

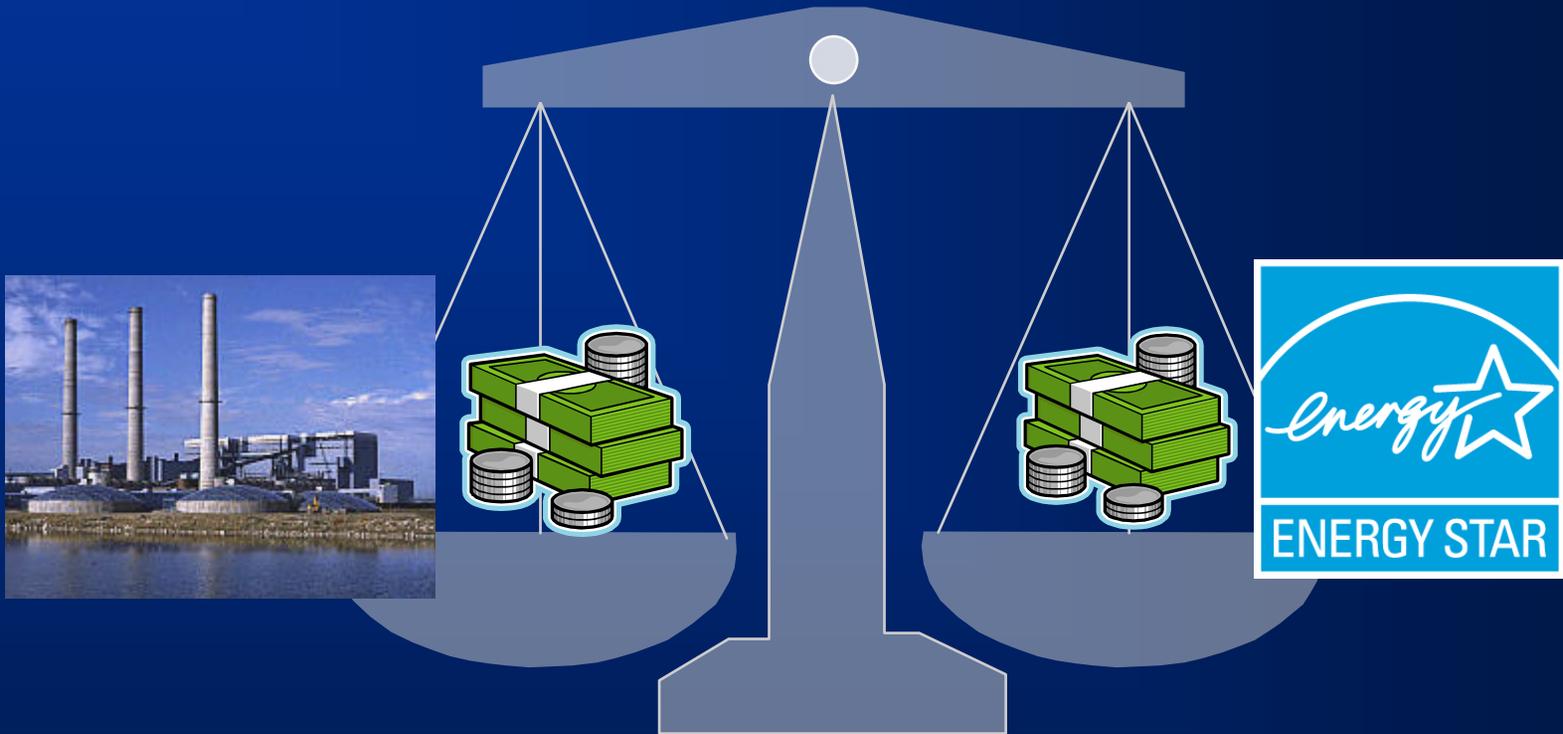
City Water and Light 2007 IRP Public Meeting November 28, 2007



Agenda

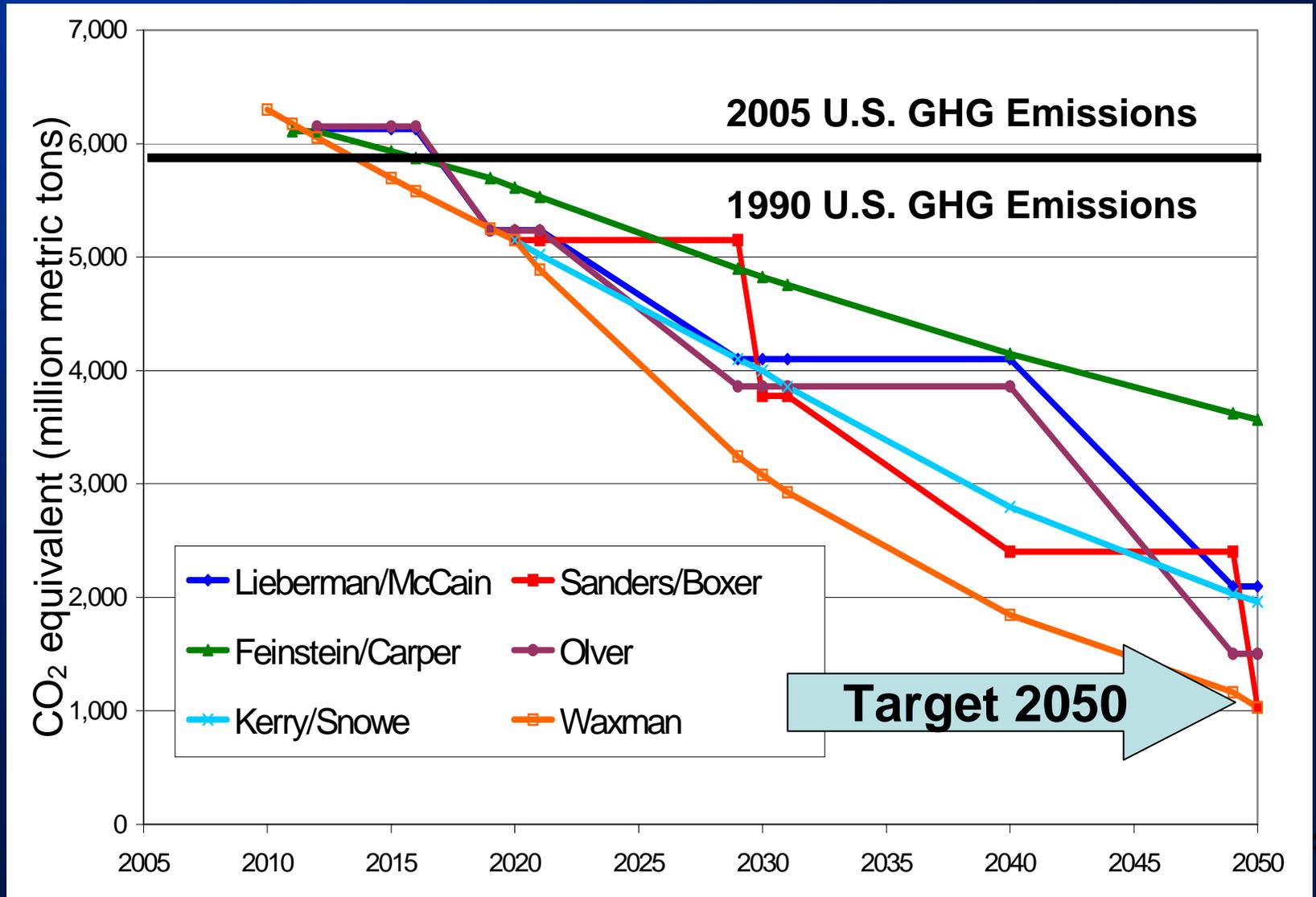
- Current CWL Conditions
- Supply Side Options
- Demand Side Options
- Public Input

