



CLADE

LEADING THE TRANSFORMATION IN
GREEN HEATING AND COOLING

22 FEBRUARY 2021 //



ACER CASE STUDY

CO2 heat pump for open air swimming pool



SYSTEM DESIGN //



Solar PV provides power to heat pump.



Simple pressurised LTHW circuit with regulating valve for balancing low resistance in pipeline with on board pump.

Normal swimming pool circuit with pumps, filters and treatment etc.



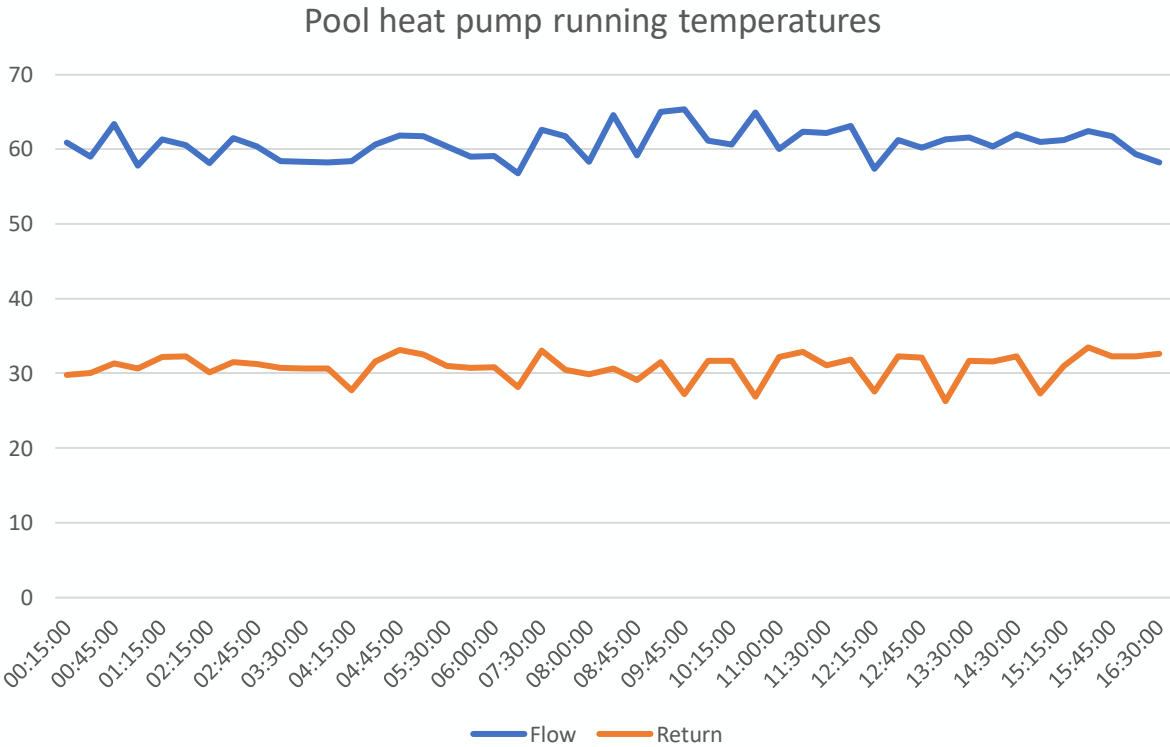


PERFORMANCE //

COP

