Energy Saving Action Plan

OLM Consulting is a dynamic company formed between three leading swimming pool water treatment consultants Ian Ogilvie, Richard Lamburn and Robin Mitchell. OLM consulting offer services to the wet leisure industry including, microbiological sampling analysis and consultancy support, energy efficiency site reviews, reports and action plans, detailed design specifications for swimming pool water treatment projects, compliance audits, certified and bespoke pool plant training, formation of compliance documents implementing industry best practice and expert advice and solutions for sustainable pool water treatment.
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With the current economic climate and the increasing pressure on the leisure industry with rising energy costs, here at OLM Consulting we have created this energy saving plan to assist sites.

OLM consulting offer a detailed energy review service to leisure operators. The review involves a site visit in order to audit energy consumption and a written report identifying actions that can be taken to reduce energy usage, operational cost and carbon emissions. Contact info@olmconsulting.co.uk for more information.

The following paper is a guide to operators to aide in ensuring a swimming facility is operated as efficiently as possible.

There has to be a starting point which is to understand the usage of the current centre. Unfortunately, in this current climate we can't do much about the unit cost per kilowatt but you may be able to limit the amount of energy (kilowatts) used by taking action.

In the first instance, we advise to start to take meter readings for electric, gas and water as a minimum on a weekly basis if not daily to understand the usage. Track this so you are able to workout the weekly usage, then averaged per day or actual daily usage.

Energy Saving Suggestions

1. Emptying the strainer basket more often will result in a reduction in head loss on the main circulation pumps and reduce the energy consumption.

2. Ensure that the fan at the back of the pump/motor is clear from dust as the fan draw in air to reduce the heat of the pump. Pumps and motor draw more energy when in warmer environments. Do this on the main circulation pumps, heat exchanger boosters and any spa massage jet pumps.

3. Install Variable Speed Drives on the main circulation pumps, We would recommend using a swimming pool specialist as they need to consider the flow switch in the Automatic Dosing Unit.

4. The sample line water could be plumbed back into the swimming pool system if the TDS can be controlled in line with mains water plus 1000ppm or less. A sample line going to waste running at 1 litre a minute will use 1440 litres per day. This will cost you £1608.34 per year (£3.06 per cubic metre) and that cost doesn't include heating.

5. Ensure that the air temperature of the pool is plus or minus 1 degree of the pool water with a maximum limit of no more than 30 degrees Celsius. As per the PWTAG Code of Practice July 2021.

   Running air temperatures on poolside at one degree less than the swimming pool water temperatures increases the evaporation of the swimming pool. Although you maybe think it will save you energy with poolside being cooler, the increased amount of water you require to replace the evaporated water ends up costing you more. This is because the mains incoming water needs to be heated, which requires a massive amount of energy from cold to the swimming pool target temperature.

6. Humidity should be maintained between 50-70 percent but an increase in humidity can reduce energy consumption. As an example, increase humidity from 60 to 62 percent.

7. Purchase a plate heat exchanger insulation cover for the swimming pool or spa system.

8. Ensure that the primary flow and return pipework on boilers are insulated and any valves that are exposed are covered. Valve covers can be purchased at a very low cost.

9. Any radiators in the building install radiator reflectors to ensure that heat isn't absorbed from the external wall.

10. Pool hall lighting can be upgraded and exchanged for LED's which have an incredibly quick payback period.

11. Installation of a pool cover can have a payback period of 10-24 months if controlled in line with a reduction of air temperature overnight when the swimming pools is covered.

12. Ensure that timeclocks are adjusted around the building and that any light sensor are clean.

13. Upgrade the air handling system, although this can be a significant cost the payback period from a new system to old can be quick. More energy efficient systems are on the market now such as Air, Water and Ground source heating.

14. The current air handling system may be able to have a run around coil fitted in retrospect. The system works by transferring the heat from the extract air back across to the incoming air. Typically, a recovery of circa 8 degrees is normal, it does this by using a refrigerant to collect the heat from the extract air and then transferring this across to the mains incoming air prior to the heating battery coil.

15. Can Solar PV be installed on the roof or if not, the roof, can you utilise the space in the car park.

16. Older toilet systems can benefit from the use of a device called a Hippo. Basically, this is a bag that displaces the water in the toilet system to reduce the amount of water during a toilet flush.

17. Consider the installation of waterless urinals if you are thinking about a refurbishment or simply just an upgrade to the centre. They do still require maintenance and a cartridge change or additional gel added to them so they are not maintenance free.

18. Could the shower heads be changed for more energy efficient ones? A standard shower uses between 8-12 litres of water per minute but new energy saving showers head can be as low as 5 litres per minute. Often this can be a small device added to the shower heads. It may not be suitable for all shower systems. But at a cost of normally less than £10 per shower, it is worth trialling one.

19. PC's, photocopiers and any other electrical devices that don't need to be left on overnight should be shutdown. Whilst still on stand by they do draw a small amount of energy but it all counts.

20. Areas not in use such as sports hall, dance studios, squash courts, office plant rooms etc, turn the lighting off when not in use.