Integrated Planning Objective

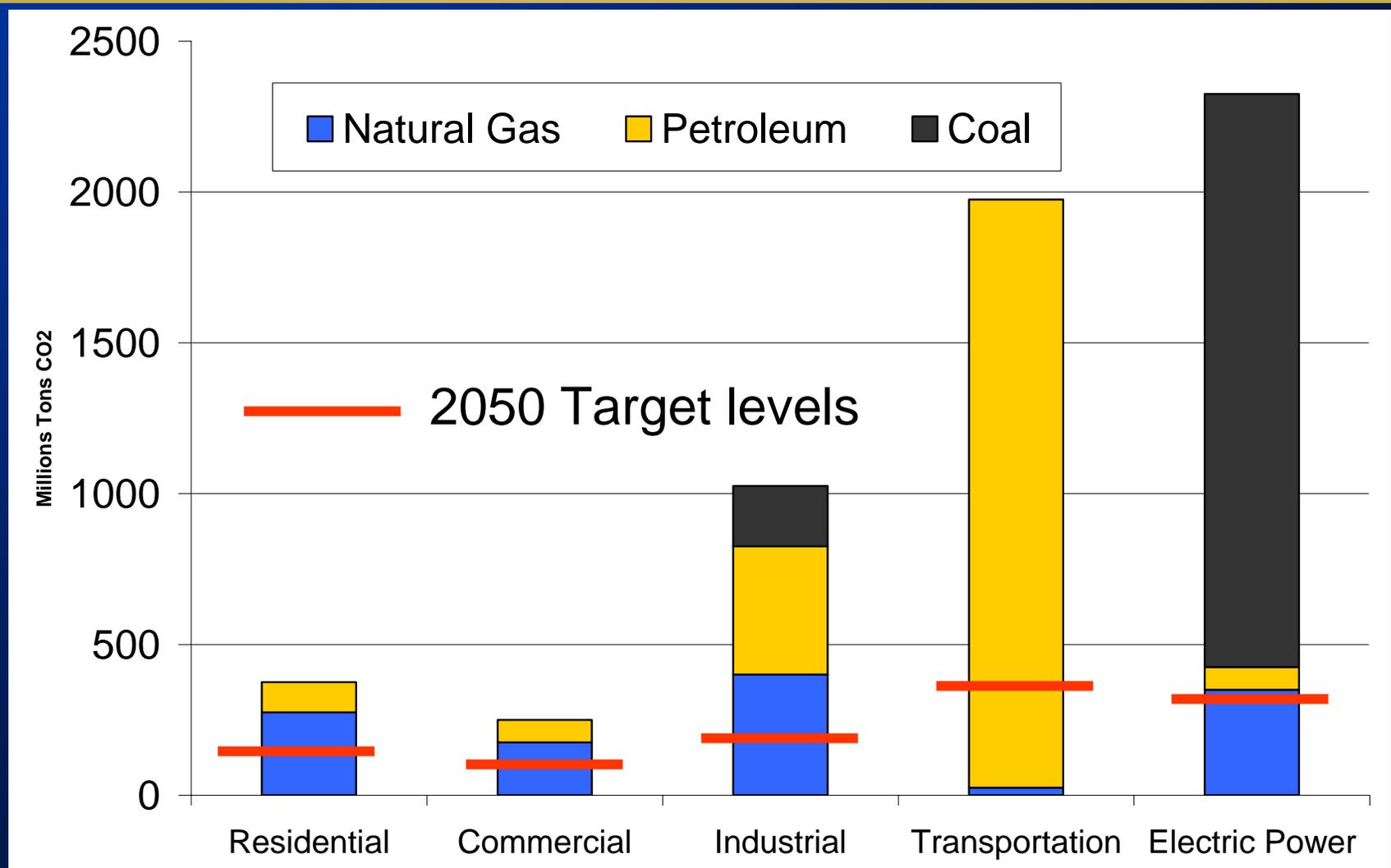


Balance costs of supplying electricity
versus saving electricity

Carbon Legislation is Major Supply Side Uncertainty in the Study...



