Comparison of Northwest Residential Electricity Use, "Rates" and Bills

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Northwest Power and Conservation Council

Context

- Follow-up to March staff presentation on recent trends in the average cost of electricity for residential customers
- Higher resolution examination of the potential factors that contribute to differences in residential electric bills
  - Type of utility ownership (public vs. private)
  - Differences in service area characteristics
    - Density (i.e., urban vs. rural)
    - Access to natural gas
    - Heating system efficiency
    - Vintage (i.e., age) of homes
    - Housing type mix (i.e., share of single family, multifamily and manufactured homes)
    - Historical energy efficiency
    - Household Income and Level of Poverty

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But Before We Start - Let's Define "Rates"

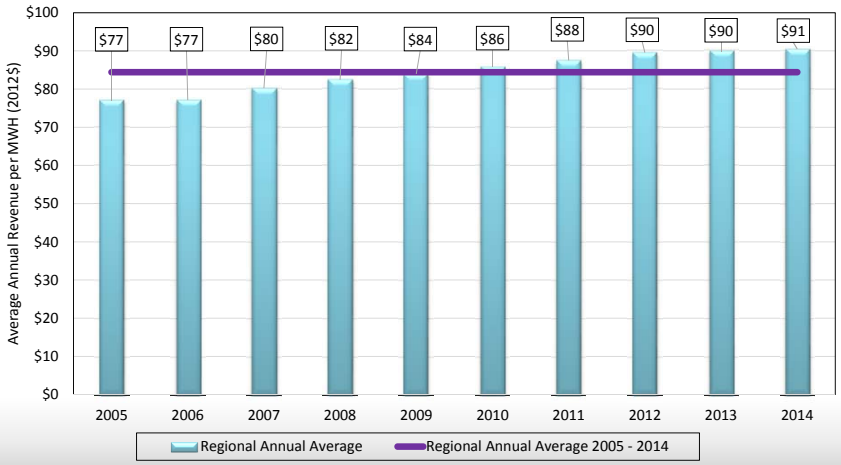
- As used in this presentation and in the issue paper "average rate" ***is not*** the average cost per megawatt-hour charged by utilities
- ***It is*** the total residential sector retail revenues/total residential sector retail sales. That is, it is the "average revenue" collected per megawatt-hour of retail sales.

Comparing Electricity Bills

- Reflect both annual electricity use and cost per unit of electricity use
- Therefore, comparisons of "annual electric bills" requires an understanding of both
  - Annual electricity consumption
  - Average price per unit of consumption (i.e., average revenue per MWh)

Key Finding: Over the past decade the average residential customer in the region paid about $84 MWH for electricity, although the average cost per MWh has increased by 18% over this period

(Values Adjusted for Inflation)



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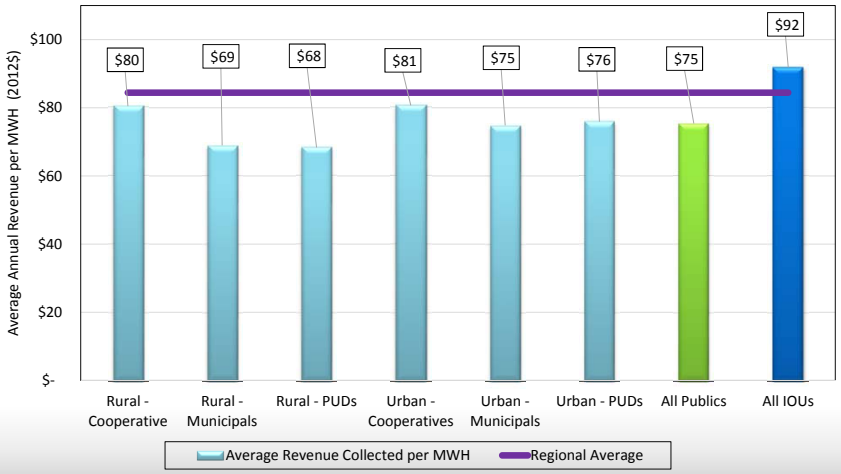
Key Finding: On average residential customers of publicly owned utilities paid about 12 percent less per MWH of electricity than residential customers of investor owned utilities



