




How to Electrify a Mid-size City

Rewiring America



REWIRING
AMERICA

Today!

-  **01** Electrify Everything
-  **02** The Municipal Opportunity
-  **03** Electrification Strategies

Electrify Everything



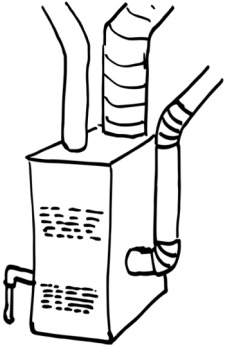
87%

of our emissions are
energy-related.

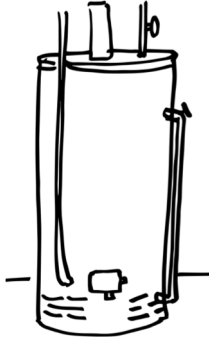
42%

of this come from
decisions made
around the kitchen
table.

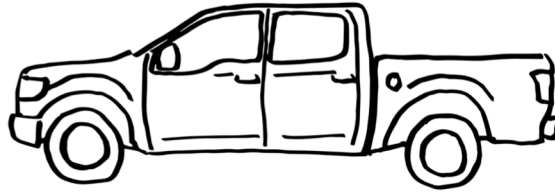
We need to electrify 500 million fossil-fuel machines.



58mm space heaters



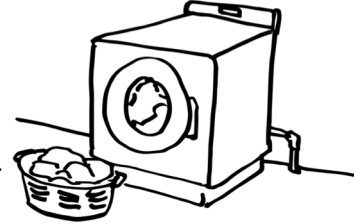
56mm water heaters



250mm cars & trucks



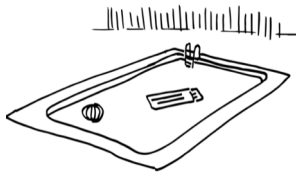
35mm stoves



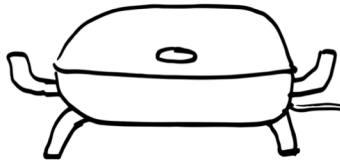
18mm dryers



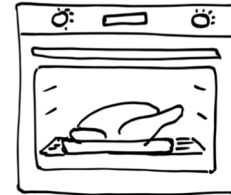
1.9mm hot tubs



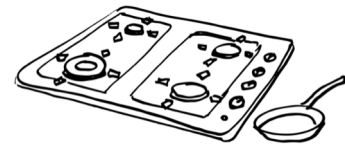
1.5mm heated pools



69mm grills

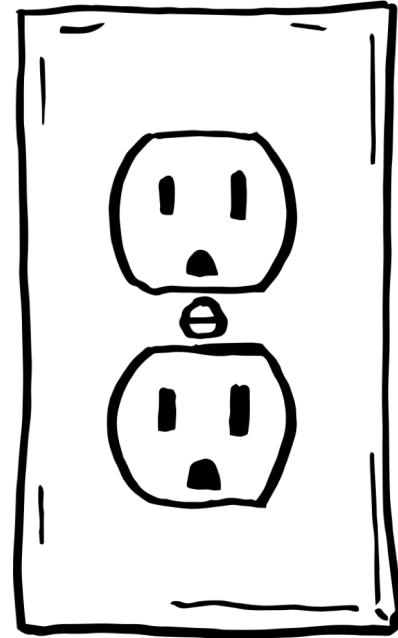
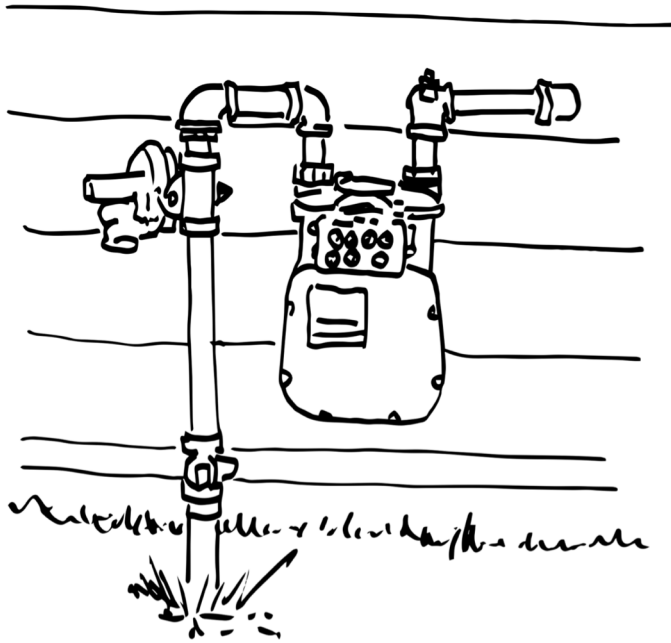