Approximate CO2 Emissions by Sector-2005



Source: EIA

Current CWL Forecast

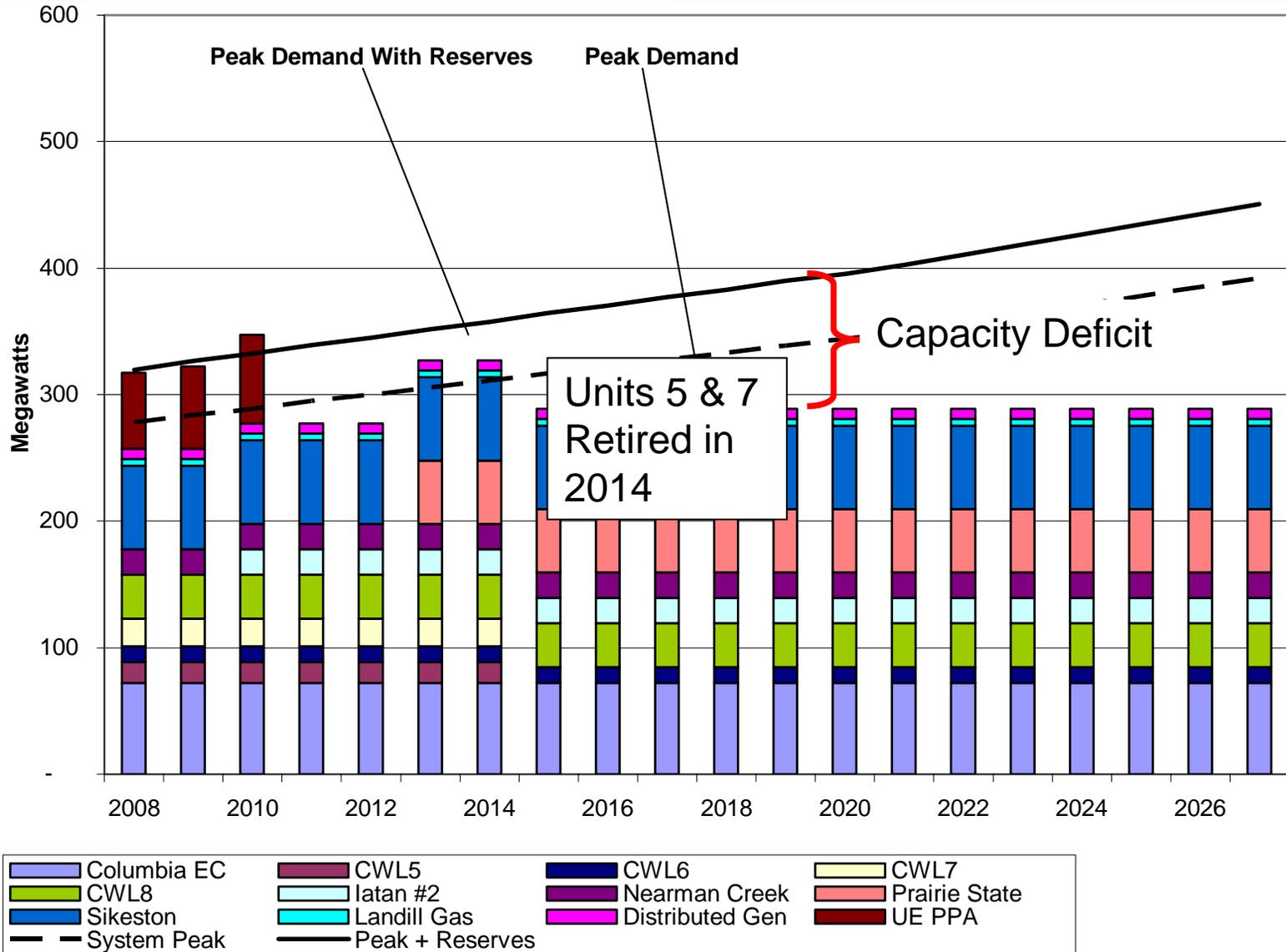


2008
278 MW
1,220,976 MWh's
44,678 Customers



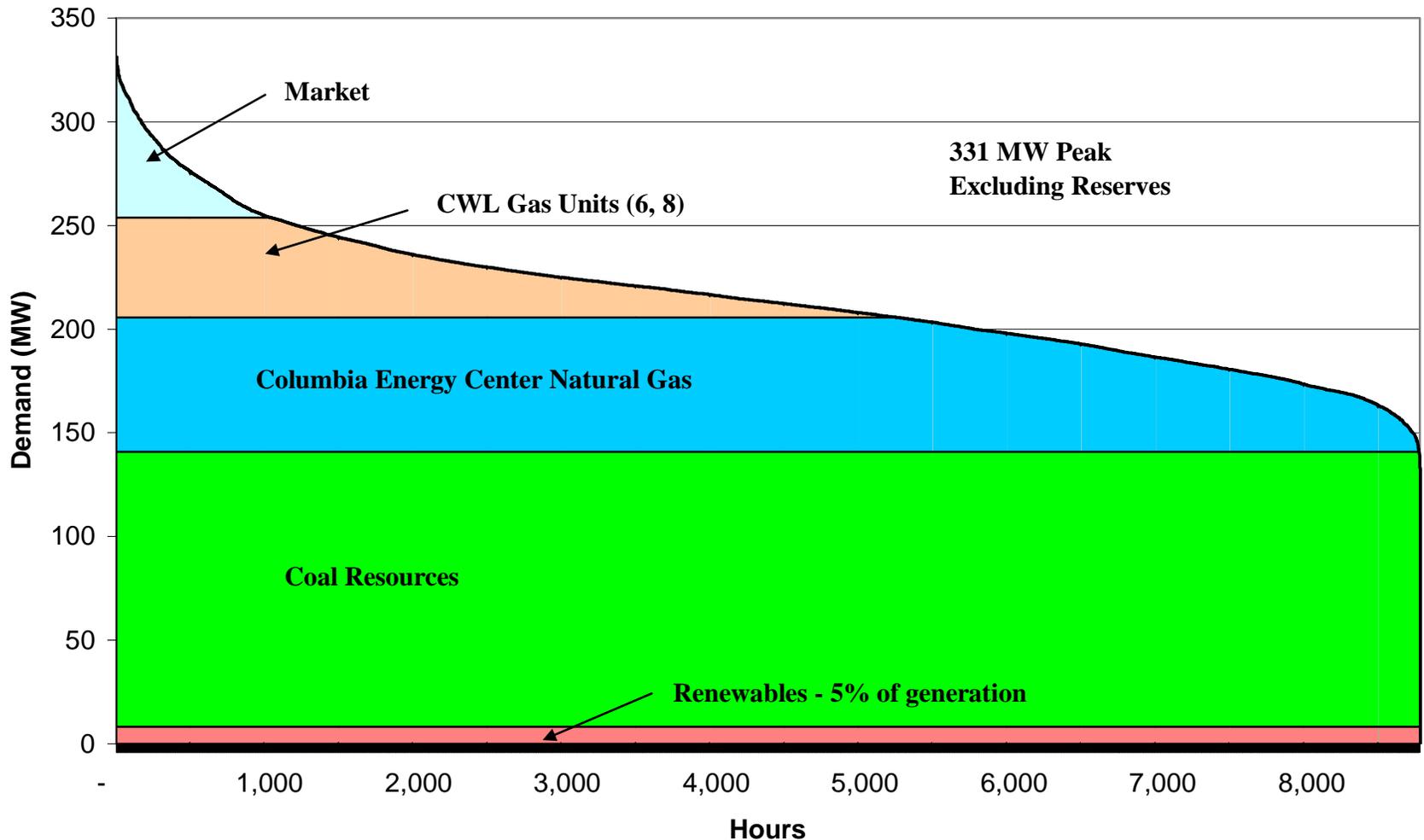
2028
399 MW
1,752,408 MWh's
77,140 Customers

Current Forecast of Demand Compared to CWL Resources

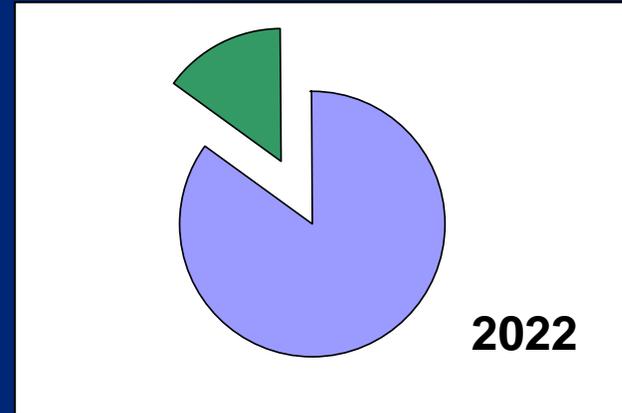
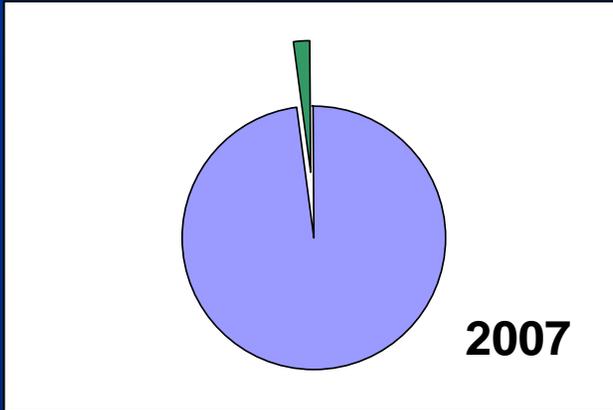


