BUILDING AUTOMATION

Smart buildings. Building automation and smart thermostats are two solutions that rely on computer systems to minimize a building's heat and electricity usage. Building automation is applicable to large commercial buildings. A building automation system uses sensors to monitor building usage. Based on usage, the system accordingly modifies use of heat, air conditioning, lighting, and appliances to minimize energy use. For example, when a room is empty, the system automatically turns out the lights. Building automation systems can be installed in new buildings from the outset, and can be added to old buildings through retrofits.

Smart thermostats reduce energy use associated with residential space heating and cooling. Since residential heating and cooling account for about 9% of energy consumption in the U.S.,[1] technologies that avoid excess use not only saves homeowners money but cuts down substantially on GHG emissions if deployed at scale. Smart thermostats use algorithms and sensors to remember a household's temperature preferences, detect whether anyone is at home, and modify ambient temperature accordingly. The newest models can also reduce energy usage at times of peak electricity grid use.

Any home that has an internet connection can install a smart thermostat. The biggest barriers to broader adoption of smart thermostats are the upfront cost and lack of knowledge, so adoption can be incentivized through government- and utility-led public awareness and demonstration programs and through market competition to bring down prices.[2]

- Fishery friendliness: Smart thermostats and building automation have no direct impact on fisheries or fishery ecosystems. Furthermore, by reducing the amount of energy needed for heating and cooling, these technologies can reduce the amount of energy production needed to maintain current standards of living, including energy that is produced in fishery-unfriendly ways.
- Co-benefits: Smart thermostats and building automation can help home/building owners and tenants save money on heating and cooling bills and maintain a more comfortable ambient temperature. Furthermore, the reduced energy use brought about by these enhancements is associated with reductions in air pollutants produced through the combustion process, such as carbon monoxide, nitrogen dioxide, particles, and sulfur dioxide.
- Environmental externalities: There do not appear to be any significant environmental externalities associated deployment of smart thermostats and building automation.
- Policy catalysts: Energy efficiency gained through use of building automation and smart thermostats can be enabled and incentivized through rebates, tax incentives, building codes, utility-based demand reduction programs, low-income energy efficiency programs, government procurement and lead-by-example policies, enabling of financing

[1] Project Drawdown. "Smart thermostats." https://drawdown.org/solutions/smart-thermostats
[2] Project Drawdown. "Smart thermostats." https://drawdown.org/solutions/smart-thermostats

instruments (e.g., property assessed clean energy programs, energy savings performance contracting, green banks), certification incentives (e.g., LEED, Energy Star), and carbon pricing.

- More information:
  - Drawdown: Building automation
  - Drawdown: Smart thermostats

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