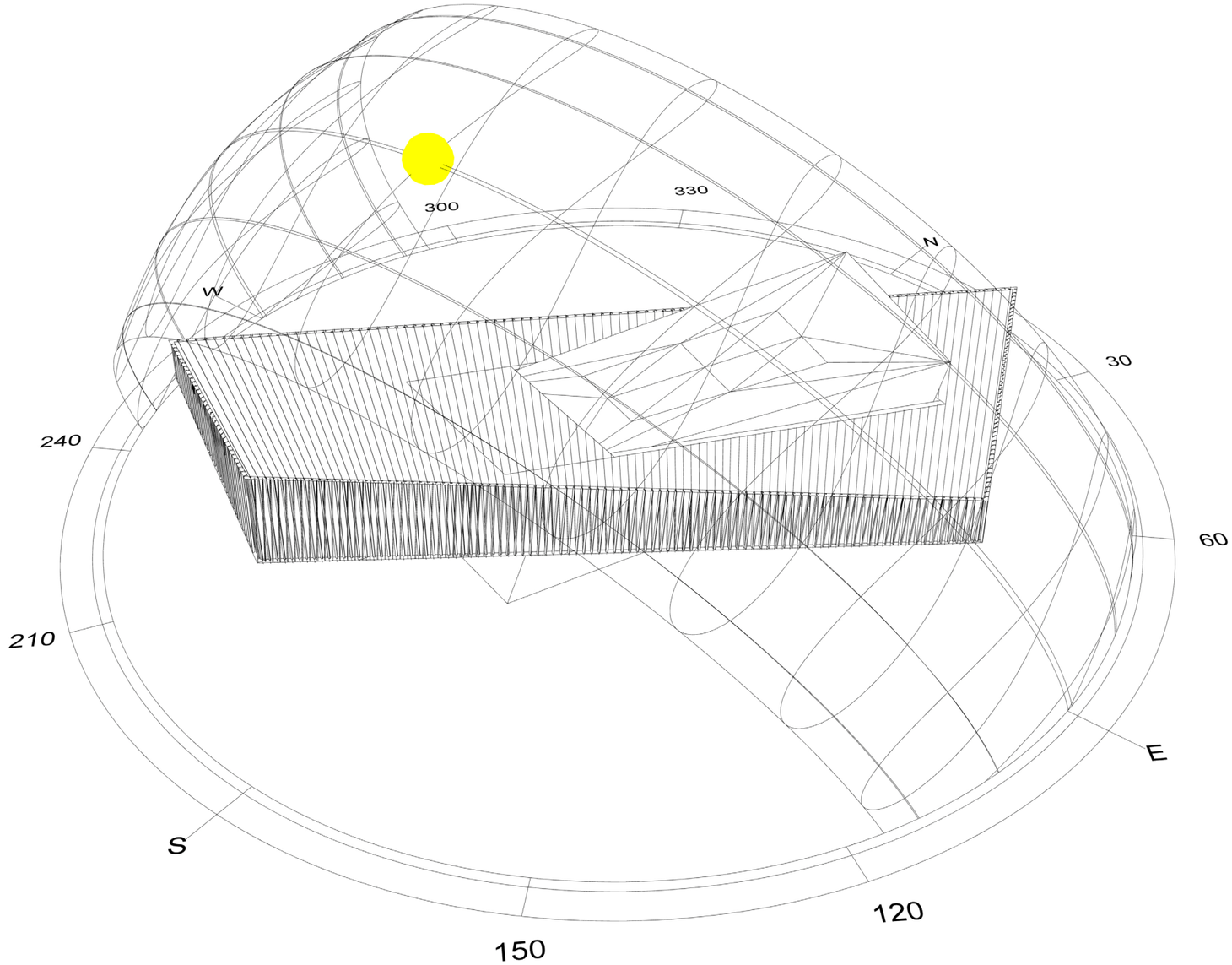


Energy Analysis for the Misk Foundation Centre

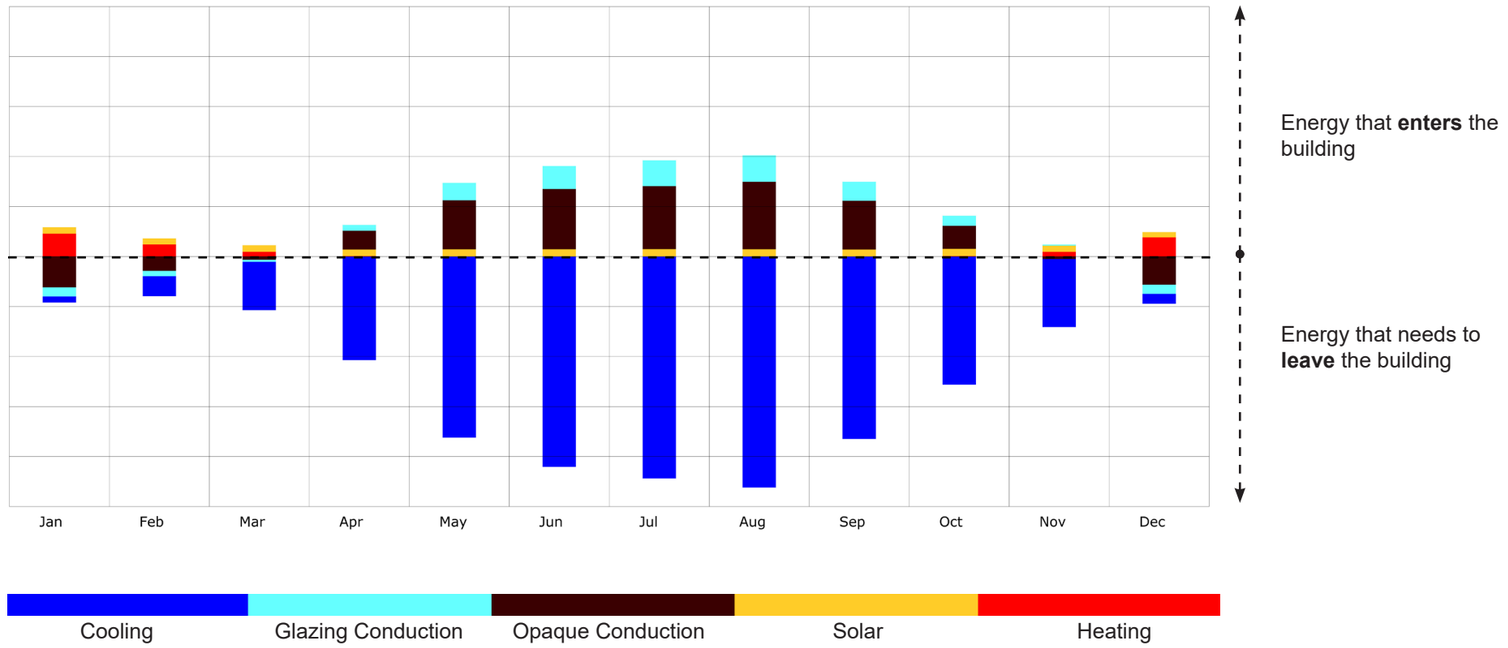
Analysis Method

Typically, energy modelling is done to estimate the amount of electricity the building will generate. However, this is not the only use of energy modelling. It is an excellent tool to assess the impact of various design decisions on the **heat balance** of a building. At the very core, energy models follow the first law of thermodynamics that the law of the conservation of energy. The amount of energy entering the building is equal to the amount of energy leaving the building.

In this report, the Misk headquarter building is simulated without an HVAC system. The objective here is the see the impact of different design alterations on the **heat balance** of the building.

The building is broken down into peripheral and core zones and the peripheral zones are further split into zones based on orientations. This is done to observe the prominent impact of environmental conditions on the peripheral zones.

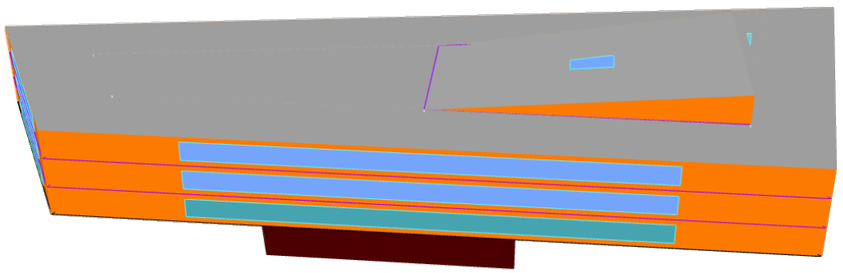
On the right, an example of the **heat balance** chart is shown. Heat balance is tracked for each design iteration and the same is reported in the following pages of this report. In every iteration, the change in simulation parameter is clearly marked.

