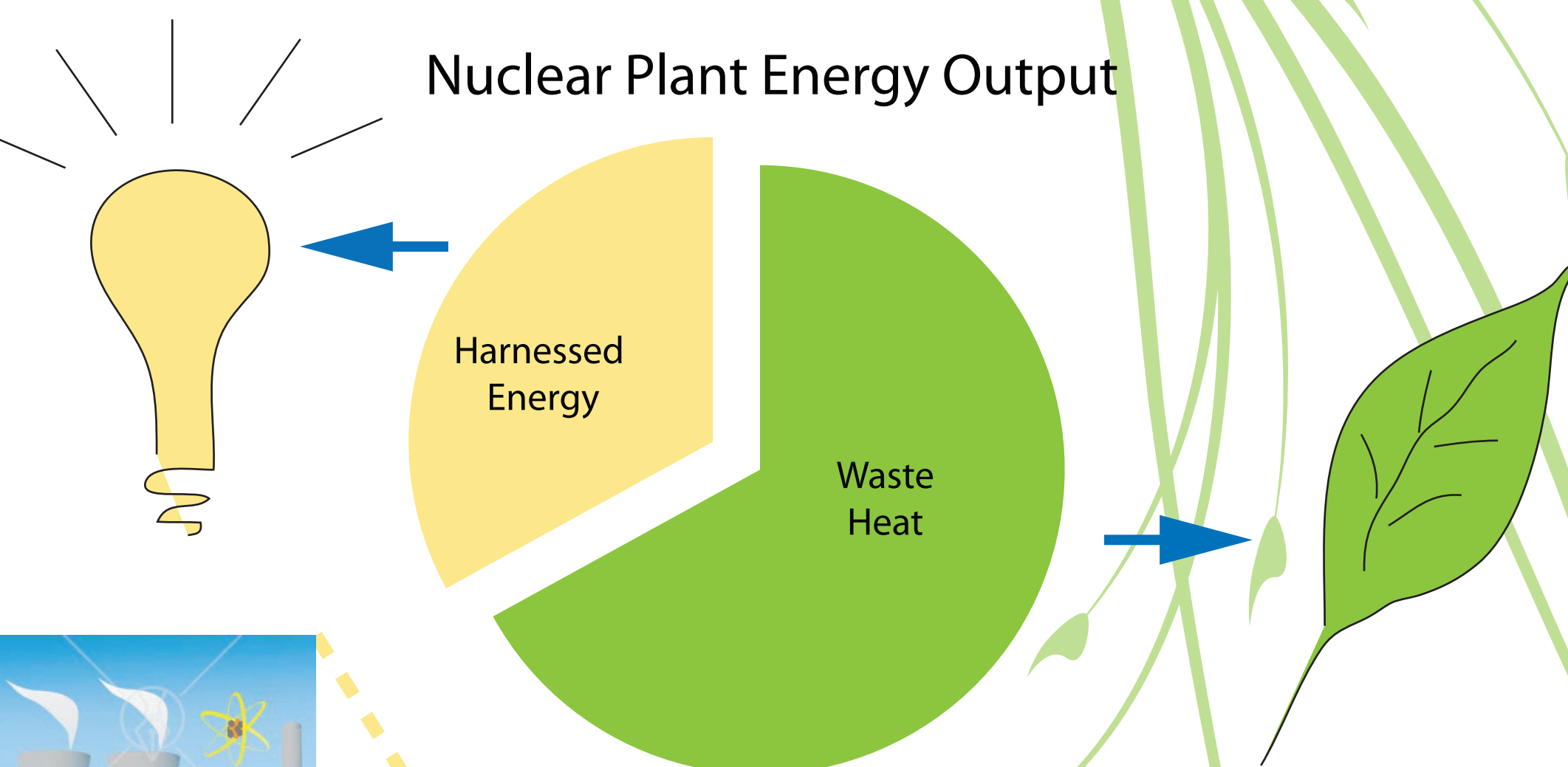


Atomic PROduce : Utilizing Waste Heat for Greenhouses

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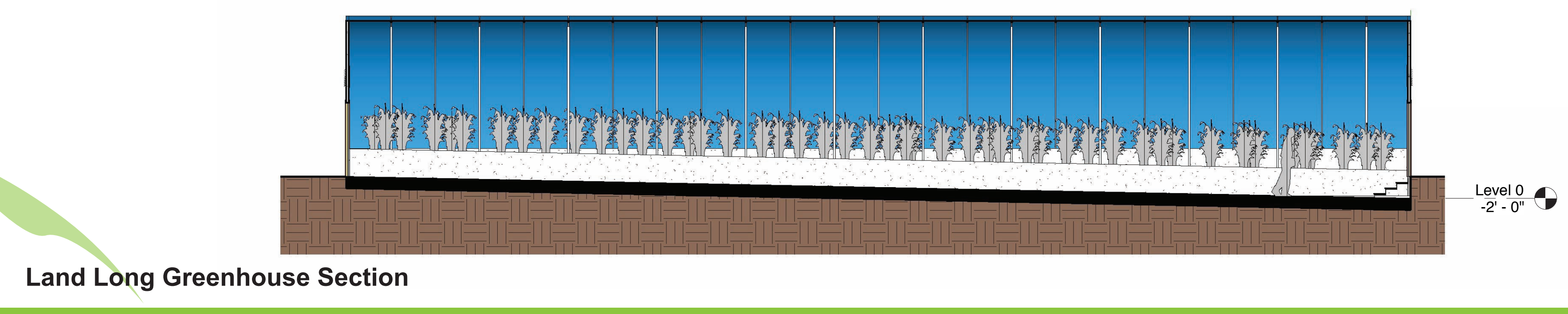
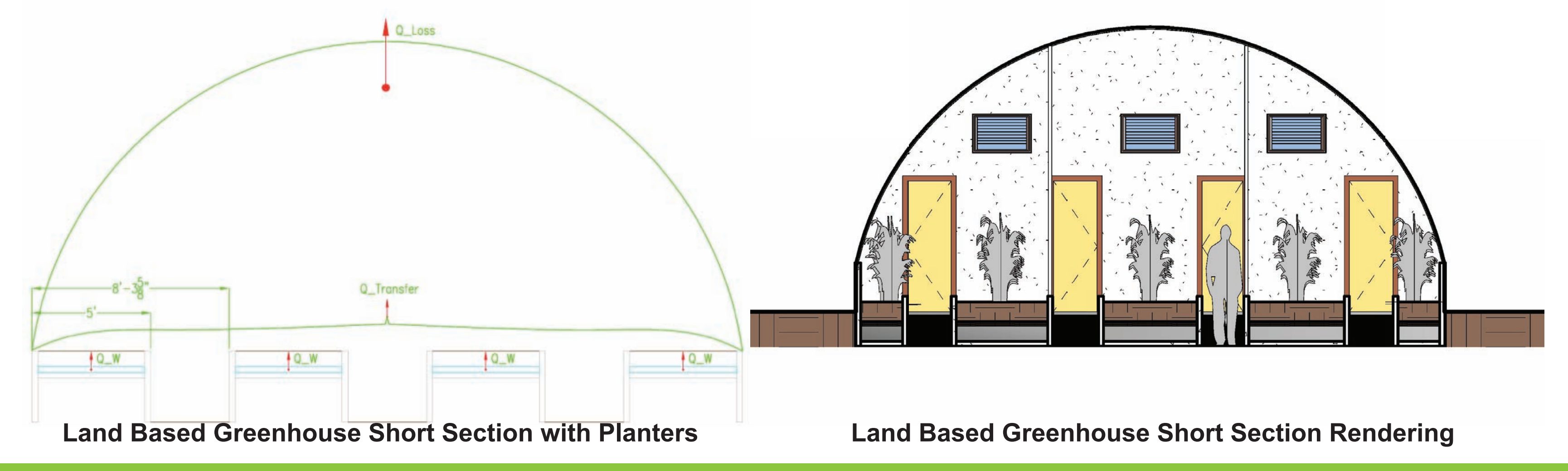
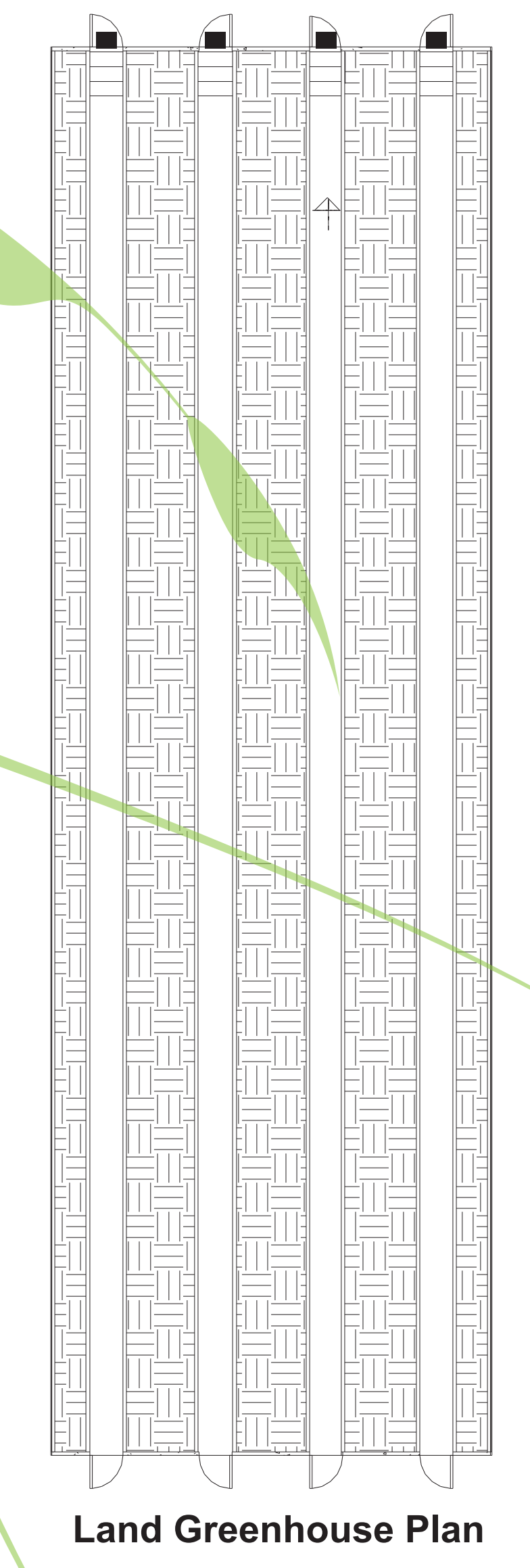
Currently only approximately one third of all energy produced by nuclear power plants is converted to electrical energy. The remainder is released into the environment, either in the form of steam or hot water in cooling lakes. This large amount of heat released may contribute to global warming and is wasteful. Finding a way to harness this waste heat and find an effective use would provide Exelon with a way to increase their environmental commitment along with an enticing business opportunity.



