

Figure 1: A packaged air handling unit used to demonstrate the formulation of a simple state-space equation for plant components. Here, a one node model is derived; more rigorous formulations are possible if the component is first divided into a number of finite volumes.

Figure 2: The energy balance matrix equation for the system of figure 1. Each row is a component state-space equation, which relates the component's state variable, enthalpy, to the state variable of the connecting component.

Figure 3: The mass balance matrix equation for the system of figure 1. The mass conservation equations are held for both phases - dry air and water vapour.

Figure 4: The two additional differential equations for the cooling coil's air and water side are appended to the figure 2 matrix equation. This permits a more explicit treatment of cooling coil behaviour.

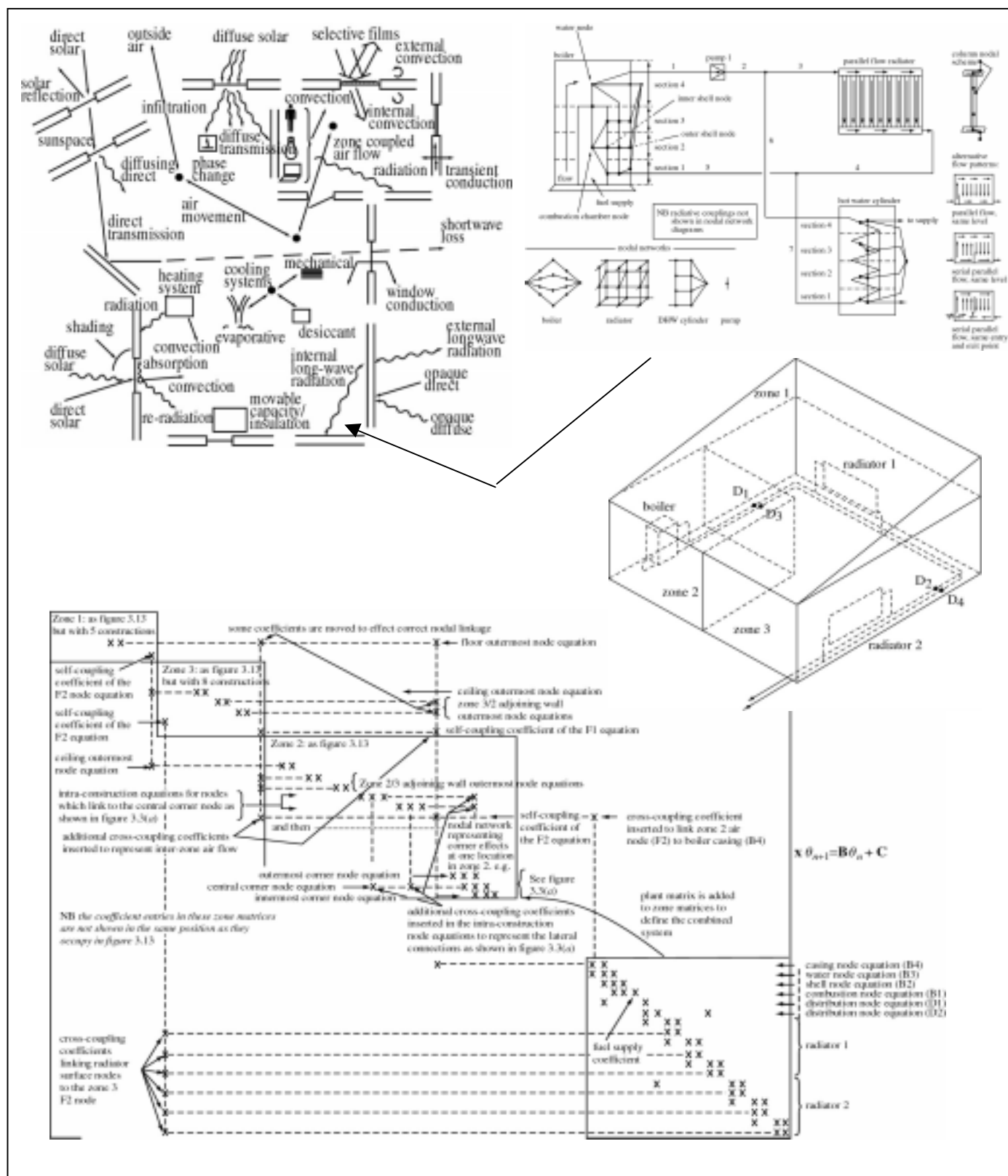


Figure 5: A multi-zone building system served by a multi-component plant. The corresponding matrix equation topology is also shown. This is the equation-set that must be simultaneously solved to obtain the energy performance of the combined system.