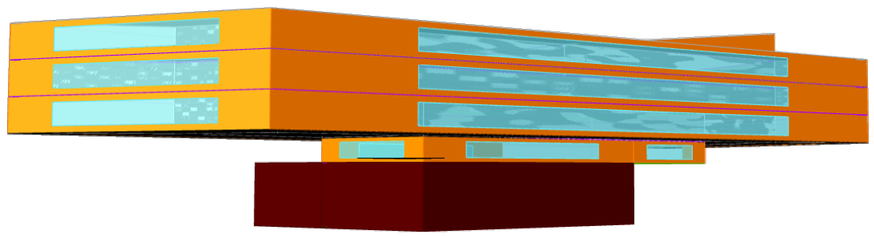


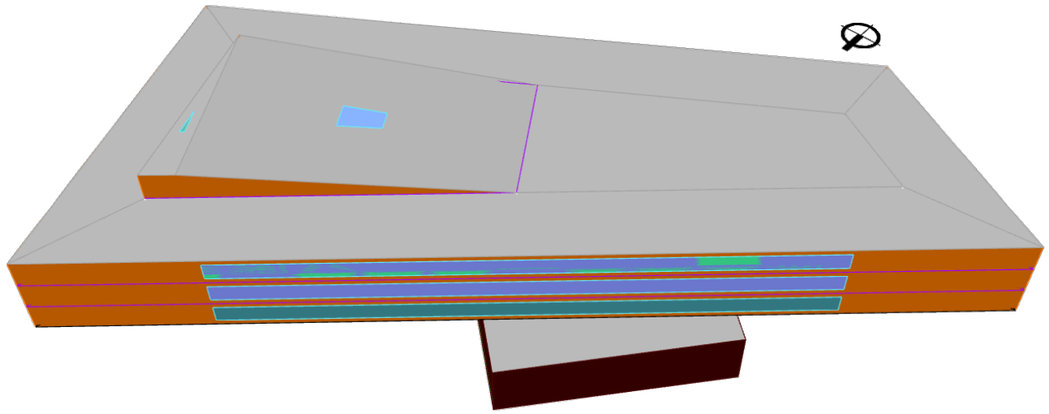
Baseline
Simulation Parameters

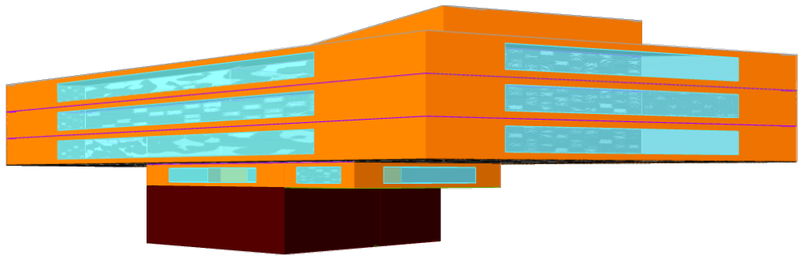
U-Value (W/m2K)			
Roof	0.358	Glazing SHGC	0.25
Wall Above Grade	0.704	Glass Visible Light Transmittance	0.45
Wall Below Grade	7.495	Window to Wall Ratio	0.40
Insulated Floor	1.987	Shade on Facade	No
Slab on Grade	1.987		
Glazing	6.814		

Energy Model Images

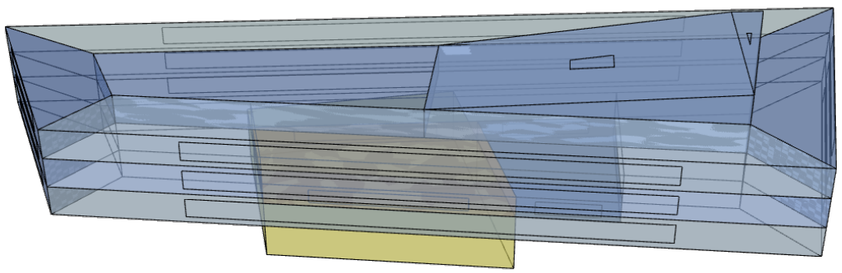


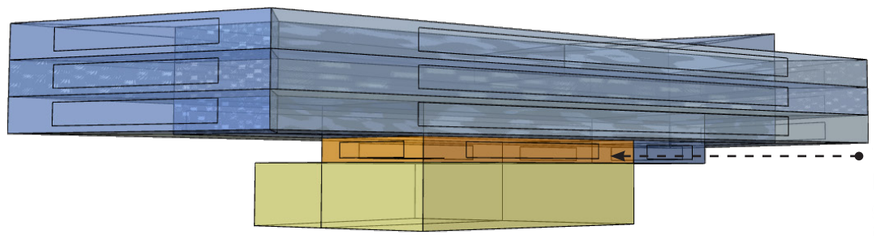




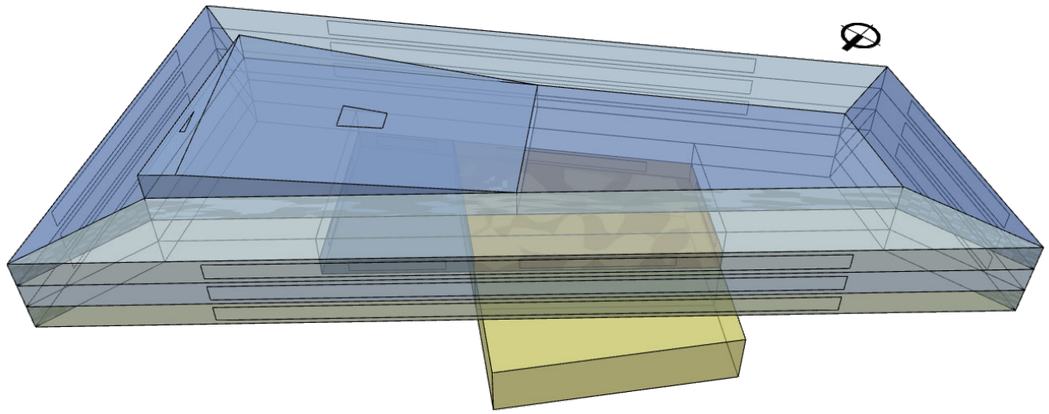


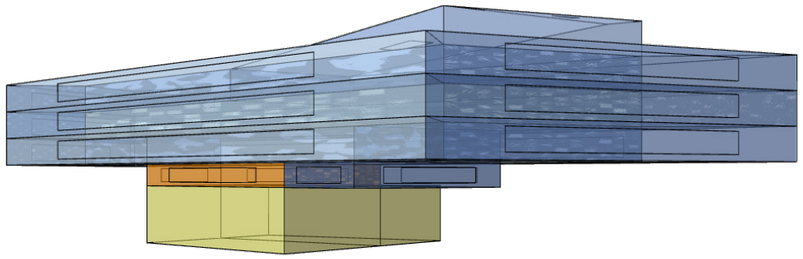
Baseline
Zones Colored Based on Cooling Load





The reason for high cooling load in the cafe at the ground floor level is the increased number of occupant density and equipment load.