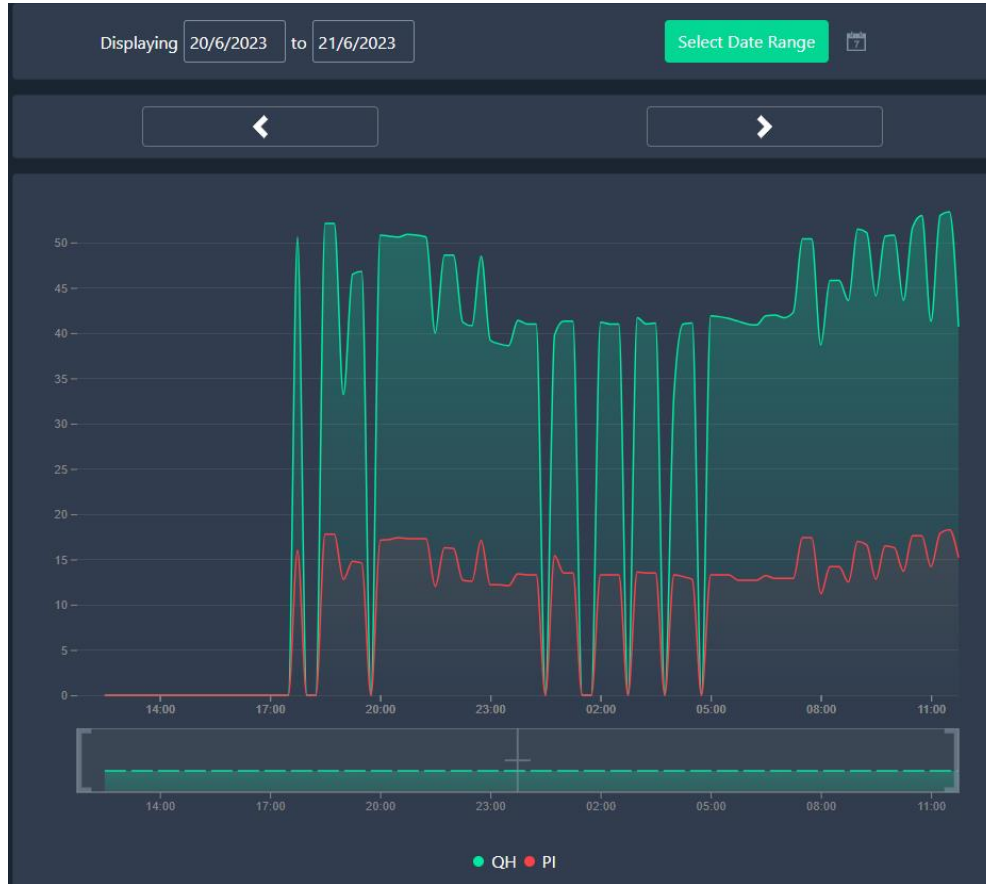
01/07/23 TO 16/07/23

Max	Average
3.6	3.0
3.7	3.0
3.6	2.9
3.3	3.0
3.3	3.0
3.5	2.9
3.5	3.0
3.4	2.9
3.6	2.9
3.6	2.9
3.6	3.0
3.6	3.0
3.3	2.9
3.5	3.0
3.6	3.0
3.6	2.9





HEAT POWER //



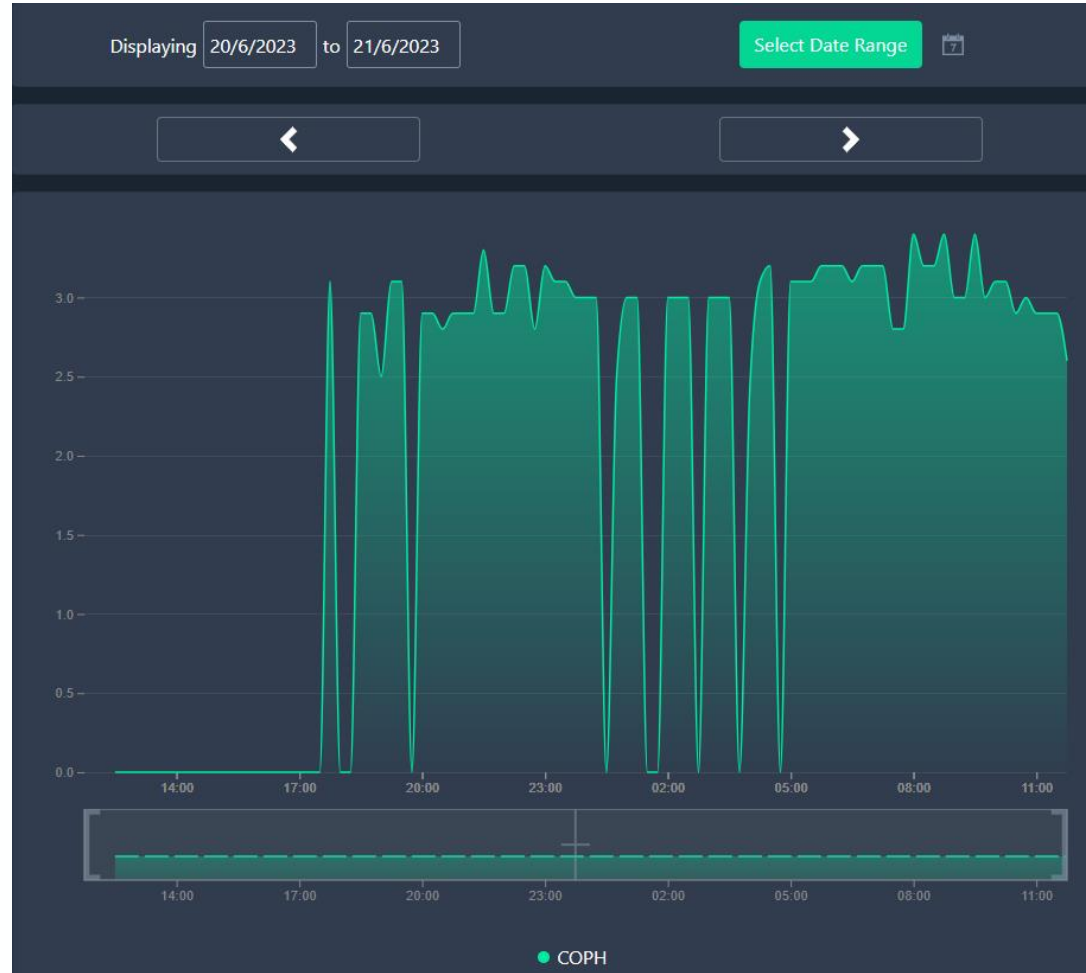
This graphic shows the heating power produced by the heat pump.

The heat pump responds to return temperature and control signals to increase or reduce output accordingly.

The ambient temperature during the test was around 10 to 15C.



