BUILDING ELECTRIFICATION

According to the U.S. Green Building Council, “Building electrification—also known as beneficial electrification or building decarbonization—describes the shift to using electricity rather than burning fossil fuels like natural gas for heating and cooking.” It is a necessary component of creating net zero emissions buildings.

Key Technologies

Electric space and water heating can directly substitute for natural gas appliances in most applications. For instance, electric heat pump technology is 2.2 to 4.5 times more efficient than gas furnaces. Beyond switching to all electric solutions, building electrification, as part of a net zero building, can be coupled with other clean solutions including on-site PV solar, smart+ energy efficient appliances, and battery storage.

Primary Technologies

- Heat pump water heaters
- Induction cooktops
- Air source heat pumps

Secondary Technologies

- Smart energy efficient appliances
- On-site solar PV
- Ground source heat pumps
- EV charging and battery storage
- Automated energy management systems

Potential Market Size & Timing

Guidehouse Insights (formerly Navigant Research) expects global revenue for all-electric home technologies to surge fivefold to $12.9 billion by 2029. California, Washington and other states are moving forward with mandates for all electric buildings, while 19 major global cities, including New York, Washington DC, San Francisco and Los Angeles, have pledged to ensure that new building are net zero carbon by 2030.

Barriers

- Outdated utility regulations such as gas line extension allowances, as well as outdated codes and equipment standards, undermine moving to all electric appliances and buildings.
- Slow turnover of existing gas appliances which can last 10 years or more.
- Higher upfront costs for equipment
- Low public awareness for clean alternatives
- Continued support by State Public Utility Commissions and other state agencies for ongoing use of natural gas in homes and offices.

Accelerators

- Full implementation of the Inflation Reduction Act which includes a tax credit for homeowners that install electric appliances and includes a rebate program for low-income households that purchase low emission appliances.
- Additional net zero building goals by states and cities.
- Updated building codes and utility regulations that eliminate incentives for gas use in homes and offices and encourage all electric systems.
- Additional federal/state and utility incentives for adoption of electrified building equipment, in low-income households and apartment and office tenants.
- Funding for consumer education.

Relevant NEMA Technologies

- Wires, connectors, and other electrical system components
- Connected, “smart” appliance and building control systems
- Energy storage systems
- Electric vehicle charging components

---

1 https://www.usgbc.org/articles/building-electrification-why-it-matters
3 https://www.greentechmedia.com/articles/read/so-what-exactly-is-building-electrification
7 IRA, Section 50122; see https://www.kiplinger.com/taxes/605069/inflation-reduction-act-tax-credits-energy-efficient-home-improvements