2mm ovens

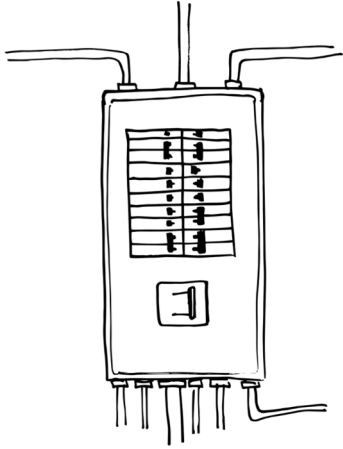


6.5mm cooktops

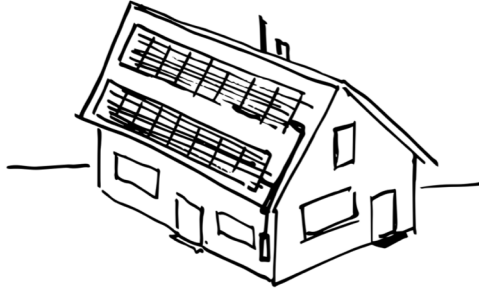
This will require new household infrastructure.



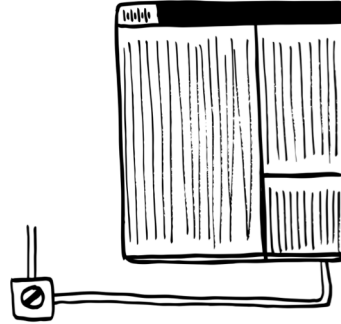
Which is another 500 million machines.