The Braidwood Nuclear Plant utilizes the large cooling pond to the south of the plant to channel the heated water, which slowly cools and recycles back into the cooling system.

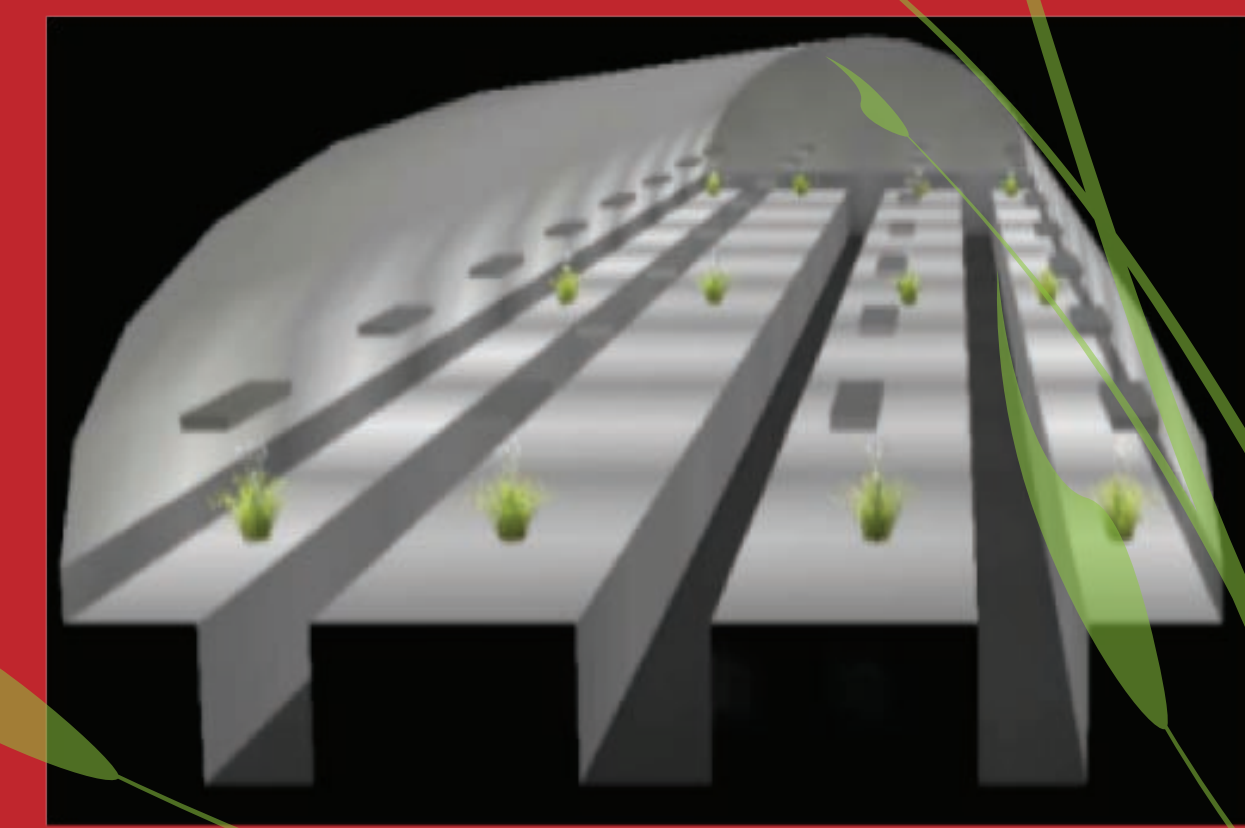
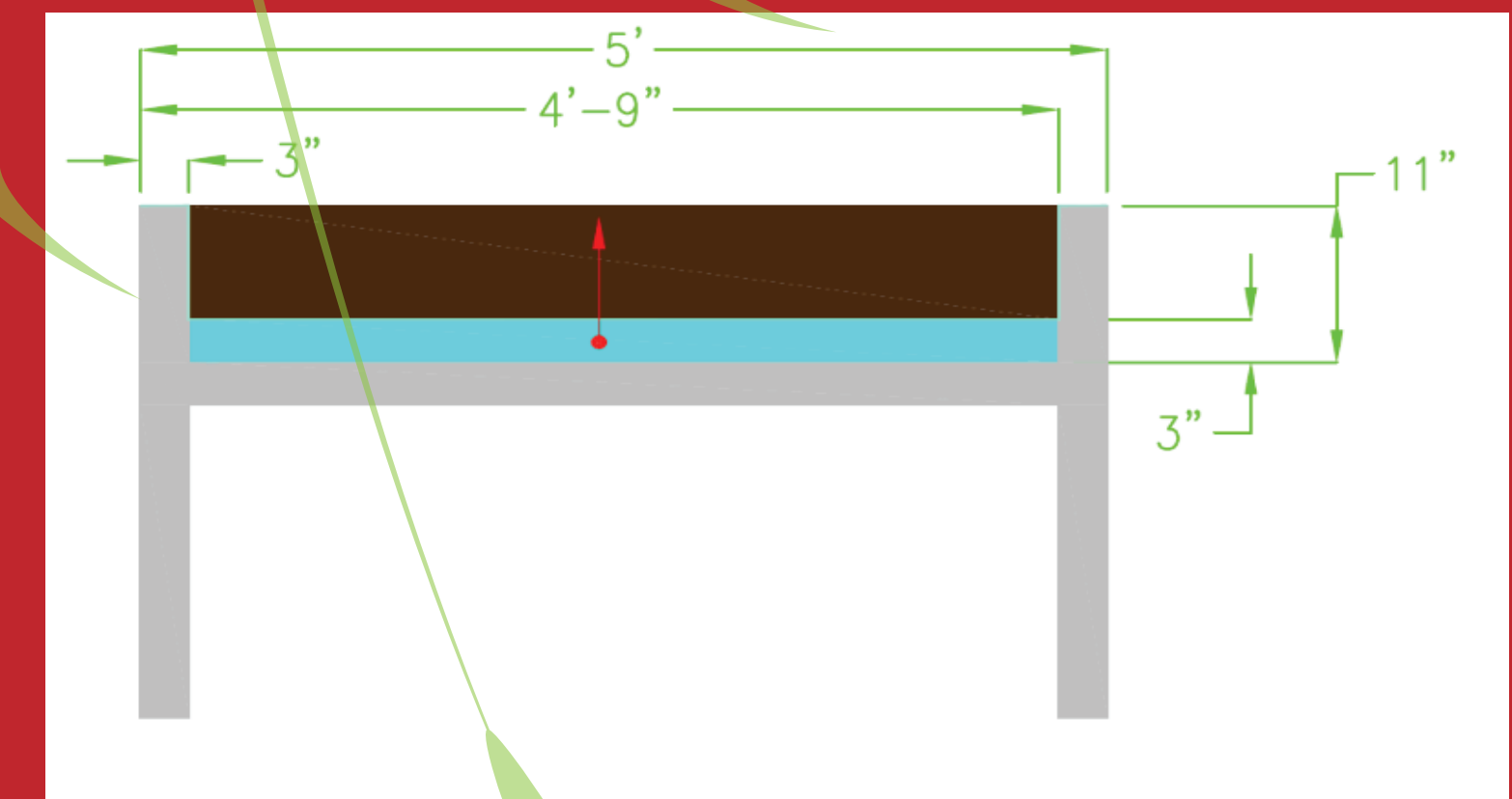
The objective is to pump this heated water from the outlet source from the cooling system into the land-based greenhouse, where it flows under the planter boxes, transferring the heat to the aluminum and ultimately the soil and roots of the plants.

For the floating design, no pumps are necessary as the planter box is submerged in the water directly, optimizing the heat transfer.



Land Based Design-

The land greenhouse incorporates traditional hoop house structure and covering. Hot water is pumped from the discharge channel during the winter. The planters rest in slightly sloped troughs. The hot water runs through these troughs and heats the soil through contact with the planters. The walkways in between the planters have the same slope as the troughs. This makes maintaining the plants easier for greenhouse workers since they are able to work at table height.



Floating Design-

This design floats in the discharge canal. The greenhouse planters are submerged in the 70°F water and receive maximum heating benefits during the winter months. This system irrigation is self-contained. This hoop house design uses 55-gallon steel drums as flotation devices and has two walkways by which a worker can access the crops. The greenhouse can be either docked or accessed by boats.

