



NC SUSTAINABLE  
ENERGY ASSOCIATION

**WAYS TO SAVE ENERGY  
AT HOME**



# What is NC Sustainable Energy Association?



The NC Sustainable Energy Association (NCSEA) is a nonprofit organization dedicated to shaping North Carolina's energy future by enabling clean energy jobs, creating business opportunities and bringing affordable energy to all of North Carolina.





Typical leakage  
in US home

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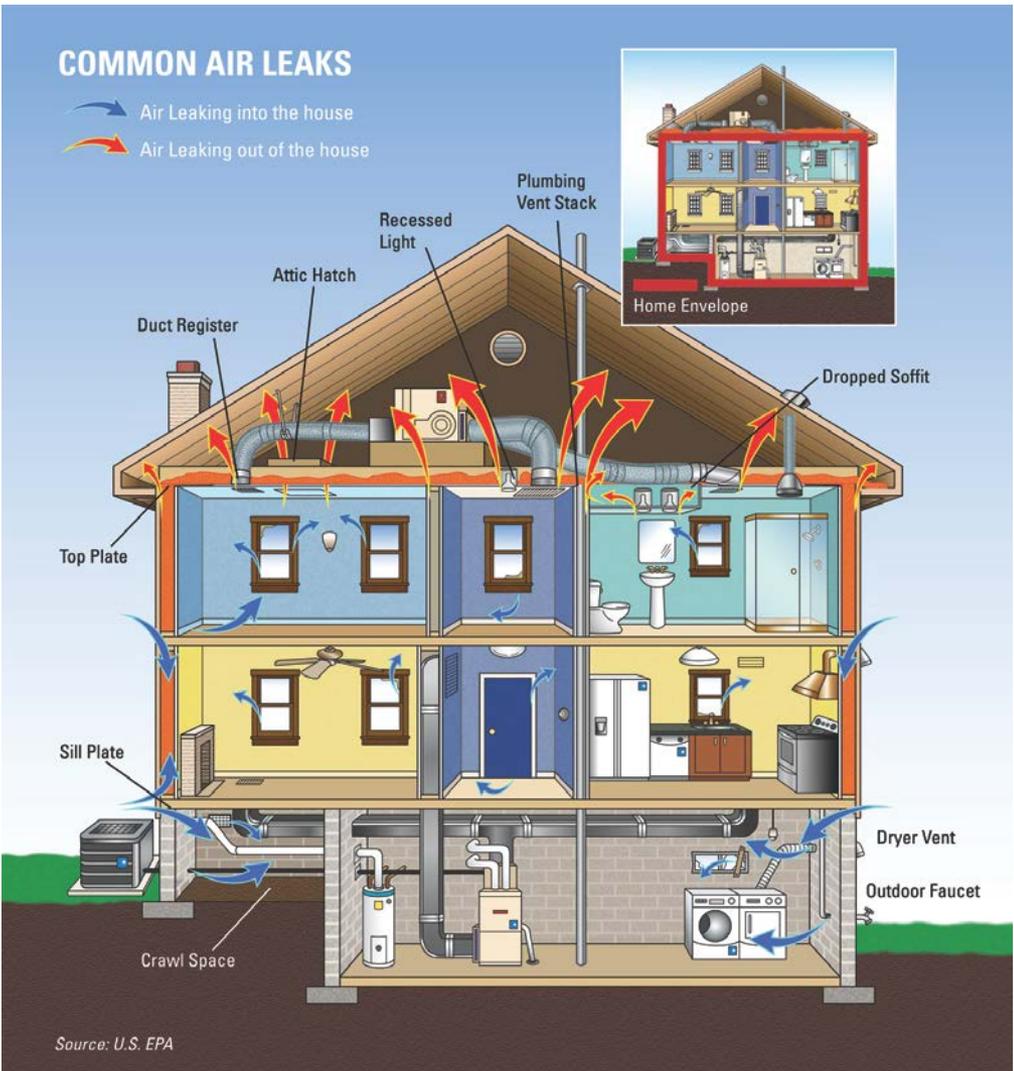
Leaving a  
window wide  
open





In most homes the most significant air leaks are hidden in the attic and basement.

These are the leaks that significantly raise your energy bill and make your house uncomfortable.





