

# **Electric & Natural Gas Efficiency Potential In New York**

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Optimal Energy, Inc.**

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Energy Efficiency Portfolio Standard Overview Forum  
July 19, 2007

# Study Background

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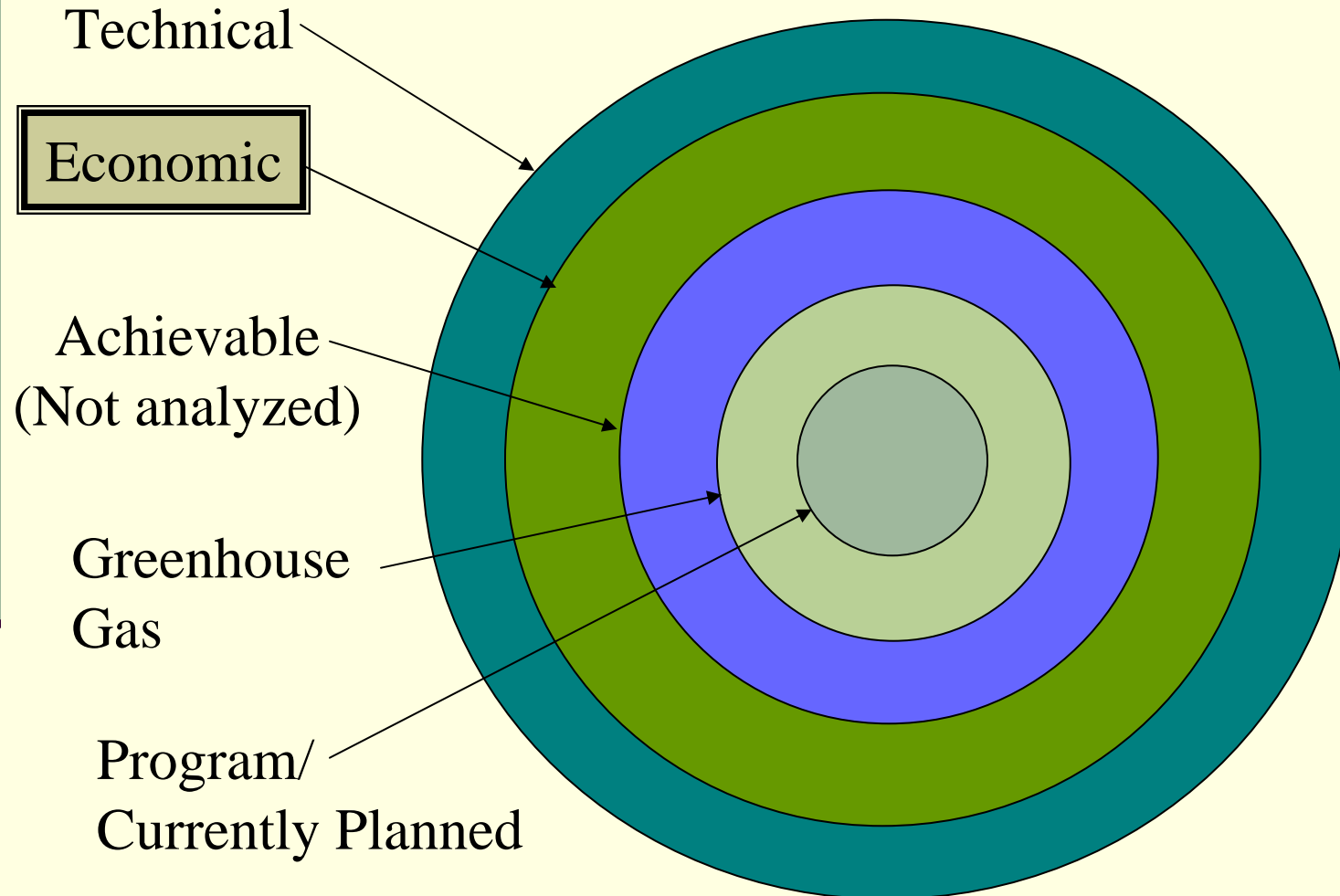
- ❖ Optimal evaluated the cost-effective efficiency resource potential in New York for electricity and natural gas
- ❖ Electric efficiency and renewables:
  - ❖ Technical and Economic potential
  - ❖ Greenhouse Gas targets and Currently Planned Initiatives scenarios
  - ❖ Completed in 2003
- ❖ Natural gas efficiency:
  - ❖ Economic potential
  - ❖ Program scenario
  - ❖ Completed in 2006

# Study Scopes

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- ❖ End-use efficiency improvements in buildings, equipment and systems with no degradation in energy service level or quality
- ❖ Residential, commercial and industrial sectors
- ❖ All electric and gas building end users (regardless of contracting mechanisms and suppliers)
- ❖ No fuel switching, electric generation or CHP
- ❖ No load shifting, curtailment or interruption

# Potential Scenarios



# Economic Perspectives

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## Total Resource Cost and Benefits (TRC Test)

- ❖ Measure of economic efficiency (improvement in economic welfare)
- ❖ Not distributional equity (e.g., not the utility test, or non-participant test) — although gas and electric energy systems test were also reported
- ❖ Technology is cost-effective if and only if:
  - *Benefits – Costs = Net Benefits > 0*
  - *Benefit/Cost Ratio > 1.0*
- ❖ Consistent with NY PSC policy

# Economic Perspectives

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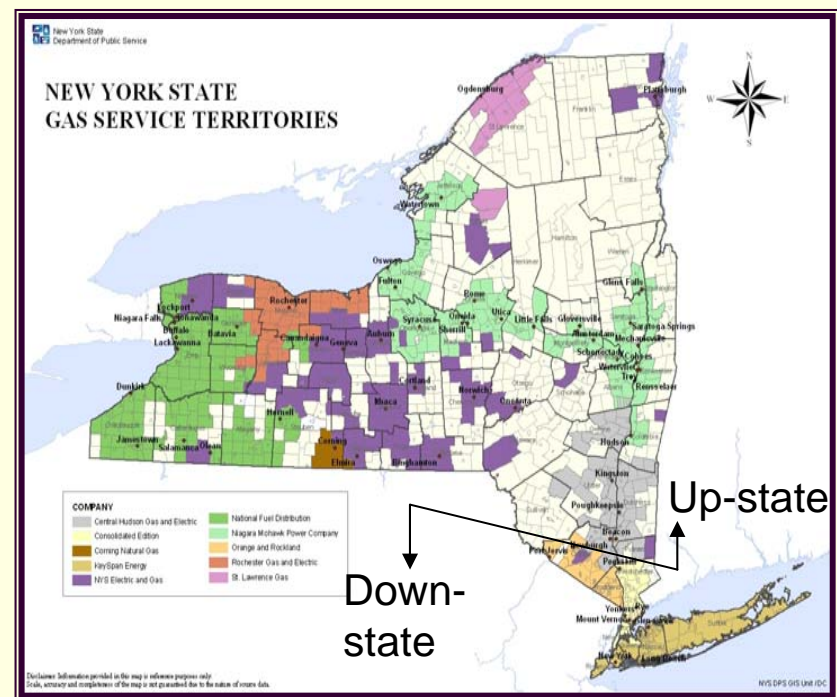
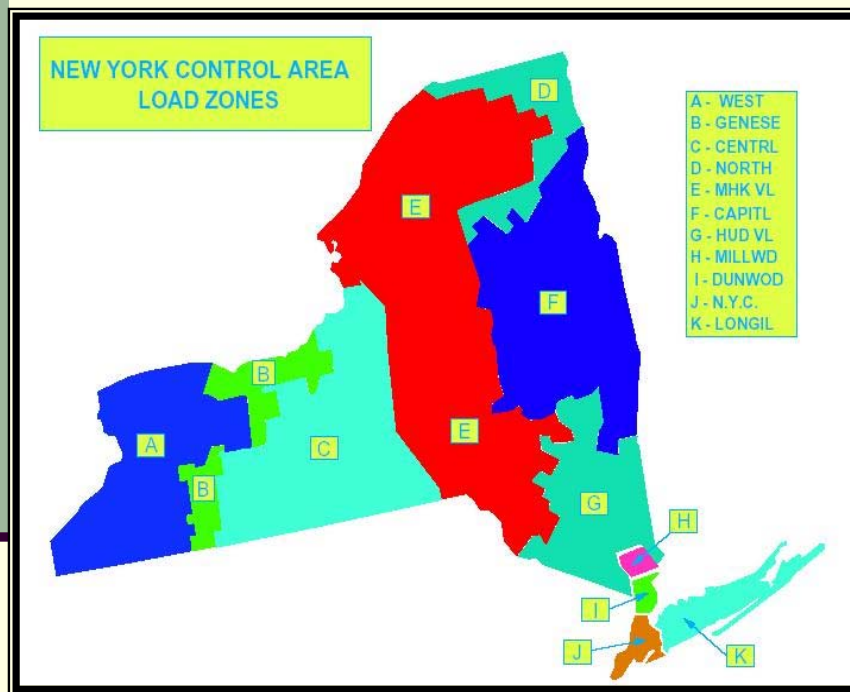
## ■ **Total Resource Cost**

