Facade Sustainability Tools

Operational Energy & Cost Analysis

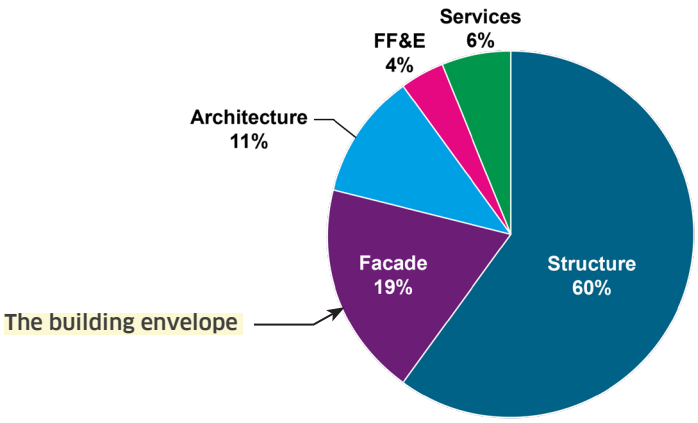
Thermosash

BUILDING ENVELOPE SOLUTIONS™

Project Sustainability Analysis

The driving force behind optimising facade design.

Our Thermosash Sustainability Team can provide expert analysis and optimised solutions to reduce carbon and operational energy throughout the project life cycle.

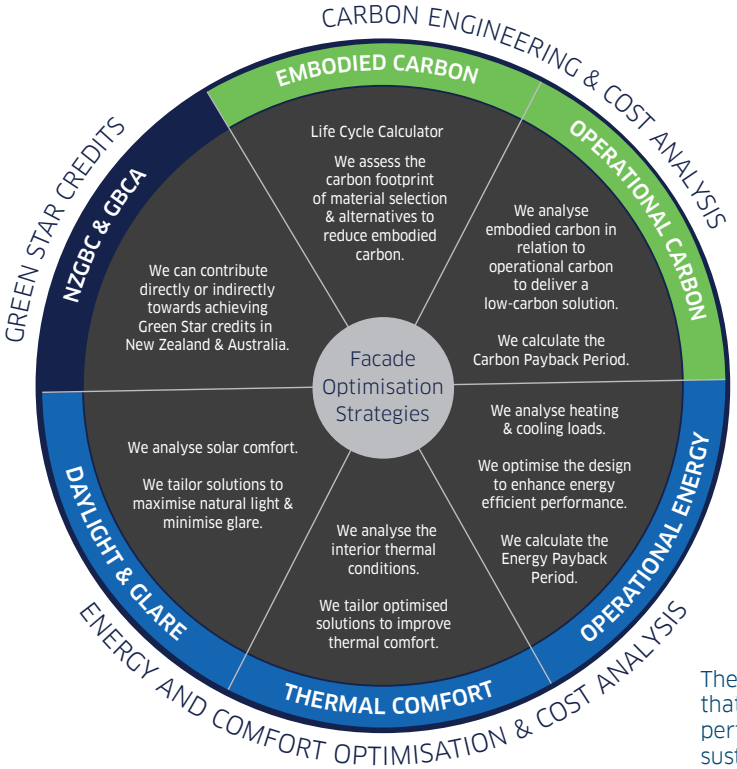


Upfront carbon by building elements

The facade of a building plays a significant role in the embodied and operational carbon impact of a project, as well as the overall operational energy use during its lifetime. Building envelopes that deliver efficient operational performance by decreasing energy costs and improving occupant comfort, as well as utilising lower embodied carbon materials, are no longer optional but essential for meeting compliance and sustainability goals.

Our Project Sustainability Analysis guides project specific decisions such as: material choices, façade systems, solar shading, glass selection, and aesthetics to optimise façades for sustainable high performance, durability and resilience – improving occupant comfort, reducing maintenance costs and ensuring a return on investment.

Sustainability is about changing how things are done in the present to create a positive impact upon the future.



Thermosash Facade Optimisation Strategies that can be implemented to optimise facade performance to achieve project specific sustainability goals.

