

The study “Modular Design and Application of Concentrating Solar Technology Integrated with Building Skin” discusses the integration of solar panels in the outer structures of existing buildings. Generally, solar panels are either attached to the top of a building, or as a separate entity in power stations which would generate electricity for multiple buildings to consume. With the assimilation of solar technology into a facade, “the aesthetic appearance, structure, and energy production characteristics” of the building will improve dramatically.

There are many advantages to building structures with the integration of solar technology. Primarily, the building can provide its own thermal insulation and energy from renewable resources. The production of energy would result in a lower consumption of nonrenewable resources, which means less pollution overall. Secondly, indoor natural lighting would be abundant in buildings due to the large amount of diffused light entering into the solar panels. Lastly, the “dynamic facade” of the building would be largely improved in strength and longevity due to the durability of the solar panel material. This is extremely beneficial for buildings because they don’t require frequent maintenance compared to standard ones.

For the solar technology to be combined with edifices, it must use first use Fresnel point concentration, which is using an angled lens with different heights to concentrate light coming from many angles into a solar cell. To get the maximum light for optimal results, the solar panels will use a dual-axis tracking system, which will “track the azimuth and elevation of angles of the sun” based on where the building is located in respect to the sun. Next, integrated heat sinks and secondary connectors throughout the solar panels provide a direct connection of heat collection and hot water throughout the building.

The integration of solar panels in building skins proves to be significant in the quest for increased use of renewable resources. Solar technology can create sufficient electricity and heating as well as

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decreasing costs and the usage of nonrenewable resources, which lowers the rate of pollution and results in a cleaner Earth.

References

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