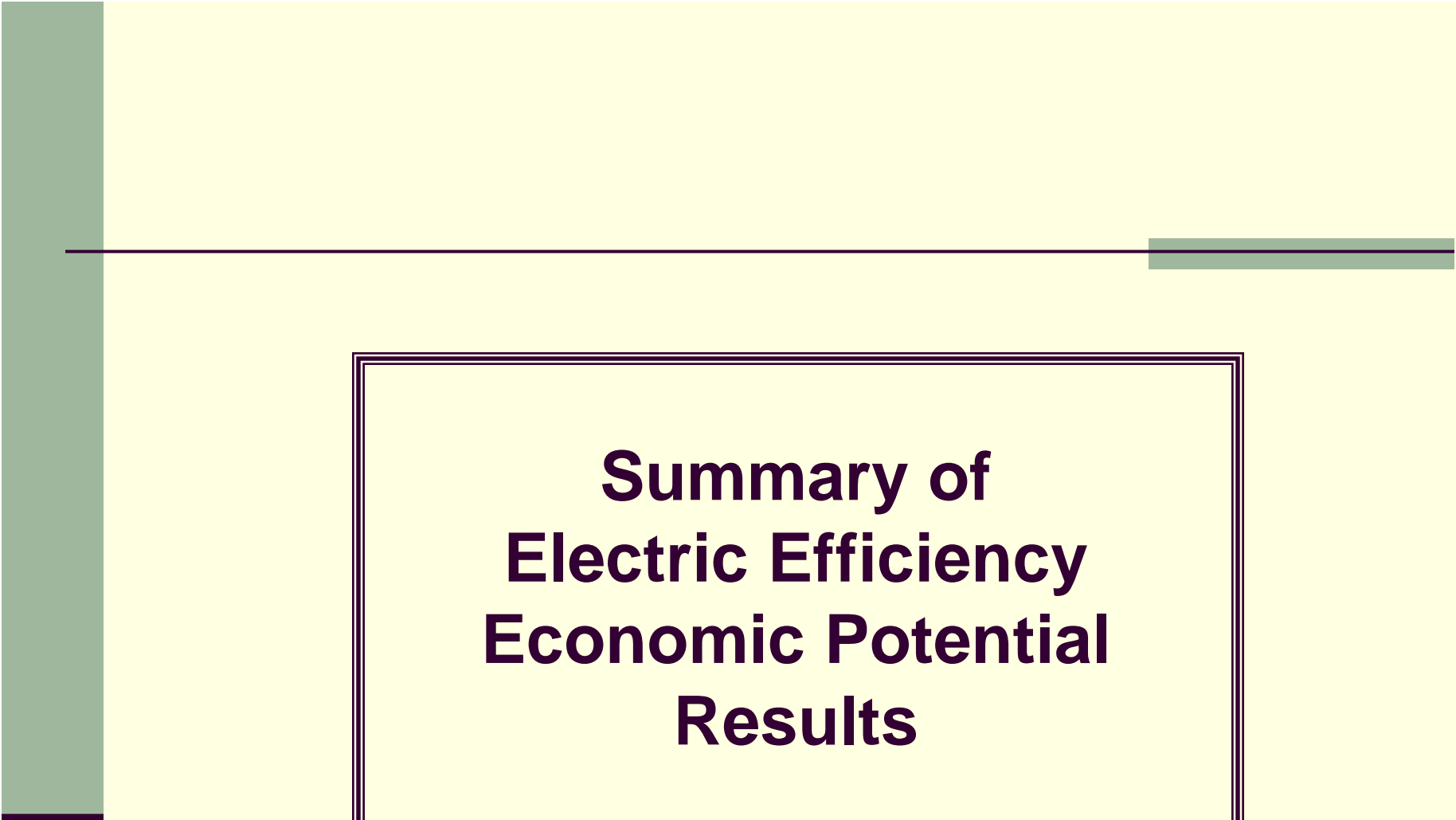
Present value of total costs of resources to society, including incremental equipment and labor costs, O&M costs, increases in energy or water costs, and program non-measure costs

## ■ **Total Resource Benefits**

Present societal value of avoided electricity, natural gas, water and other resource costs resulting from efficiency, reductions in O&M costs

