



# Energy Efficiency: A Smart Investment

## *Utah Renewable Energy Conference*

April 19, 2011

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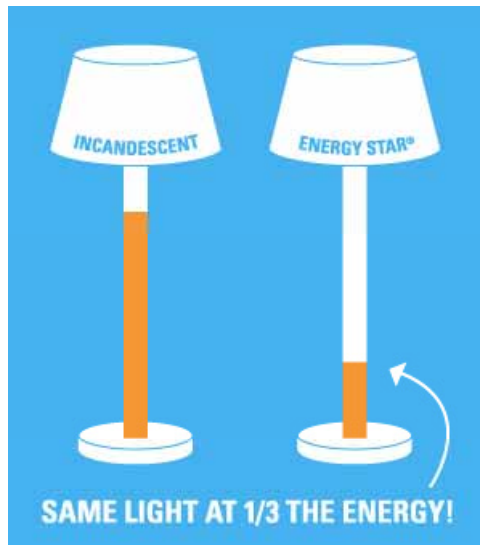


[www.utahcleanenergy.org](http://www.utahcleanenergy.org)



- Non-Profit Organization, est 2001
  - Public Education & Outreach
  - Policy and Regulatory Advocacy
    - Diverse partnerships
    - Solutions-oriented approach
- [WWW.UTAHCLEANENERGY.ORG](http://WWW.UTAHCLEANENERGY.ORG)

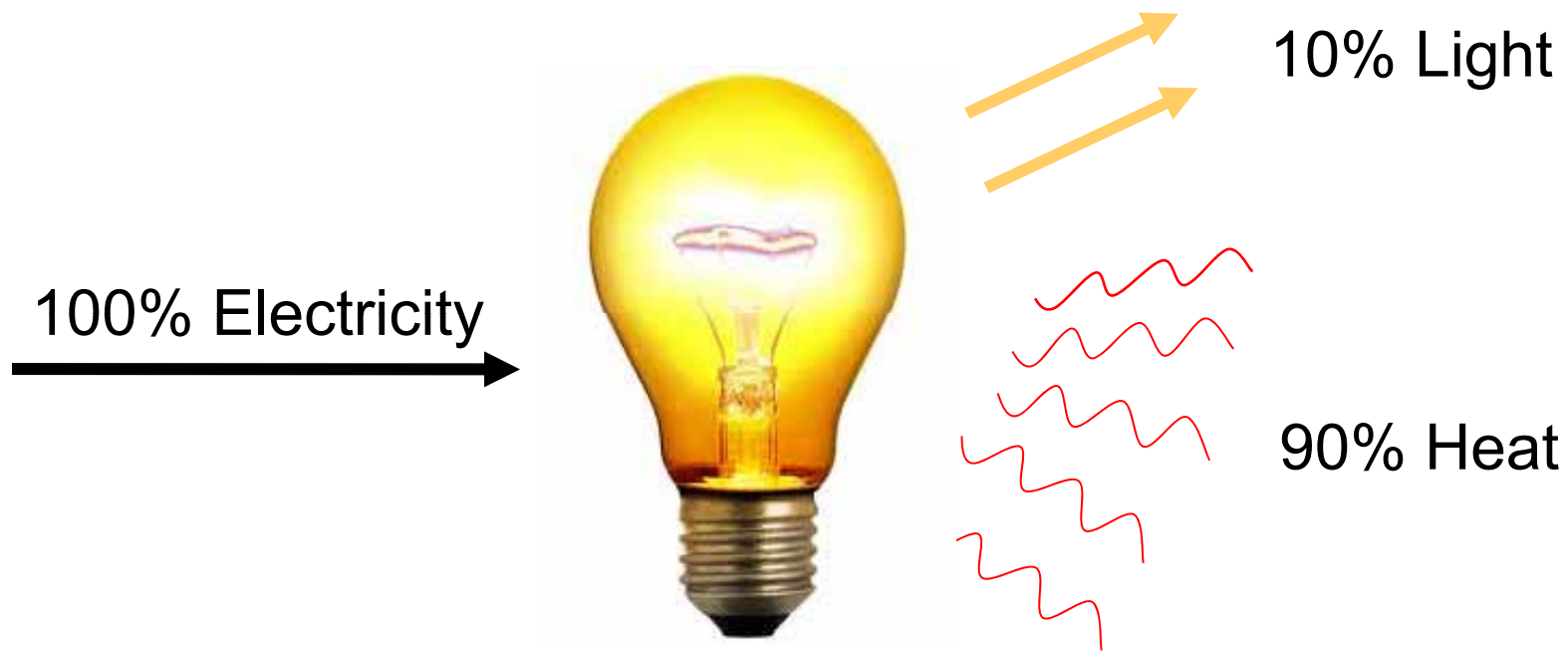
# Know the Difference: Energy Efficiency vs. Conservation



