

4.3.8 Pumping systems

Some 30 to 50 % of the energy consumed by pumping systems may be saved through equipment or control system changes (see Section 3.8).

For electric motors used for driving pumps, see BAT 24. However, the use of VSDs (a key technique) is also mentioned in Table 4.7.

26. BAT is to optimise pumping systems by using the techniques in Table 4.7, according to applicability (see Section 3.8):

Technique	Applicability	Section in this document	Additional information
DESIGN			
Avoid oversizing when selecting pumps and replace oversized pumps	For new pumps: all cases For existing pumps: lifetime cost benefit	3.8.1 3.8.2	Largest single source of pump energy wastage
Match the correct choice of pump to the correct motor for the duty	For new pumps: all cases For existing pumps: lifetime cost benefit	3.8.2 3.8.6	
Design of pipework system (see Distribution system, below)		3.8.3	
CONTROL and MAINTENANCE			
Control and regulation system	All cases	3.8.5	
Shut down unnecessary pumps	All cases	3.8.5	
Use of variable speed drives (VSDs)	Lifetime cost benefit. Not applicable where flows are constant	3.8.5	See BAT 24, in Section 4.3.6
Use of multiple pumps (staged cut in)	When the pumping flow is less than half the maximum single capacity	3.8.5	
Regular maintenance. Where unplanned maintenance becomes excessive, check for: <ul style="list-style-type: none"> • cavitation • wear • wrong type of pump 	All cases. Repair or replace as necessary	3.8.4	
DISTRIBUTION SYSTEM			
Minimise the number of valves and bends commensurate with keeping ease of operation and maintenance	All cases at design and installation (including changes). May need qualified technical advice	3.8.3	
Avoiding using too many bends (especially tight bends)	All cases at design and installation (including changes). May need qualified technical advice	3.8.3	
Ensuring the pipework diameter is not too small (correct pipework diameter)	All cases at design and installation (including changes). May need qualified technical advice	3.8.3	

Table 4.7: Pumping system techniques to improve energy efficiency

Note that throttle control is less energy wasteful than bypass control or no control. However, all are wasteful of energy and should be considered for replacement according to size of the pump and how frequently it is used.