# New York Electric & Gas Service Areas

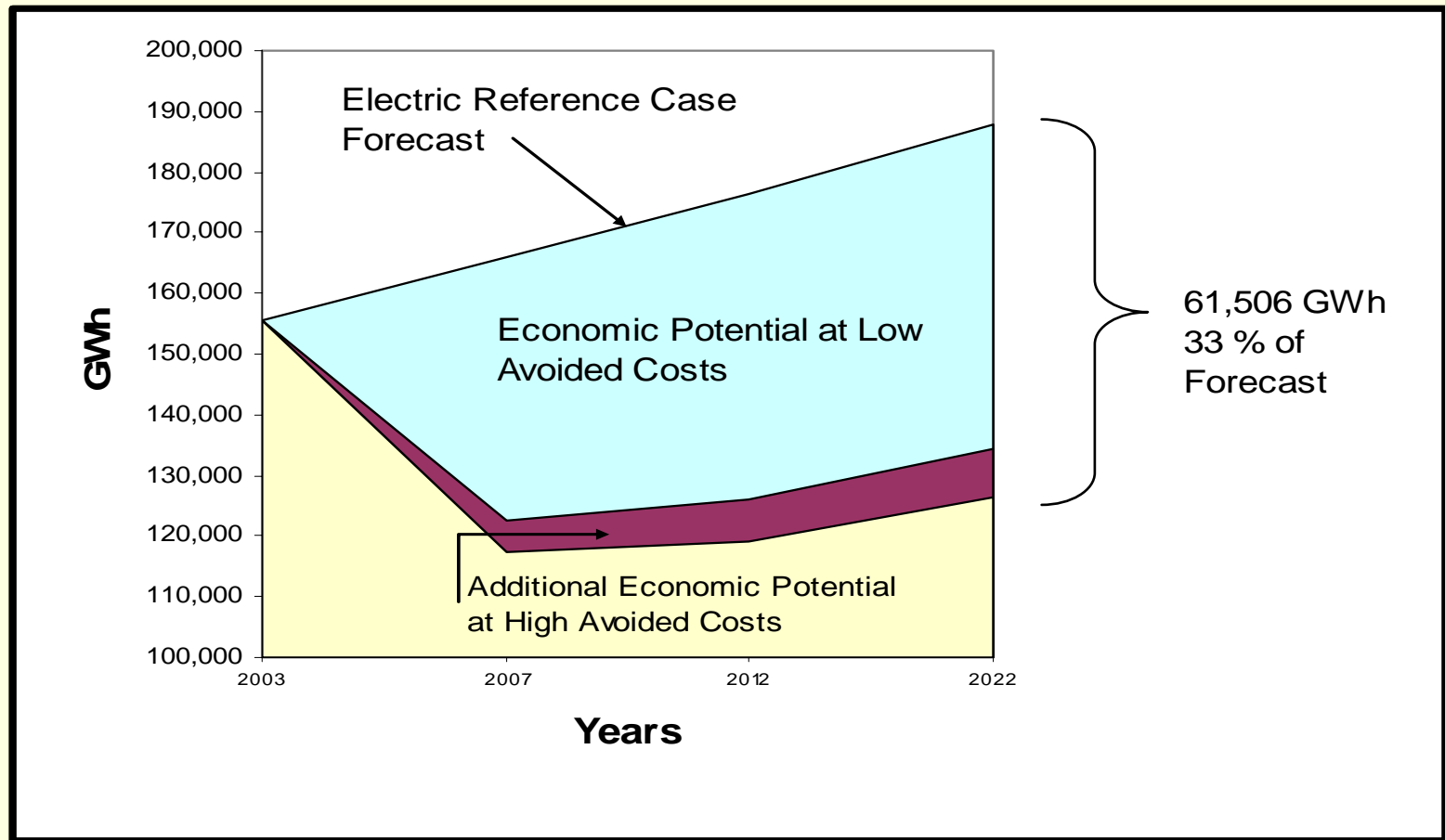




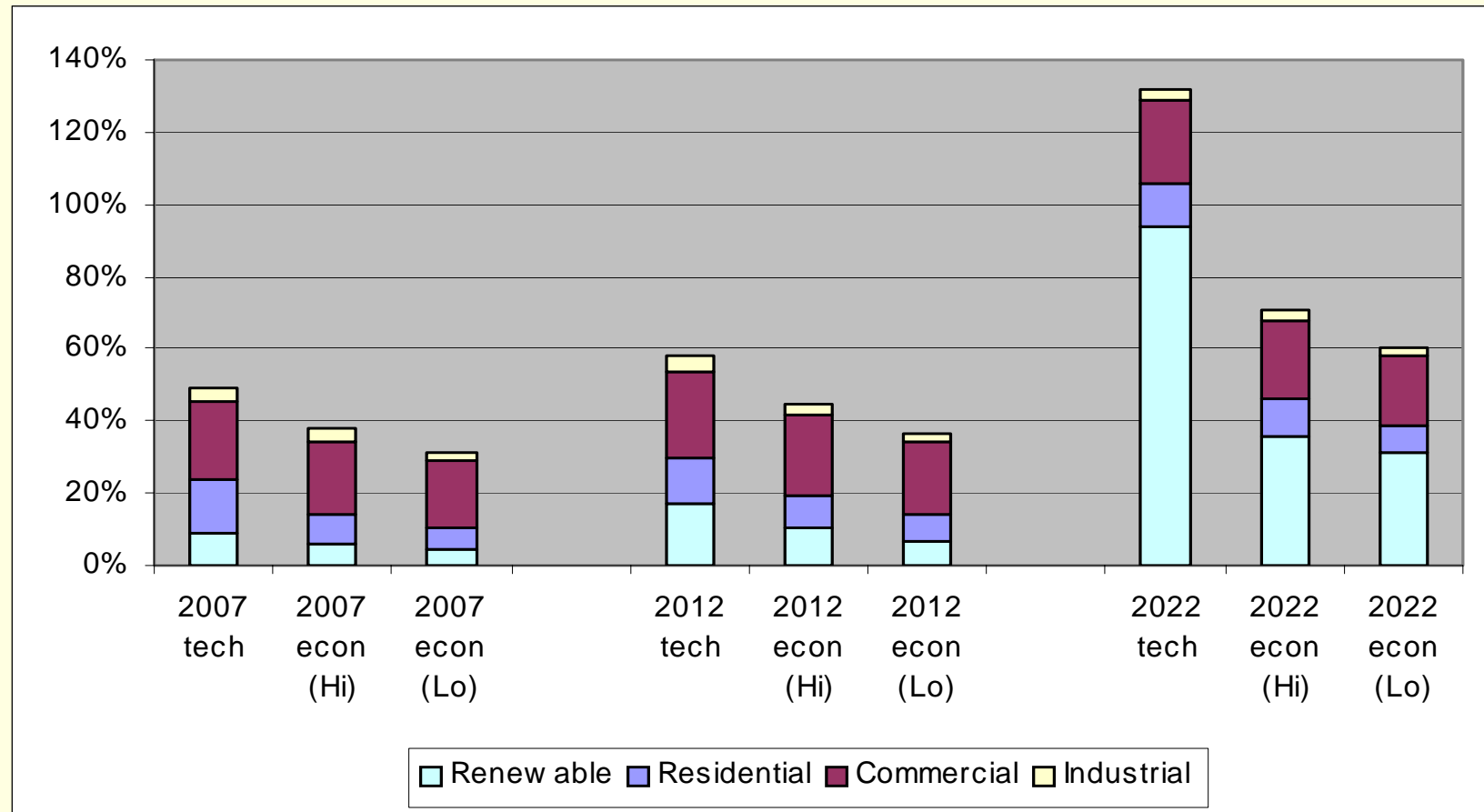
# **Summary of Electric Efficiency Economic Potential Results**