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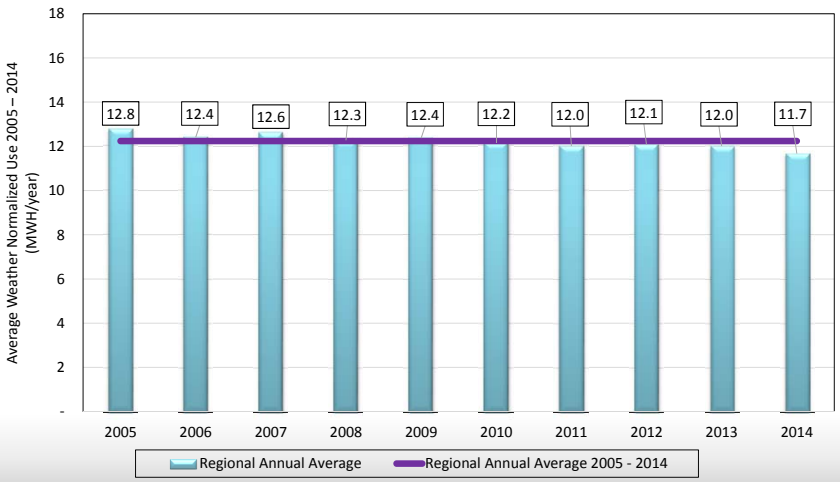
Key Finding: Over the past decade the average residential customer in the region consumed 12.2 MWH/year of electricity



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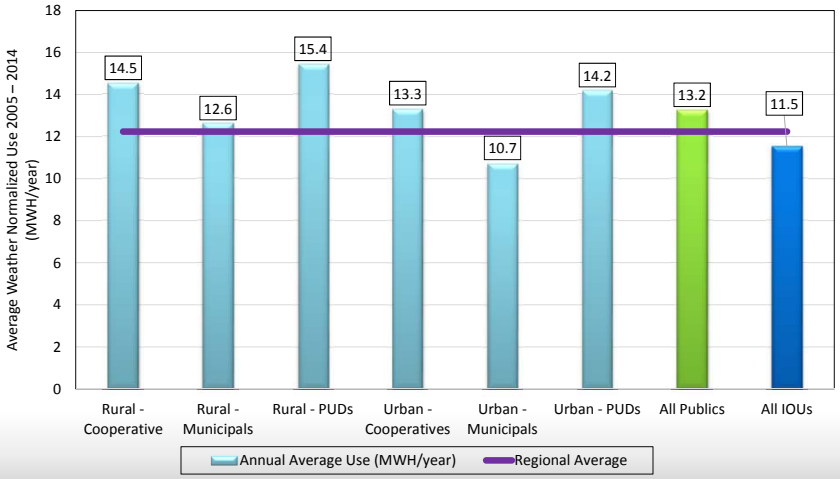
Key Finding: On average residential customers of publicly owned utilities consumed about 15 percent more electricity than residential customers of investor owned utilities



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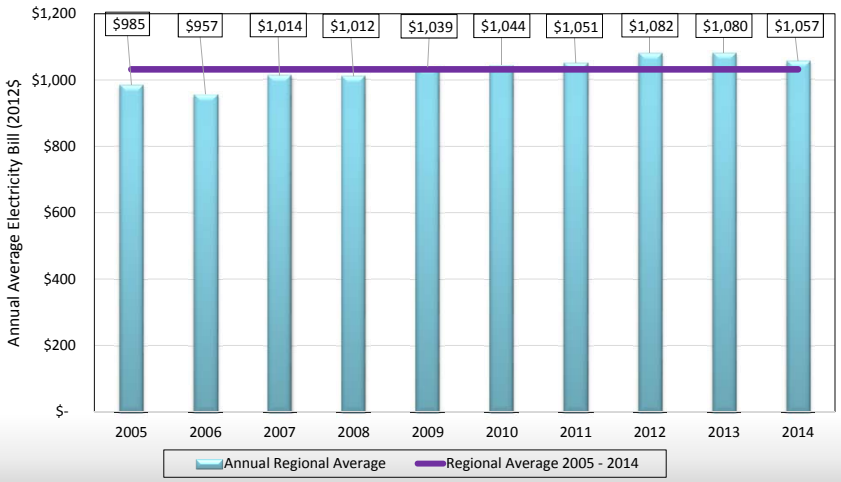
Key Finding: Over the past decade the average residential customer in the region paid an average of about $1000 dollars per year for electricity