For ESP ...

Heating plant sizing  
Cooling plant sizing  
Climate severity assessment  
Plant control strategy appraisal  
Condensation expert  
Summer overheating analysis expert.  
Building zone dimensions take-off.  
Comfort expert.  
Annual energy requirements and causal breakdown.  
Solar utilisation expert.  
Air flow expert.

For other ABACUS programs ...

Perspective views.  
Walk-around movie.  
Cost-in-use assessment.  
Regulations compliance

Table 1: Rules scripts for performance assessment exist for the areas listed. When invoked, the scripts conduct a rigorous design appraisal, returning information relevant to the performance status encountered.

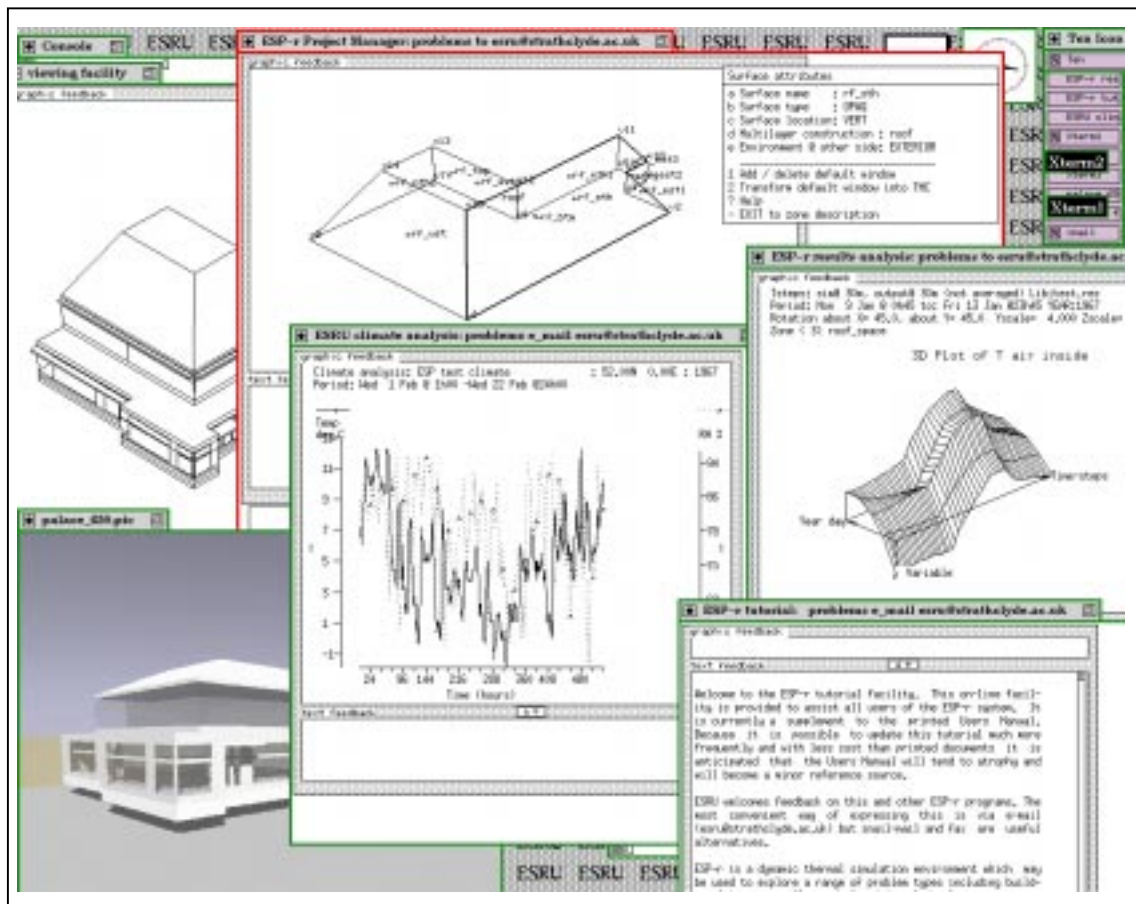


Figure 6: A multi-window screen image showing the results from an ESP performance assessment on a Whitechapel MG-1 workstation. Such assessments may be undertaken interactively or automated through simple command line arguments.