REWIRING AMERICA

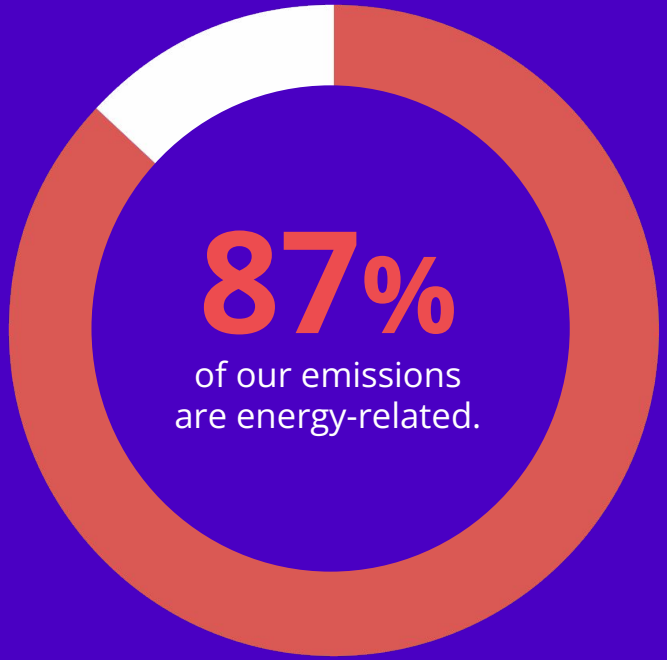
How to Electrify a Mid-size City

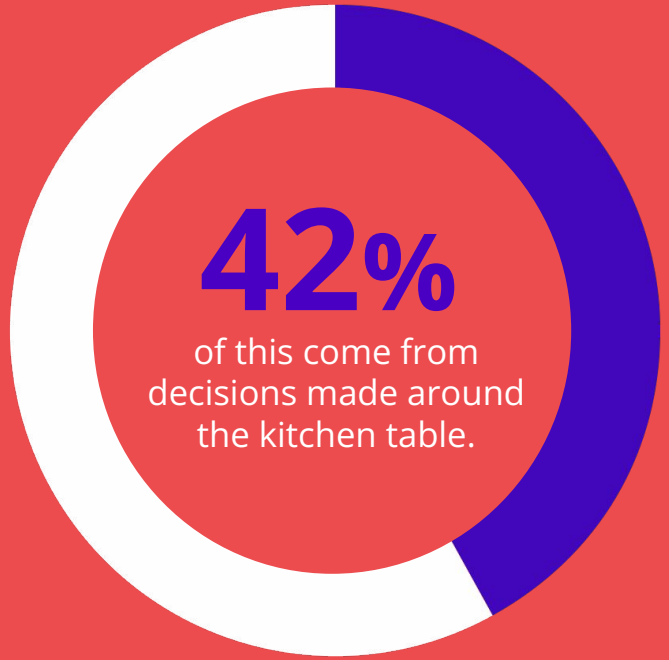
Content

PART 1

Electrify Everything.

DID YOU KNOW?





Do we have sources for these??

58mm
space heaters

56mm
water heaters

58mm
space heaters

250mm
cars & trucks

18mm
dryers

WE NEED TO ELECTRIFY 500 MILLION FOSSIL-FUEL MACHINES

1.9mm
hot tubs

1.5mm
heated pool

69mm
grills

2mm
ovens

6.5mm
cooktops

This will require new household infrastructure.

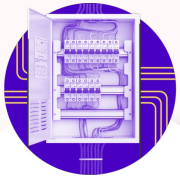
THIS WILL REQUIRE

Gas

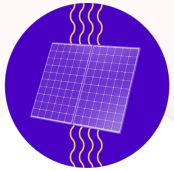
Electricity

NEW HOUSEHOLD INFRASTRUCTURE

WHICH IS ANOTHER 500 MILLION MACHINES



100mm breaker boxes



100mm solar rooftops

100mm home batteries

200mm chargers

WE NEED TO ELECTRIFY 500 MILLION FOSSIL-FUEL MACHINES

1 billion machines.

PART 2

The Municipal Opportunity

ZERO EMISSIONS

Electrification is the only viable path to zero emissions

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.