Courtesy of EPA Energy Star

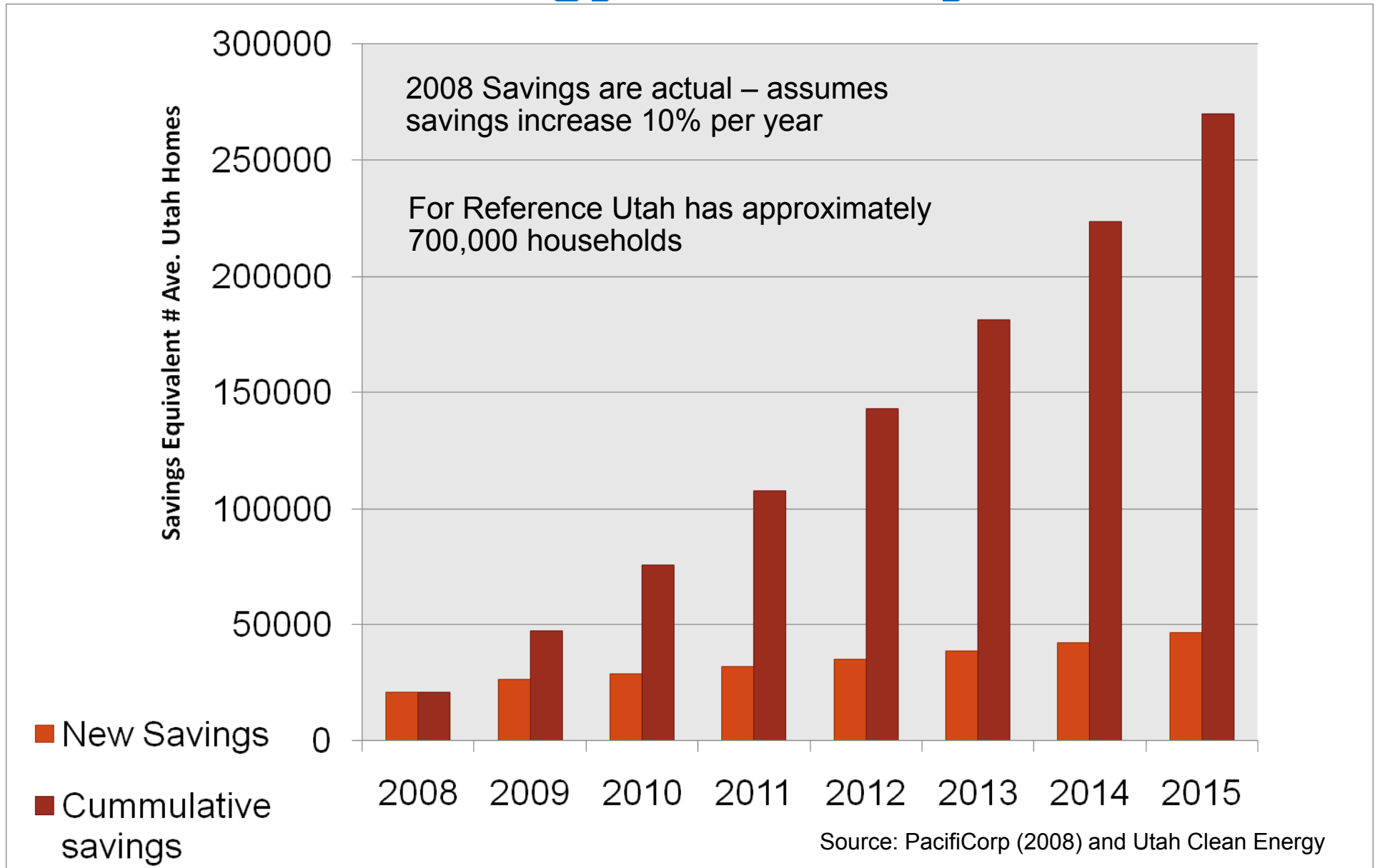


# Example of Inefficiency



CFLs are much more efficient at converting electricity into visible light  
– can save 50-75% of energy!