With Existing Resources, energy post 2015
will come increasingly from natural gas,
market, renewables

Example 2015 Load Duration Curve and Available Energy



Renewables/DG



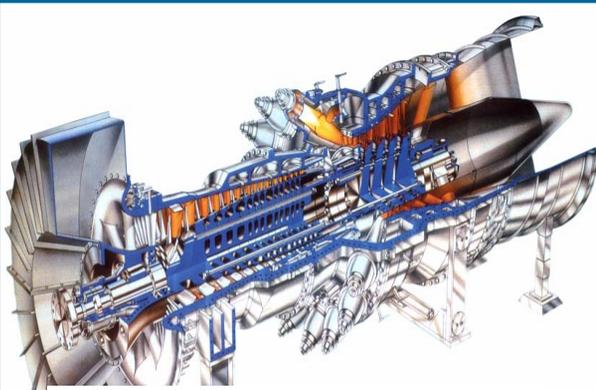
Renewable electricity will grow from 2% to 15% of energy mix

Sources of renewable energy

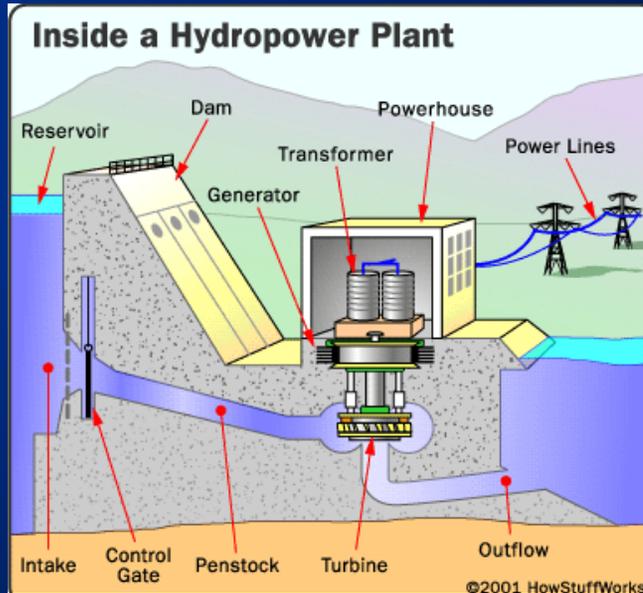
- Bluegrass Ridge wind farm 22,075MWh
- Ameresco Landfill 25,119MWh
- Columbia Landfill 17,010MWh