**Attic Hatch**



**Recessed  
Light**



**Plumbing Penetration**

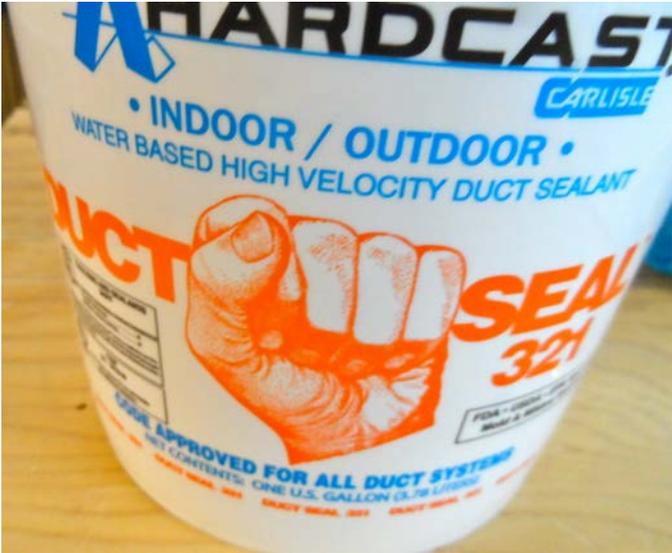


Air seal before you insulate





# Air Sealing Materials





If you rarely use your fireplace, make sure the damper is closed and the opening is sealed. Another option is to use a chimney balloon



These are inflatable balloon-like items that can be installed to help block air leakage in an unused fireplace.

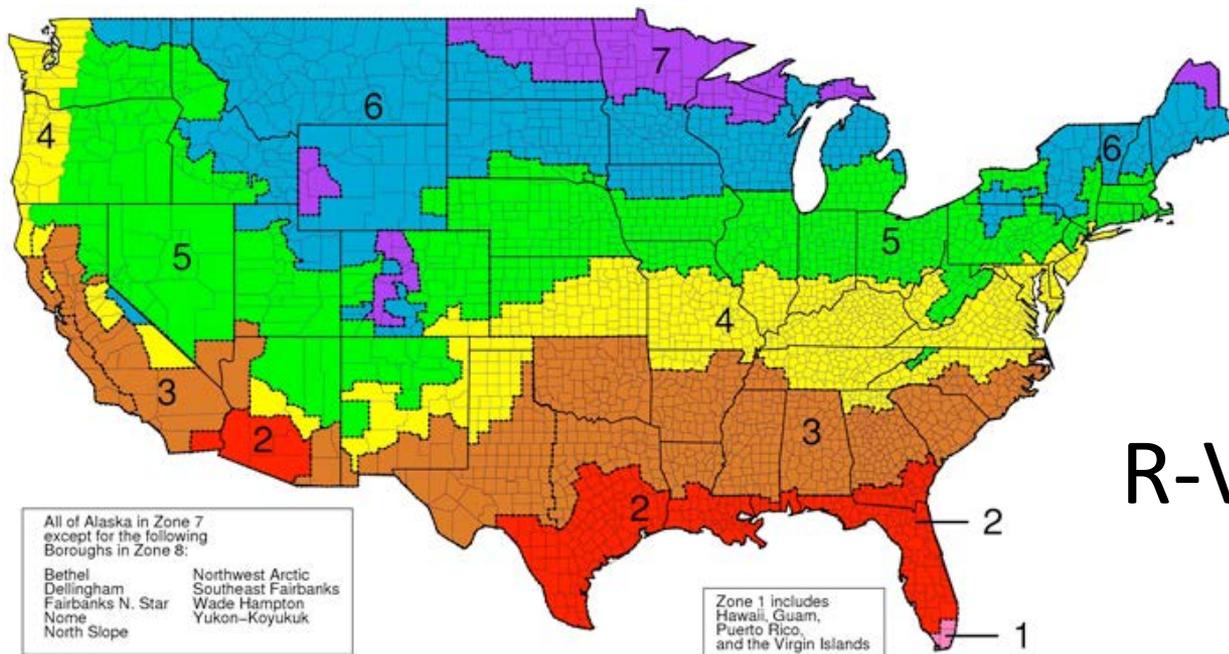


# Insulation

For insulation to work it must:

1. Stay in place
2. Be installed without:
  - Gaps and voids
  - Compression and low spots
3. Touch the air barrier
4. Stay dry





