Comparative study of dynamic vs static shading devices for an office building in hot and dry climate

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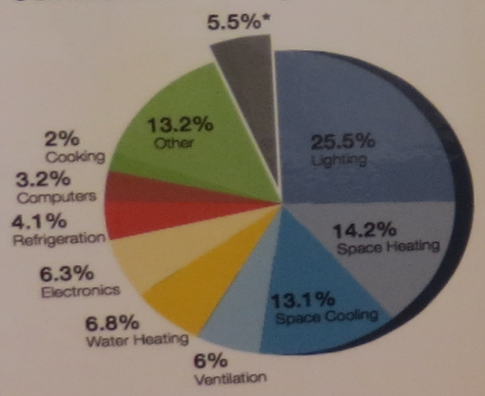
Introduction & Background

- Energy consumption of commercial buildings are high due to the neglect of utilizing natural sources

Commercial Primary Energy Use



- Dynamic shading on the exterior of buildings reduces energy consumption.
- Systematic solar shading alters itself according to the angle of the sun
- Allows utilization of sunlight
- Lower the need to increase air conditioner cooling.

Objective

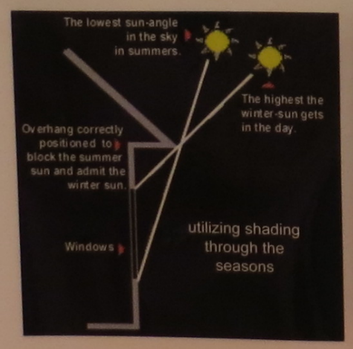
- Overall determine whether dynamic shading would be effective to implement into society.
- Create a model to successfully prove efficiency that dynamic shading has to offer

Research Question

Comparative analysis of dynamic and traditional shading to see their effectiveness for commercial buildings in terms of energy savings and occupant comfort

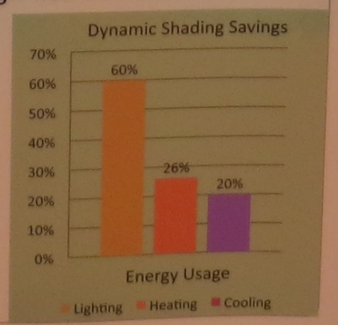
Methods & Tools

Research Dynamic Shading → Ideas to Implement into the Building → Designng the Building on SketchUp → Incorporate Building into COMFen → Simulate test in COMFen → Analysis and Results



Significance

- In the U.S., $30,600/yr is spent on average for lighting one high rise commercial building.
- Solar dynamic shading systems can help reduce energy consumption by reducing the need of electrical lighting by 60%, cooling by 20%, and heating by 26%.
- El Paso Texas simply does not utilize its year round sun light to lower overall energy consumption and cost
- Money spent on lighting, heating and cooling can be used for other purposes to improve the city.
- Buildings in El Paso utilize static shading rather than dynamic
- Dynamic shading would add aesthetic appeal



Expected Results

- Dynamic shading would turn out to be the most beneficial to any community.
- Ultimately dynamic shading would pay for itself with the amount of money saved from reduction in lighting, cooling, and heating.

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