# Electric Forecast with and without Economic Potential

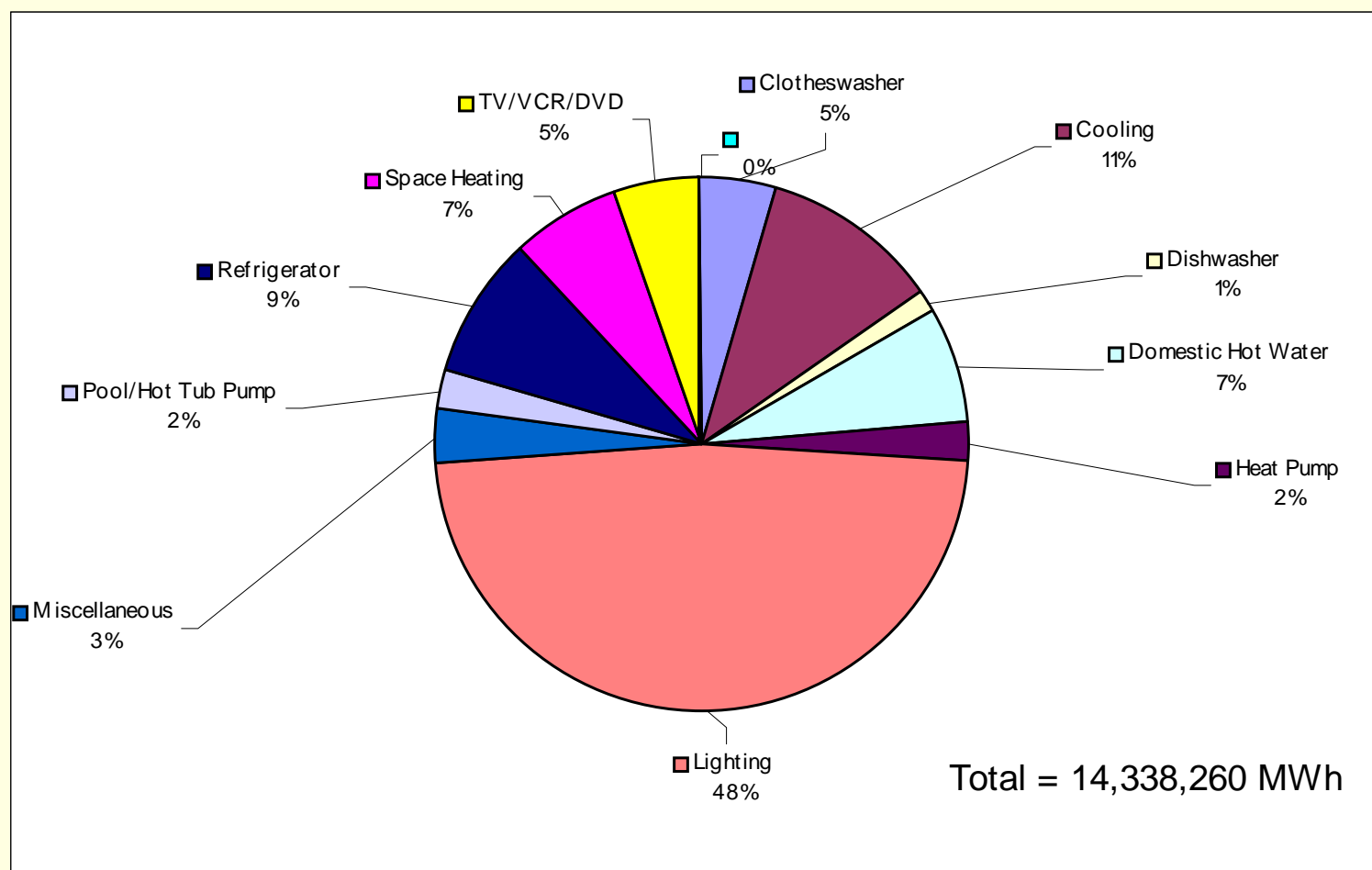


# Technical & Economic Potential by Sector as % of Forecast MWh Sales



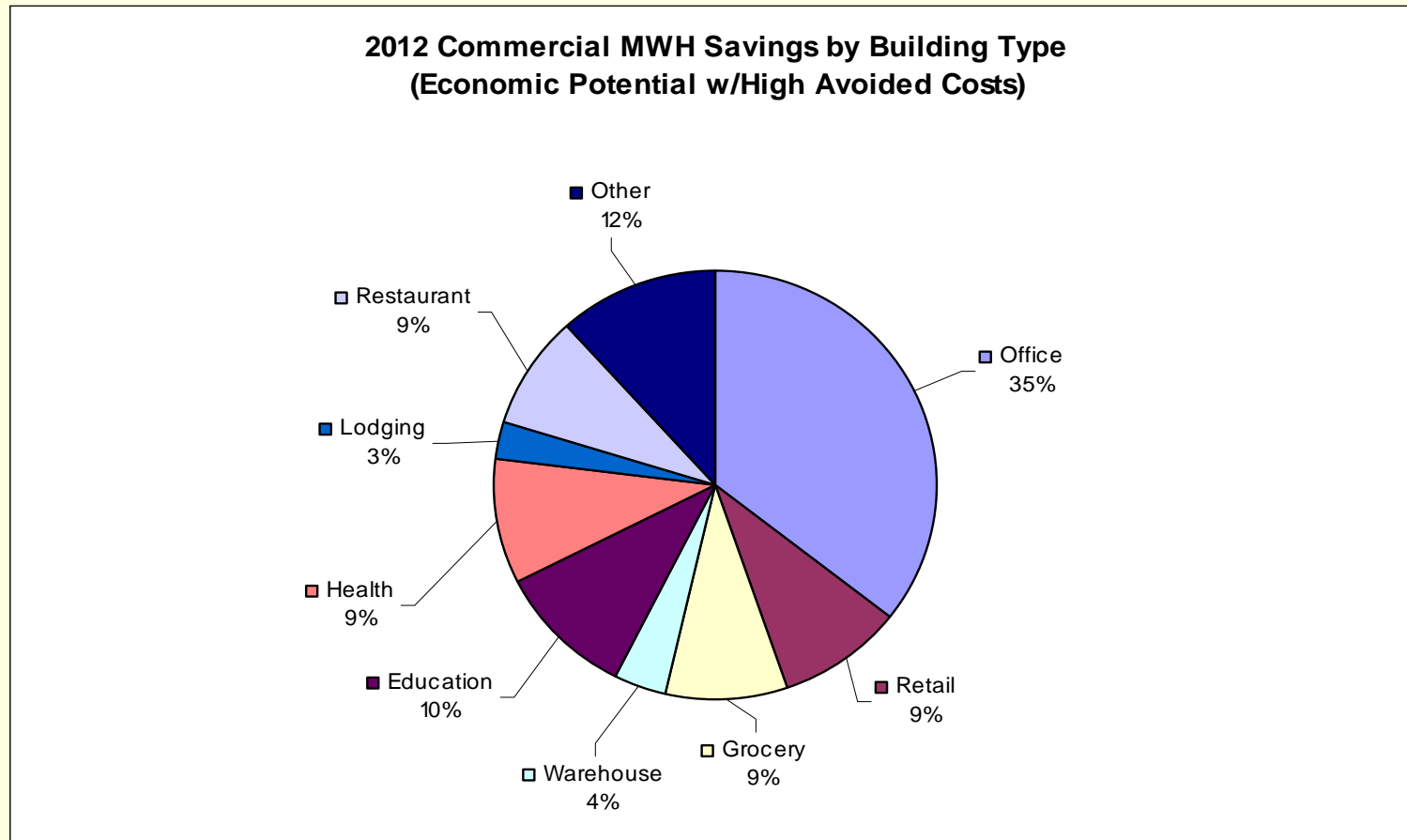
# Residential Electricity Potential

(2012 Economic Potential (MWh) w/High Avoided Costs)