# R-Values



Zone	Add Insulation to Attic		Floor
	Uninsulated Attic	Existing 3–4 Inches of Insulation	
1	R30 to R49	R25 to R30	R13
2	R30 to R60	R25 to R38	R13 to R19
3	R30 to R60	R25 to R38	R19 to R25
4	R38 to R60	R38	R25 to R30
5 to 8	R49 to R60	R38 to R49	R25 to R30

Source: Energy Star

[http://www.energystar.gov/index.cfm?c=home\\_sealing.hm\\_improvement\\_insulation\\_table](http://www.energystar.gov/index.cfm?c=home_sealing.hm_improvement_insulation_table)



Insulate Your Water Heater: If your water heater is located in an unheated location, such as a garage or attic, wrap the tank in a blanket of glass fiber insulation.





Newer high efficiency showerheads are able to maintain water pressure while using significantly less water. Low-flow showerheads typically pay for themselves within a year.





# Keep Your HVAC Unit in Good Working Order

- Clean/replace filters regularly





Heating systems, like other pieces of equipment in your home, require maintenance in order for them to operate efficiently





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<http://www.energync.org/>

**If you have any questions,  
please contact:**

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# Energy Efficiency Incentives

4<sup>th</sup> Eastern NC Sustainability Summit

**Jen Weiss**

**Energy Efficiency Policy Manager**

# Why Energy Efficiency?

**“The cheapest energy is the energy we never use.”**

# Barriers to Energy Efficiency

- **Lack of information – Where do I start? What should I do?**
- **Lack of trust – Who should I hire?**
- **Lack of time – How do I find time in my busy schedule to do/manage the retrofit?**
- **Lack of motivation – But, my favorite show is on and I don't really want to get off the couch...**
- **Lack of capital – How do I pay for the retrofit?**

# Utility Incentive Programs

- **Duke Energy Progress**

- Home Energy House Call
- Home Energy Improvement Program

- **Dominion North Carolina**

- Home Energy Check Up
- Heat Pump and Duct Sealing Rebates

- **Electric Cooperatives**

- Edgecomb Martin EMC – Free Energy Audit
- Halifax EMC – Water Heater and Heat Pump Rebates
- Pitt and Greene EMC
- Roanoke EC – Upgrade to Save

# Halifax Energy Loan

- **Heat pumps, electric/solar water heaters, insulation, windows, doors, and other solar or energy star related items**
- **Low fixed rate loan (3.99%) from ElecTel Credit Union**
- **Up to \$20,000 (\$5,000 for a mobile home)**
- **Repayment terms up to 60 months**
- **Subject to credit approval**

# On-Bill Energy Efficiency

- **Energy efficiency improvements paid on an existing bill by a home or business**
  - Utility Bill
  - Property (Tax) Bill
- **Benefits**
  - ✓ Upfront capital for EE improvements
  - ✓ Ease of payment
  - ✓ Energy savings can offset payment
  - ✓ Potential to expand access to renters

# Roanoke EC - Upgrade to Save

- 1. Member contacts utility seeking assistance with cost savings**
- 2. Utility identifies best efficiency upgrades**
- 3. Contractor installs upgrades (no upfront cost for member)**
- 4. Utility recovers costs with fixed charge on bill (less than estimated savings)**



# Example of On-Bill Tariff

## Sample of over 75 homes

Average cost of upgrades	\$6,900
Average monthly estimated savings per site	\$120
Average monthly tariff	\$62
Average monthly estimated savings for member	\$58
% of savings kept by member during cost recovery (Target: 25%)	50%

Source: Roanoke EC

# Weatherization Assistance Program

- 1. Federal program that provides weatherization services to low-income households**
- 2. WAP program treats the whole home for a cost-effective, energy efficient makeover including- insulation, sealing air leakages, lighting, HVAC and others.**
- 3. To qualify household income must be under 150% of poverty**
- 4. Families qualifying for Supplemental Security Income, or Temporary Assistance for Needy Families qualify.**

Household Size*	Maximum Income Level (Per Year)
1	\$23,760
2	\$32,040
3	\$40,320
4	\$48,600
5	\$56,880
6	\$65,160
7	\$73,460
8	\$81,780

# WAP Program provides in UCPCOG counties

Organization	County	Address	Phone Number
Choanoke Area Development Asso	Halifax	Rich Square, NC	252-539-4155
Choanoke Area Develop. Asso.	Northampton	Rich Square, NC	252-539-4155
Martin County Community Act.	Edgecombe	Williamston, NC	252-792-7111
Martin County Community Act	Wilson	Williamston, NC	252-792-7111
Martin County Community Act.	Nash	Williamston, NC	252-792-7111

Thank you!

