of the energy efficiency programme by using a variety of techniques.</p>   | <p>Undertaken. ISO:50001. Planning and management with regular meetings</p>  | <p>In Place</p>              |
| <p><b>BAT 13.</b><br/>BAT is to maintain expertise in energy efficiency and energy- using systems through recruitment/training: use of specialist staff/systems/functions; resource sharing.</p>  | <p>Undertaken. ISO:50001.</p>  | <p>In Place</p>              |
| <p><b>BAT 14.</b><br/>Implement effective process control through compliance with procedures; EE performance parameters identified &amp; optimised and documented/recorded.</p> <ul style="list-style-type: none"> <li>• Having systems in place to ensure that procedures are known, understood, and complied with</li> <li>• Ensuring that the key performance parameters are identified, optimised for energy efficiency, and monitored</li> <li>• Documenting or recording these parameters.</li> </ul> | <p>Undertaken. ISO:50001. KPI's and SOPs are commenced onsite. With all processes parameter documented and recorded.</p> | <p>In Place</p>              |
| <p><b>BAT 15.</b><br/>Carry out maintenance to optimise EE through measures: (Section 4.2.8).</p> <ul style="list-style-type: none"> <li>• clearly allocating responsibility for the planning and execution of maintenance</li> <li>• establishing a structured programme for maintenance based on technical descriptions of the equipment, norms, etc. as well as any equipment failures and consequences. Some maintenance activities may be best scheduled for plant shutdown periods.</li> </ul>        | <p>Undertaken. Plantmaster maintenance programme in place.</p>   | <p>In Place. Continuous.</p> |

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| <ul style="list-style-type: none"> <li>• Supporting the maintenance programme by appropriate record keeping systems and diagnostic testing</li> <li>• Identifying from routine maintenance, breakdowns and/or abnormalities possible losses in EE, or where EE could be improved</li> <li>• Identifying leaks, broken equipment, worm bearings, etc. that affect or control energy usage, and rectifying them at the earliest opportunity.</li> </ul> |                            |                         |
| <p><b>BAT 16.</b><br/>BAT is to establish and maintain documented procedures to monitor and measure, on a regular basis, the key characteristics of operation and activities that can have a significant impact on energy efficiency.</p>   | Undertaken. ISO:50001.     | In Place.               |
| <p><b>BAT 17.</b><br/>BAT is to optimise the energy efficiency of combustion.</p>   | Undertaken.                | Continuous improvement. |
| <p><b>BAT 18.</b><br/>BAT for steam systems is to optimise energy efficiency by using techniques such as: those measures listed in 4.2 regarding design, operation/control, generation and distribution, recovery of condensate.</p>  | Undertaken.                | Continuous improvement. |
| <p><b>BAT 19.</b><br/>BAT is to maintain the efficiency of heat exchangers by monitoring efficiency &amp; preventing/removing fouling.</p>  | Not Applicable             | N/A                     |
| <p><b>BAT 20.</b><br/>BAT is to seek possibilities for cogeneration, inside and/or outside the installation.</p>  | Not a suitable technology. | N/A                     |

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| <p><b>BAT 21.</b></p> <p>BAT is to increase to power factor according to the requirements of the local electricity distributor such as:</p> <ul style="list-style-type: none"> <li>• installing capacitors in the AC circuits to decrease the magnitude of reactive power or lightly loaded motors.</li> <li>• Minimising the operation of idling</li> <li>• Avoiding the operation of equipment above its rated voltage</li> <li>• When replacing motors, using an EE motor.</li> </ul> | <p>Undertaken.</p>            | <p>Continuous improvement</p>  |
| <p><b>BAT 22.</b></p> <p>BAT is the check the power supply for harmonics and apply filters if required.</p>  | <p>Undertaken</p>             | <p>In Place</p>                |
| <p><b>BAT 23.</b></p> <p>Optimise various power supply efficiency measures.</p> <ul style="list-style-type: none"> <li>• Ensure power cables have the correct dimensions for the power demand.</li> <li>• Keep online transformer(s) operating at a load above 40 50% of the rated power.</li> <li>• Use high efficiency/low loss transformers.</li> </ul>   | <p>Undertaken ISO: 50001.</p> | <p>Continuous improvement.</p> |
| <p><b>BAT 24.</b></p> <p>BAT is to optimise electric motors</p> <ul style="list-style-type: none"> <li>• using EE motors</li> <li>• proper motor sizing</li> <li>• installing variable speed drives</li> </ul>   | <p>Undertaken ISO: 50001</p>  | <p>Continuous improvement.</p> |



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| <ul style="list-style-type: none"> <li>• installing high efficiency transmission/reducers</li> <li>• use direct coupling where possible, synchronous belts or cogged v-belts in place of V belts and helical gears in place of worm gears</li> <li>• EE motor repairs or replacement with an EE motor</li> <li>• Rewinding: avoid rewinding and replace with an EE motor, or use a certified rewinding contactor</li> <li>• Power quality control</li> <li>• Integrate lubrication, adjustment and tuning into system operation and maintenance.</li> </ul> |                        |                         |
| <p><b>BAT 25.</b><br/>BAT is to optimise compressed air systems.</p>  | Undertaken ISO: 50001  | Continuous improvement. |
| <p><b>BAT 26.</b><br/>BAT is to optimise pumping stations.</p>  | Undertaken ISO: 50001. | Continuous improvement. |
| <p><b>BAT 27.</b><br/>BAT is to optimise heating, ventilation, and air conditioning systems.</p>  | Undertaken ISO: 50001. | Continuous improvement. |
| <p><b>BAT 28.</b><br/>BAT is to optimise artificial lighting systems.</p>   | Undertaken ISO: 50001. | Continuous improvement. |
| <p><b>BAT 29.</b><br/>BAT is to optimise drying, separation and concentration processes, according to applicability, and to seek opportunities to use mechanical separation in conjunction with thermal processes.</p>  | Undertaken ISO: 50001. | Continuous improvement. |