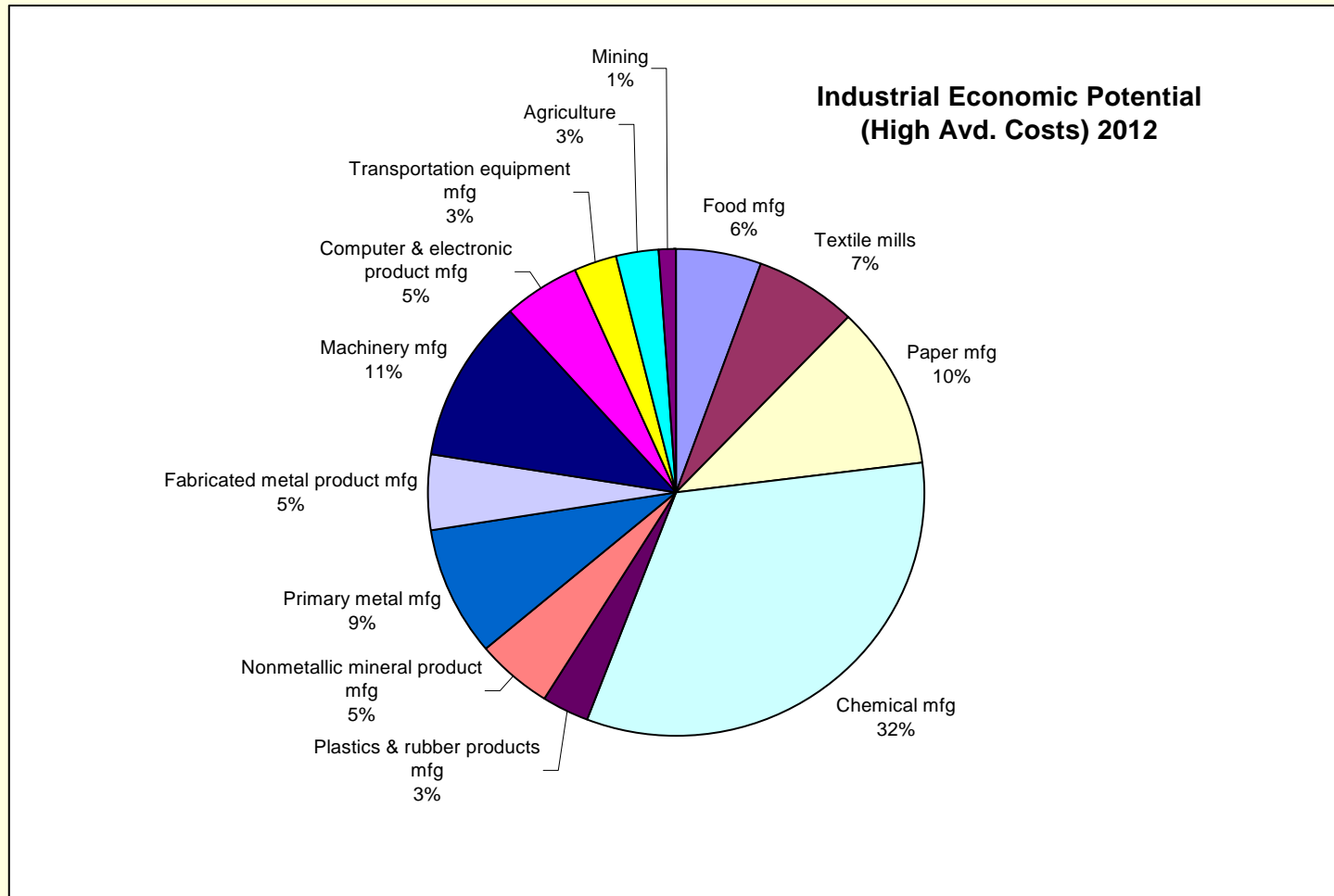
# Commercial Electricity Potential

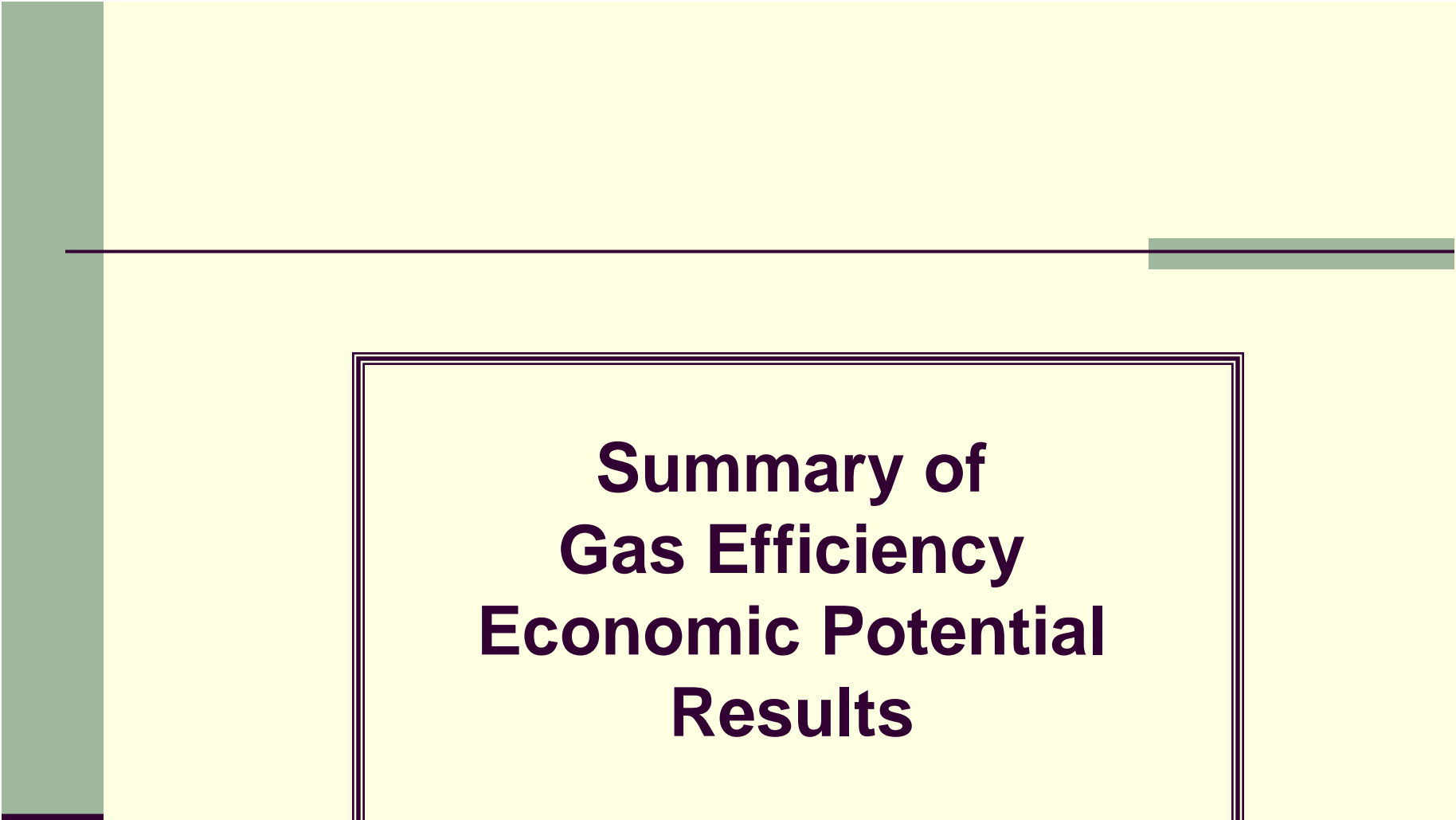
(2012 Economic Potential (MWh) w/High Avoided Costs)