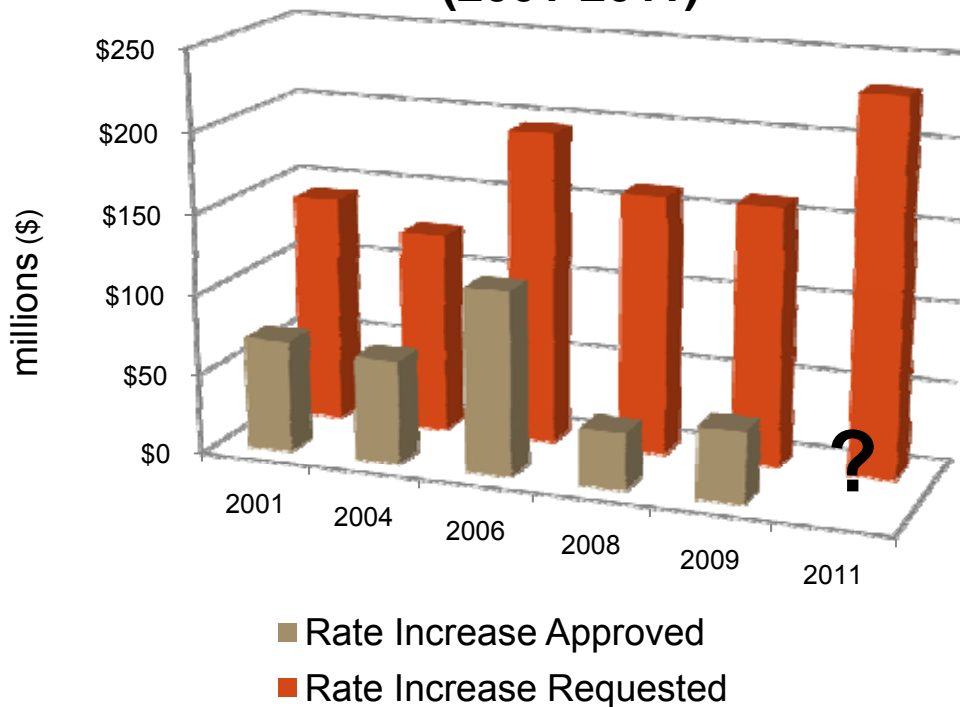
# Energy Savings from 1-year of Energy Efficiency!





# ...but that is quickly changing

## Rocky Mountain Power Rate Increases (2001-2011)



## Questar Gas requests rate increase

Published Jun 25, 2010 06:25PM  
Updated Sep 17, 2010 11:29AM

### Article Tools



- » Comments ( 0 )
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### Home Prices



See what homes along the Wasatch Front are worth

Questar Gas Co. is asking Utah's utility regulators for permission to raise the amount it charges customers for natural gas by 3.9 percent.

The utility, which provides most Utahns with the natural gas used in their homes, said if its request is approved, a typical customer will pay about \$2.20 more a month beginning Aug. 1.

Questar Gas is required to apply to the PSC for gas-cost rate changes twice a year.

The Salt Lake Tribune

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## Rocky Mountain Power submits largest rate hike request ever

**Rocky Mountain Power** » \$232.4M increase in electric rates is the largest it has ever proposed.

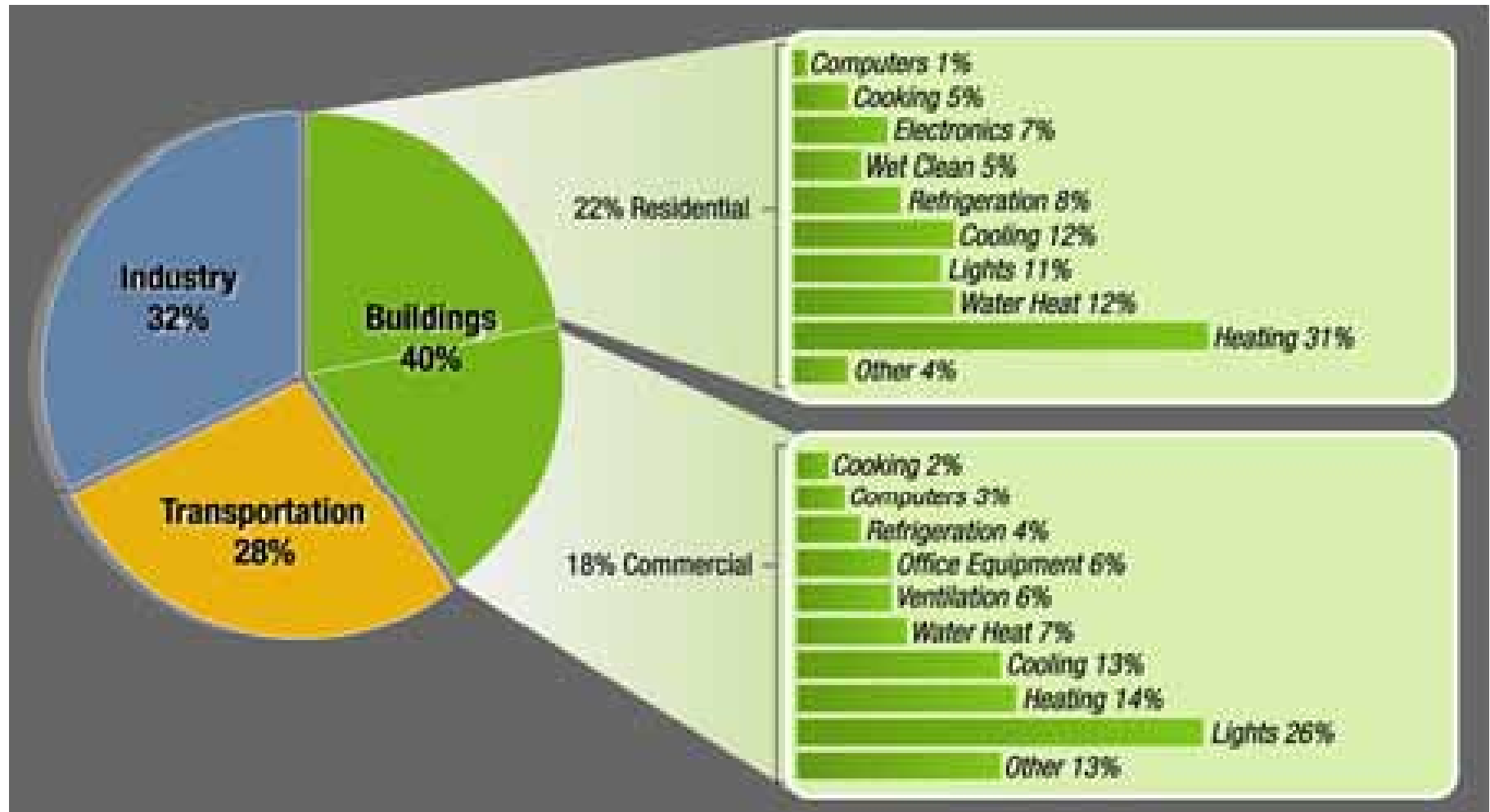
BY STEVEN OBERBECK  
The Salt Lake Tribune