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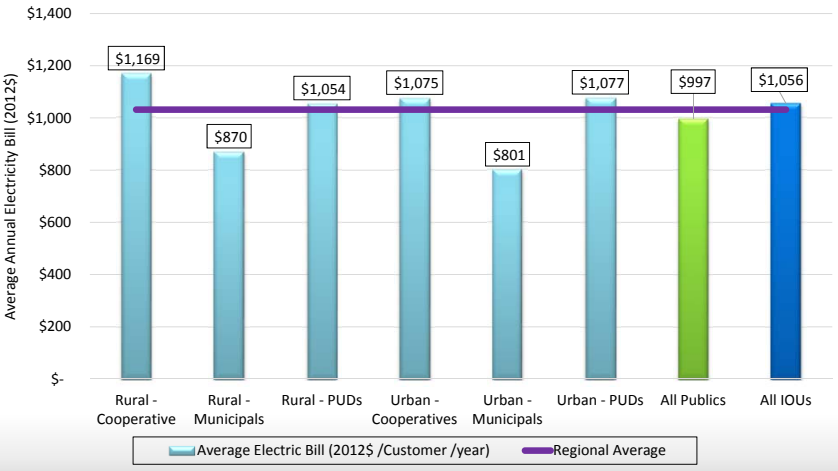
Key Finding: Residential customers of publicly owned utilities paid on average about $997 while residential customers of investor owned utilities customers on average paid about $1056 annually for electricity



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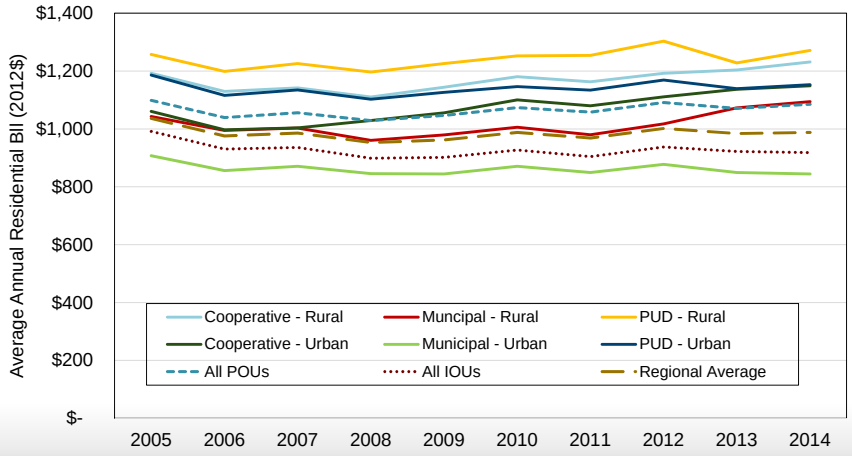
Key Finding: Over the past decade average annual residential electricity bills have declined slightly
(Weather normalized, Adjusted for Inflation)



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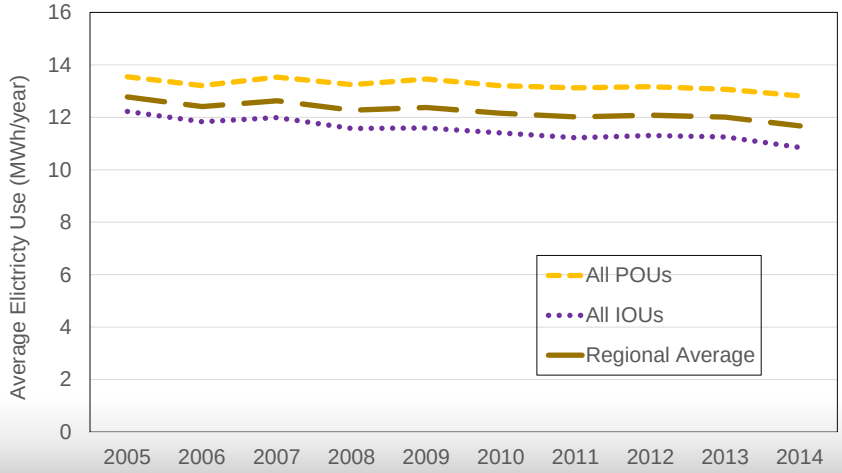
Key Finding: Average Annual Residential Electricity Use per Customer Declined From 2005 To 2014 for IOUs and "On Average" Across All Public Utilities
(Weather Normalized)



