



IESVE  
Trial Support  
Material

[www.iesve.com](http://www.iesve.com)

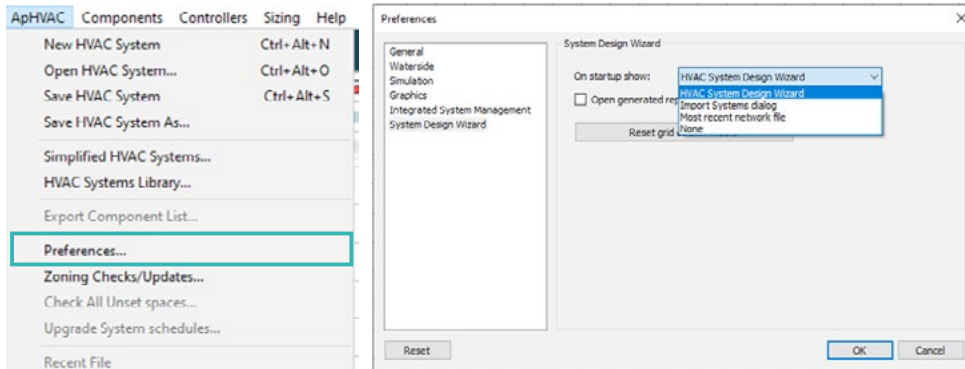
ApacheHVAC  
Wizard

# ApacheHVAC Wizard

The HVAC System Design Wizard is the easiest way to get to grips with selecting and sizing HVAC Systems in the Virtual Environment when you need to study HVAC systems in greater detail than our simpler ApacheSystems approach.

The HVAC System Design Wizard is a simple step by step approach.

The approach changes dependent upon whether you're only selecting and sizing for Design or for Compliance purposes. We're only going to cover Design here, but as a taster, the Compliance Mode, launched from the appropriate Compliance Navigator, can help selection further by automatically selecting the correct baseline systems for the chosen Compliance route.



The HVAC System Design Wizard should launch automatically as you open ApacheHVAC,

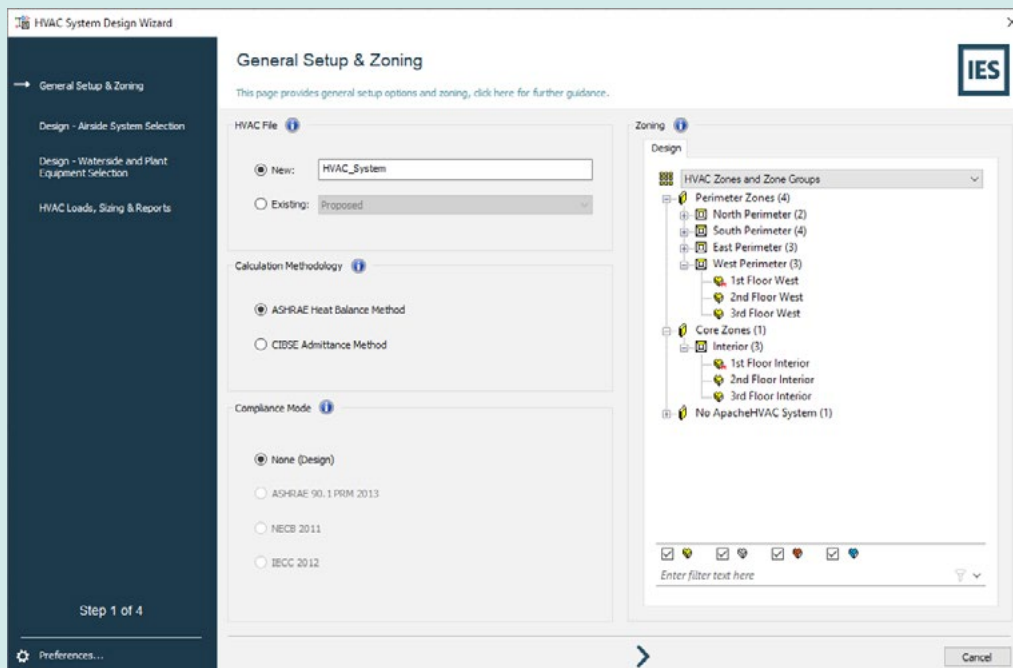
*If you do not see the HVAC System Design Wizard when you open ApacheHVAC go to Preferences in the ApHVAC menu and select it to always show on startup*

## Step 1 of 4

In the first step you need to:

- Name your HVAC System
- Choose your Loads Calculation methodology: either ASHRAE or CIBSE
- Zone the spaces in your model to represent the HVAC zones in your Design model.