First published Jan 27 2011 10:24AM  
Updated Mar 22, 2011 11:25PM

# *Utah customers are using more energy than ever before*

- **“Utah customers are using more electricity than ever before”** ... “Low electricity rates are attracting a lot of new industry, which puts pressure on existing generating capacity”
  - » Rocky Mountain Power spokesman Dave Eskelsen (Salt Lake Tribune, “Rocky Mountain Power submits largest rate hike request ever”, Steven Oberbeck, 01/27/2011)
- Aging Infrastructure
- Peak Demand (Air conditioning)
- Transmission/Distribution upgrades
- Growing Population → New Infrastructure
- Gadgets
- Aging buildings/appliances

# Building Energy Efficiency: An Opportunity We Can't Afford to Miss



Buildings Use 40% of Total US Energy (U.S. Department of Energy, 2010)

# Now is the time...

- To Mine For Nega-WATTS:

- New homes
- Existing homes
- Commercial Buildings
- Industry
- Data Centers
- Near Net Zero Construction



- To Re-think Business-as-Usual

- Remove split incentives to efficiency
- Provide support for high up-front capital investments
- Adopt latest code and pursue above-code construction/retrofits

# Utah Building Energy Efficiency Strategies (UBEES)

- Create the **market & workforce** to **position Utah at the forefront for social & economic prosperity** through leadership in **high performance homes & buildings**
- Division of Facilities and Construction Management,  
Staff of Governor's Energy Advisor,  
Utah Clean Energy,  
State Energy Program,  
Governor's Office of Economic Development



# Priority: Adopting Most Up-to-date Energy Codes for New Homes

## Outdated energy codes lead to uncomfortable homes

February 23rd, 2011 @ 10:38pm  
By Jed Boal

FARMINGTON -- When you buy a new home, you expect the best in energy efficiency. But many Utah homeowners are wasting energy and losing comfort due to outdated energy codes.

Shelly Bouvang's beautiful 3-year-old home in Farmington hides a costly secret within its walls.

"If they would have fixed it in the first place, or done it right in the first place, I wouldn't be dealing with this right now," she said.

The home's ducts leak, so hot air does not efficiently flow through the house in the winter and cool air doesn't get the job done in the summer.

Mitch Richardson is a home energy inspector who showed KSL News the inefficiencies throughout the home. He pinpointed the problems with a thermal camera, citing leaky ducts and inadequate insulation.

In the family room, Richardson demonstrated how hot air became trapped in the walls. "So instead of all that warm air getting to where you want it to go, it's too busy heating up this whole cavity," he said, pointing to the air duct that runs the length of the family room.

In Bouvang's playroom over the garage it's too cold in the winter and too hot in the summer, so the family rarely spends time there. Richardson traces it back to the leaky air ducts.

"Any one particular crack or seam in a duct isn't a big deal," he said. "But once you add up all of those tiny cracks and seams, it turns into a pretty big hole."