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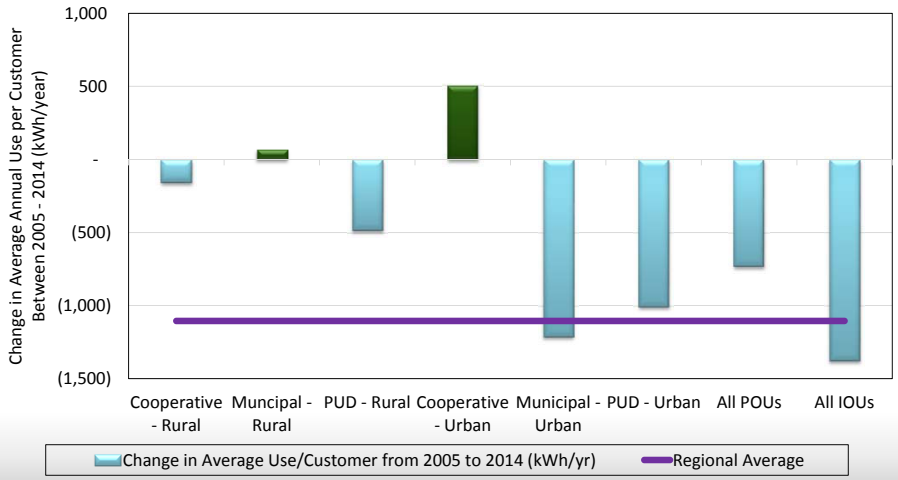
Key Finding: Not all utility types experienced a declined in average annual electricity use per residential customer



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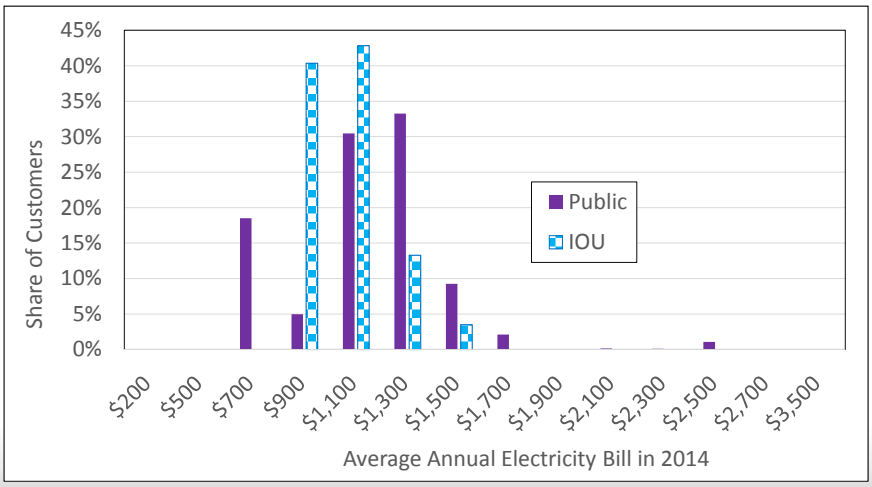
Key Finding: There Was a Large Variation in the Average Annual Residential Electricity Bill Among Both Publicly Owned and Investor Owned Utilities in 2014

(Nominal$, Not Weather Normalized)



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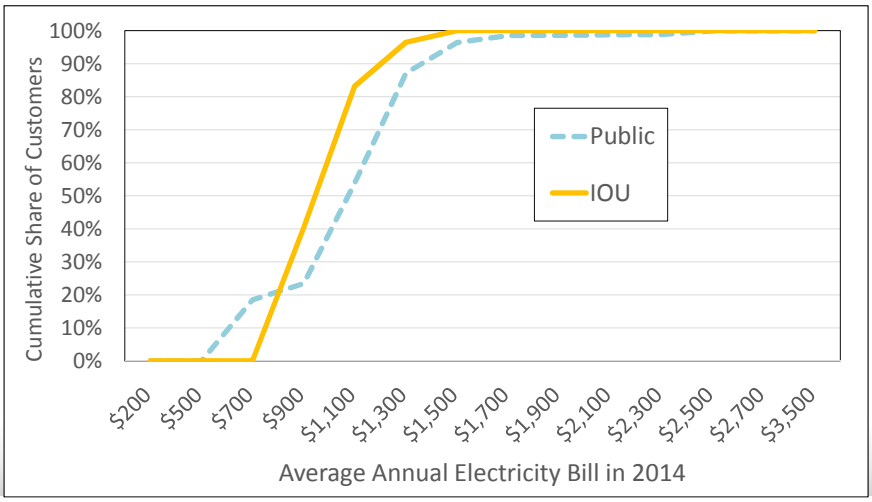
Key Finding: In 2014, 90% of the Average Residential Electric Bills Paid Public Utilities and IOUs Were Less Than $1,300



