

By some estimates, the United States spends approximately 40% of its energy on indoor climate control. Much of this is inefficient because large volumes of indoor space are heated or cooled simply cater to the individuals in it. This project aims to take on this issue by introducing a new concept that targets the operation of HVAC systems and reduces the impact that they have on the environment.

Eco-Furniture is a highly effective system that will tend to individual requests for microclimates. By adding a microclimate, a user's immediate area can be tailored to suit them in a manner of ease. By embedding an HVAC system within every-day furniture, we create controllable, energy efficient heating and cooling that can target the users directly. This will allow for customizing ideal comforts in a small area, rather than impacting a large area at the cost of more energy. Thermal sensors and thermal imaging cameras are also embedded into the system to produce an accurate reading of the area, as well as detect the presence of the user. This leads to efficient use of the product as well – The product will switch on when a user is present; cooling or heating the user to their liking, or remain switched off if there is no user detected.

The application of this product will be displayed in the office environment – where Eco-Furniture can be embedded into office chairs and desks. This is the ideal environment, as there are a large number of users within a single space, each with reserved unique thermal comfort zones. Those comfort zones are often disturbed, since there is only one heat or cool protocol in the entire facility. Eco-Furniture can tend to every user, and eliminate the inconvenience of spending energy and money- heating or cooling a large space only to benefit particular users.