5.5% of 2008 requirements

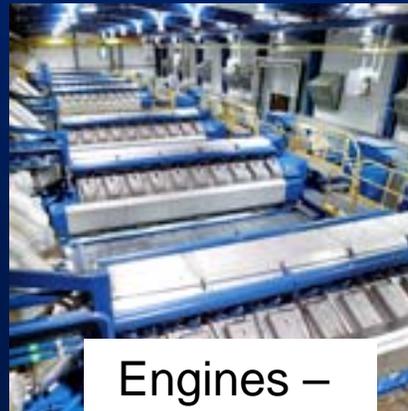
Supply Side Options



Combustion
Turbine – Natural Gas



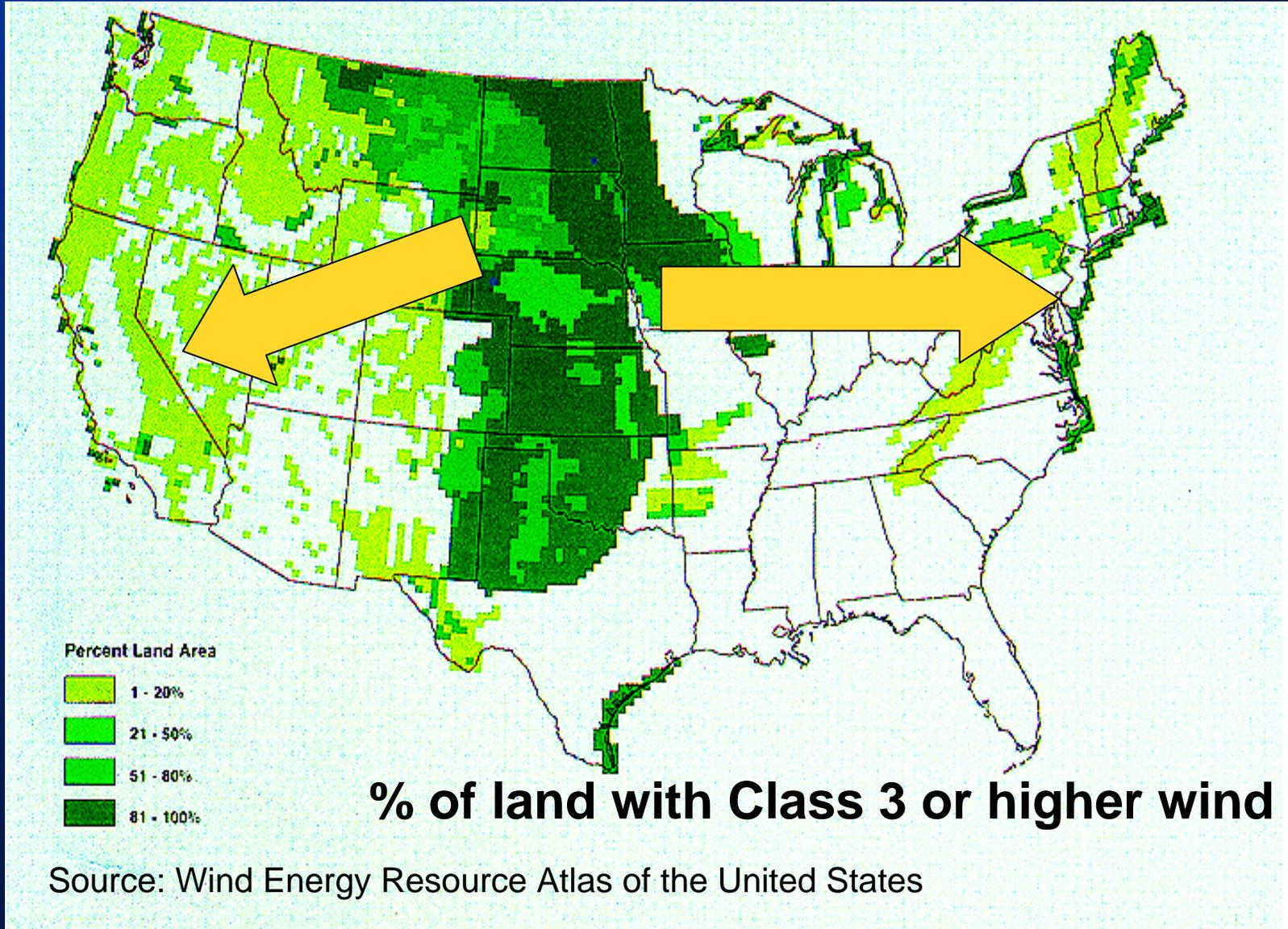
Coal/Biomass



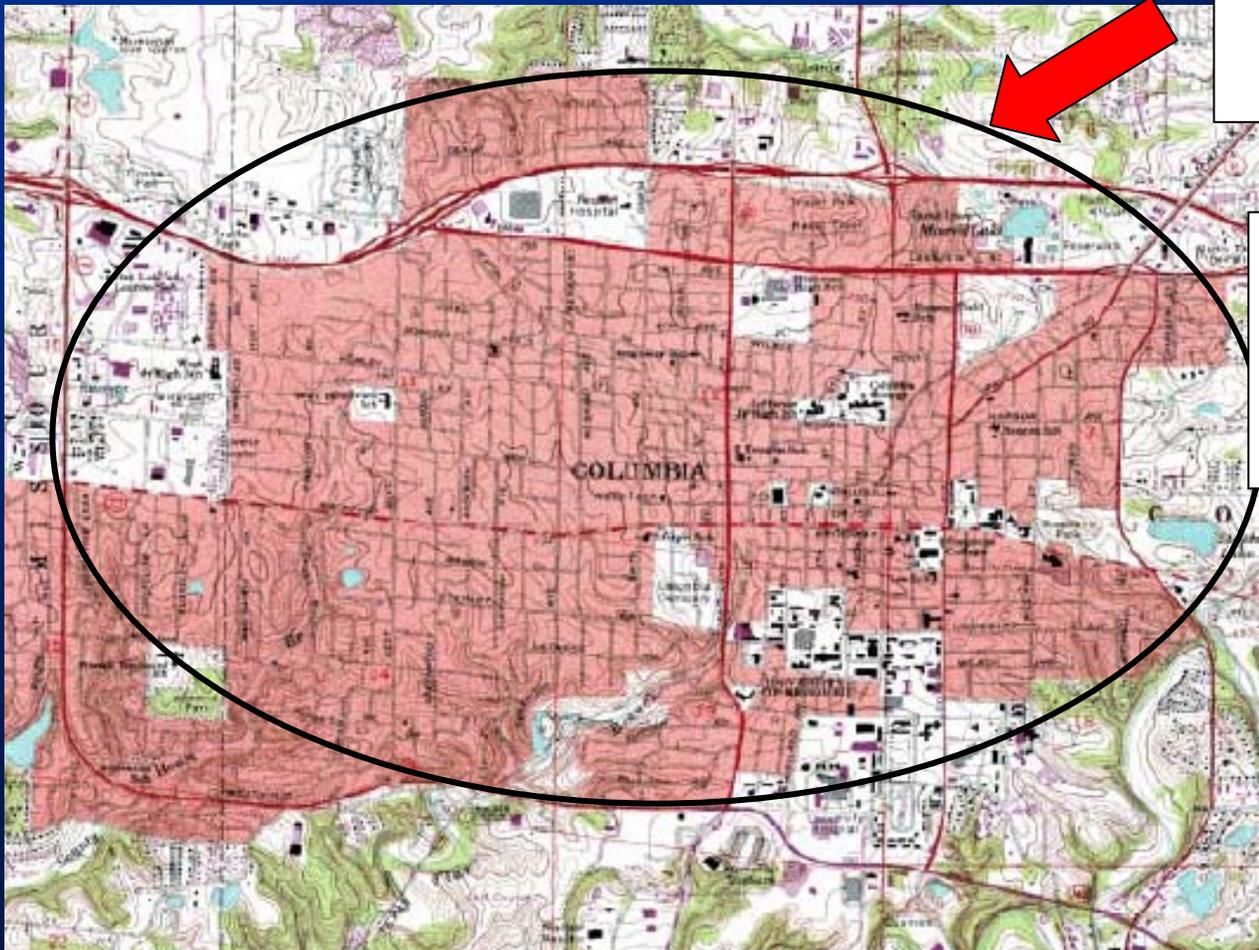
Engines –
Natural Gas



Best Wind is Where People Aren't...



Demand Side Issues



Only way to
achieve savings
is from customers
within Columbia

Number of
end uses times
savings per
end use

Energy Use per Consumer



1987 Ave Sq Ft = 2,249



2006 Ave Sq Ft = 3,226

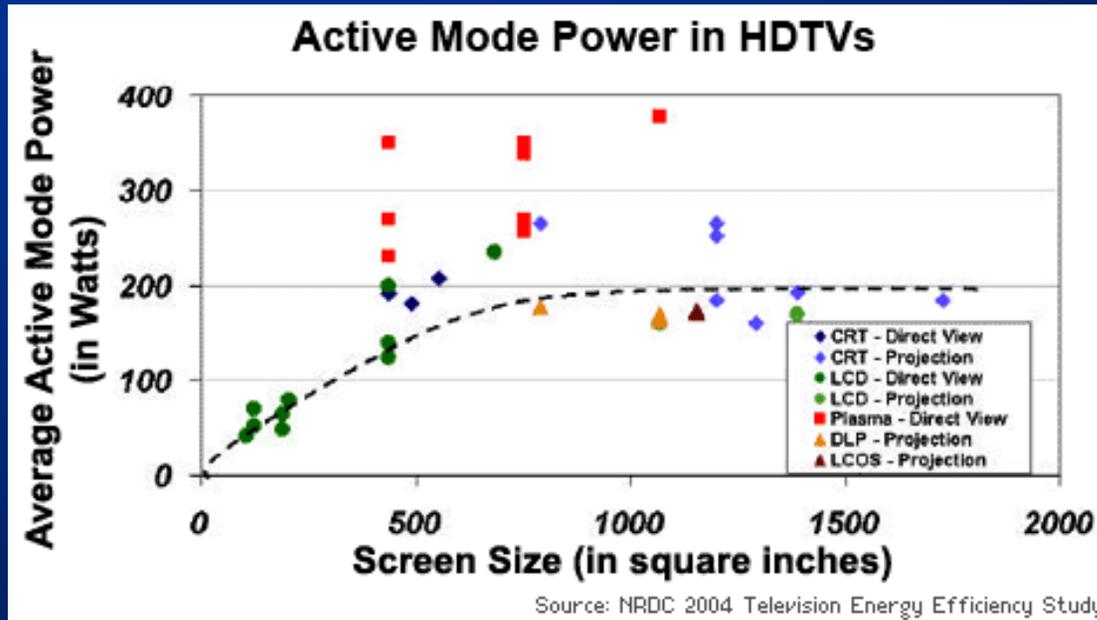
Ave Annual Energy per Residence

1987=602 kWh

2006=824kWh

Even with existing programs, a 37% increase per meter

An Example of Increased Usage is Expansion of Flat Panel TVs



Have "standby" mode
Unplug them when not used!