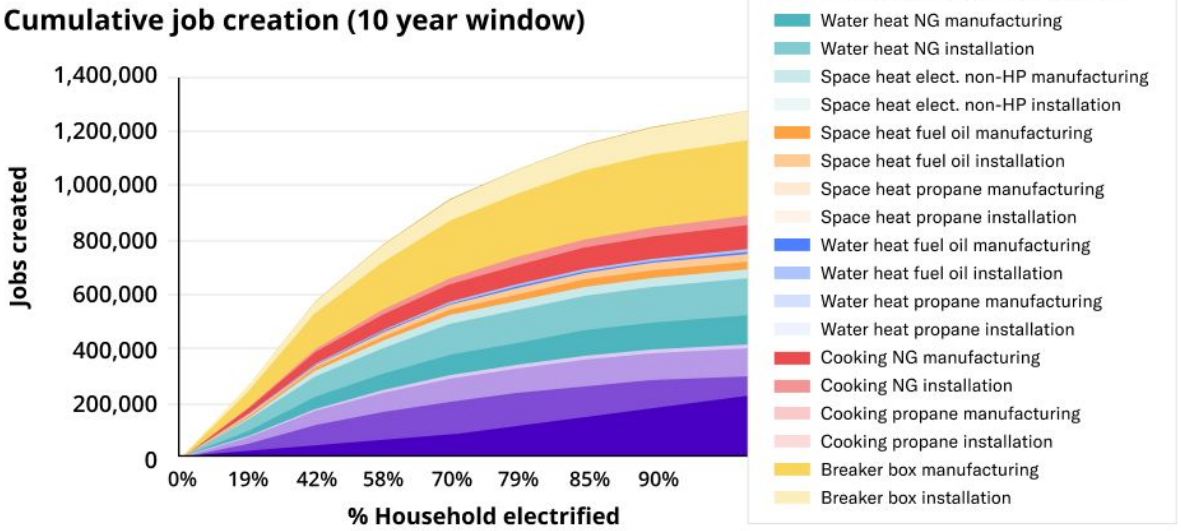
COMMUNITY

+ it keeps money in your community

→ Reduced energy bills

→ Job creation

→ Buying energy made close to home



AFFORDABILITY

+ it improves housing affordability
Electric housing is affordable housing.

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.

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

PUBLIC HEALTH

+ it improves public health

“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 NOx 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

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

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

PART 3

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

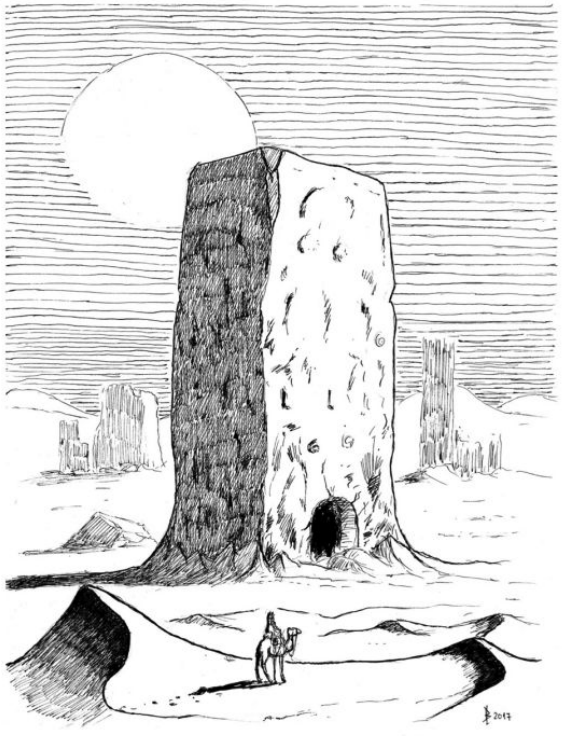


Image credit: László Gábor Báti

1. 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.

2. PICK SOME FRUIT

Start with the easiest opportunities.

Push for all-electric new building codes. Require all new affordable housing to be 100% electric.

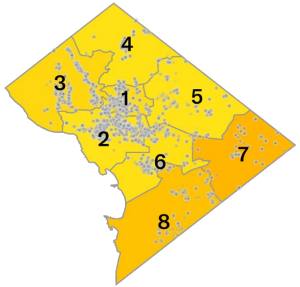
Eliminate incentives for one-way air conditioners.

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.

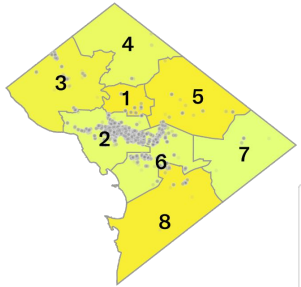
Target commercial buildings with high operating hours, such as health care, food, retail, and offices.