Project Sustainability Analysis

To achieve optimised high performance outcomes we offer our clients the option of a Project Sustainability Analysis that covers different aspects of the full sustainability cycle. When specifying our facade systems, clients can engage us to implement one or several of our Facade Optimisation Strategies to achieve their project sustainability goals. To gain the most from our strategies, talk to us early on in the design phase of your project.

Optimising Operational Energy

Efficiency through material selection & design enhancement.

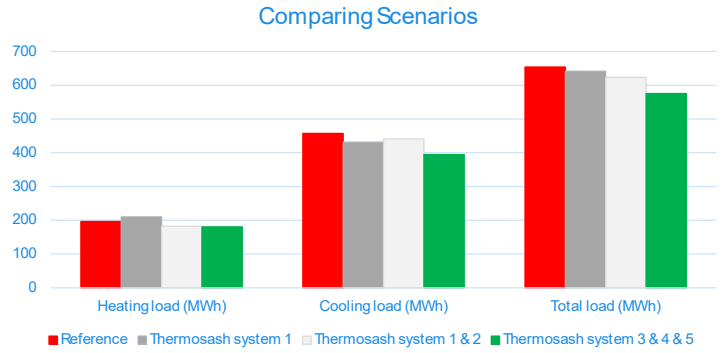
Our Thermosash Sustainability Team has extensive capabilities in modelling the heating and cooling loads of commercial buildings and multi-storey apartments.

Enhancing Performance

Optimising operational energy through panel design directly impacts on both operational carbon and long term energy costs. We collaborate with our customers to deliver the most efficiently designed façade possible. By modelling the baseline design, Thermosash can determine material selections and panel design to enhance the performance of the finished building – ensuring that the occupier/tenant is able to enjoy an energy efficient and lower operational energy environment. Our modelling software can be utilised to compare scenarios where slight changes to the façade design are made which further reduce the cooling and/or heating loads.

Comparing heating and cooling loads between a Reference and Thermosash system

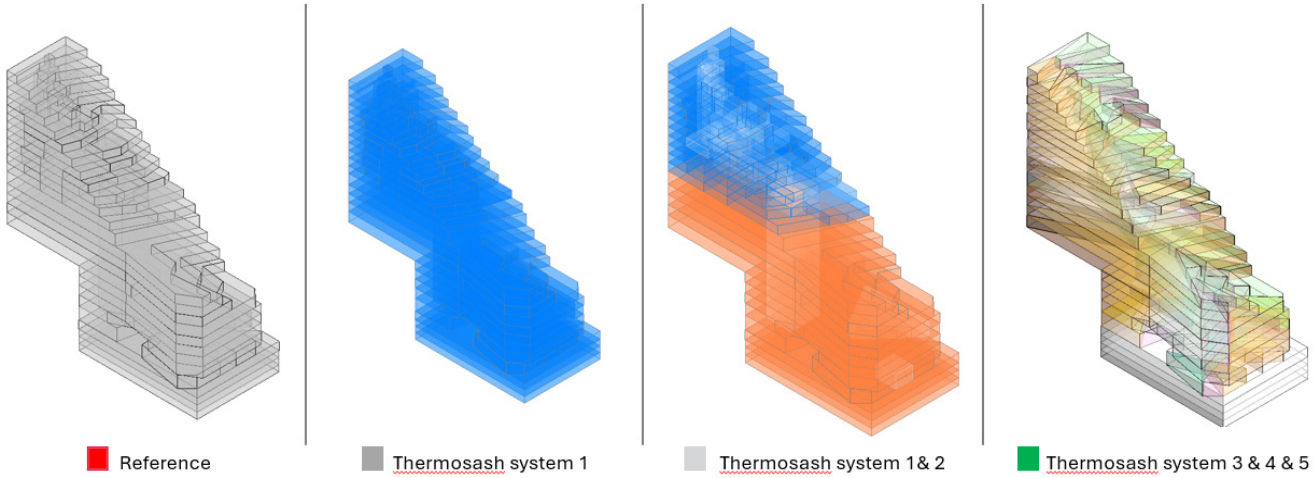
	Heating Load (MWh)	Cooling Load (MWh)	Total Load (MWh)	Total yearly loads per m2(kWh/m2)
REFERENCE	196.31	457.59	653.9	18.65
THERMOSASH SYSTEM 1	210.31	431.28	641.59	18.30
THERMOSASH SYSTEM 1 + 2	182.31	441.18	623.49	17.78
THERMOSASH SYSTEM 3 + 4 + 5	180.64	394.87	575.51	16.41



Example of targeted design

The example modelled here shows the heating and cooling loads of a Reference system compared to a Thermosash system, including possible enhancements, that highlight how the iterative process of targeted design enhancements can incrementally lower the total yearly energy load.