Home energy inspector Mitch Richardson used a thermal camera to detect where the heat was going in Shelly Bouvang's house.

- US Energy Conservation Initiative
- Utah Home Performance

# All hands on deck



# Need more reasons?

- Comfort, Comfort, Comfort!
- Re-sale value of home
- Rising and volatile utility rates
- Rebates and Programs
- Make renewable energy a more cost-effective proposition:
  - Cost of a 5 kW system vs. 2 kW system



# WHAT YOU CAN DO...

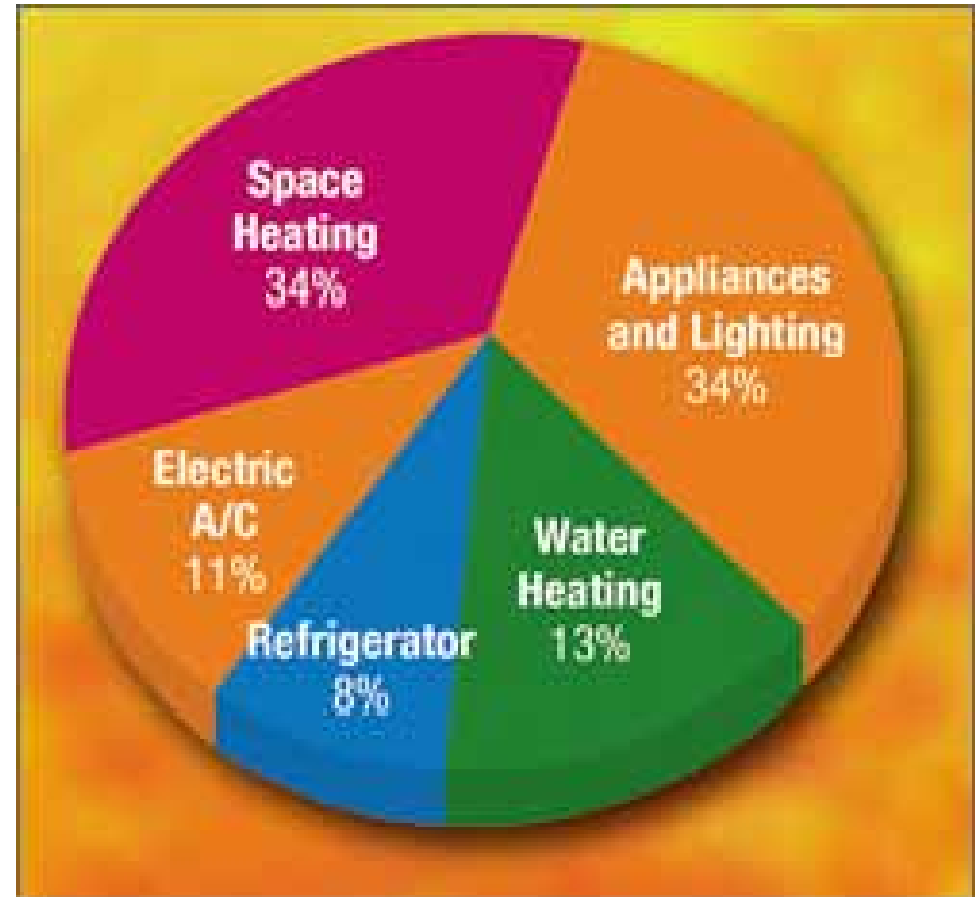


# Energy Use at Home

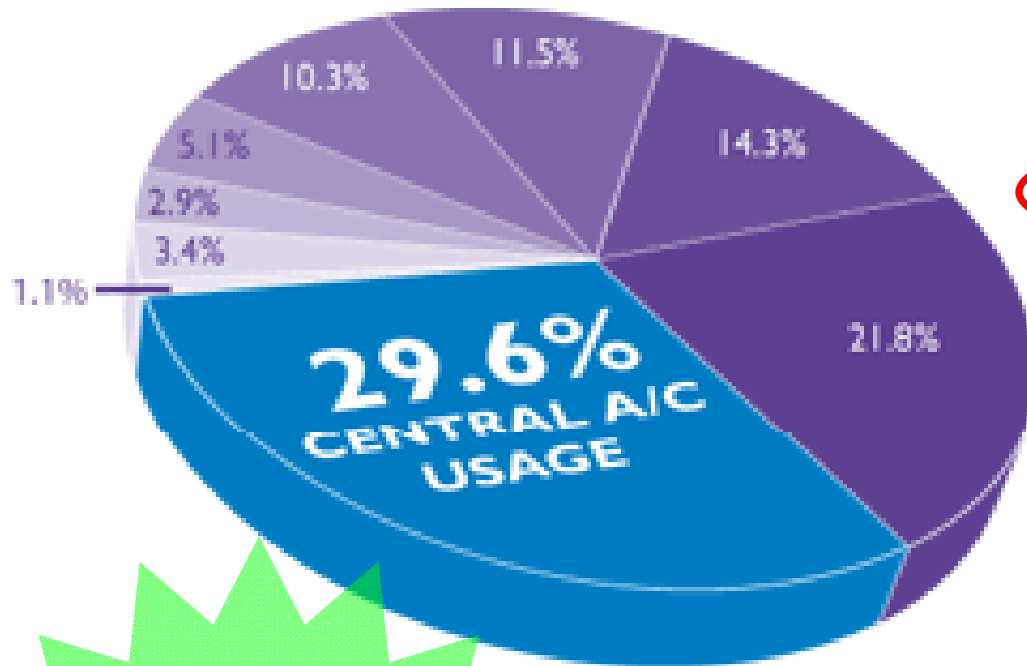
**Huge opportunities for savings!**











The average Utahn consumes:

- Natural gas
  - **6.7 decatherms/month**
  - **80.4 decatherms/year**
- Electricity:
  - **800 kWh/month**
  - **9,600 kWh/year**



# Electricity Use at Home



<b>Air conditioning</b>		<b>29.6%</b>
Refrigerator/Freezer		21.8%
Plasma TV		14.3%
Lighting		14.3%
Electric Range/Oven		11.5%
Dryer		10.3%
Non-Plasma TV		5.1%
Computer		2.9%
Dishwasher		3.4%
Washer		1.1%

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to determine  
how much your  
home gadgets  
use*





Questions about your bill: 1-888-221-7070  
 24 hours a day, 7 days a week  
 www.rockymtnpower.net

BILLING DATE: Oct 31, 2006

ACCOUNT NUMBER:

DATE DUE: Nov 27, 2006

AMOUNT DUE: \$14.68

**Your Balance With Us**

Previous Account Balance	16.01
Payments/Credits	-33.92
New Charges	+32.59
<b>Current Account Balance</b>	<b>\$ 14.68</b>

**Payments Received**

DATE	DESCRIPTION	AMOUNT
Oct 27, 2006	Payment from Auto Pay through Checkfree - Thank you	33.92