# Industrial Electricity Potential

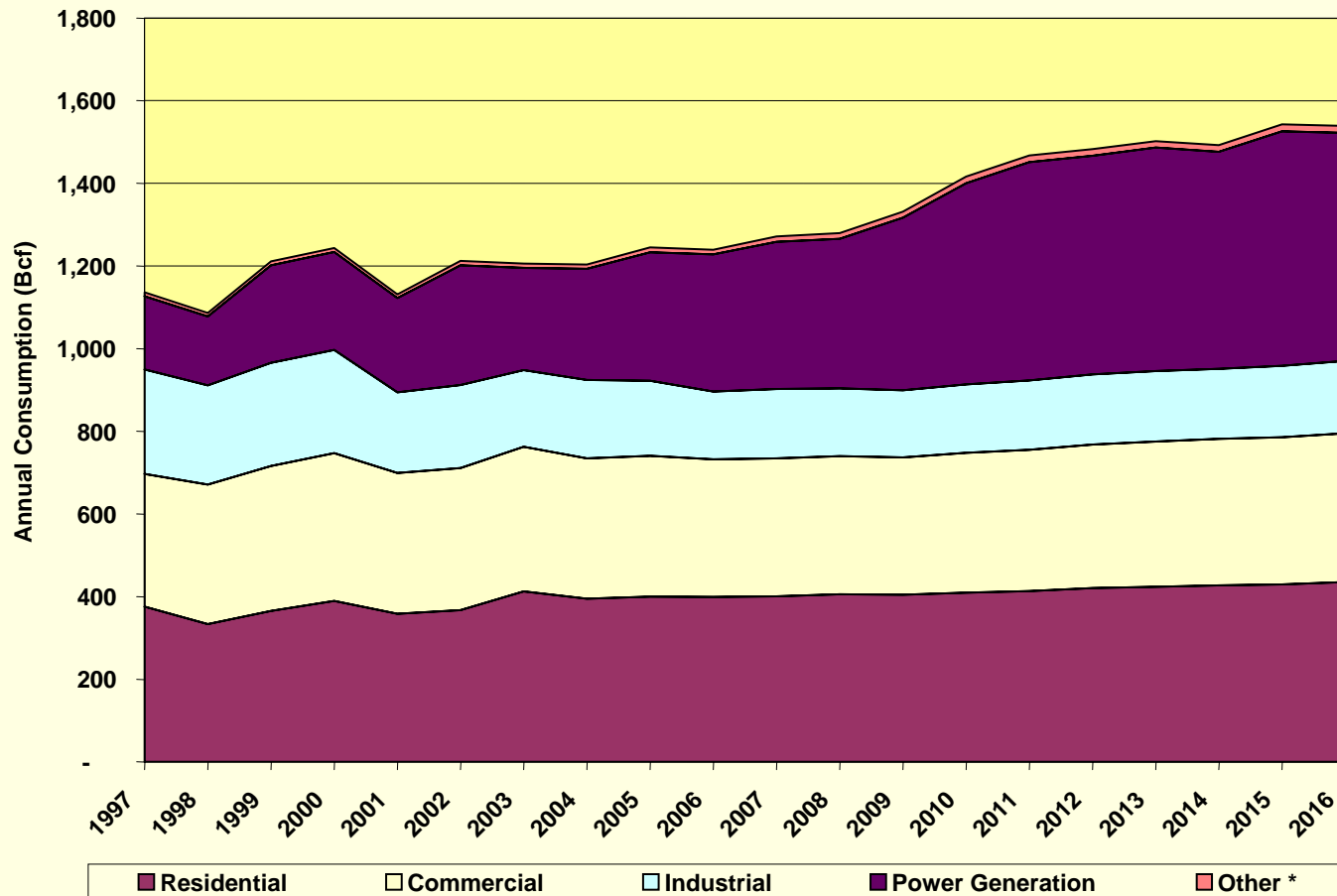
(2012 Economic Potential (MWh) w/High Avoided Costs)