- Connected to game sets, DVDs, etc
- A set in every room
- Mounted in bars and restaurants
- Used by companies as notice boards

“Vampire” Loads



Estimates are that these are 5% of
electrical consumption

Savings With a Twist...



Replace your most commonly
used lights and save!



Conservation Programs

Residential Programs:

Energy Audits.....	377,600 kWh Total
AC Rebates.....	56,103 kWh/yr
Solar Domestic Hot Water Rebate.....	3,600 kWh/yr
Load Management.....	5.25 MW at Peak
Super Saver Loan.....	121,800 kWh/yr
Change a Light.....	3,585,943 kWh/yr
Tree Power.....	320 kW at Peak
Home Performance Energy Star (In Dev).	*
PV Rebates.....	*

Savings:

* No customer usage yet





Conservation Programs

Industrial Programs:

Savings:

Energy Audits.....	800,000 kWh/yr
Infrared Scans	
Ultrasonic Leak Detection	
Energy Conservation Loans.....	*
Load Shedding.....	8 MW at Peak
Interruptible Program.....	2 MW at Peak
Lighting Incentive.....	200.3 kW
PV Rebates.....	*

* No customer usage yet





Conservation Programs

Commercial:

Energy Audits.....	150,000 kWh/yr
AC Rebates.....	*
Solar Hot Water Rebate.....	*
Load Management.....	1.75 MW at Peak
Super Saver Loan.....	*
Lighting Incentive.....	157.54 kW
Building Operator Certification Program..	5,676,000 kWh/yr
PV Rebates.....	*

Savings:

* No customer usage yet



Conservation Programs

Educational:

Peak Warning.....
 Energy Challenge.....
 “Energy Guy”.....
 Calendar Contest.....
 Promotional Displays / Trade Shows and
 Saturday Science

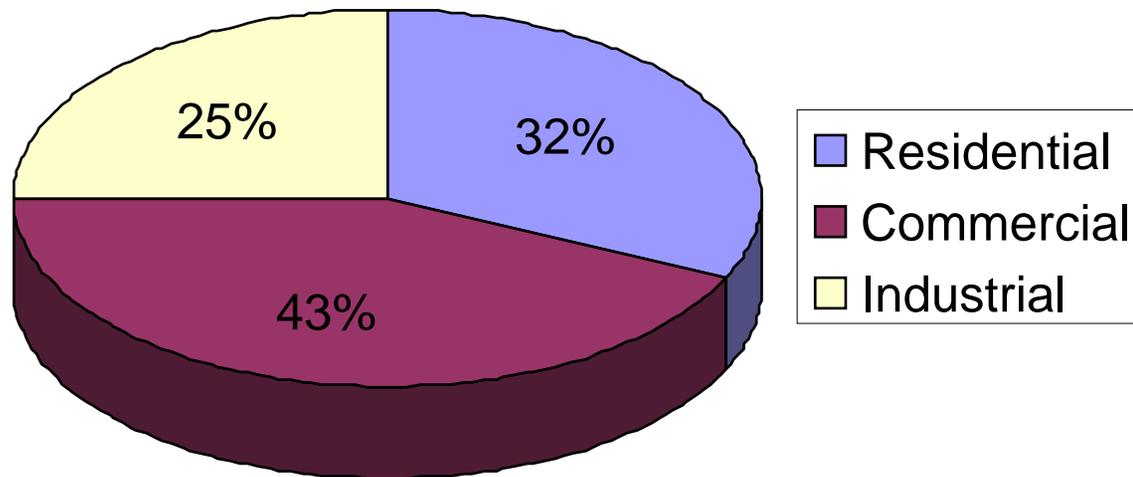
Savings:

1-2 MW When Imp.
 250 kWh Per Student / yr
 50,000 kWh per year
 10,000 kWh per year

