The Home of the Future

What might the cleaner, greener houses and apartments of 2050 look like if they take advantage of new technologies?

Researchers are hard at work on ways to make buildings more energy-efficient and user-friendly as part of net zero carbon emissions energy systems. That means things like windows and walls that take advantage of nature to heat and cool, better batteries to store and deliver energy when needed, and systems that can adapt to changes from the electrical grid.

What would it look like to combine all of these technologies into one place? Berkeley Lab energy technology researchers gave a glimpse into what a home built in 2050 might look like.

Electric Vehicle Chargers

EV chargers will be integrated into the building, allowing occupants to plug in their car and have it charged when they need it. With a bi-directional charger, people will be able to power their home with the electric vehicle if there is a problem with the grid.

Dynamic Walls and Roofs

The building will have dynamic walls and roof systems that reflect solar energy in the summer and switch to absorb energy on cold days.

Integrated Battery Storage

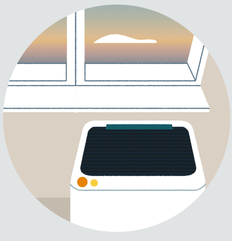
Changes in energy storage will make appliances more resilient. Fans, lights, electric stoves, and the refrigerator will each have their own electric batteries so they can power themselves if there are any problems with the local energy supply.

Green Heating and Cooling

Heat pump systems will be integrated with thermal energy storage to provide clean, renewable energy for heating, cooling, and water heating. There will be a hot reservoir for winter and both a hot and cold reservoir for summer.

Dynamic Windows

Windows will automatically change their properties to help control building temperature. They'll let through the sun's heat to warm the building or reflect it away, as needed. Occupants can switch between clear and tinted windows for privacy and glare management.

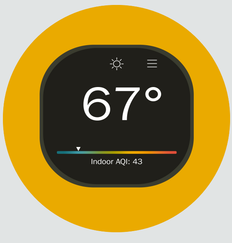


Energy-efficient Ventilation

The ventilation system will provide clean, filtered air that occupants can use in different seasons to manage any outdoor air problems such as smoke or smog.

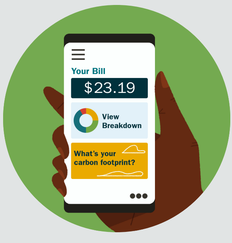
Local Microgrids

Homes, schools, and office buildings of the future will be super efficient and connected with clean renewable energy systems powered by a local microgrid.



Smart Thermostats

Smart thermostats will provide real-time information on the temperature and air cleanliness.



Energy Costs - In Your Control

Energy use will be low, with minimal utility bills and fully automated controls that enable the building to optimize use of clean renewable energy from the electric grid. Occupants will have access to the greenhouse gas footprint of the building as well as real-time grid conditions and costs.

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