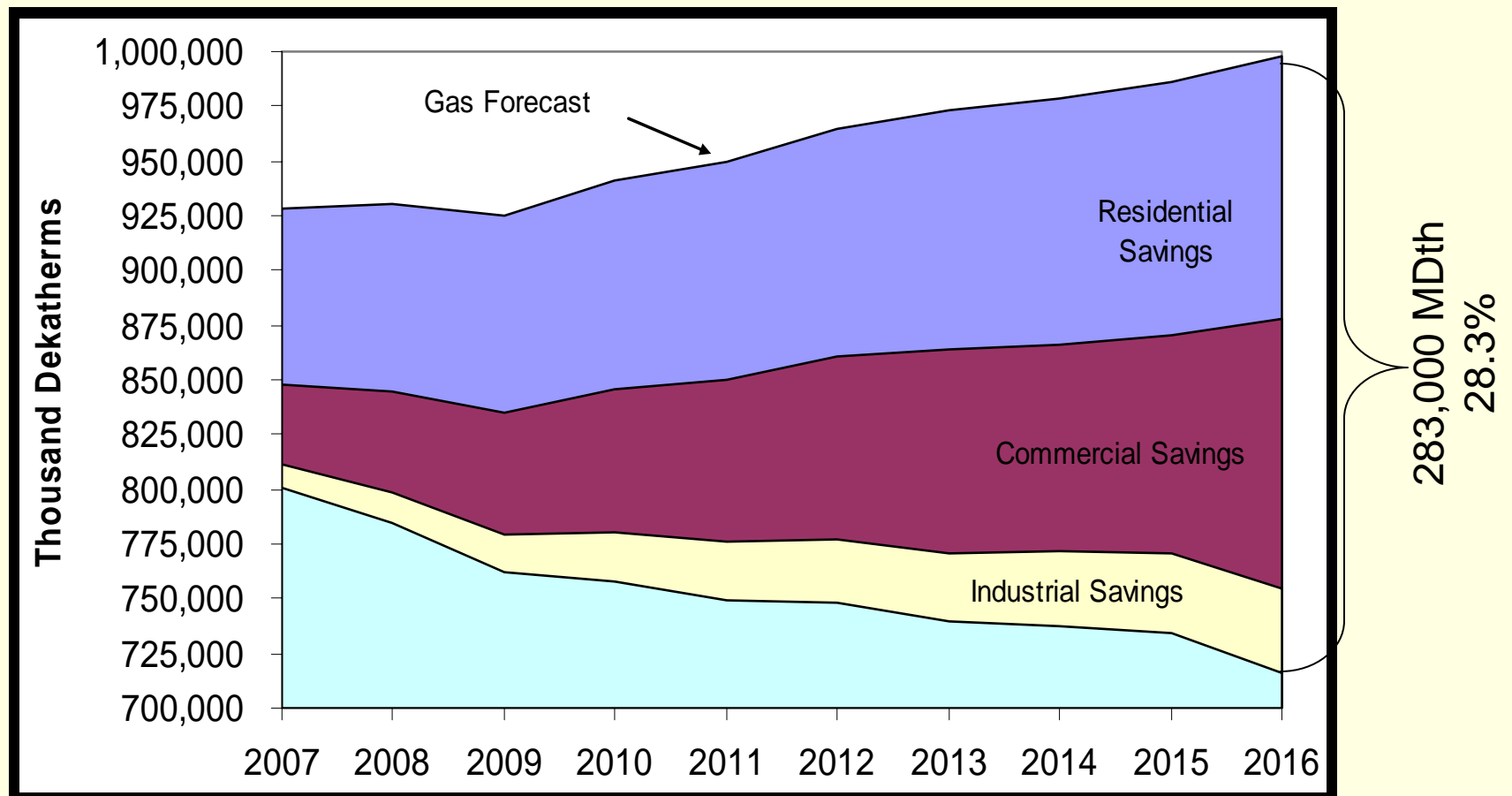


# **Summary of Gas Efficiency Economic Potential Results**

# New York Natural Gas Demand Forecast

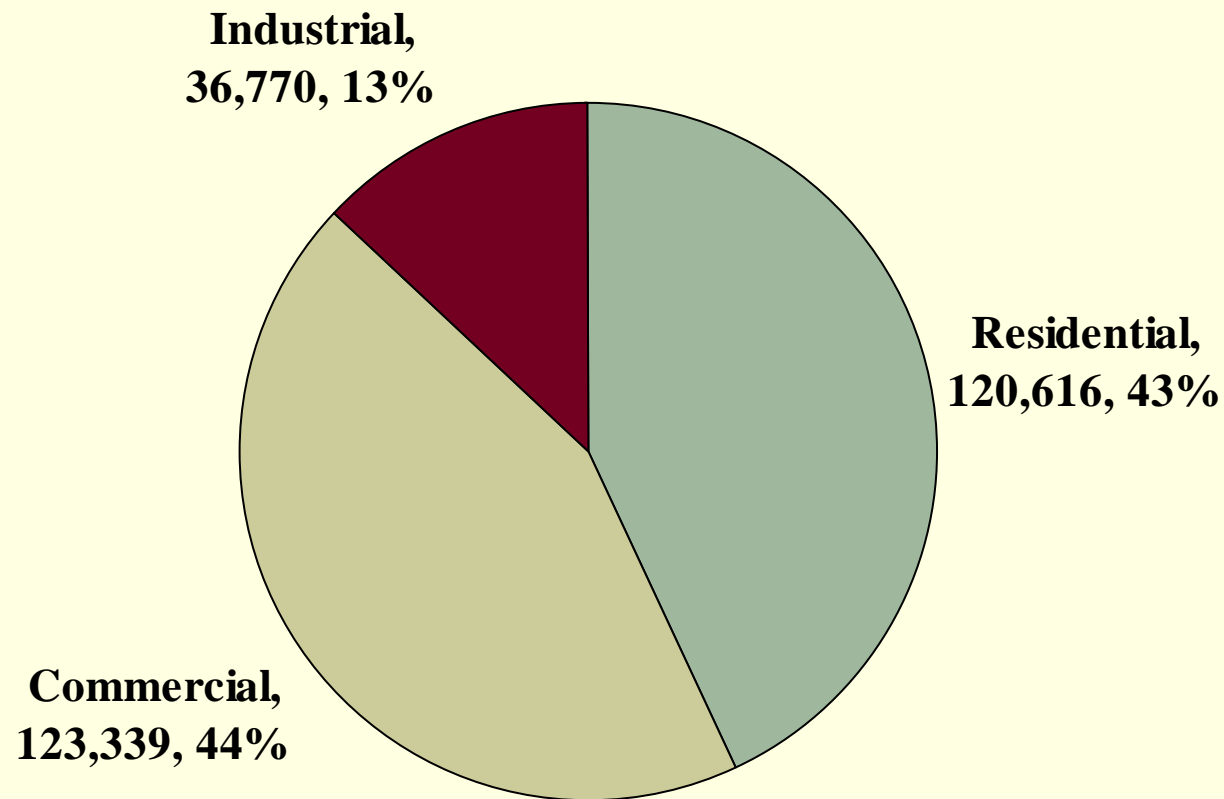


# Natural Gas Forecast With and Without Economic Potential Savings





# Economic Potential by 2016 by Sector



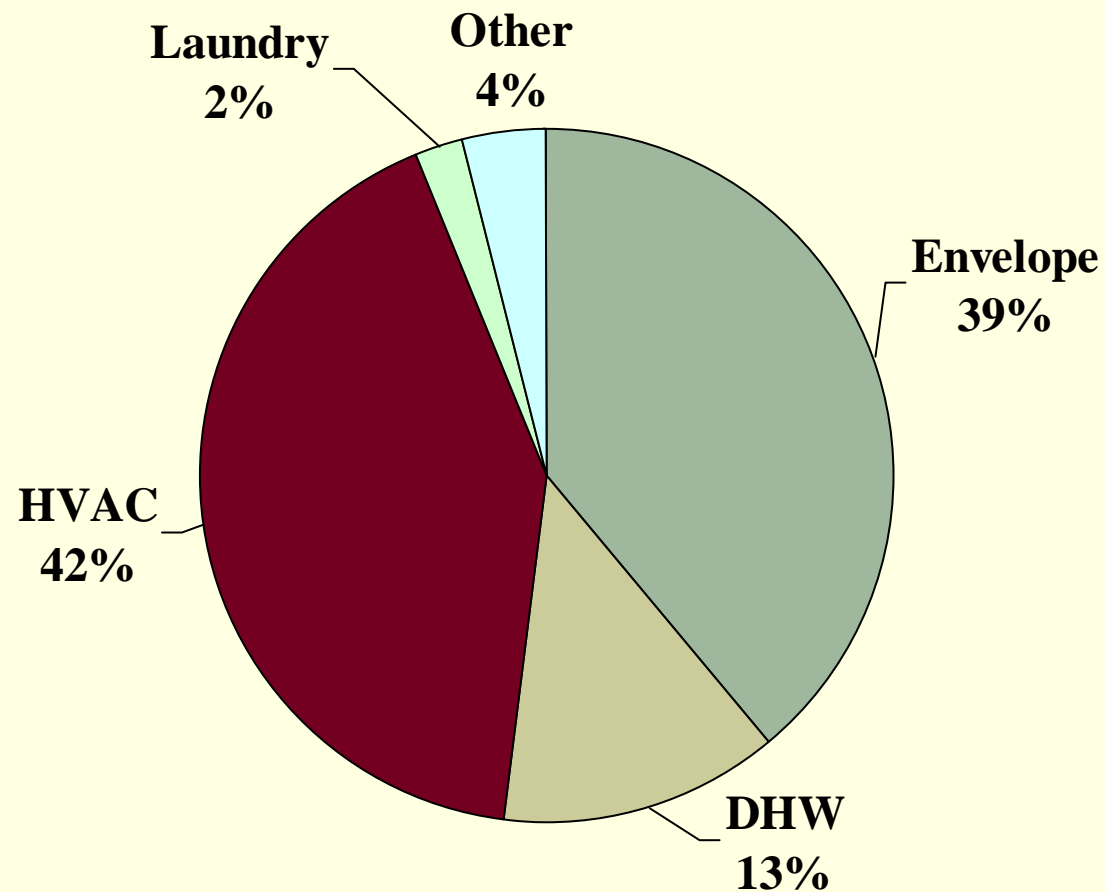
Total: 283,000 MDth, 28.3% of forecast