Commercial building CO2 intensity varies across Washington, DC.

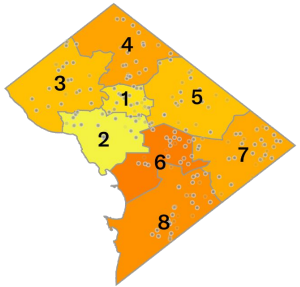
Large residential buildings



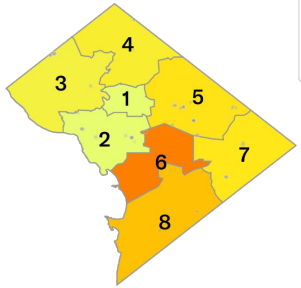
Office buildings



Education Buildings



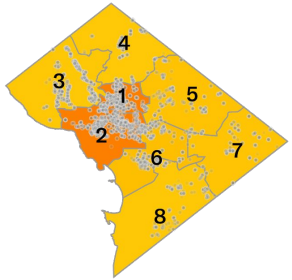
Retail



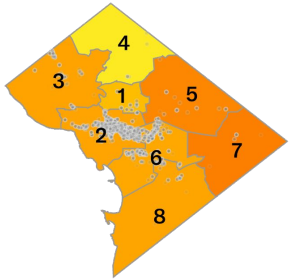
Gas use (therm/sqft)
0
1
2
3
4
5

But does not correlate with gas use intensity.

Large residential buildings



Office buildings



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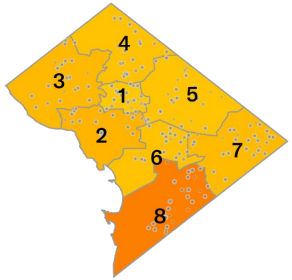
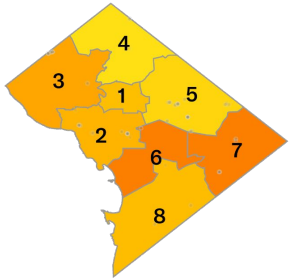


Retail



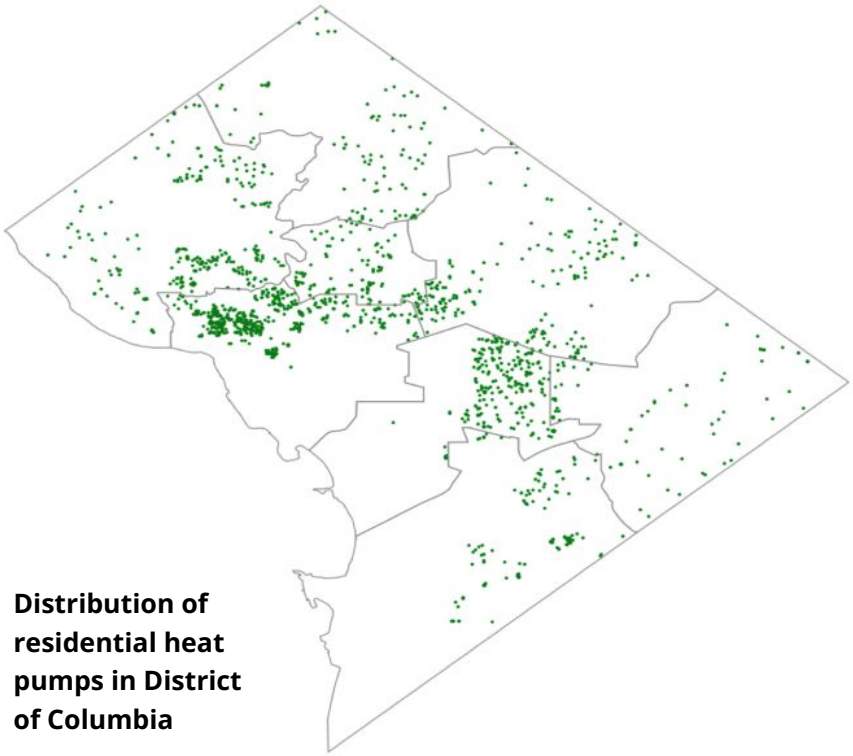
CO2 Intensity (kg/sqft)
0
2
4
6
8
10

Combining benchmarking and audit data can identify the best opportunities.

3. 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

4. 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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