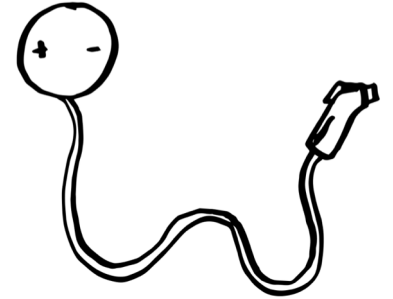
100mm
Breaker boxes



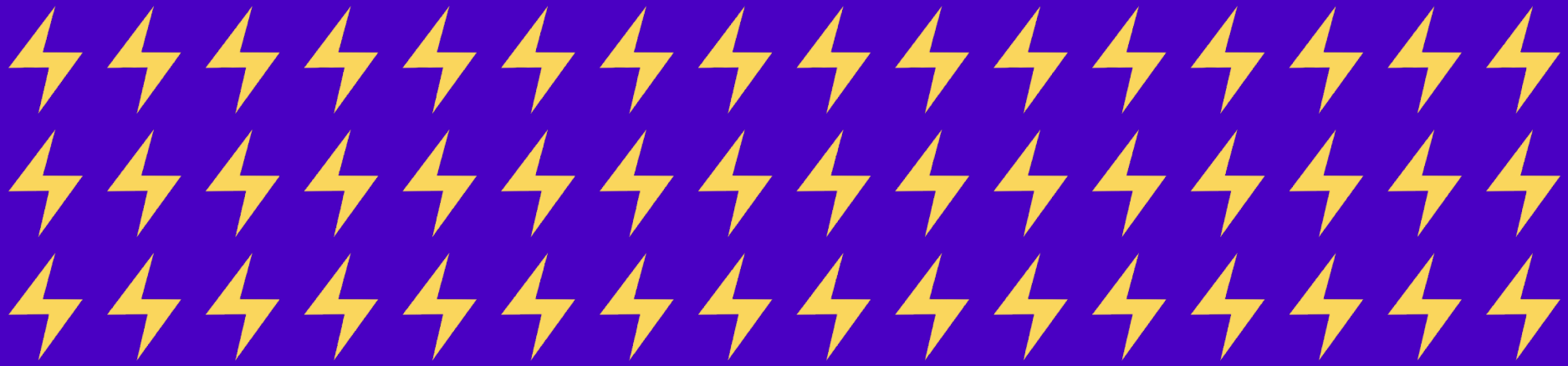
100mm
Solar rooftops



100mm
Home batteries



200mm
EV chargers



1 billion machines.

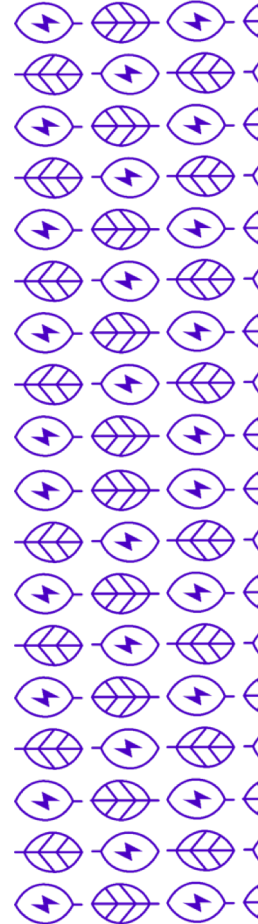
The Municipal Opportunity



Electrification is the only viable path to zero emissions

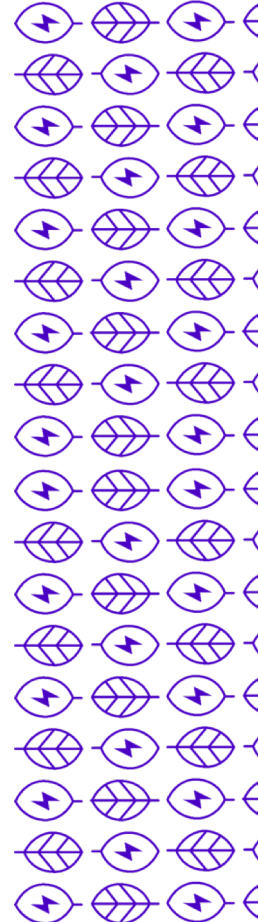
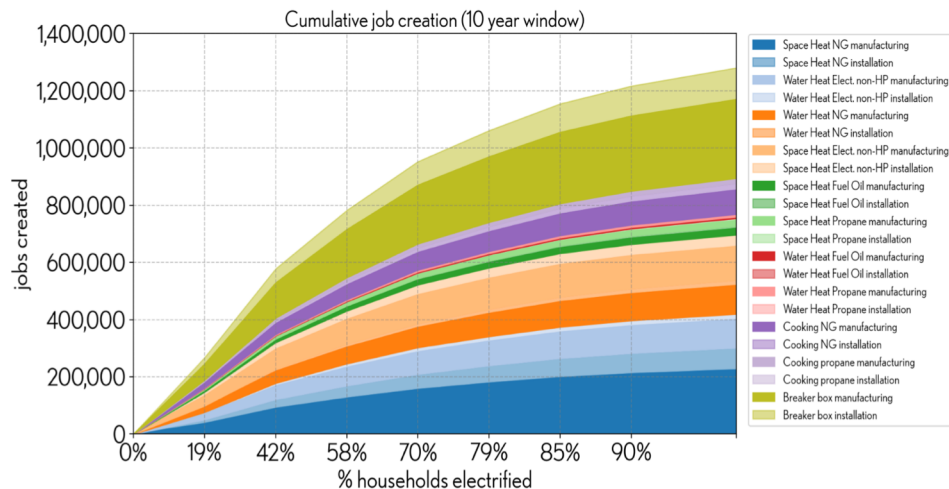
You can't solve a fossil fuel problem with more fossil fuels.