<b>Total Payments</b>		<b>\$ 33.92</b>

**Detailed Account Activity**

**ITEM 1 - ELECTRIC SERVICE**

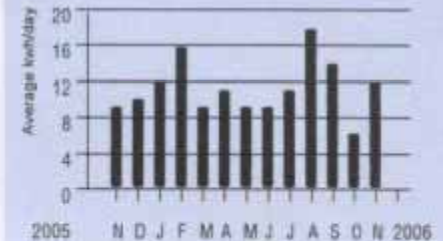
Schedule 1

METER NUMBER	SERVICE PERIOD		ELAPSED DAYS	METER READINGS		METER MULTIPLIER	AMOUNT USED THIS MONTH
	From	To		Previous	Current		
39429086	Sep 29, 2006	Oct 30, 2006	31	32955	33325	1.0	370 kwh

**NEW CHARGES - 11/06**

	UNITS	COST PER UNIT	CHARGE
Basic Charge - 1P			0.98
Energy Charge Summer 1st Block for 1 day(s)	12 kwh	0.0693600	0.83
Energy Charge Winter Rate for 30 day(s)	358 kwh	0.0693600	24.83
Customer Efficiency Services		0.0216000	0.55
Home Electric Lifeline Program			0.10
City Franchise Tax		0.0600000	1.64
Utah Sales Tax		0.0385000	1.11
<b>Total New Charges</b>			<b>30.04</b>

**Historical Data - ITEM 1**



**Your Average Daily kwh Usage by Month**

PERIOD ENDING	NOV 2006	NOV 2005
Avg. Daily Temp.	51	54
Total kwh	370	253
Avg. kwh per Day	12	9
Cost per Day	\$0.96	

**Looking for ways to pay?**

Try ePay and pay online with your checking account, it's free! Or, pay by phone for a small fee by dialing 1-800-672-2405 for credit card payments and 1-800-285-9234 to use your checking account.



Account:

Page 1 of 1

Paid Deposits on file: \$ 286.22-

*Thank you for your patronage. Your prompt payment assists us in providing our customers with high-quality natural gas service.*

**Account Summary** as of: October 13, 2006

Previous Balance Due - 10/04/2006	14.61
Payment Received - 10/4/2006	-14.61
<b>Current Charges - Gas Service</b>	<b>23.15</b>
<b>Total Amount Due Upon Receipt</b>	<b>\$ 23.15</b>

