

ENGINEERING
TOMORROW



How to future-proof **HVAC systems** to meet **efficiency** and **carbon emission goals**

Part I: A brief overview of climate policies in the United States

By John Sheff,

Danfoss Director of Public and Industry Affairs



Climate policy in the US is currently fragmented. There is not much federal leadership, which has led to nearly half the states in the Union joining the US Climate Alliance and developing their own climate policies. Some of these states have set very ambitious goals and, perhaps most consequential, several major cities have passed the most significant building emissions laws ever seen.

Drivers of **Climate** Policy in the U.S.

Lack of **Federal** Leadership

U.S. **Climate** Alliance

Ambitious **State** Climate Goals

Cities Tackle **Building** Emissions



In the past several years, for better or for worse, the federal government has pulled back any further climate regulations. The Trump administration officially withdrew from the Paris Climate Accord and has showed little interest in bringing the Kigali Amendment which regulates five global warming potential refrigerants to the Senate floor for ratification. Meanwhile, as younger generations mature politically, they are pushing politicians to engage more on this issue and make it an election year issue as well. And last year saw climate protests in many major cities around the country.

Lack of federal climate **leadership**



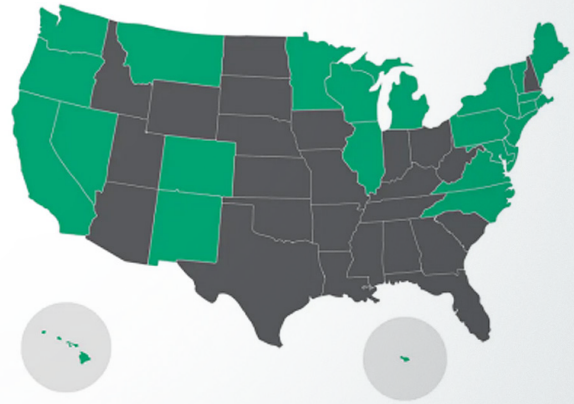
- Trump Administration withdraws from the Paris Climate Accord.
- U.S. Senate has failed to ratify the Kigali Amendment to the Montreal Protocol.
- No comprehensive U.S. energy strategy.
- Climate policy emerging as a political issue with certain voters.

The US Climate Alliance is a group of governors who have committed their states to upholding their commitments under the Paris Climate Accord. This alliance now includes 25 governors, covers 55% of the US population, and includes an \$11.7 trillion economy. New York and California are both climate alliance members and have set some of the most ambitious goals in the country. California is committed to lowering its emissions by 40% below a 1990 baseline, while New York is going even further, aiming for an 85% reduction below that baseline by 2050. It is cities, however, that have made the biggest impact with climate legislation.

States take up the charge

- **The U.S. Climate Alliance** now includes 25 governors committed to lower upholding their states' commitments to Paris Climate Accord.
- **California:** 40% below 1990 baseline by 2040.
- **New York:** 85% below 1990 baseline by 2050.

In 2019, New York and Washington, DC, both passed building emissions laws with real financial teeth. These laws have the potential to spur the retrofit market in commercial buildings in ways never before seen. In addition, around 30 California cities have passed legislation or ordinances that ban natural gas infrastructure in new constructions, and other cities in places like New Jersey and Massachusetts are following suit.



Cities tackle **building** emissions



- **Building Emissions Laws (retrofits)**
- **Natural Gas Bans (new construction)**

New York and Washington, DC each passed tough building emissions laws meant to sharply reduce the greenhouse gas output from existing buildings. While the two laws have different mechanisms, they both create an emissions cap and put pretty strict penalties in place for building owners who do not comply. In New York, when the first cap goes into effect in 2025, an estimated 25% of the city's commercial buildings over 25,000 square feet will need to make some sort of improvements in order to comply. In 2030, however, when the emissions cap is adjusted, it is estimated that 75% of those buildings will be affected. In Washington, the city is using a median Energy Star score as its cap. That cap, though, periodically adjusts downward as more buildings comply, forcing more and more buildings into the program. And while DC has yet to lay out exactly what the financial penalties will be, they are expected to be substantial.

Building emissions laws



NYC Local Law 97

- Cap on CO₂ emissions on buildings over 25k square feet
- 50k city buildings affected
- Penalty: \$268/ton of CO₂ over the cap



Clean Energy DC Act

- Mandatory performance benchmarking for buildings over 10k square feet
- Building Energy Performance Standards (BEPS) no lower than median Energy Star Score for each building type
- Substantial fines for non-complying buildings
- Median Energy Star Score resets periodically

While building emissions laws that target retrofits are emerging in large cities on the East Coast, electrification policies focused on new construction are popping up in small and mid-size cities on the West Coast and spreading to the rest of the country. The below quote from Colorado's Energy Director illustrates the enthusiasm in certain places for these types of policies. More than 30 cities in California alone have passed some sort of natural gas ban, and the state is now being forced to address the patchwork of regulations that is emerging. And some places, like Arizona, are even seeing a backlash in the form of preemptive state laws prohibiting cities from banning natural gas.

Electrification Laws

"Electrify the heck out of a lot of other sectors"

- Will Toor, Exec. Director of the Colorado Energy Office

- More than 40 electrification plans either enacted or announced in cities across the U.S.
- Mostly in California, but also in places like New Jersey and Massachusetts.
- Backlash in Arizona: State law forbidding cities from banning natural gas.

John is currently the Director of Public and Industry Affairs at Danfoss, where he covers a range of issues including refrigerants, energy efficiency, electric vehicles, and urban development. Sheff previously worked on energy climate and sustainability policy in the Office of Maryland governor Martin O'Malley before earning an MBA from the Robert H. Smith School of Business at the University of Maryland, College Park.



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