By the time “renewable natural gas” (RNG) reaches 50% of its hypothetical market potential, the price will have jumped to 4X the price of fossil gas. In the maximum case, RNG would cost 15X as much as fossil gas.



+ it keeps money in your community

- ✓ **Reduced energy bills**
- ✓ **Job creation**
- ✓ **Buying energy made close to home**



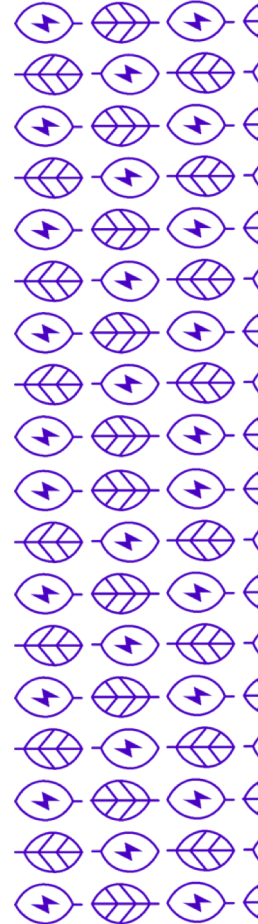
+ it improves housing affordability

Electric housing is affordable housing.

45.6 million low and moderate income American households could save \$17.2 billion from electrification.

Adding a gas line to an otherwise affordable home will increase fuel costs and carry a growing range of fixed fees.

There are additional costs in terms of increased pollution and health impacts from burning fossil fuels in the home.

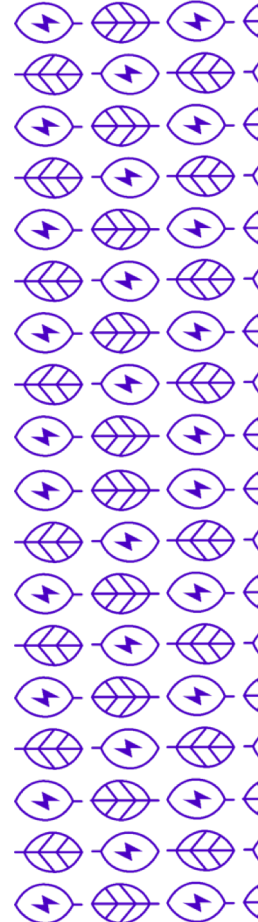


+ it improves public health

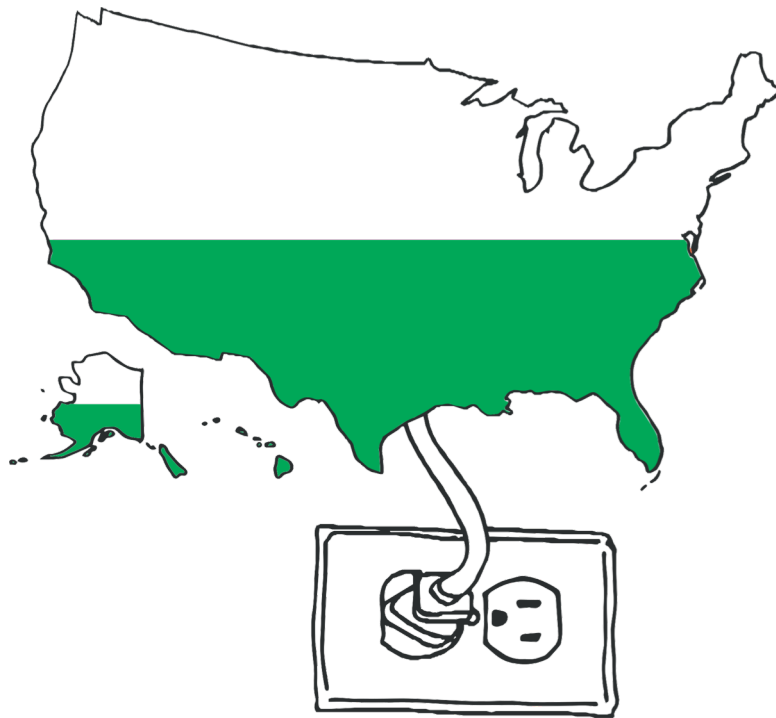
Gas cooktops produce harmful indoor air pollution, especially in homes with poor ventilation.

