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Environmental Permit Application

BAT Conclusions for Energy Efficiency

Document Ref: Attachment B.3.10 – Revision 1

Conclusions on BAT	Applicability Assessment (describe how the technique applies or not to your installation)	State whether it is in place or state schedule for implementation
BAT 1. BAT is to implement and adhere to an energy efficiency management system (ENEMS) 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): a. commitment of top management (commitment of the top management is regarded as a precondition for the successful application of energy efficiency management); b. definition of an energy efficiency policy for the installation by top management; c. planning and establishing objectives and targets (see BAT 2, 3 and 8) ; d. implementation and operation of procedures paying particular attention to: i) structure and responsibility ii) training, awareness and competence (see BAT 13); iii) communication iv) employee involvement	Site will apply for ISO 50001 later this year. Objectives and targets in place set by top management yearly.	Yes

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v) documentation vi) effective control of processes (see BAT 14) vii) maintenance (see BAT 15) viii) emergency preparedness and response ix) safeguarding compliance with energy efficiency-related legislation and agreements (where such agreements exist). e. benchmarking, checking performance and taking corrective active, g review of EMS	`Emergency plans in place	
BAT 2. BAT is to continuously minimise the environmental impact of an installation by planning action & investments on an integrated basis and for the short, medium and long term, considering the costs/benefits & cross media effects.	Reviewed when any new installations are being fitted to site	In place
BAT 3. BAT is to identify the aspects of an installation that influence EE by means of an audit.		In place
BAT 4. When carrying out an audit, BAT is to ensure that the audit identifies the following aspects (See BREF Section 2.11) : This BATC lists the aspects to be considered (a) - (f):	Fridges turned off over the weekend, to minimise usage of power	In place

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a. energy use and type in the installation and its component systems and processes; b. energy-using equipment, and the type and quantity of energy used in the installation; c. possibilities to minimise energy use, such as: • controlling/reducing operating times, e.g. switching off when not in use (e.g. see Sections 3.6, 3.7, 3.8, 3.9, 3.11) • ensuring insulation is optimised, e.g. see Sections 3.1.7, 3.2.11 and 3.11.3.7 • optimising utilities, associated systems, processes and equipment (see Chapter 3); d. possibilities to use alternative sources or use of energy that is more efficient, in particular energy surplus from other processes/ systems, see Section 3.3; e. possibilities to apply energy surplus to other processes and/or systems, see Section 3.3; f. possibilities to upgrade heat quality (see Section 3.3.).	Sensors in place to turn lights off when no one in area.	
BAT 5. BAT is to use appropriate tools/methods to identify/quantify energy optimisation, eg models databases & balances; techniques such as pinch technology, thermoeconomics; estimates & calculations.	EpiSensors Thermograph Readings	In Place
BAT 6. BAT is to Identify opportunities to optimise energy recovery within and between systems at the installation, including 3rd parties as per BREF 3.2-3.4		N/A
BAT 7. BAT is to Optimise EE through a systems approach to energy management.	Used when new installations are to be carried out	

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BAT 8. BAT is to establish EE indicators by carrying out all of the following: to be developed as per section 4.2.2.4 a. 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. b. identifying and recording appropriate boundaries associated with the indicators. c. identifying and recording factors that can cause variation in the energy efficiency of the relevant process, systems and/or units.	Targets set by group, episensors on all equipment so usage can be monitored and to identify efficiency of energy usage.	In Place.
BAT 9. BAT is to carry out sectoral/regional/national benchmarking.		
BAT 10. BAT is to optimise EE when planning a new installation, unit, system or significant upgrade by considering the list in 4.2.3: a. the energy efficient design (EED) should be initiated at the early stages of the conceptual design/basic design phase b. the development and/or selection of energy efficient technologies c. additional data collection may need to be carried out to supplement existing data or fill gaps in knowledge d. the EED work should be carried out by an energy expert e. the initial mapping of energy consumption should also address which parties in the project organisations influence the future energy consumption, and should optimise EED of the future plant with them.		N/A