In the model shown there are two HVAC Systems with two HVAC Zones, one for Perimeter spaces and one for all the Core spaces – you can zone in any way you please, with as many HVAC System Zones as you like.

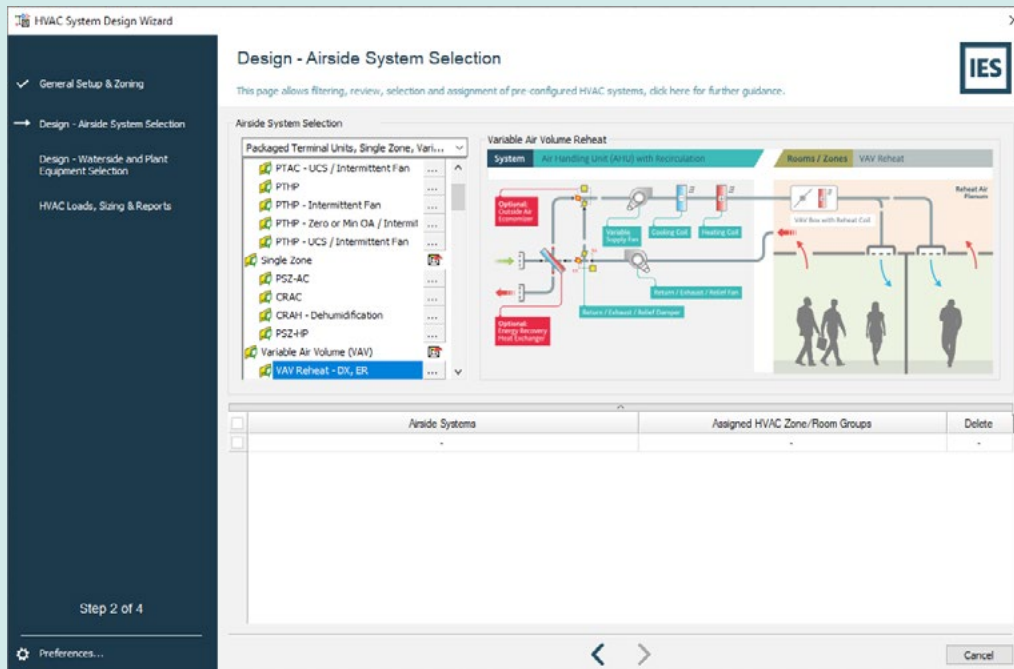


You can also use the **Create and edit space groups** tool (discussed in ApacheSim) before you open ApacheHVAC, to assign your space to the correct groups in the default grouping scheme called HVAC Zones and Zone Groups.

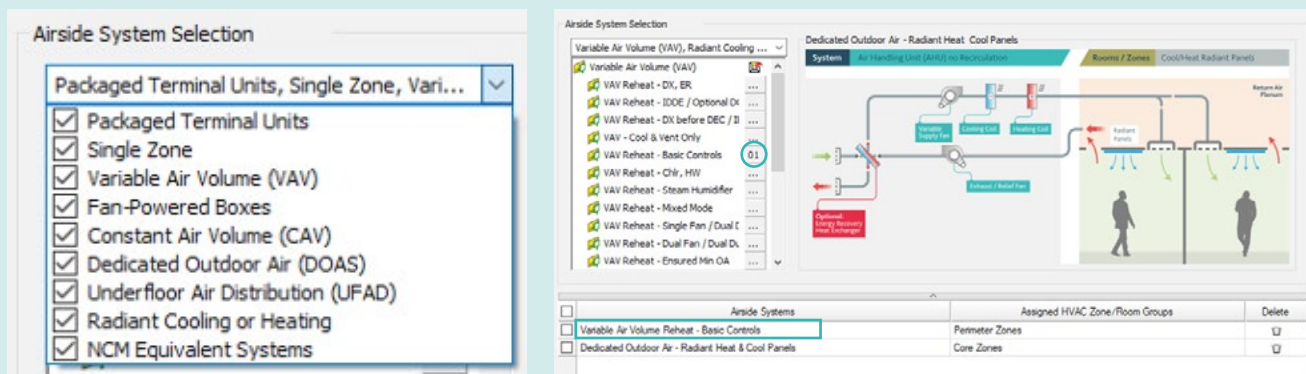
Click on the **arrow** at the bottom to move to the next step

## Step 2 of 4

In this next step on the HVAC System Design Wizard, you need to select the Airside Systems for the HVAC System Zones set up in the first step. There are a large number of pre-defined systems to choose from, all categorised into various types, including standard systems for both ASHRAE and NCM compliance.