“Families who don’t use their range hoods or who have poor ventilation can surpass the 1-hour national standard of NO₂ (100 ppb) within a few minutes of stove usage, particularly in smaller kitchens.”

Methane and NO_x Emissions from Natural Gas Stoves, Cooktops, and Ovens in Residential Homes
Eric D. Lebel, Colin J. Finnegan, Zutao Ouyang, and Robert B. Jackson
Environmental Science & Technology **2022** 56 (4), 2529-2539
DOI: 10.1021/acs.est.1c04707



**All the American dream,
half the energy,
none of the emissions.**



Electrification Strategies



Electrification should be...

Accessible

To all residents, regardless of location or social status, whether they rent or own, and whether they live in a single-family home, apartment, condo, or co-op.

Affordable

To all residents and building owners, regardless of their economic status.

Equitable

By actively managing and fairly distributing costs during decommissioning of the existing gas distribution network.



Where do we begin?

1. **Dig a hole under the fence**
2. **Pick some fruit**
3. **Show off**
4. **Throw away the shovel**

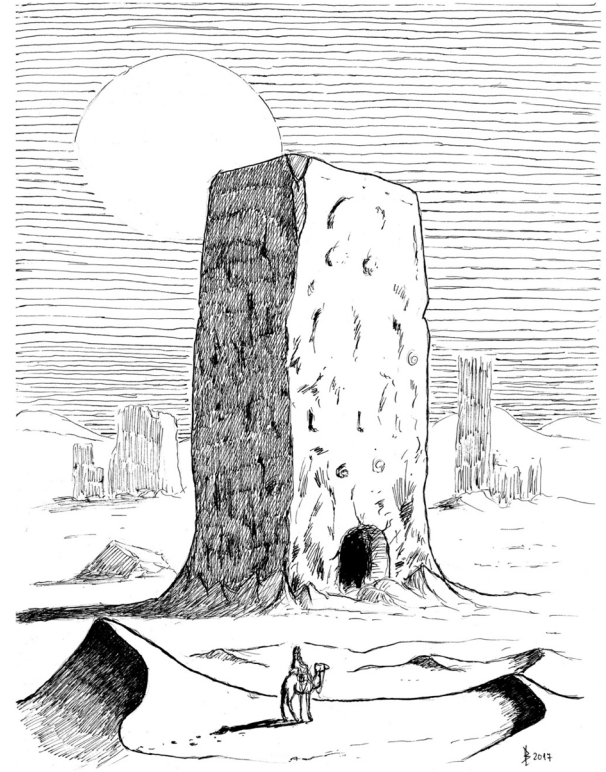
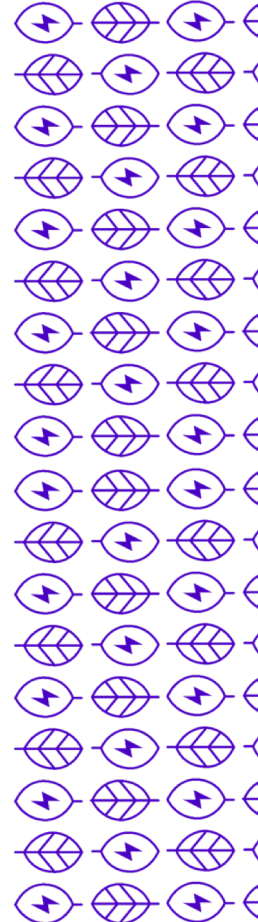


Image credit: László Gábor Bati

Dig a hole under the fence

Remove structural barriers that slow market transformation.