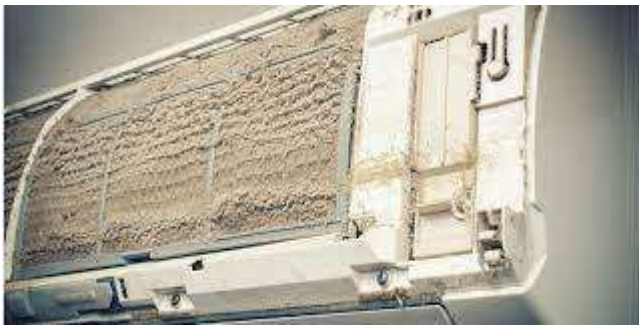
21. Can you send to sleep some of the CV equipment to sleep during off peak times? Just leave a polite message on the equipment saying "I'm off to sleep right now to save energy. If you want me, ask a member of staff to wake me up"

22. Vending machines might be able to be switched off overnight or put on a timer, but please ensure to contact the vending machine supplier to see if this is possible. Also be careful with chocolate and ice creams in the summer.

23. When using air conditioning units ensure that all windows and door are closed so that we are not trying to air condition the world.

24. Door closers should be in working order if not for fire but to prevent the spread of heat loss and to improve the efficiency of air handling.

25. Air condition units work more efficiently and use less energy when the filters are clean. They are easily to remove and usually just require vacuuming.



26. If upgrading the centre, have you considered using green or grey water system that either capture rain water or waste water and use it to flush toilets and urinals. These can now be retro fitted to most urinals so the existing system doesn't have to be changed. An average urinal uses between 7.5-12 litres per flush with an annual usage of 197-315 metres cubed of water. Which is turn is between £600-£960 per year in water.

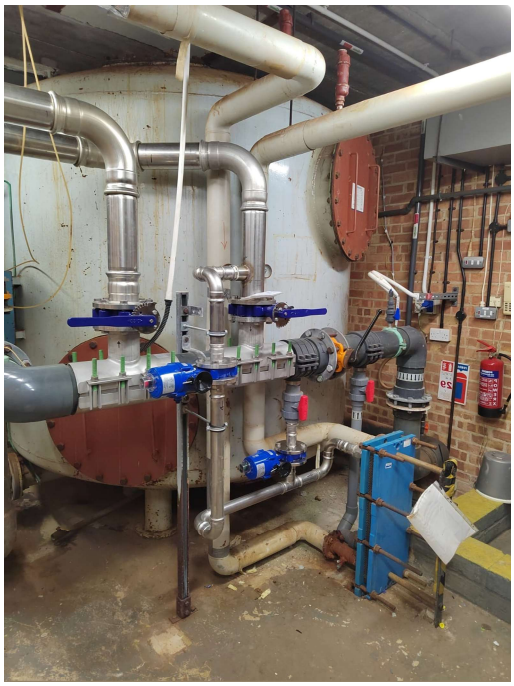
27. Installing a heat recovery system on the backwash/shower water can be installed in line with a grey water system as mentioned above. The water

leaving the filter from the backwash goes through a reclaim system and using the heat recovered to put back into the main hot water system of the building.

28. A tap dripping once a second will use 18 litres of water per day and in turn this equate to 7881 litres per year. That's a cost of approximately £24 for the entire year against the cost of a rubber washer usually needed to repair it of less than £1.

29. Although a you may already have this installed or could be looking at one, a Building Management System (BMS) is fantastic when used correctly in a building. It can easily highlight areas or problems and areas where you maybe able to fine tune the use of energy in the building. Many of us are even beginning to have BMS in our homes to control our heating and lights.

30. Technology not exists where not only can we use Air, Water or Ground source heating for heating the air but also the pool water. This can be retro fitted using the existing plate heat exchanger.



31. When changing boiler on a swimming pool consider more green options such as Biomass boilers or a Biomass CHP which will generate energy as well as the heat required for the leisure centre.

Energy saving checklist taken from the carbon trust – Swimming pools - A deeper look at energy efficiency

Action checklist

Existing systems	Complete?	Action/Comment
Ensure air temperature is set at 1°C above water temperature to avoid convection air movement		
Control ventilation rates with a dew point sensor to the minimum rate consistent with avoiding condensation		
If existing control is by humidistat, reset each season according to the outside temperature		
If ventilation volume is set at 'full' or controlled manually or by timer, investigate how to link this with humidity levels as an alternative option		
Reposition supply air outlets so that drier supply air entering the pool hall is pointed towards the building structure rather than down on to the surface of the pool water		
Keep doors closed between areas with different temperatures and humidity		
Provide localised cooling for staff using overhead fans and discourage staff from opening doors and windows if they are hot		
Conduct regular pool backwashing and clean the pool filters to maintain good quality clean water		
Benchmark separately for fossil fuels and electricity to show potential for savings		
Inspect system components such as fans, coils and pumps for corrosion and clean or replace if necessary		
Minimise the frequency of backwashing consistent with achieving the required minimum standard of water quality		
Provide heating, lighting and hot water only to occupied areas		
Inspect heat recovery devices and air filters once a month and clean or replace if necessary		
Walk around the premises at different times of the day and during different seasons to see how energy is being used. Develop an action plan for making savings		
Refurbishment and capital expenditure		
Fit pool covers to minimise evaporation and ensure staff are trained to use them properly		
Consider fitting variable speed drives on pumps and fans		
Explore solar water heating potential		
Replace ageing conventional boilers with high efficiency condensing boilers		
Consider combined heat and power; evaluate the economics including maintenance and plant replacement costs		
Consider ventilation heat recovery and waste water heat recovery		
Evaluate options for using heat pumps for dehumidification and utilising the recovered energy for pool heating		
Investigate installing additional insulation and consider insulating any existing cold bridges		

For more information contact OLM Consulting at info@olmconsulting.co.uk