By using the Airside System Selection drop down list you can reduce the amount of HVAC Airside Systems to make selection easier. When you click on any single system the graphic on the right hand side of the display will update informing you of the choice you have made with a simple to understand representation of the chosen HVAC System.



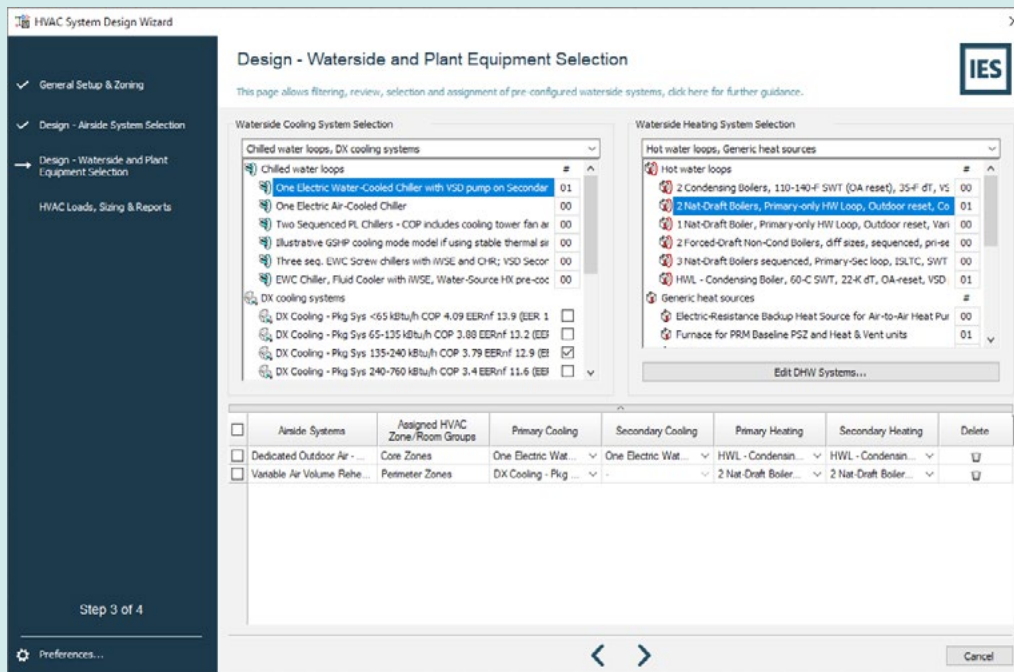
Selection of an Airside system is easy click on the '...' box next to the HVAC System you'd like to apply, and then choose the HVAC Zone for that System.

When you have chosen an Airside System two things change, firstly a number appears by the side of the system (here you can see '01' is shown, meaning there is one VAV Reheat System chosen), secondly the selected systems are shown in the list below along with which HVAC Zone the HVAC System is now assigned to. This can be changed by deleting the system choice and starting again.

Click on the **arrow** to move onto the next step

## Step 3 of 4

This next step is even easier than the first, as the software chooses the most appropriate Waterside Cooling and Heating System for you! Of course you can change the defaults to your hearts content.



As with the Airside selection step, the number of Waterside systems chosen is shown both with a number (or a checkbox) and in the list of systems. The automatic selection also shows the Primary and, where appropriate, the Secondary Heating and Cooling Waterside systems per Airside systems.

In this example there is a Waterside System for both the Perimeter and Core Airside Systems.

If you do want to choose a non-default system, use the drop down lists to reduce the list of available choices and simplify your search. Clicking to the right of the waterside system will allow you to select the systems from the drop-down list in the table below, and the number used will increment to identify that you have selected that Waterside system.