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Key Finding: Only Two Factors Contribute to Difference In Average Annual Electricity Use Between Public Utilities and IOUs

Factor	Yes	No
Access to natural gas	X	
Heating system efficiency		X
Vintage (i.e., age) of homes		X
Housing type mix (i.e., share of single family, multifamily and manufactured homes)		X
Historical energy efficiency	X	
Household Income and Level of Poverty		X

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16

Natural Gas Availability Reduces Saturation of Electric Space and Water Heating, Resulting In Lower Average Use by Customers if IOUs (and Public Utilities Serving Urban Areas)

Space heating	IOU	Publics	REGION
Electric	22%	43%	30%
Natural Gas	53%	32%	45%
All others	25%	26%	25%

Water heating	IOU	Publics	REGION
Electric	52%	67%	59%
Natural Gas	46%	31%	40%
All others	2%	2%	1%

Finding – The average annual electricity use per residential customer served by public utilities is higher because they have a higher saturation of electric space and water heating than those served by investor owned utilities

Source of data: RBSA 2012-2013.

Key Finding: There are only minor variations in electric heating system types saturations between public utilities and IOUs

Electric Heating System Technology	Marker Share of Technology		
	IOU	Public	Region
Ductless HP	3%	2%	3%
Electric Baseboard/Zonal	47%	38%	42%
FAF/electric	19%	19%	19%
Heat Pump	31%	40%	36%
Total Electric	100%	100%	100%

Finding – The higher average annual electricity use of residential customer served by public utilities compared to those served by investor owned utilities *is not due to differences in the mix of electric space heating technologies*

Key Finding: There are only minor variations in housing type saturations between public utilities and IOUs

Housing Type	IOU	POU	Total
Single Family	77%	74%	76%
Multi family	13%	16%	14%
Manufactured Housing			
Multi-section	7%	7%	7%
single section	3%	3%	3%

Finding – The higher average electricity use residential customer served by public utilities compared to those served by investor owned utilities *is not due to differences in the composition of housing stock in their service areas*.

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There are only minor differences in the vintages of housing found in Public Utility and IOU service areas

	Pre 1980	1980-1992	1993-2006	Post 2006
Single Family -IOUs	62%	17%	16%	5%
Single Family - POU	65%	15%	14%	5%
Manufactured Housing -IOU	35%	32%	27%	3%
Manufactured Housing -POU	35%	34%	27%	3%

Finding - The higher average electricity use residential customer served by public utilities compared to those served by investor owned utilities *is not due to differences in the vintage of housing stock in their service areas.*

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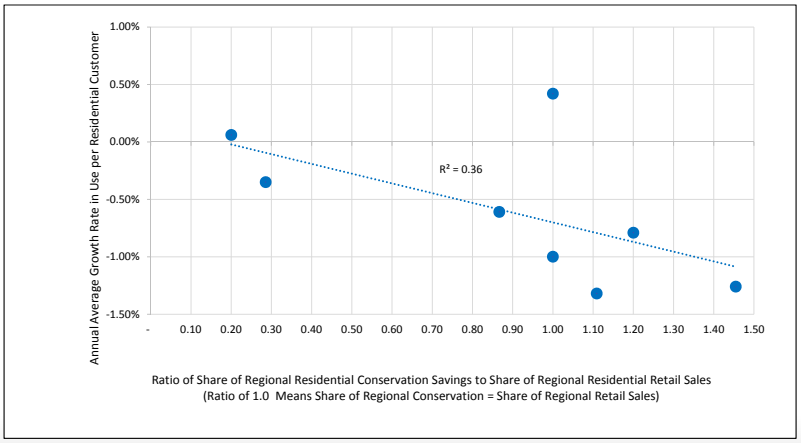
The relationship between conservation acquisitions and changes in the average annual electricity use per customer from 2005 to 2014 appears to have a significant impact on the direction and magnitude of the change in average annual customer bills