**Jen Weiss**

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# Mapping a comprehensive energy strategy for the Upper Coastal Plain Council of Government Region

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NC Clean Energy Technology Center



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# Why are we doing it?

- Energy costs is a significant financial burden to low income households in North Carolina.
- More than 288,000 North Carolina Households with incomes at or below 50% of the Federal poverty level pay at least 35% of their annual income on home energy bills, compared to 10% national average.
- There are already a number of federal, state, utility, and local programs towards this cause, but there is very little, if any coordination.



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# What is the project?

- The goal of the project is to address this challenge by creating a comprehensive data driven platform where these independent programs can be integrated together.
- We propose creating geospatial database of energy efficiency programs in the UCPCOG area and integrate that database with energy usage data from the utility.
- This will allow for data-driven analysis and collaboration between, ultimately resulting in improved targeting and design of energy efficiency programs and increased energy efficiency among energy-intensive and low-income households in the utility's service area.

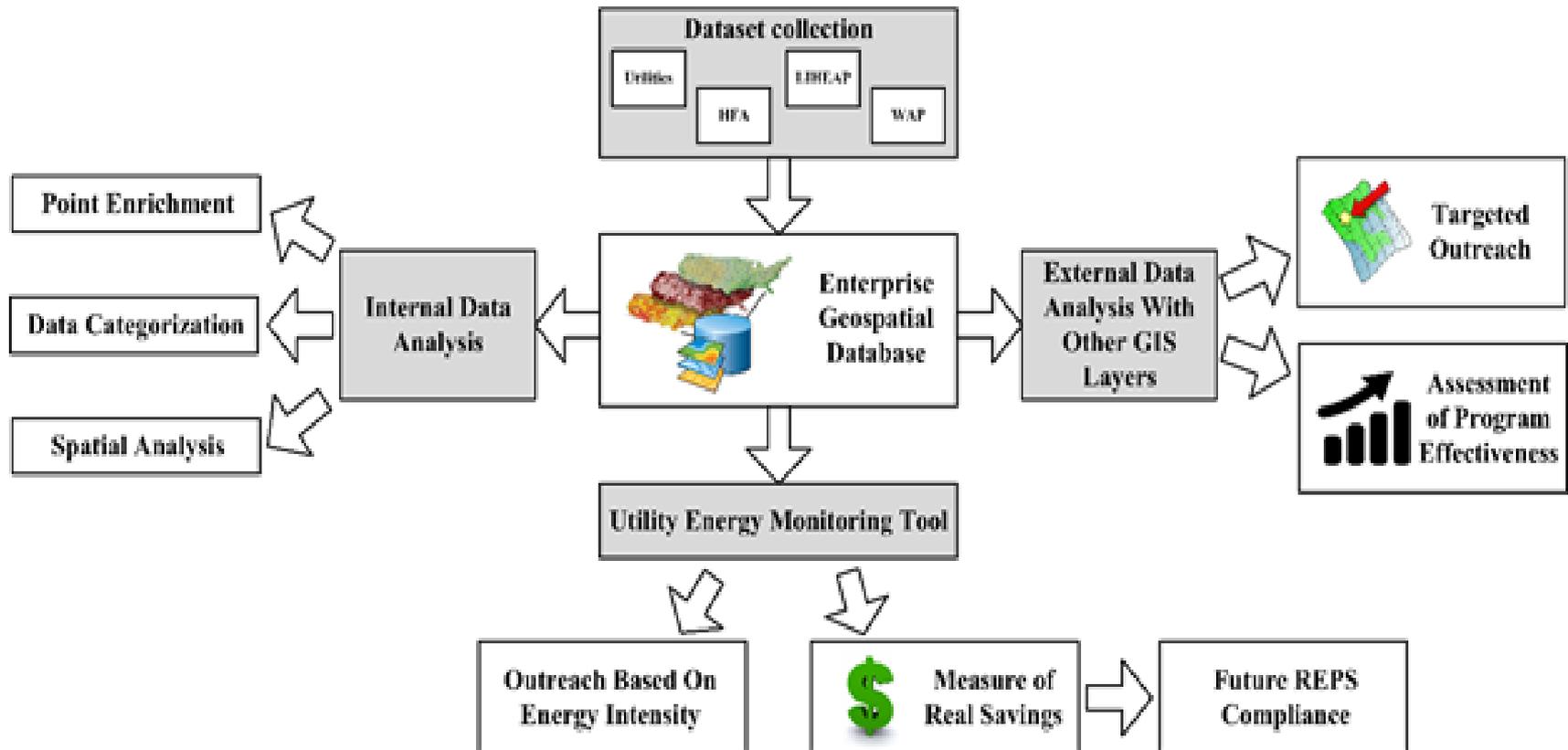


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# Project Framework



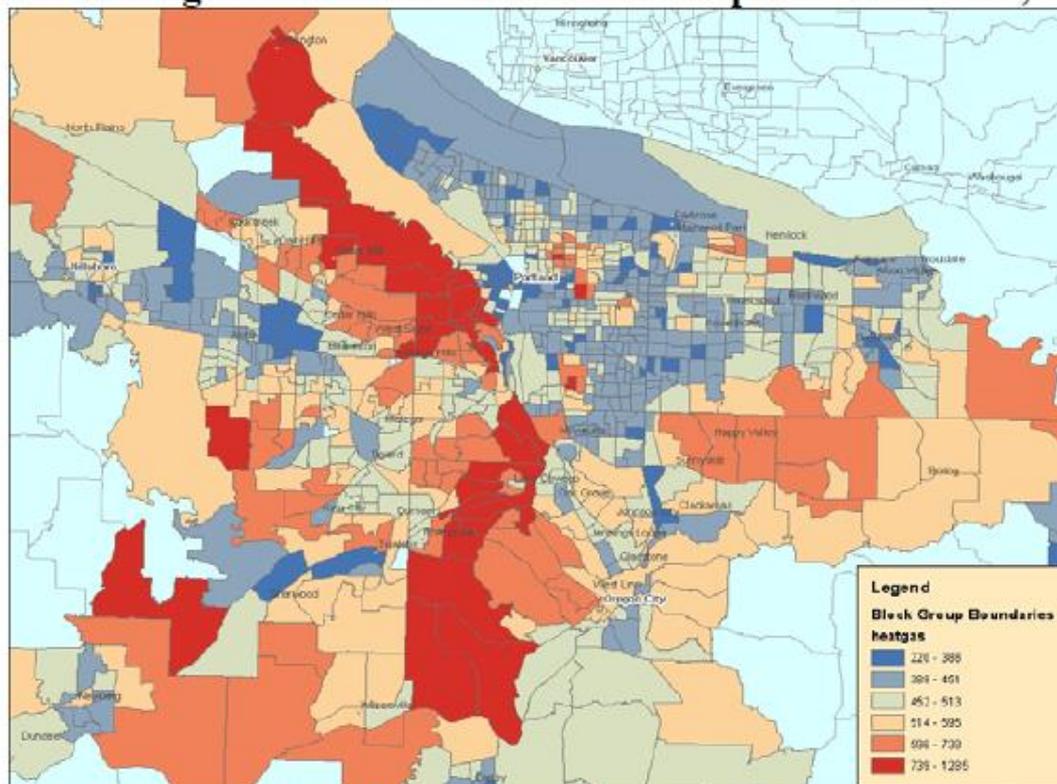
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# Mapping Energy Data