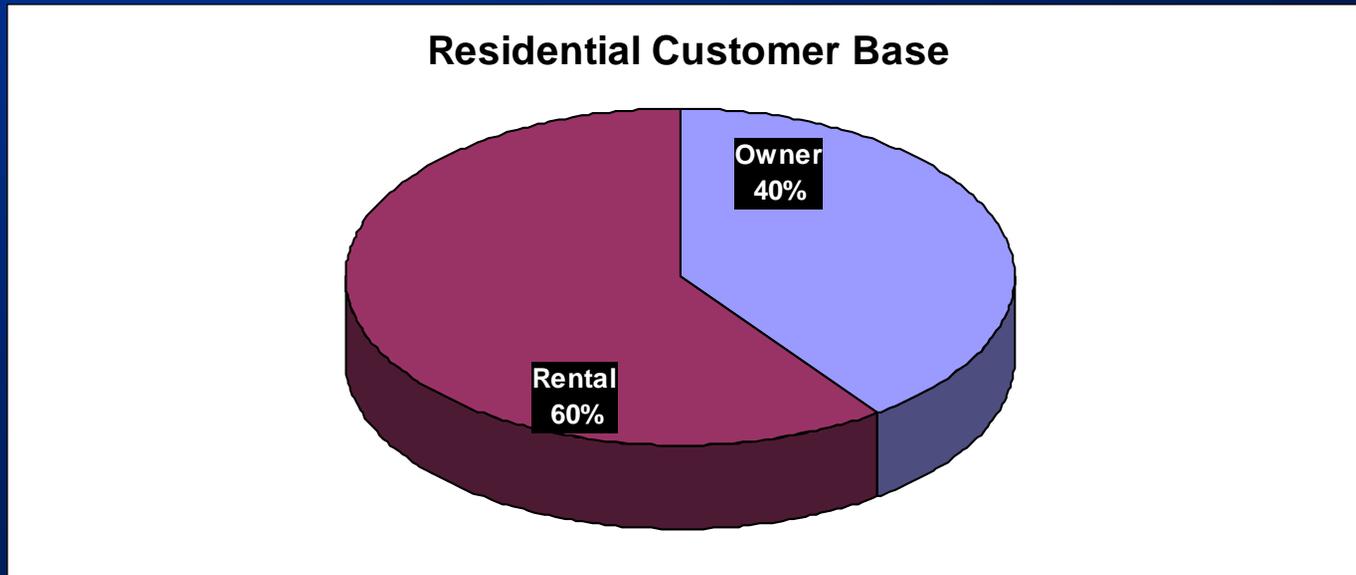


Conservation Programs

CWL Customer Class Usage



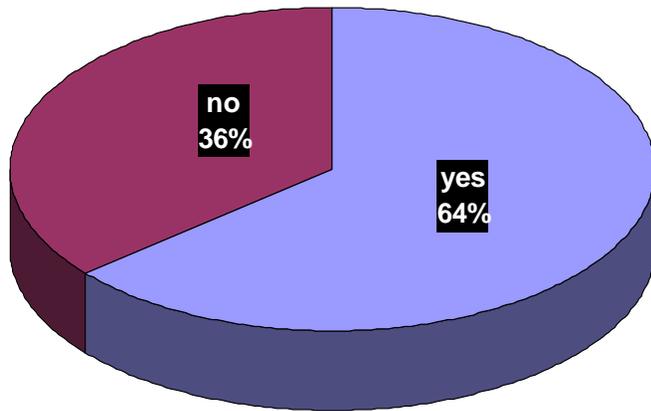
Conservation Programs



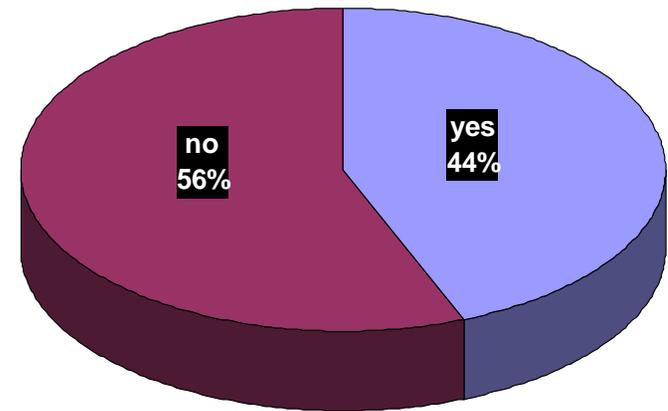
2006 Residential Consumption: 376554 MWh

Conservation Programs

Q1. Are you aware of the
Free Energy Audit
program?

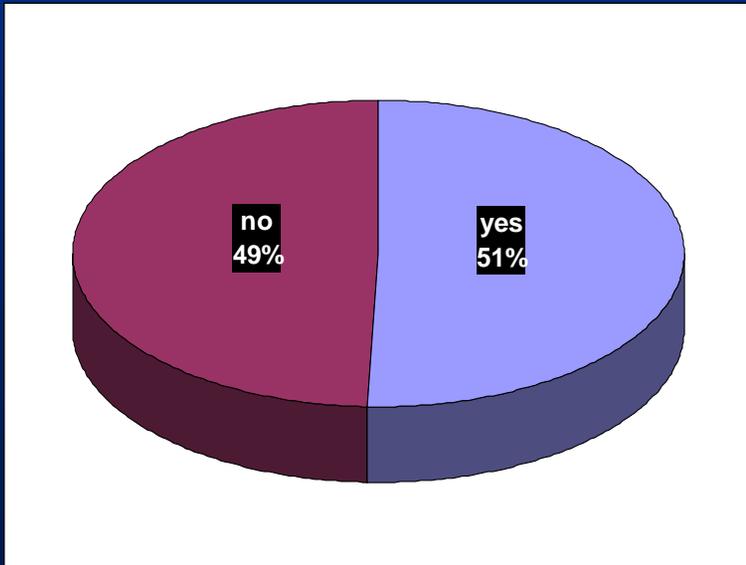


Q2. Are you aware of the
Energy Efficiency
Improvement Loans?

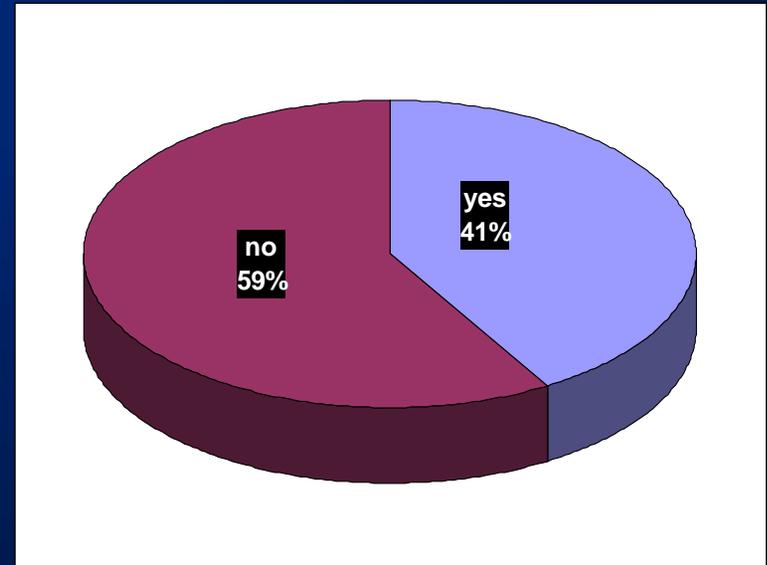


Conservation Programs

Q3. Are you aware of the
Tree Power Program?

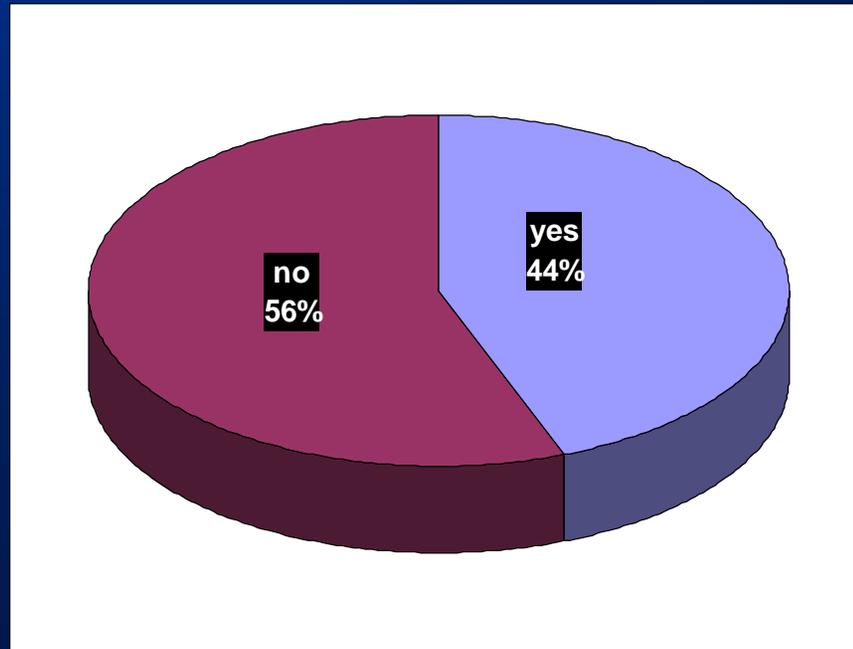


Q4. Are you aware of the
Load Management 3%
Savings Program?