	Share of Residential Customers	Share of Residential Sector Retail Sales	Share of Regional Conservation Acquisitions	Average Annual Growth Rate in Electricity Use per Customer
Rural	14%	17%	3%	
Cooperative	7%	9%	0.6%	-0.12%
Municipal	2%	2%	0.4%	0.06%
PUDs	5%	7%	2%	-0.35%
Urban	27%	28%	36%	
Cooperative	2%	2%	2%	0.42%
Municipal	13%	11%	16%	-1.26%
PUDs	13%	15%	18%	-0.79%
All Publics	42%	45%	39%	-0.61%
Investor Owned	58%	55%	61%	-1.32%
Regional Average	100%	100%	100%	-1.00%

Change in Average Annual Residential Sector Electricity Bill 2005 to 2014

Utility Ownership and Service Area Type	Nominal dollars	Real (2012$)
Rural		
Cooperatives	$ 279	$ 39
Municipals	$ 203	$ 26
PUDs	$ 248	$ 29
Urban		
Cooperative	$ 276	$ 55
Municipals	$ 142	$ (28)
PUDs	$ 145	$ (83)
All POUs	$ 190	$ (19)
All IOUs	$ 330	$ 136
Regional Average	$ 272	$ 72

Key Finding: Higher levels of energy efficiency resulted in smaller increases in the growth in average annual electricity use per residential customer between 2005 and 2014



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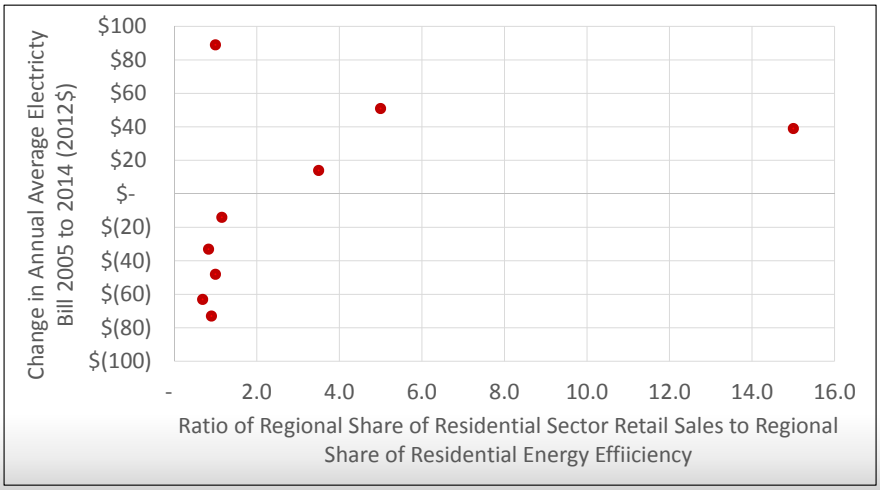
Key Finding: Lower levels of conservation generally resulted in larger increases in annual electricity bills between 2005 and 2014



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Key Finding: Median Incomes In Urban Areas Are Higher Than Those in Rural Areas, Regardless of Utility Ownership

	Median income	Number of Households
Cooperative	45,310	529,695
Rural	44,728	462,909
Urban	55,528	66,786
Municipal	59,463	457,940
Rural	46,202	36,743
Urban	60,897	421,197
PUDs	46,797	540,042
Rural	43,661	185,082
Urban	51,024	354,960
All Public Utilities	50,523	1,527,677
Investor Owned	53,183	3,180,731
Grand Total	49,999	4,915,996

Finding– The higher average electricity use residential customer served by public utilities compared to those served by investor owned utilities or those serving urban and rural area does not appear to be related to differences in income.

Key Finding: While Public Utilities serve a larger share of customers with incomes at or below federal poverty levels, investor owned utilities serve nearly double the number of people with income below federal poverty levels

Utility Type	Population	Population in Poverty	Share of Population in Poverty
IOU	8,248,525	1,165,451	14%
Public	3,817,408	621,408	16%
#N/A*	485,016	72,496	15%
Grand Total	12,550,949	1,859,355	15%

Finding: The higher average electricity use residential customer served by public utilities compared to those served by investor owned utilities or those serving urban and rural area *does not appear to be related to differences in income or levels of poverty.*

Questions ?