**Note that care should be taken that the waterside system chosen, is appropriate for the airside system.**

That's the selection completed, now click on the arrow to move onto the next step: selecting the approach to loads calculations and energy simulations and deciding what content is required for output in the format of a Loads Report.

## Step 4 of 4

The last step... the three check boxes are used to decide which calculations to perform:

- HVAC Zone/Room loads/sizing calculations
- HVAC System loads/sizing calculations
- and Energy Simulations.

All three calculation types will produce results that can be viewed in the Virtual Environment results viewer (VistaPro), in addition the Loads calculations can also create configurable reports.

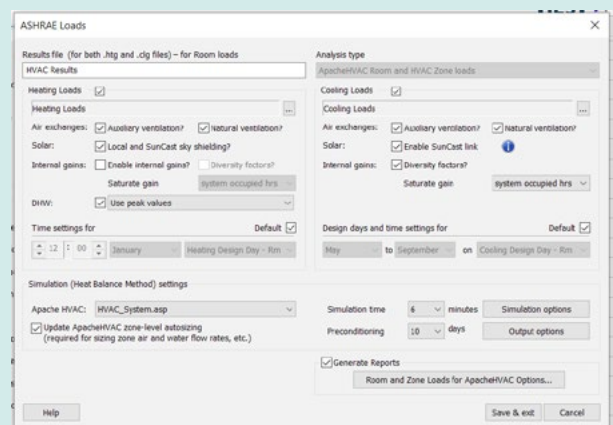
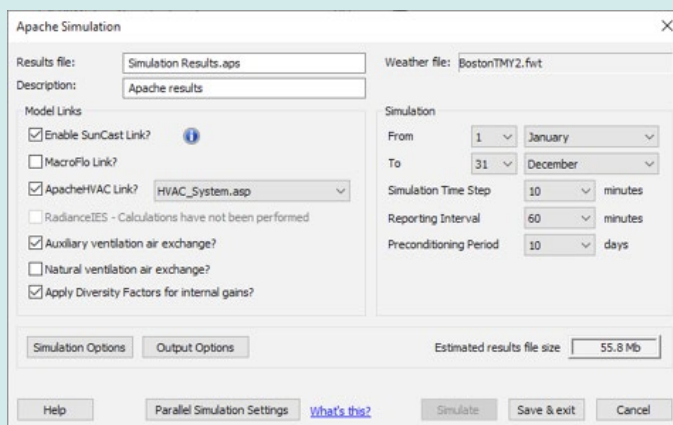
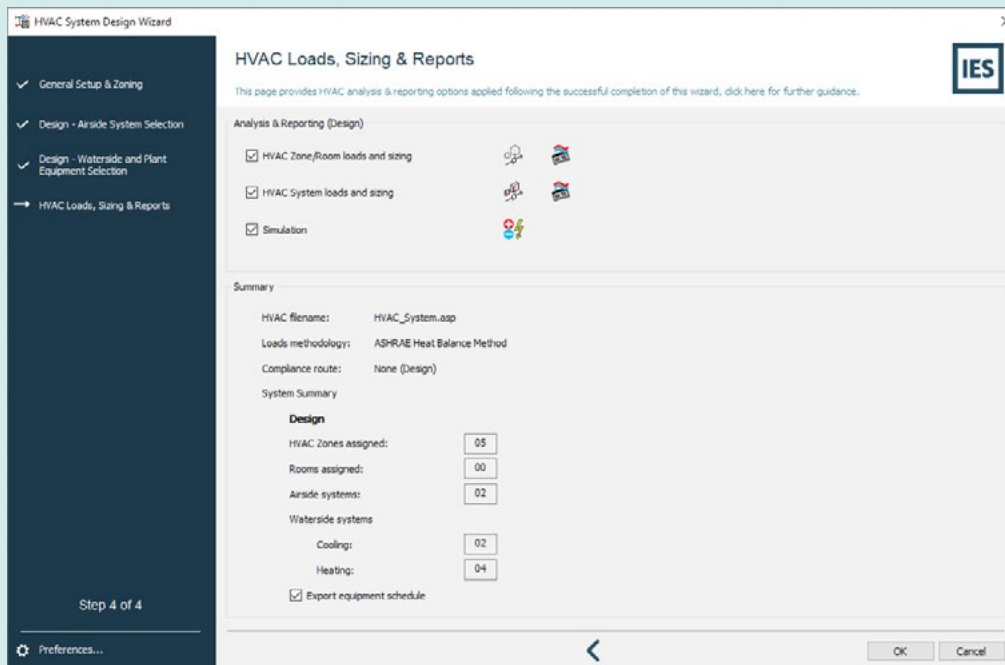


The first button configures the calculation for the Loads and Energy Simulations – for instance you can choose to include SunCast results for accurate solar tracking, or configure the design day choices or simulation duration.