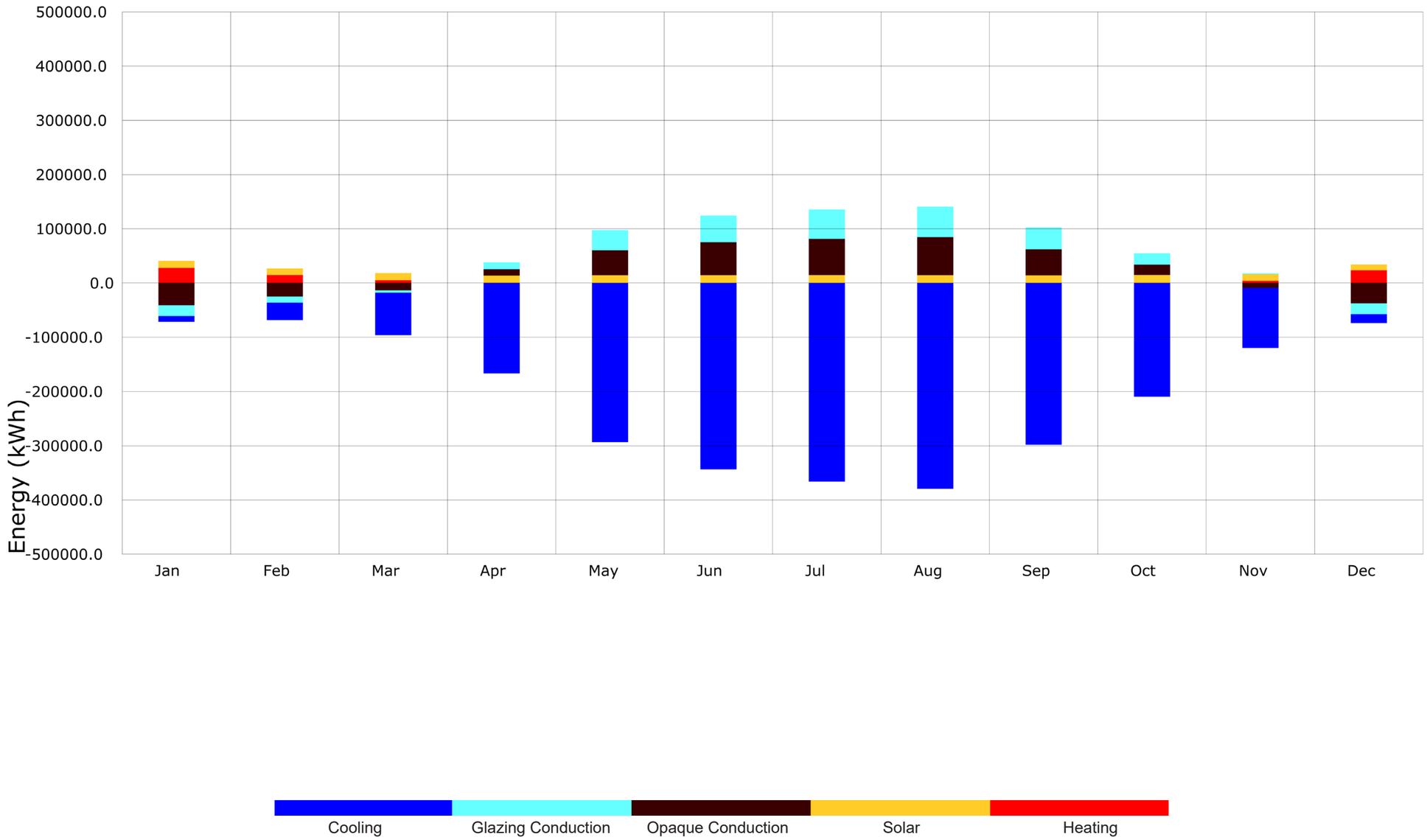




Baseline

Simulation Parameters

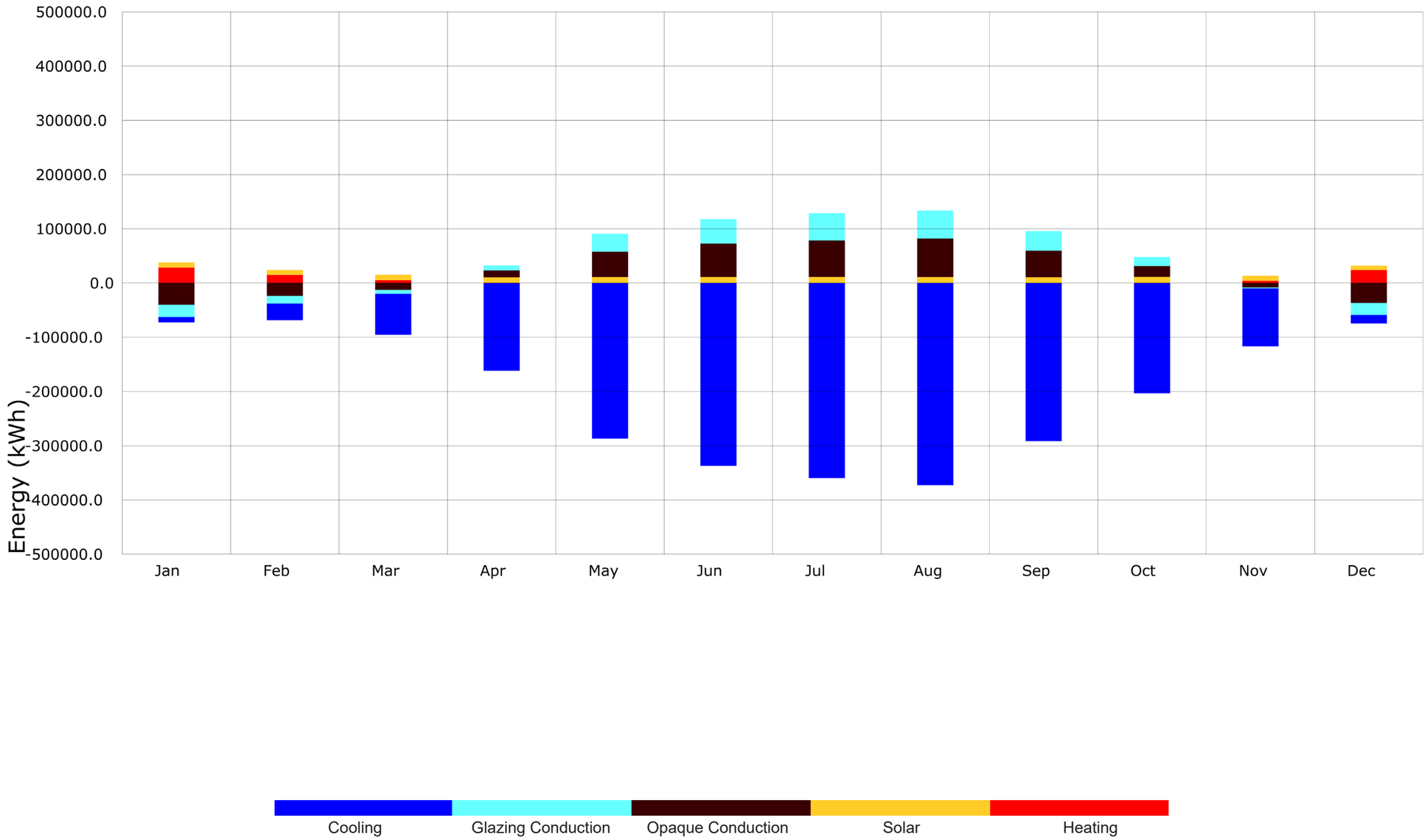
U-Value (W/m2K)			
Roof	0.358	Glazing SHGC	0.25
Wall Above Grade	0.704	Glass Visible Light Transmittance	0.45
Wall Below Grade	7.495	Window to Wall Ratio	0.40