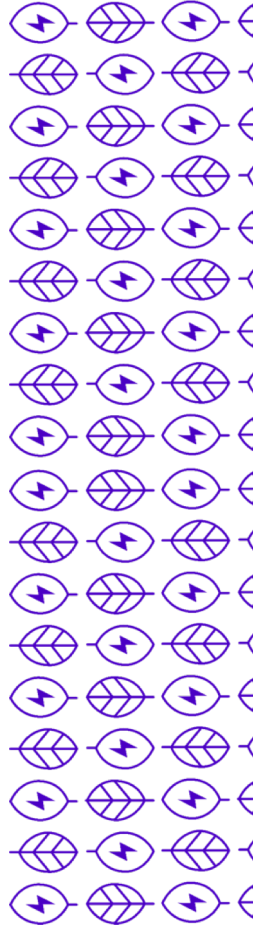
- Electrification Audits
 - Enhance energy audits to provide all residents with a detailed action plan.
 - Collect data to inform electrification program planning.
- Rewiring for Readiness
 - Provide incentives to upgrade electrical panels and wiring to prepare homes for electrification. Tie to solar & EV charger installations.
- Proactive Full-electrification with Gas Decommissioning
 - Prioritize public housing, subsidized housing, and individual city blocks in low-income neighborhoods.
 - Target buildings with oil and propane, and those near leaking/obsolete gas infrastructure.



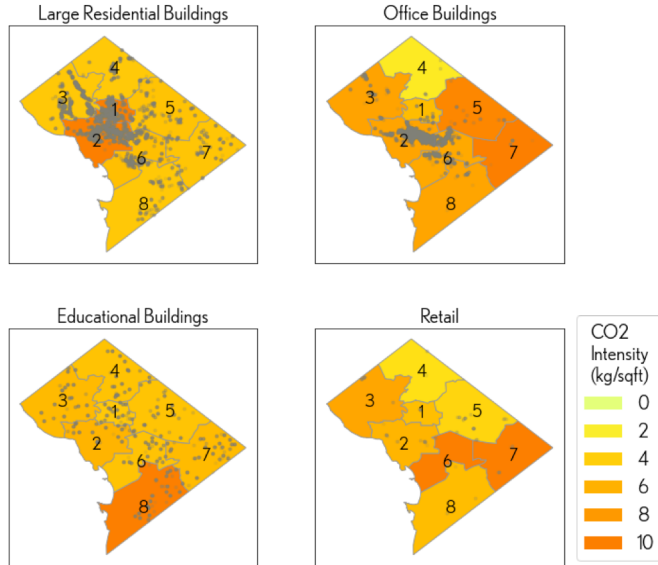
Pick some fruit

Start with the easiest opportunities.

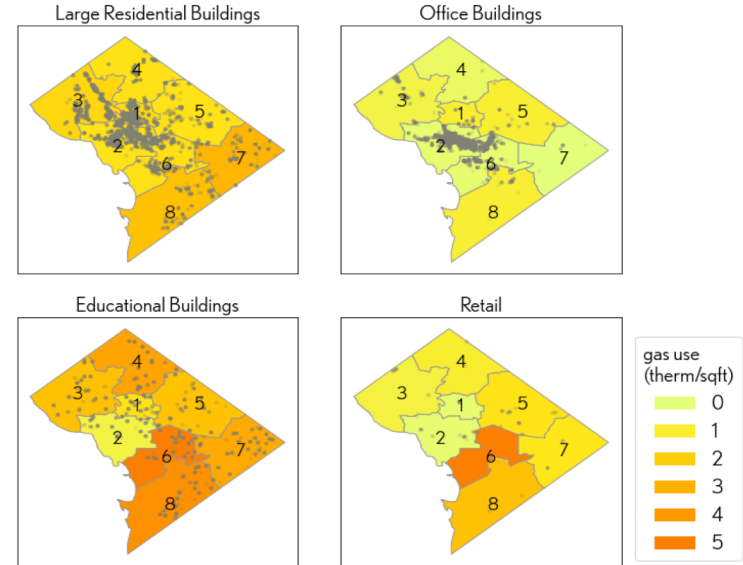
- Push for all-electric new building codes. Require all new affordable housing to be 100% electric.
- Eliminate incentives for one-way air conditioners.
- Target residential buildings with oil, propane, and electric resistance heat where operating cost savings will be greatest. Especially those with old equipment. Electrify and weatherize at once.
- Target commercial buildings with high operating hours, such as health care, food, retail, and offices.