The second button (only available for the Loads calculations) configures the Loads Reports.

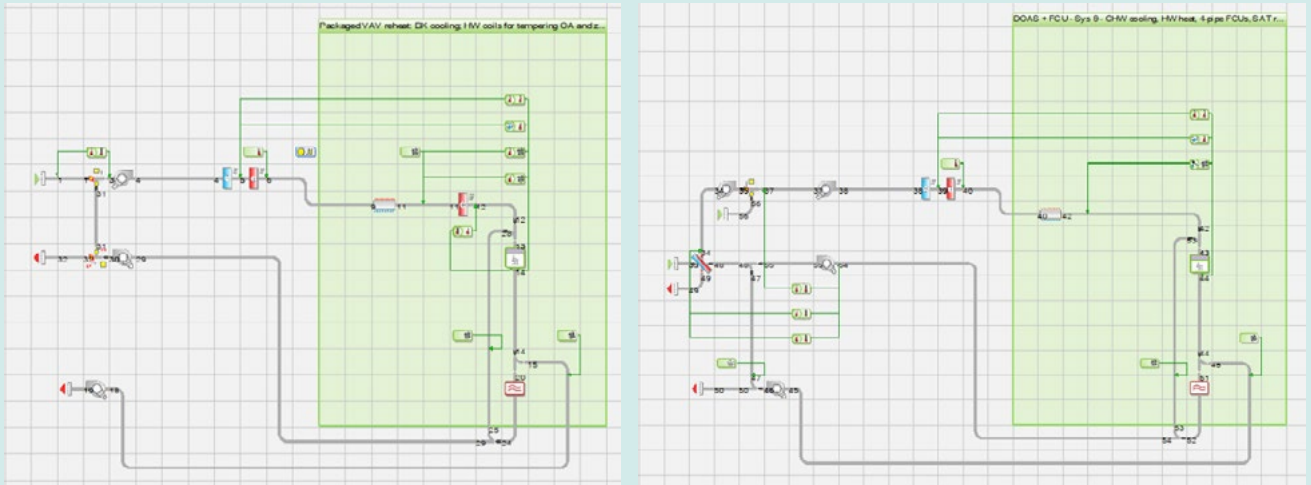
Clicking this button opens the Generate loads and sizing reports where you can define the detail that appears in the Loads reports. For instance you can choose whether to have both Zone and Room conditioning loads, or only System Loads.



## Step 4 of 4

When you've made all the decisions about the format of the Loads reports, and chosen all the calculation and simulation options clicking **OK** on the 4th step performs a number of tasks automatically:

1. Creates all the Airside and Waterside systems



2. Runs the calculations for the Zone/Room loads
  - a. Creates the Zone/Room Loads Report

**Plant Loops and Equipment** IES VIRTUAL ENVIRONMENT VE 2019 IES

<p><b>Chilled Water Loop (1) of 1</b></p> <p>Name: One-Drain Water-Cooled Outdoor with 100 pump on Secondary Chilled Water</p> <p>Capacity: 100.00 MW</p> <p>Primary design flow rate: 3.000 m³/s</p> <p>Primary pump power: 400.00 kW</p> <p>Secondary design flow rate: 3.000 m³/s</p> <p>Secondary pump power: 400.00 kW</p> <p>Condenser heat design capacity: 200.00 MW</p> <p>Condenser heat design flow rate: 4.27 m³/s</p> <p>Condenser water pump power: 2.760 kW</p> <p>Evaporator heat capacity: -</p> <p>Evaporator flow rate: -</p> <p>Equipment Capacity: 100.00 MW</p> <p>4000 Chilled Water Units (Units and 100 units) pumps, 1 hot-cold tower fan</p> <p>COOL, Chilled Water: 200.00 MW</p>	<p><b>Hot Water Loop (1) of 1</b></p> <p>Name: 2 Hot-Draft Boilers, Primary only with 1 unit, Outdoor reset, Condenser pump</p> <p>Capacity: 100.00 MW</p> <p>Pre-heating condenser heat capacity: -</p> <p>Pre-heating water to water heat capacity: -</p> <p>Pre-heating water to water heat capacity: -</p> <p>Pre-heating condenser hot &amp; power capacity: -</p> <p>Primary design flow rate: 1.000 m³/s</p> <p>Primary pump power: 100.00 kW</p> <p>Secondary design flow rate: 1.000 m³/s</p> <p>Secondary pump power: 100.00 kW</p> <p>Evaporator heat capacity: -</p> <p>Evaporator flow rate: -</p> <p>Equipment Capacity: 100.00 MW</p> <p>Hot Water Loop (Condenser/Boiler) 100.00 MW</p>
---	---