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BAT 11. Optimise EE/Energy recovery between systems/processes /parties at installations.	As and when required.	Yes
BAT 12. Maintain impetus of EE initiatives as per list		
BAT 13. Maintain expertise in EE/energy using systems through recruitment/training; use of specialist staff/systems/functions; resource sharing.		N/A
BAT 14. Implement effective process control through: compliance with procedures; EE performance parameters identified & optimised, and documented/recorded. a. having systems in place to ensure that procedures are known, understood and complied with. b. ensuring that the key performance parameters are identified, optimised for energy efficiency and monitored. c. documenting or recording these parameters	Documents in place. Readings taken daily/weekly.	In place
BAT 15. Carry out maintenance to optimise EE through measures specified in 4.2.8. a. clearly allocating responsibility for the planning and execution of maintenance. b. 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.	Planned maintenance programme in place. PMP in place. Morning setup of equipment.	In place

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c. supporting the maintenance programme by appropriate record keeping systems and diagnostic testing. d. identifying from routine maintenance, breakdowns and/or abnormalities possible losses in energy efficiency, or where energy efficiency could be improved. e. identifying leaks, broken equipment, worn bearings, etc. that affect or control energy usage, and rectifying them at the earliest opportunity.		
BAT 16. Establish & maintain documented procedures to measure characteristics of operations with a significant impact on EE.	All readings and usage recorded weekly and analysed frequently	Yes
BAT 17. **BAT is to optimise EE of combustion by related techniques such as:** i) Advanced computer control of combustion conditions. ii) reduced excess air. iii) pre-heating of fuel gas. iv) pre-heating of combustion air.		N/A
BAT 18. BAT for steam systems is to optimise EE by using techniques such as: those measures listed in 4.2 in regard to design, operation/control, generation and distribution, recovery of condensate.	Steam boiler used and regularly maintained and checked for efficiency	In Place
BAT 19. Maintain heat exchanger efficiency by monitoring efficiency & preventing/removing fouling.	Heat exchangers fitted to boiler and maintained and monitored	In Place

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BAT 20. BAT is to seek possibilities for cogeneration inside and /or outside the installation (with a third party).		
BAT 21. **Increase power factor according to local power distributor requirements:** a. Installing capacitors in the AC circuits to decrease the magnitude of reactive power. b. or lightly loaded motors. c. Minimising the operation of idling. d. Avoiding the operation of equipment above its rated voltage. e. When replacing motors, using energy efficient motors.	Ways of maintaining, checking efficiency of electricity usage on site ongoing	In Place
BAT 22. Check for harmonics & apply filters if required.		N/A
BAT 23. Optimise various power supply efficiency measures. a. Ensure power cables have the correct dimensions for the power demand. b. Keep online transformer(s) operating at a load above 40 50 % of the rated power. c. c. Use high efficiency/low loss transformers.	Thermograph readings.	In Place
BAT 24. **Optimise electric motors as per section 4.3.6a.** a. Using energy efficient motors (EEM). b. Proper motor sizing c. Installing variable speed drives (VSD) d. Installing high efficiency transmission/reducers	When replacement required, motor looked at for efficiency and lifetime.	In Place

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e. Use direct coupling where possible, synchronous belts or cogged V-belts in place of V belts and helical gears in place of worm gears. f. Energy efficient motor repair (EEMR) or replacement with an EEM. g. Rewinding: avoid rewinding and replace with an EEM, or use a certified rewinding contractor (EEMR). h. Power quality control i. Integrate lubrication, adjustments and tuning into system operation and maintenance.		
BAT 25. Optimise compressed air systems (CAS) as per table 4.6.	All systems have ongoing preventative maintenance systems in place.	Yes
BAT 26. Optimise pumping systems as per 4.3.8	All pumps and motors have ongoing preventative maintenance systems in place.	Yes
BAT 27. Optimise HVAC systems as per 4.3.9		N/A
BAT 28. Optimise lighting systems as per 4.3.10.	Lights switched off in areas when not in use. Motion detectors in low traffic areas.	Yes
BAT 29. BAT is to optimise drying, separation and concentration processes by using techniques such as those in Table 4.10 according to applicability, and to seek opportunities to use mechanical separation in conjunction with thermal processes.		N/A