Hi Achim – replies to your questions below …

Regards, Nick

Dear Jon, Nick,

Attached is the plant scheme as I was able to extract from the plant definition (and control) file. Following questions:

1. On the lower left, the heat pump has a kind of loop with f\_pump and pump\_bypass\_cvg. In this loop, the flow rate seems to always be zero. What is the loop for? Is it necessary? The f\_pump is there if a modeller wants to use a component other than the heat pump. The heat pump has its own water pump to circulate the hot water. However, another component such as a boiler would need the additional feed pump component. With the heat pump, the additional pump and bypass loop are redundant and so the flow through them should be 0. .
2. The heat pump has an internal pump which seems to always be running with 0.26 kg/s. What is this for? Is the electricity taken into account (can it be ~) in the electricity net? I assume it cannot be controlled, as the one available control variable is on/off of the heat pump itself, it seems. The heat pumps internal pump is needed to circulate hot water around the primary heating loop, which in this case just runs to the buffer tank. The pump turns on and off with the heat pump and the electricity consumption is included in the device’s power demand.
3. The connection of the stochastic DHW draw is confusion (physically illogical, also). It seems this is the only way it works, though. Where does the return temperature come from? It is around 7 °C when indoor temperatures are around 15 to 20 °C. That seems strange. Is the return temperature fixed at "mains water supply temperature"? Where is this value set? The DHW draw component assumes that the hot water taken from the DHW ank is lost to the drain and replenished (via the return connection from the component) with mains water. The temperature of the input mains water is taken from the ground temperature profile. In the model with the grey water heat recovery tank (GWHR), the input water to the
4. What is the GWHR tank, actually? And the buffer tank? Each of the three tanks of the plant has a volume of 0.5 m3. This seems like a strange configuration - is it based on a real-world product (if yes, could you give me a name/manufacturer/type)? The three tanks are grey water heat recovery, domestic hot water and buffer tank. The GWHR recovers heat lost from the hot water draw component  - the network directs 80% of the heat from the hot water draw to the GWHR tank with the assumption that 20% of the heat is lost. The DHW tank supplies the hot water. The buffer tank is there to allow load shifting of the heat pump, but you’ll need to increase the tank volume to ~1000L to do this over long periods of time.
5. The model seems to have ideal control without plant components for space heating/cooling. Is that to "keep it simple"? The model doesn’t have any cooling capacity however heating is delivered via the plant systems – the heat from the plant is transferred via a building control law 6. There are several plant control loops to maintain the air temperature inside the building and the hot water temperature (from memory I think these are on/off with dead band).
6. How does the ventilation via heat exchanger interact with the (controlled) air changes given in the .opr files? I was unable to find out, somehow.

It doesn’t – the .opr files deal with infiltration only – the air exchange with the plant is dealt with as an equivalent heat flux via the building control law 6.

1. Is a "type 4" connection with "zone 0" equivalent to "air from the ambient"?

       Yes, that’s right.

1. … probably some more …

After understanding the plant, I would like to extend it to also heat the building via radiators (WCH) or maybe radiant floor slabs. I would be happy about any ideas about how to best (realistically) extend the plant accordingly (not really my area of expertise).

       We’re already got examples of broadly the same system connected to a boiler, micro-CHP, hydronic radiators and underfloor heating. So I’m sure we can dig out the files for you.