**Space Loads and Ventilation** IES VIRTUAL ENVIRONMENT VE 2019 IES

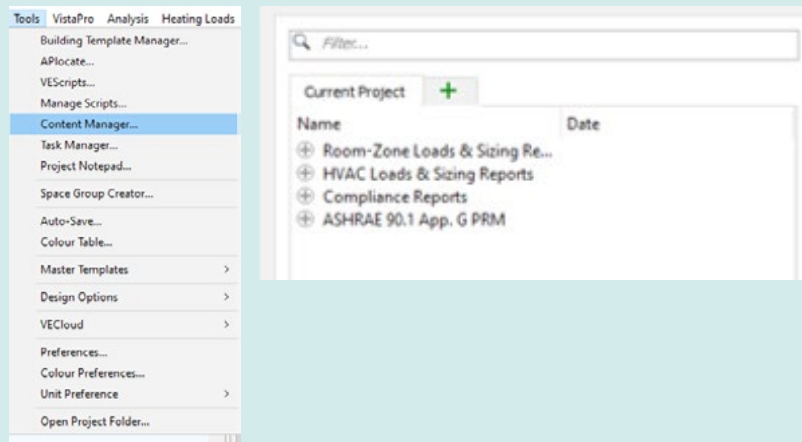
05 e Variable Air Volume Reheat - Basic Controls (Perimeter Zones)

Zone	Rooms	Sensible Cooling Load (kW)	Latent Cooling Load (kW)	Total Cooling Load (kW)	Total Cooling Load (kW)	Cooling Airflow (l/s/m²)	Cooling Airflow (l/s/m²)	Heating Load (kW)	Heating Load (kW)	Heating Airflow (l/s/m²)	Heating Airflow (l/s/m²)	Outdoor Airflow (l/s)	Outdoor Airflow (l/s)	Min OA Airflow (l/s)	Min OA Airflow (l/s/m²)
System		130.314	0.000	130.314	05.000	0.074	4.802	09.303	34.34	4.802	2.763	1.139	0.900	-	-
North Perimeter	1st Floor North	18.632	1.675	21.207	51.16	1.445	3.480	14.030	33.84	563	2.372	225	0.543	-	-
	2nd Floor North	9.760	0.797	10.558	55.94	718	3.485	6.090	33.88	410	2.302	-	-	-	-
	3rd Floor North	9.623	0.788	10.411	55.88	729	3.515	7.050	34.03	406	2.300	-	-	-	-
South Perimeter	1st Floor South	58.481	2.822	61.303	79.42	4.582	4.923	28.003	33.78	1.993	2.388	450	0.543	-	-
	2nd Floor South	15.744	0.730	16.475	79.48	1.090	5.258	6.999	33.99	524	2.529	-	-	-	-
	3rd Floor South	15.740	0.731	16.477	79.48	1.090	5.260	6.999	33.71	524	2.528	-	-	-	-
East Perimeter	1st Floor East	20.828	1.406	22.234	79.85	2.173	5.839	13.051	34.61	907	3.428	214	0.543	-	-
	2nd Floor East	9.430	0.500	10.329	79.90	724	5.983	4.549	34.59	319	2.423	-	-	-	-
	3rd Floor East	9.425	0.500	10.325	79.92	724	5.985	4.556	34.65	319	2.424	-	-	-	-
West Perimeter	1st Floor West	30.084	1.406	31.490	81.78	2.258	5.740	13.078	34.75	939	3.438	214	0.543	-	-
	2nd Floor West	10.181	0.468	10.649	81.40	750	5.714	4.543	34.63	318	2.425	-	-	-	-
	3rd Floor West	10.183	0.469	10.652	81.41	750	5.716	4.547	34.69	318	2.428	-	-	-	-
3rd Floor West	10.330	0.469	10.829	82.53	760	5.769	4.588	34.97	323	2.487	-	-	-	-	