1% monthly interest (12% annually) charged on balance on or after 11/06/2006

Service Address: 1014 2Nd Ave, Salt Lake City, UT 84103

2.577257 0.000000 154.550000 235.500000

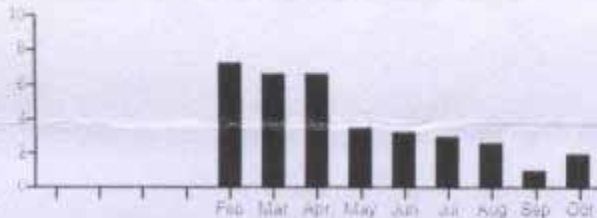
**Commercial Gas Service UTGS1 Rate**

Comparison	Last Year	This Year
Decatherms/Day	N/A	0.06
Dollars/Day	\$0.00	\$0.77

**Service from 9/12/2006 - 10/11/2006**

Charge for Gas Used (Avg cost per DTH \$ (8.85263))	16.82
Basic Service Fee Total	5.00
Franchise Fee (2%)(Salt Lake City)	0.44
Municipal Energy Tax (4%)(Salt Lake City)	0.89
<b>Current Gas Billing</b>	<b>23.15</b>

DTH Usage History



Meter ID	Current Meter Read		Previous Meter Read		Days	Dial Difference	Volume Multiplier	Billed Usage
	Date	Reading	Date	Reading				
26049397	10/11/2006	7528	9/11/2006	7507	30	21 CCF	0.092263	1.9 DTH

# Quick Tips and Resources



# TIP 1: Perform an Energy Audit

- **ENERGY STAR** - Home Energy Yardstick: **FREE**  
<http://www.energystar.gov>
- **Questar** – [www.thermwise.com](http://www.thermwise.com)
  - Mail-in: **FREE (download on-line)**
  - In person: **\$25** (*refunded with adoption of suggestions*)
- **Rocky Mountain Power** –
  - Mail-in Energy Audit: **FREE**
  - Online Energy Audit : **FREE**
  - Online Energy Calculator:  
<http://www.rockymountainpower.net/res/sem/eeti/eec.html>
- **Home Performance with Energy Star Assessment - \$100**
- **Home Energy Raters**
  - High tech in-home efficiency audit: **\$300 - \$500**



# Home Performance with Energy Star



- [www.utahhomeperformance.com](http://www.utahhomeperformance.com)
- Schedule an Energy Assessment, \$100
- Review your recommendations
- Have measures installed
- Average cost of retrofits is \$5400
- Average blend of Home Performance Rebate plus utility rebates is \$2220
- Financing is available
- Note: If you live in a home 50 years or older, there is an additional step which must be performed



## Tip 2: Beware of Phantom Loads

- Energy still being used in the “off” mode
- Anything with a standby light, charger, remote control, or clock
  - Computer Screen
  - Cell phone, ipod, and computer chargers
  - CD or DVD players
  - Televisions
  - Video game consols
- **Use a Smart Strip**
- **Or Unplug it** when not in use!



## TIP 3: Don't heat the street

- Insulate your attic, floors, and accessible walls
- Attics are primarily responsible for heat loss (winter) and heat gain (summer)
- New attic insulation requirements for utility rebates: at least R-38 up to R-60 (at least increments of R-11)
- Incentives (vary according to application)
  - Questar Thermwise – [www.thermwise.com](http://www.thermwise.com)
    - Incentives up to \$.030/sq ft (varies)
      - Note: work must be completed by a ThermWise Authorized Contractor or, if DIY, verified by Questar Representative prior to receiving incentives
  - Rocky Mountain Power (with central A/C or electric heat)
    - Incentives up to \$.045/sq ft (varies)
    - \$200 bonus incentive!
    - Visit: [www.rockymountainpower.net/env/ws.html](http://www.rockymountainpower.net/env/ws.html)



# TIP 4: Install & Use a Programmable Thermostat

- Night/day/weekend and vacation settings
- Seasonal modifications
- Cost \$20 - \$200
- Save 10% per year on heating/cooling by turning thermostat back 10-15 degrees for eight hours
- 1% for every degree (for 8 hours)
- Must be used properly to provide energy savings!
- Heat pumps require special thermostats
- Furnace efficiency myth (similar to idling myth)
- Questar Thermwise Incentive - \$30 for Energy Star
  - Energy Audit Required



# TIP 5: Seal Leaks and Insulate Ducts

- Floors, walls, HVAC ducts, electrical sockets, holes, windows, doors, etc.
- Weather-stripping, caulk, mastic, etc. can all be found at local hardware store
- REF: Energy Star DIY Guide to Home Sealing
- Incentives:
  - Questar
  - Rocky Mountain Power (for homes with central A/C)



# TIP 6: Weatherize Windows

- Install storm windows
- Buy new (if not the whole home, then rooms most used)
  - U-value of 0.35 or lower (measure of heat transfer; lower is better)
  - Solar Heat Gain Co-Efficient (SHGC) of 0.33 or less (how well window blocks heat caused from the sun; lower is better)
- Install plastic during heating/peak cooling seasons
- Use thick curtains/drapes and/or shades
- Incentives:
  - Questar Thermwise: \$0.95/sq. ft
  - Rocky Mountain Power (with central A/C or electric heat): \$0.95/sq. ft.