Commercial building CO2 intensity varies across Washington, DC.



But does not correlate with gas use intensity.



Combining benchmarking and audit data can identify the best opportunities.

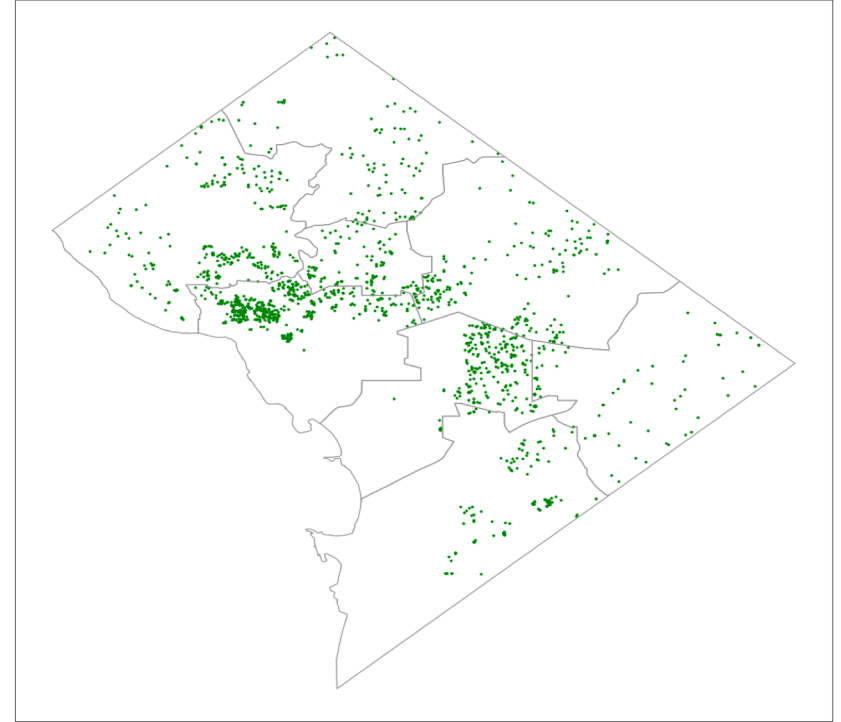


Show off

Heat pumps may be more common in your town than you think!

Prioritize schools, senior centers, places of worship, etc. to showcase benefits and educate the community. Social proof and word of mouth is important.

Distribution of residential heat pumps in District of Columbia

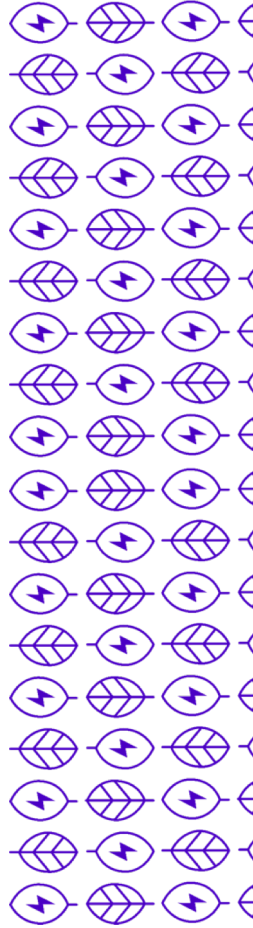


Throw away the shovel

Gas utilities are spending billions to replace aging transmission and distribution pipes. These 'buried assets' will soon be obsolete but must be paid for over 50 to 100 years.

Electrification carries none of these risks.

In DC, repurposing \$4.5 billion in gas replacement funds would provide \$27,400 per household for electrification.



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