COP //



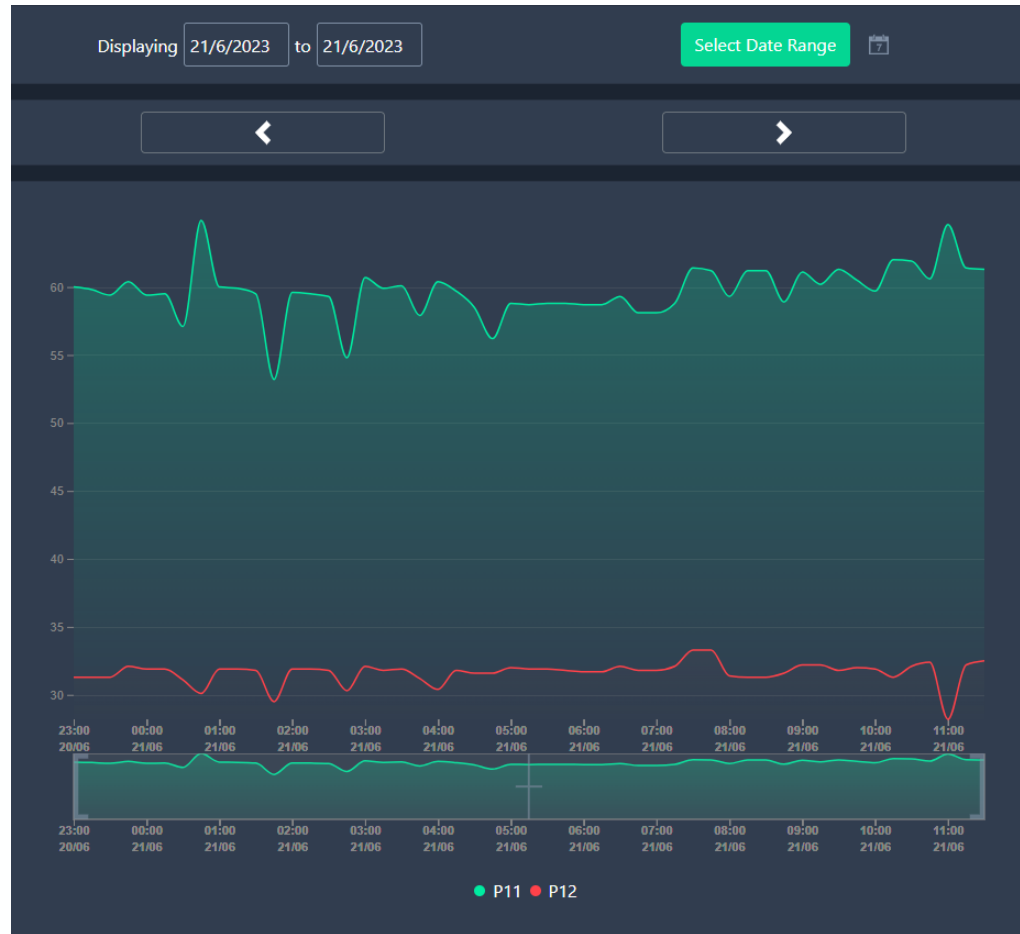
This graphic shows the COP of the heat pump minute by minute.

When running the COP is around 3.0 average, which is as expected.

The effect of stop/start operations on COP is clearly visible. This period is during the initial start up and so interruptions are normal. However, effort should be made to ensure that during operation the start/stops are minimised.



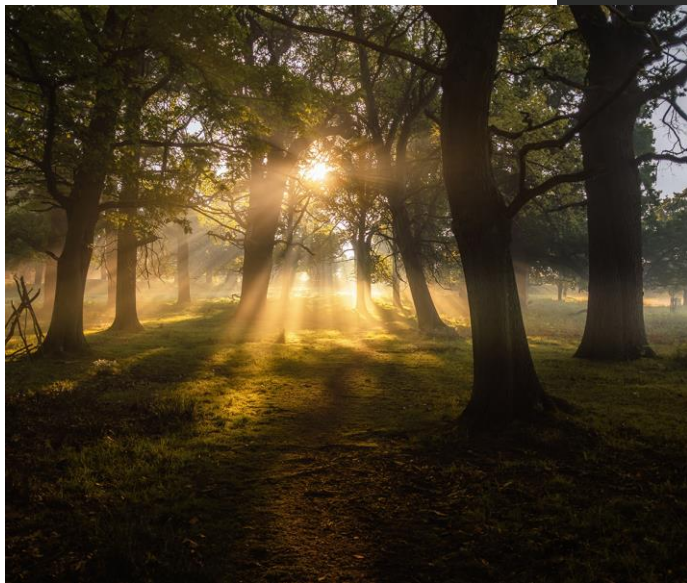
FLOW AND RETURN TEMPERATURES //



This graphic shows the flow and return temperatures.

The heat pump supplies a shell and tube heat exchanger, typical of swimming pools. This is not ideal but is functional, the return temperature is a little higher than would be ideal but works well and achieves a good COP.

The flow temp target is 60C.



— THANK YOU //

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