Insulated Floor	1.987	Shade on Facade	No
Slab on Grade	1.987		
Glazing	6.814		



Iteration - 01
Simulation Parameters

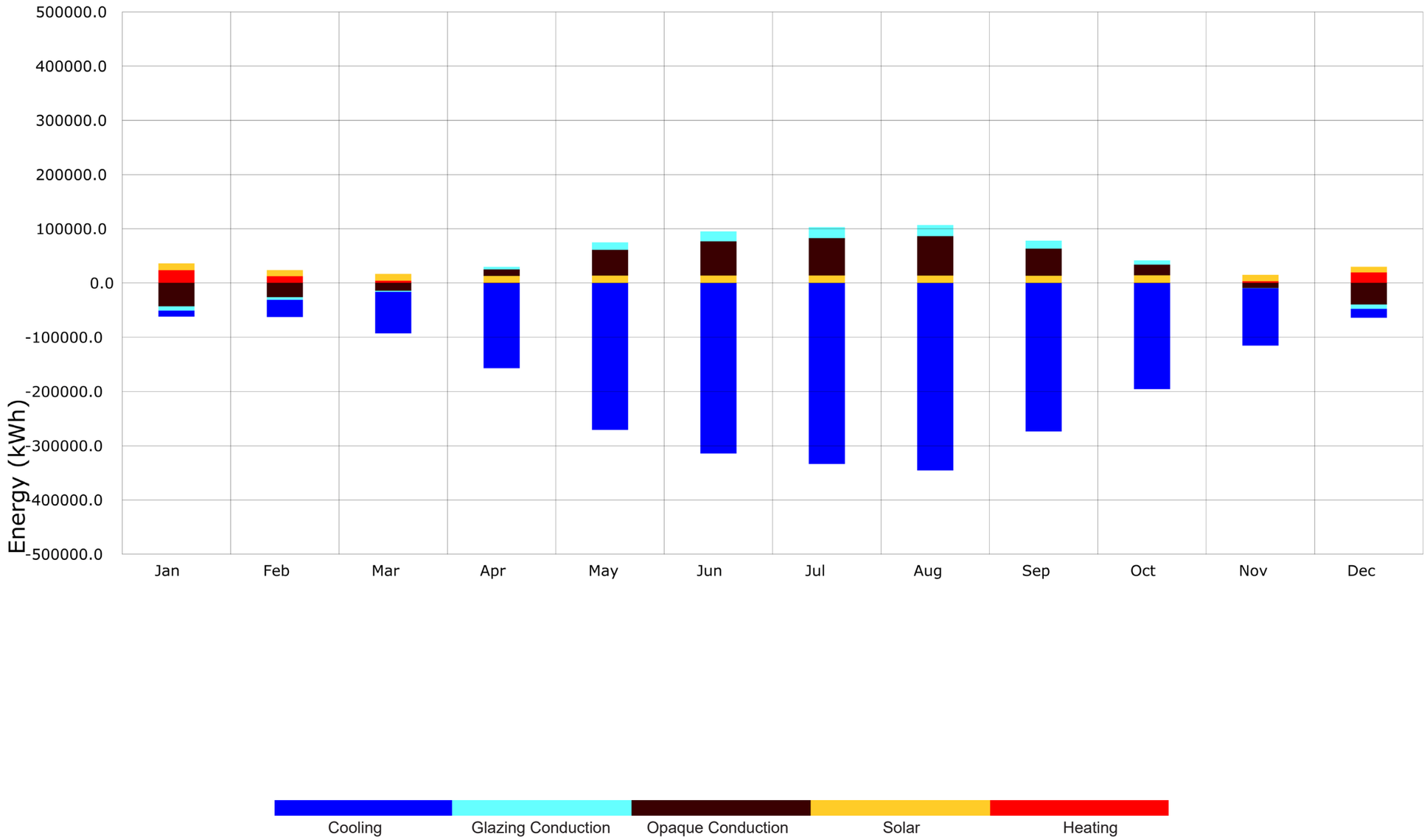
U-Value (W/m2K)	
Roof	0.358
Wall Above Grade	0.704
Wall Below Grade	7.495
Insulated Floor	1.987
Slab on Grade	1.987
Glazing	6.814