Figure 1. Average Annual Gas Therm Consumption – Portland, Oregon



Source: Conservation Services Group internal report. 2012

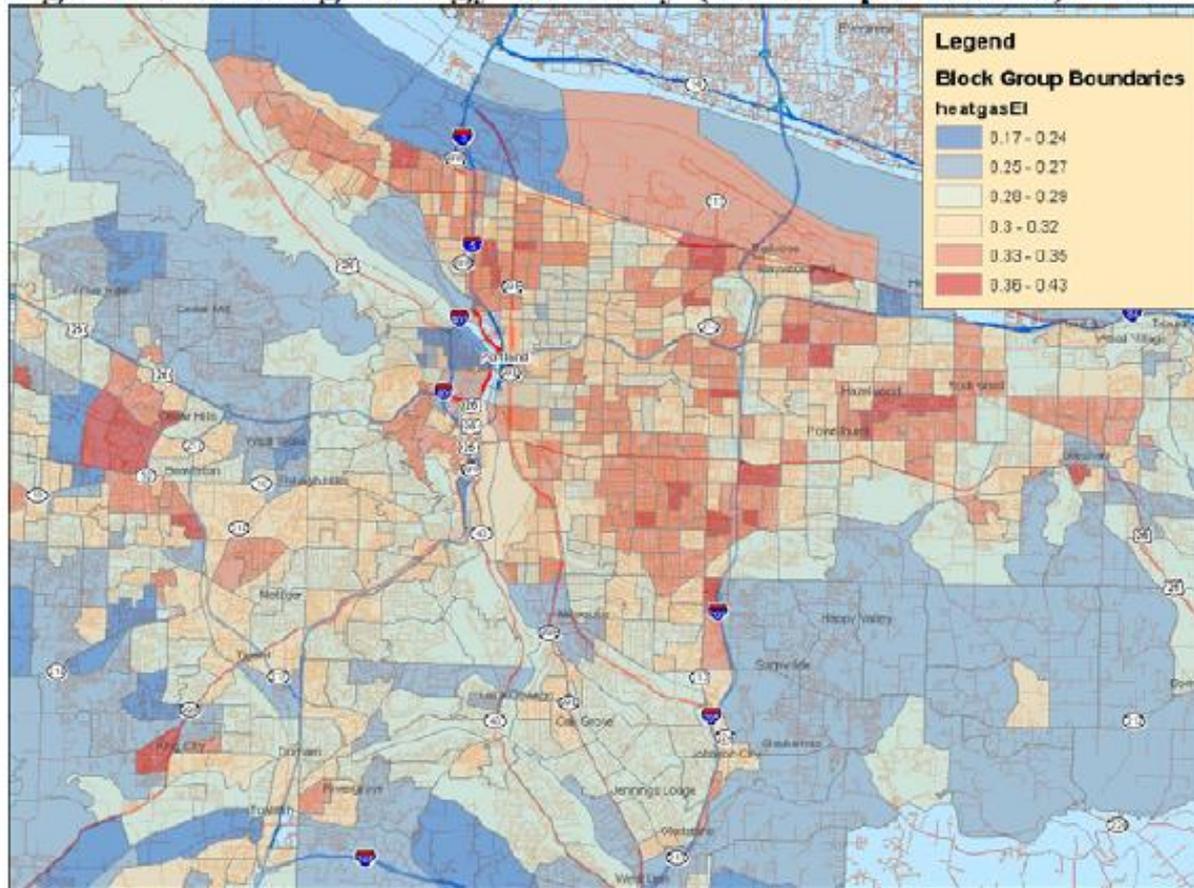


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Figure 2. Average Gas Heating Energy Intensity (home sqft/therms) in Portland, Oregon