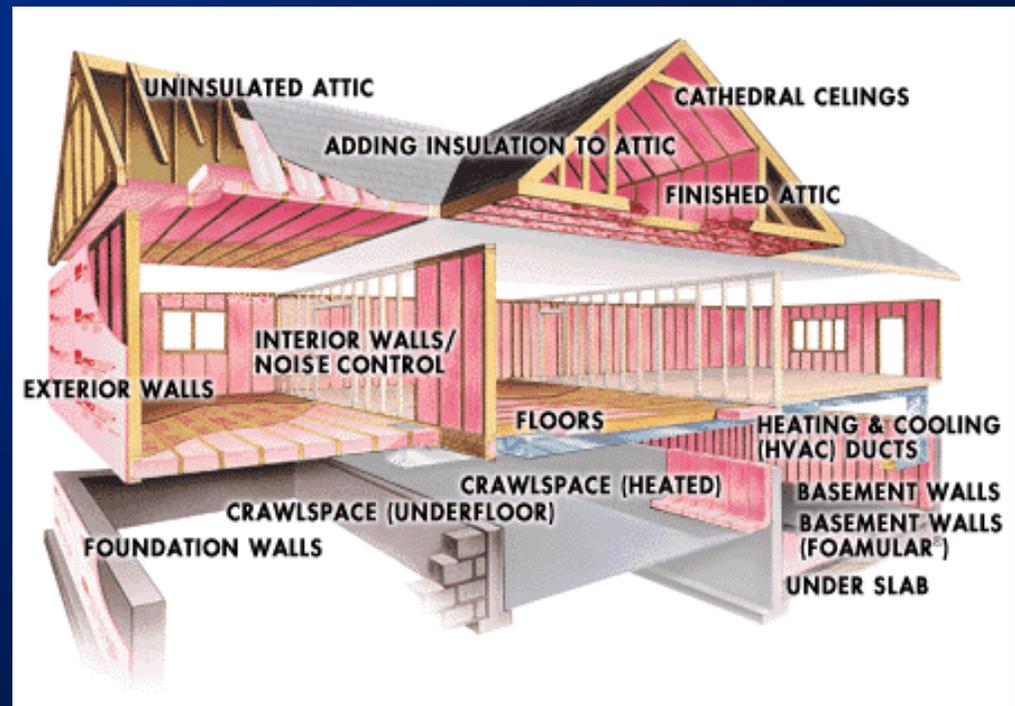
Conservation Programs

Q5. Are you aware of The
Energy Guy's Show
"Conservation Tips?"



Programs for Evaluation Include

- New Insulation
- Energy Star rated structures



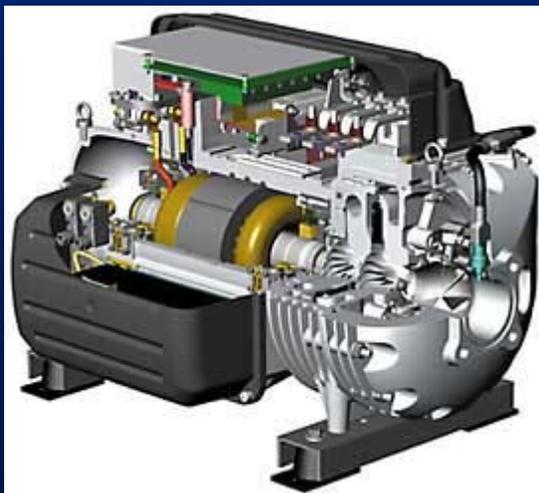
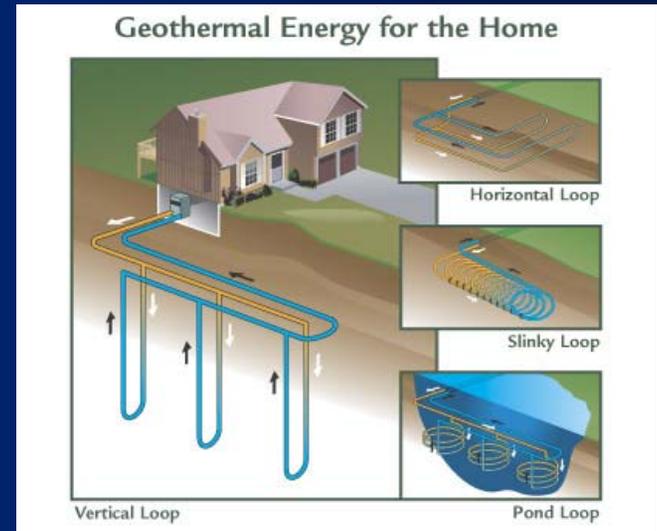
New Appliance Options



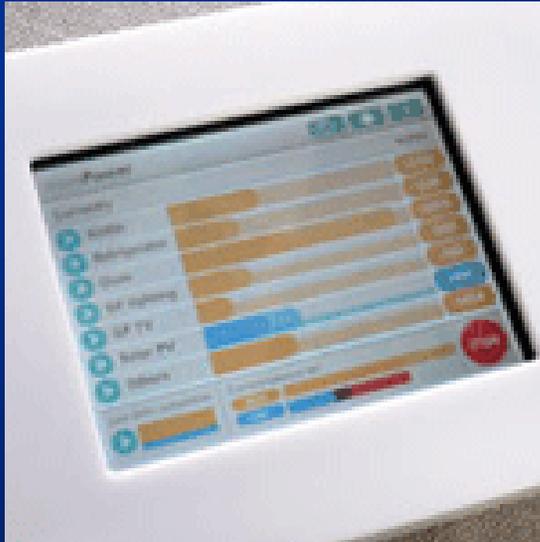
WATTS	RANGE	LENGTH MM	LUMENS
14	High Efficiency	549	1350
21	High Efficiency	849	2100
28	High Efficiency	1149	2900
35	High Efficiency	1,449	3650
24	High Output	549	2000
39	High Output	849	3500
54	High Output	1149	5000
49	High Output	1449	4900
80	High Output	1449	7000



New HVAC Options



New Metering Options



“Smart” meters

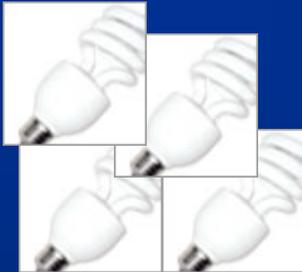
- Provide the consumption by appliance
- Allow customer to choose to turn off or not



“Pay as You Go” meters

- Prepaid card establishes budget
- Use till limit is reached
- Recharge card when \$ are gone
- User can budget usage

DSM Benefit/Cost



Number of
End uses

X

kWh(old)-kWh(new)

Impact per
End use
(kW or kWh)

=

Expected energy or
demand reduction for CWL



\$ for DSM program

- Cost of device
- Cost of rebates
- Cost of operations & maintenance

Compared to

\$ for Power Production

- Cost of Investment
- Cost of fuel, emissions
- Cost of operations & maintenance

Your Thoughts??