Glazing SHGC	0.20
Glass Visible Light Transmittance	0.45
Window to Wall Ratio	0.40
Shade on Facade	No



Iteration - 02
Simulation Parameters

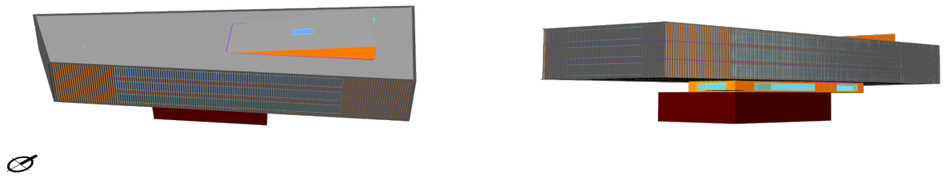
U-Value (W/m2K)			
Roof	0.358	Glazing SHGC	0.20
Wall Above Grade	0.704	Glass Visible Light Transmittance	0.45
Wall Below Grade	7.495	Window to Wall Ratio	0.40
Insulated Floor	1.987	Shade on Facade	No
Slab on Grade	1.987		
Glazing	1.7		

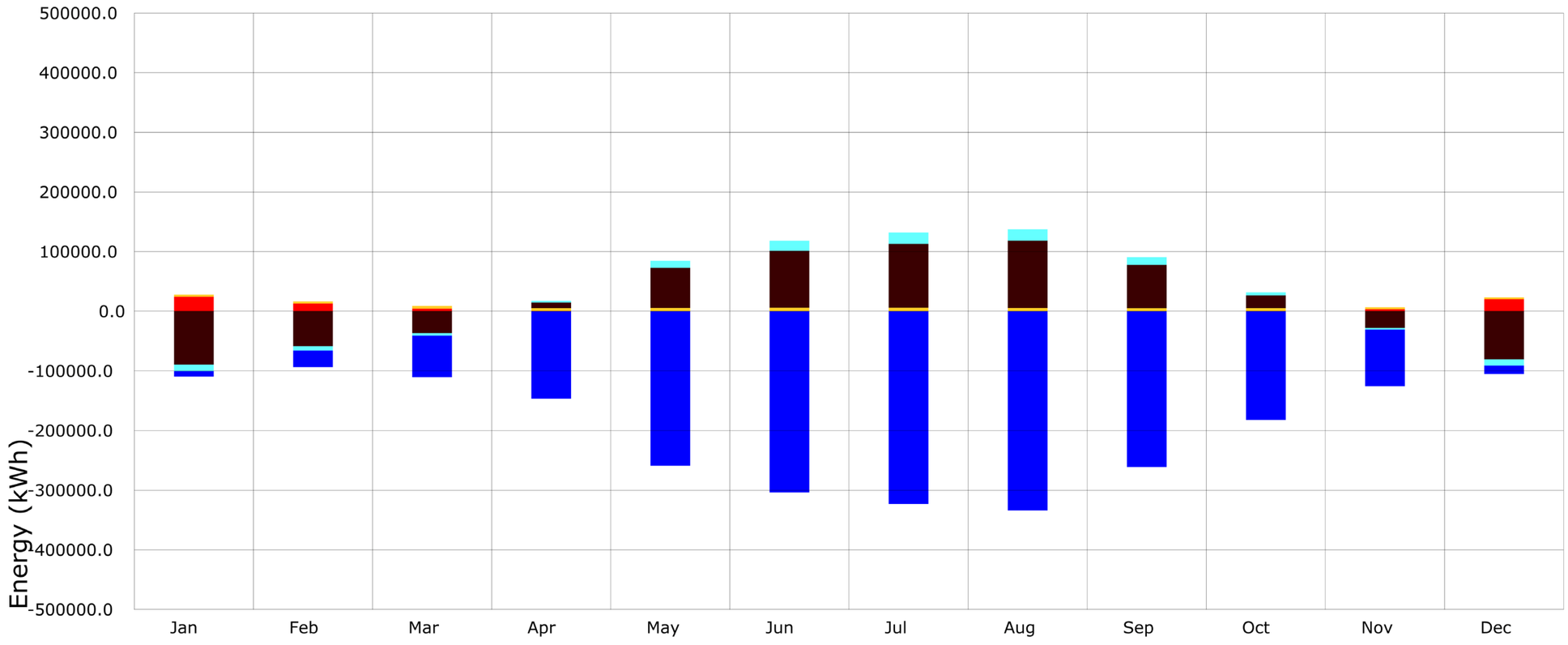


Iteration - 03

Simulation Parameters

U-Value (W/m2K)			
Roof	0.358	Glazing SHGC	0.20
Wall Above Grade	0.704	Glass Visible Light Transmittance	0.45
Wall Below Grade	7.495	Window to Wall Ratio	0.40
Insulated Floor	1.987	Shade on Facade	Yes
Slab on Grade	1.987		
Glazing	1.7		