The data in the table depicted in the bar graph 'Comparing Scenarios' demonstrates that the optimal design option, Thermosash system 3 & 4 & 5 (shown in green), reduces the total loads by approx. 12% compared to the base reference model (shown in red) of this sample project.



Energy Cost Analysis

Long-term savings potential over the life of the building.

After optimizing the total building loads, Thermosash will analyse the potential energy cost savings over time, for each project.

An example of cost savings on energy

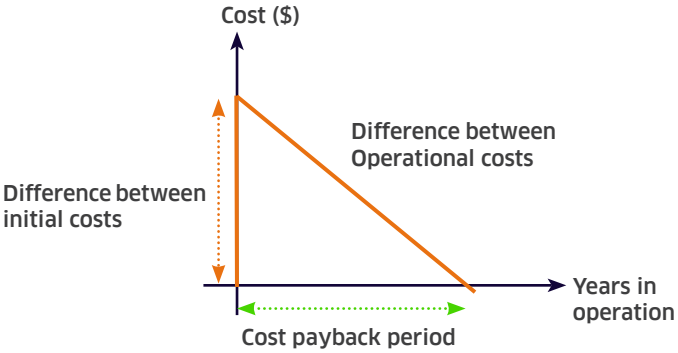
While carbon reduction and environmental sustainability is at the forefront of Thermosash's values, operational energy reduction is a commercial benefit to building occupiers. An inefficient design is not noticed in the construction phase, but is paid for over the life of the building. Thermosash's energy efficiency modelling is intended to reduce this ongoing cost.

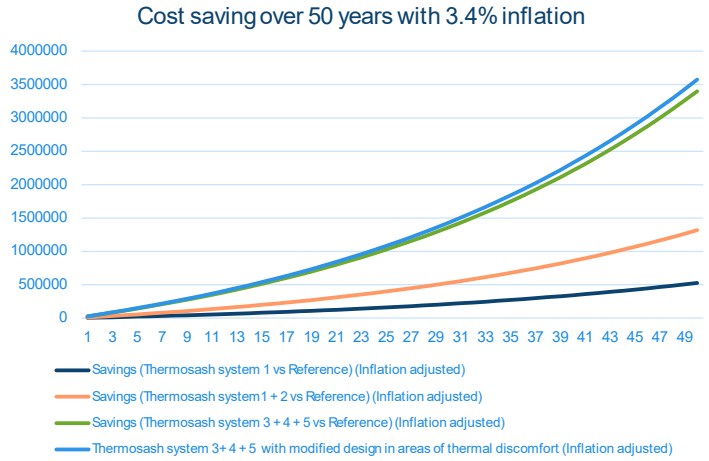
To highlight the benefit over time, the below example table demonstrates the ongoing savings over 25 years and 50 years comparing a Reference model to different Thermosash systems.

The advantage of selecting our most efficient systems is depicted in the graph which shows a potential savings of around $3.5 million on energy costs over 50 years, assuming an inflation rate of 3.4%.

The payback period

Thermosash also calculates the payback period by comparing the difference in initial costs – based on the selected panels – with the difference in operational energy costs over the years in operation, helping clients understand when their investment will pay off.





Option	Total load (MWh)	Annual cost (NZD)	Saving s(NZD/year)	25-year savings (NZD) (3.4%Inflation adjusted)	50-year savings (NZD) (3.4%Inflation adjusted)
Reference	653.9	215,787	-	-	-
Thermosash system 1	641.59	211,725	4,062	151,188	527,790
Thermosash system1 + 2	623.49	205,752	10,035	375,668	1,318,817
Thermosash system 3+ 4 + 5	575.51	189,918	25,869	968,427	3,399,750
Thermosash system 3+ 4 + 5 with modified design in areas of thermal discomfort	571.45	188,578	27,208	1,018,554	3,575,723

Photography by Jasmax

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