- b. Creates the results file for further interrogation
3. Runs the calculations for System loads
    - a. Creates the System Loads Report
    - b. Creates the results file for further interrogation
  4. Runs the Energy simulation
    - a. Creates the energy results file for further investigation

## To View Reports

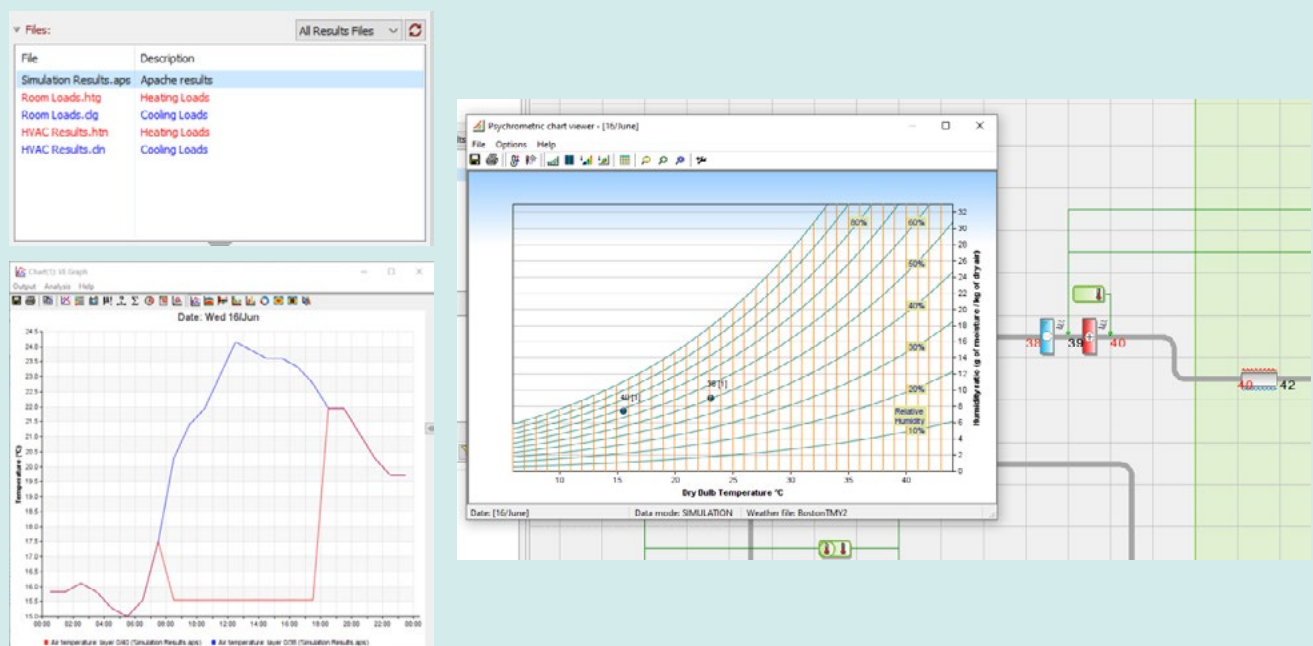
To view the Loads Reports go to the Content Manager in the Tools menu, there you will see the reports categorised by type. Double clicking will open the PDF of the report for interrogation.



## To View Results

Results for the Loads and Energy calculations can be viewed in VistaPro. All of the functionality in VistaPro is available for interrogation of the results created from the HVAC System Wizard.

To give some examples, the images show that investigation could be looking at the air temperatures throughout the Airside System (done by selection within the System) graphically in a time-based approach over a day or perhaps at any single point in time on a Psychrometric Chart.



For a greater insight into the strengths of VistaPro for results visualisation, go to

[https://help.iesve.com/ve2019/specifying\\_data\\_for\\_output.htm#](https://help.iesve.com/ve2019/specifying_data_for_output.htm#) and

[https://help.iesve.com/ve2019/using\\_the\\_output\\_toolbar.htm#](https://help.iesve.com/ve2019/using_the_output_toolbar.htm#)