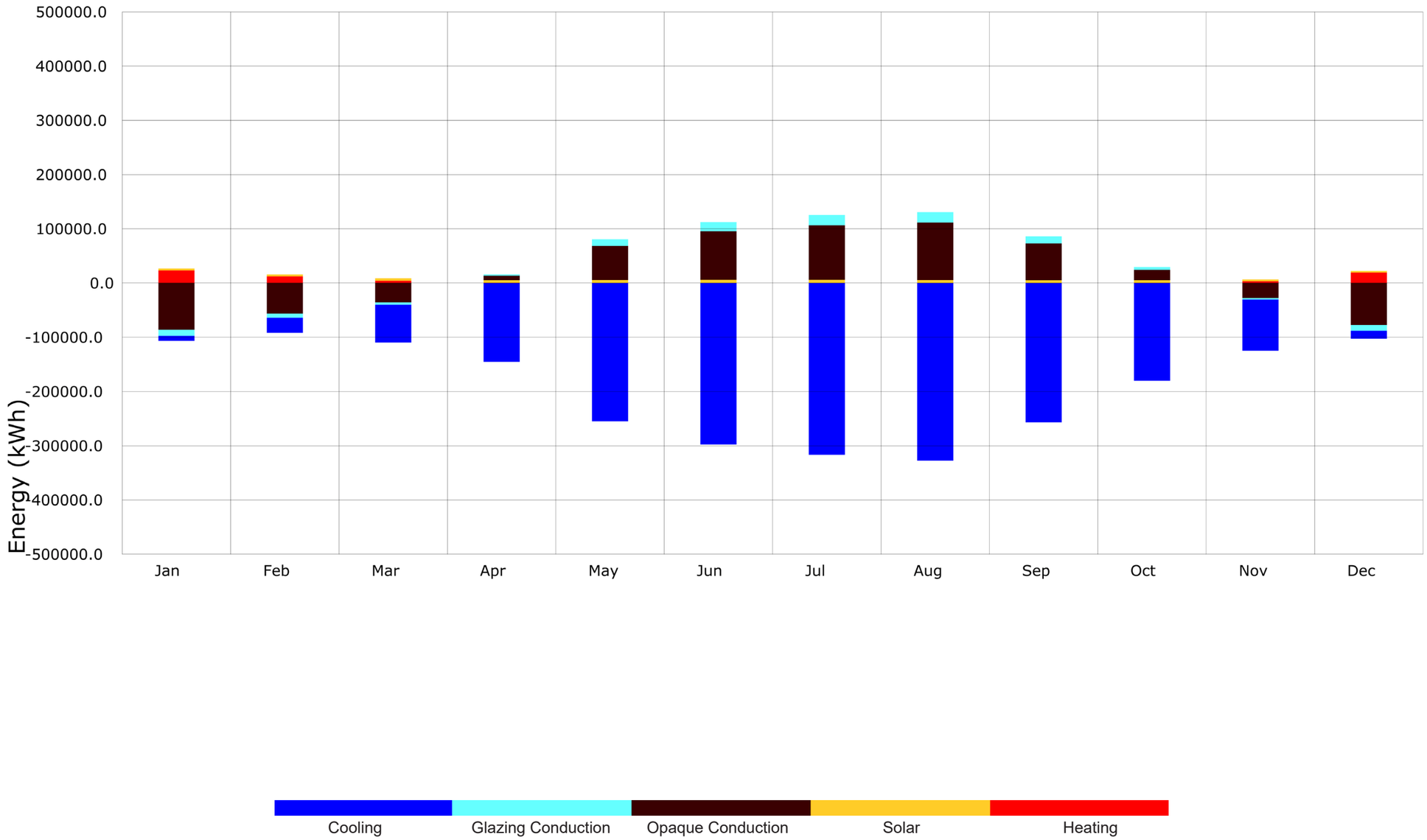




Iteration - 04

Simulation Parameters

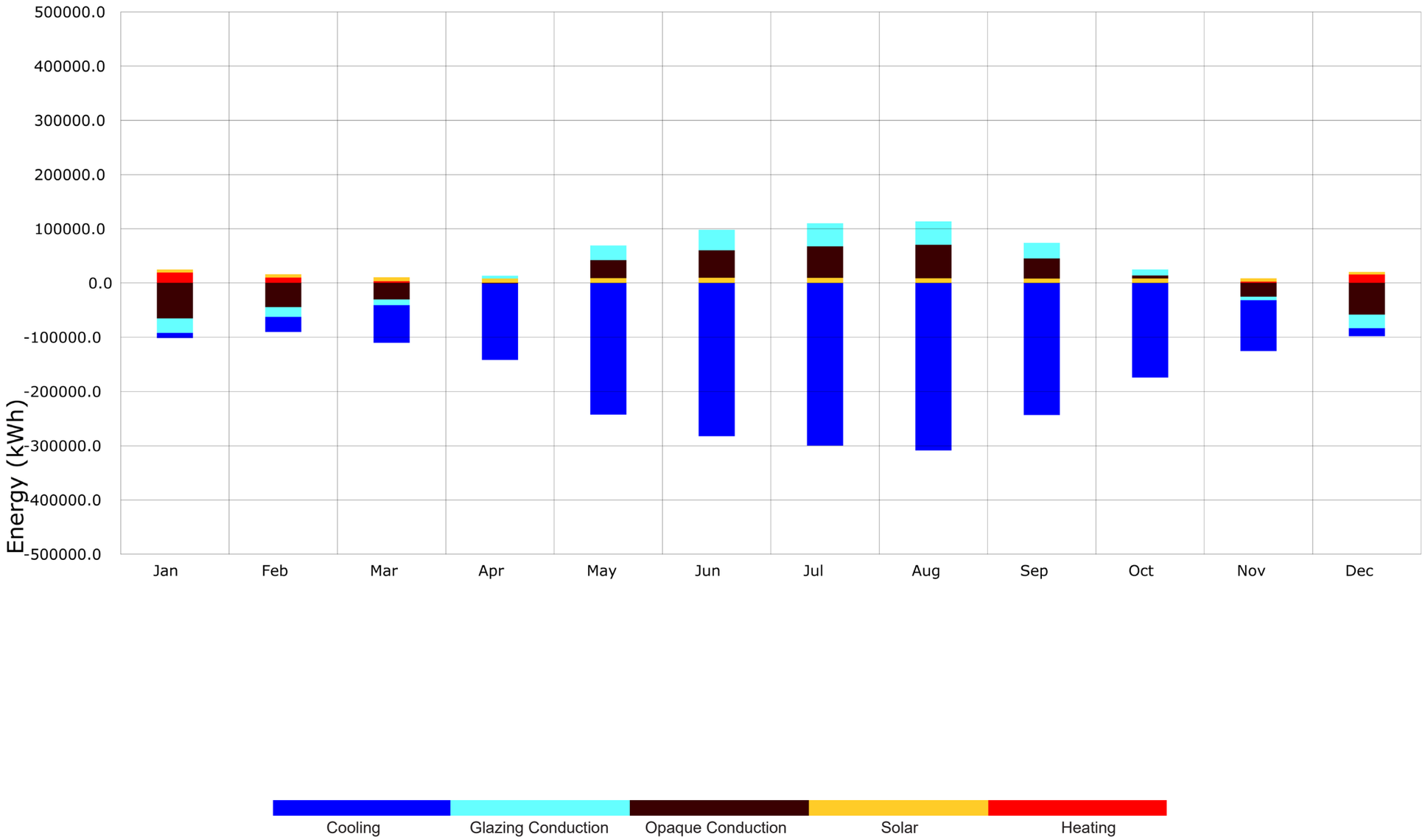
U-Value (W/m2K)			
Roof	0.358	Glazing SHGC	0.20
Wall Above Grade	0.300	Glass Visible Light Transmittance	0.45
Wall Below Grade	7.495	Window to Wall Ratio	0.40
Insulated Floor	1.987	Shade on Facade	Yes
Slab on Grade	1.987		
Glazing	1.7		



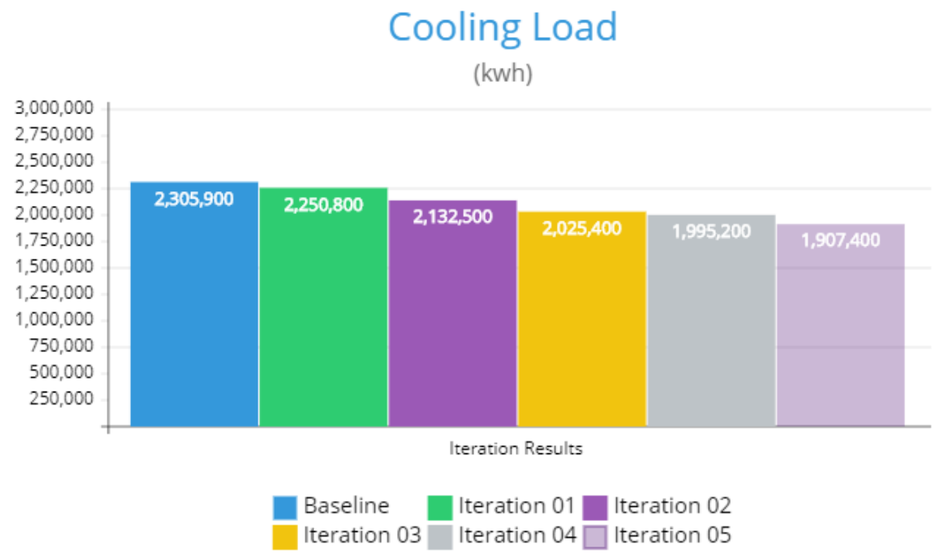
Iteration - 05

Simulation Parameters

U-Value (W/m2K)			
Roof	0.130	Glazing SHGC	0.20
Wall Above Grade	0.300	Glass Visible Light Transmittance	0.45
Wall Below Grade	7.495	Window to Wall Ratio	As per design
Insulated Floor	0.200	Shade on Facade	Yes
Slab on Grade	1.987		
Glazing	1.7		



Result - Summary



17.28 % Reduction in Cooling load of the building from baseline