# TIP 7: Efficient Heating

- Consider replacement if 15 years or older
  - 90-95% efficient furnaces available
- Bigger not necessarily better – make sure contractor provides manual J-load calculations
- New furnace improves value, comfort, and safety
- Incentives:
  - Questar Thermwise
    - Different tiers
    - Gas Furnace (AFUE 95% or higher) –\$350
    - Gas Boilers (AFUE 95% or higher) – \$600
  - Geothermal Heat Pump (state and federal credits)



# TIP 8: Efficient Cooling

- Consider Evaporative Cooling before Central A/C
  - New, improved, and more intelligent (whole-house ducted systems)
  - Water use is minimal compared with water consumption of fossil fuel power plants
- Consider using ceiling fans to direct cool air flow
- Get regular tune-ups (incentives available)
- Geothermal Cooling
- Incentives:
  - Rocky Mountain Power See *Wattsmart* for details
  - State and Federal Tax Credits (Geothermal Heat Pump)
  - Cool Keeper Program (load control)



# TIP 9: Appliances

- Consider energy costs with the sale price
- Not all that glitters is gold! (i.e. Energy Star refrigerators can use up to 20% less than a conventional model)
- Look for Energy Star label and Energy Guide
- Ask the store if they carry Energy Star Appliances – if they don't, go elsewhere
- Incentives:
  - Questar Thermwise
  - Rocky Mountain Power
  - 'See ya later, refrigerator' – get \$30 back

# TIP 10: Efficient (or Solar) Water Heaters

- Install Water Heater 'Blanket' to insulate (\$20 – free with Questar Home Energy Audit)
- Turn down to 120°F (any higher may lead to scalding)
- Incentives:
  - Questar Gas Thermwise:
    - Solar Assisted Hot Water Heating - \$750
    - High-Efficiency Storage Water Heater - \$50 - 350
    - Tankless Gas Water Heater - \$300 - \$350
  - Rocky Mountain Power
    - Energy Star Electric Water Heater - \$50
  - Federal Tax Credit for Solar (30% with no cap)



# TIP 11: Efficient Lighting

- If every U.S. home replaced just 1 light with Energy Star light:
  - Save enough electricity to light more than 3 million homes for a year
  - Save \$700 million in energy costs
  - Prevent 9 billion pounds of CO2 per year
- Use in most used lights
- CFLs have evolved significantly over the last decade
  - 3-way switch compatible
  - Range of lumens and light qualities (daylight, soft, etc)
  - Indoor and outdoor (be sure to use appropriately)
  - Decorative and different shapes
  - CFL covers available
  - Recessed lights
  - Dimmers (only certain lights)
  - Energy Star qualified light fixtures (RMP \$20 incentive)
- LEDs are emerging on the market



# Additional Programs

## Questar Gas Thermwise

[www.thermwise.com](http://www.thermwise.com); 1-800-323-5517

- Rebates for builders
- Multi-family Incentives
- ENERGY STAR New Home Certification - \$500
- Federal Tax Credit Home (50% above code) - \$800

## Rocky Mountain Power Home Energy Savings Program

[www.homeenergysavings.net/utah/home.html](http://www.homeenergysavings.net/utah/home.html);  
1-800-942-0266

- ENERGY STAR New Homes - \$250 - \$1170
- Time of Day reduced rates during on-peak hours
- FinAnswer and FinAnswer Express
- Recommissioning
- Self-Direction

## Commercial Federal Tax Credits

Salt Lake County Energy Smart Loan Program

State Weatherization Program





**Ask yourself:**

**What is the cost  
of NOT investing  
in energy  
efficiency today?**

# Resources



- Utah Clean Energy: [www.utahcleanenergy.org](http://www.utahcleanenergy.org)
- UBEES: <http://ubees.utah.gov/>
- ENERGY STAR: [www.energystar.gov](http://www.energystar.gov)
- Questar ThermWise : [www.thermwise.com](http://www.thermwise.com)
- Rocky Mountain Power:  
[www.rockymtnpower.net](http://www.rockymtnpower.net)
- Utah State Energy Program:  
[www.geology.utah.gov/sep/](http://www.geology.utah.gov/sep/)
- Governor's Energy Advisor Office:  
[www.energy.utah.gov](http://www.energy.utah.gov)
- Federal Energy Incentives DSIRE USA:  
[www.dsireusa.org](http://www.dsireusa.org)





# Utah's Energy Future is Right Now



## Thank you!

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Associate

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