Source: Conservation Services Group internal report. 2012



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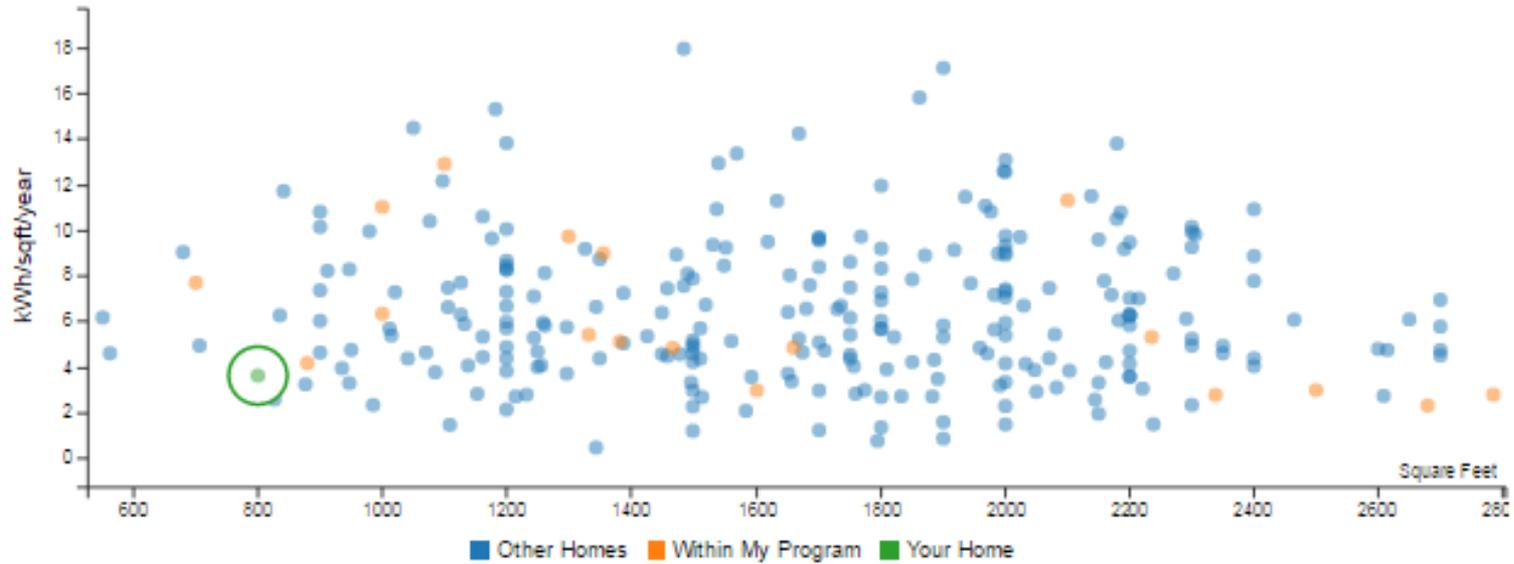
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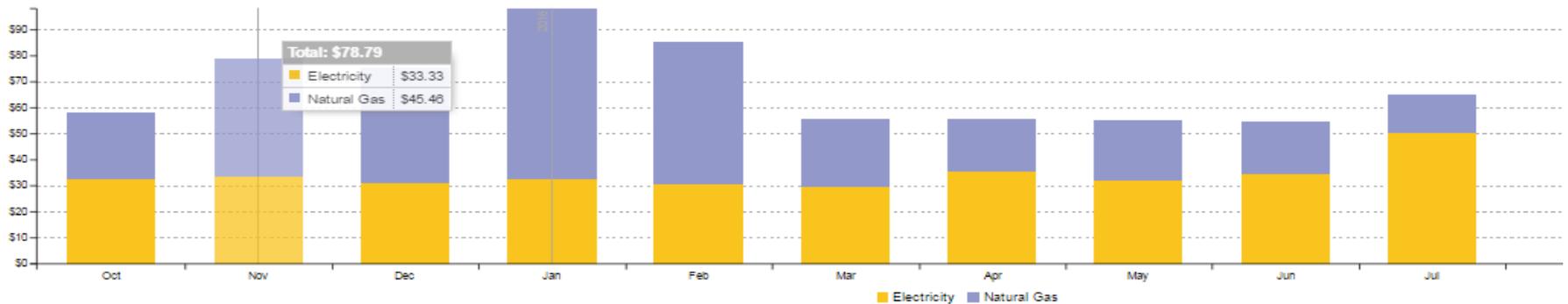
# Electricity



## 12 Month Total Use



## Monthly Costs



## Outcomes

1. First-of-its kind, comprehensive energy efficiency evaluation tool.
2. Provide unprecedented level of comprehensive insight into the effectiveness of the programs.
3. Use energy data analysis to make informed decisions for targeting incentives, renovations.
4. Quantify energy savings.

## Challenges

1. Data Collection from different energy efficiency programs in the area.
2. Data privacy and data handling issues.
3. Sustainability of the project



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# Timeline

**Phase 1 Product:** Resolve data privacy and security concerns. Design and develop the enterprise geodatabase and integrate residential utility energy use data.

**Final Product:** Provide a geospatial analysis capability to partner organizations to store, track, and analyze their energy efficiency program data, providing incentive to continue to provide data input and populate the database



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# Partner Organizations

1. Upper Coastal Plains Council of Governments (UCPCOG),
2. North Carolina State University,
3. North Carolina Sustainable Energy Association (NCSEA),
4. Roanoke Electric Cooperative,
5. Vermont Law School,
6. Terracel Energy LLC,
7. University of South Carolina,
8. North Carolina Justice Center



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