# 2016 (10 year) Gas Economic Potential Total Resource Economics

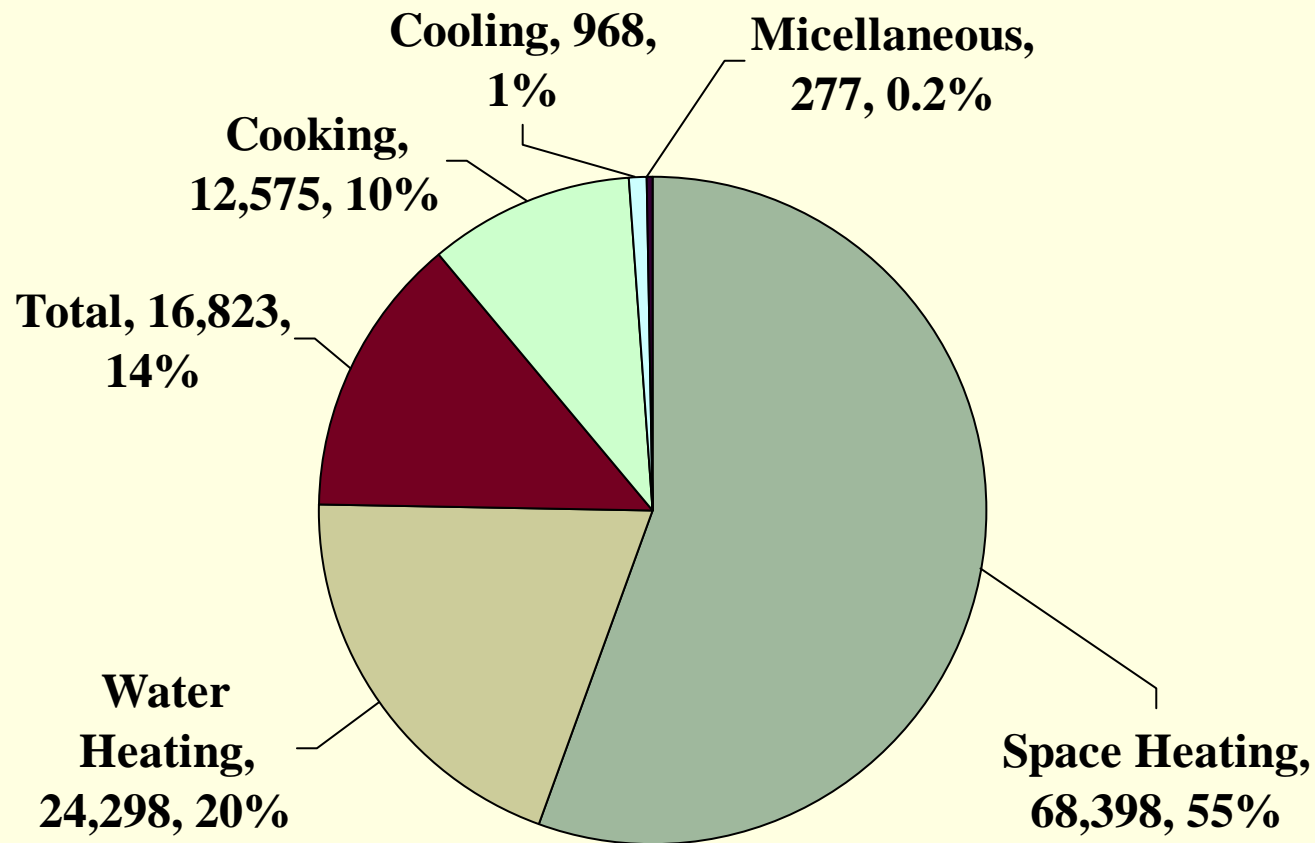
Avoided Cost Scenario	Gross Benefits (\$Billion)	Costs (\$Billion)	Net Benefits (\$Billion)	B/C Ratio
Reference Avoided Costs	\$40.3	\$13.9	\$26.4	\$2.9
Low Avoided Costs	\$30.5	\$11.9	\$18.6	\$2.6
High Avoided Costs	\$49.5	\$14.8	\$34.7	\$3.4

(PV, 2005\$ - Not Including Price Effects)

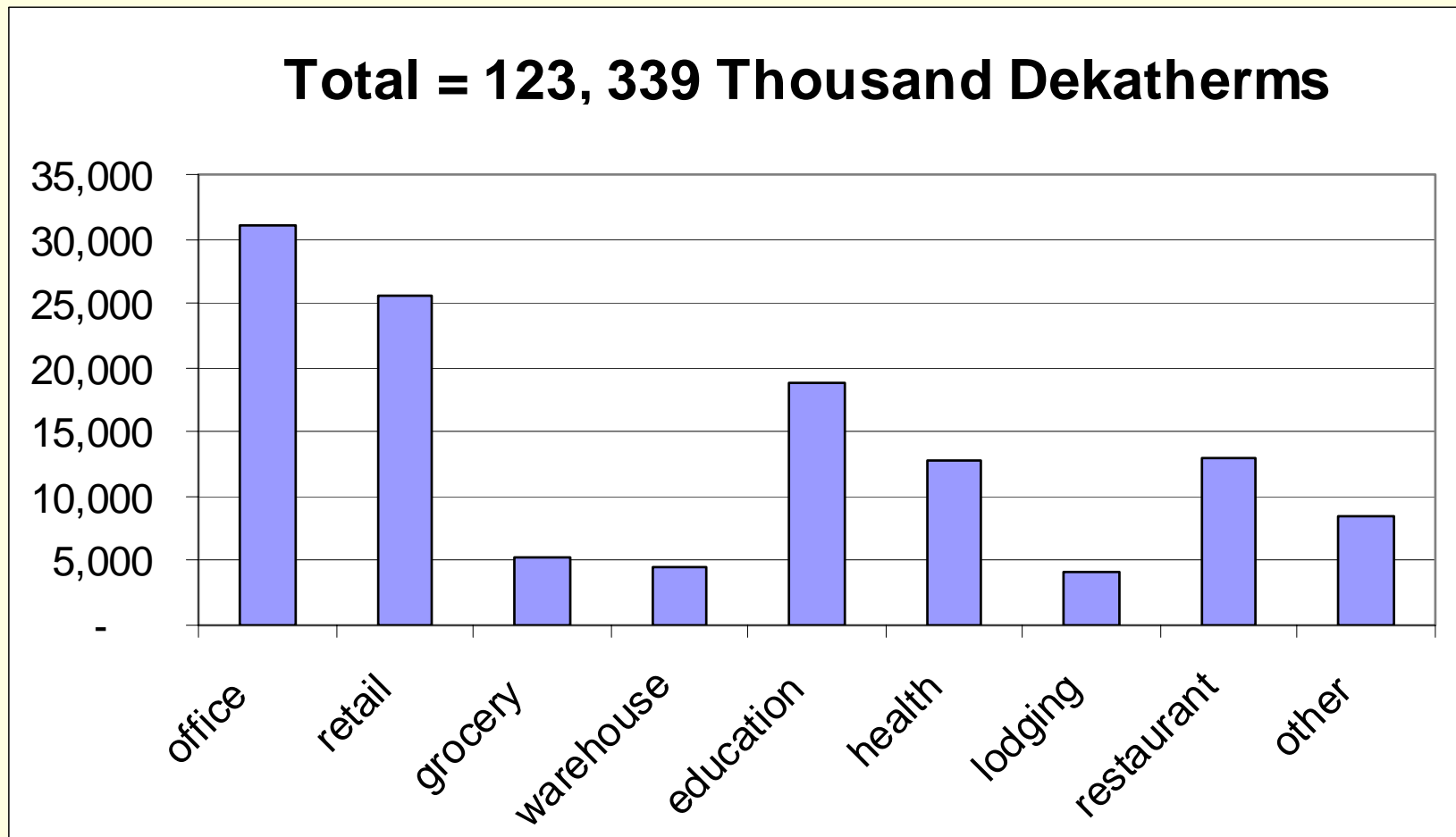
# Residential Economic Potential by End Use



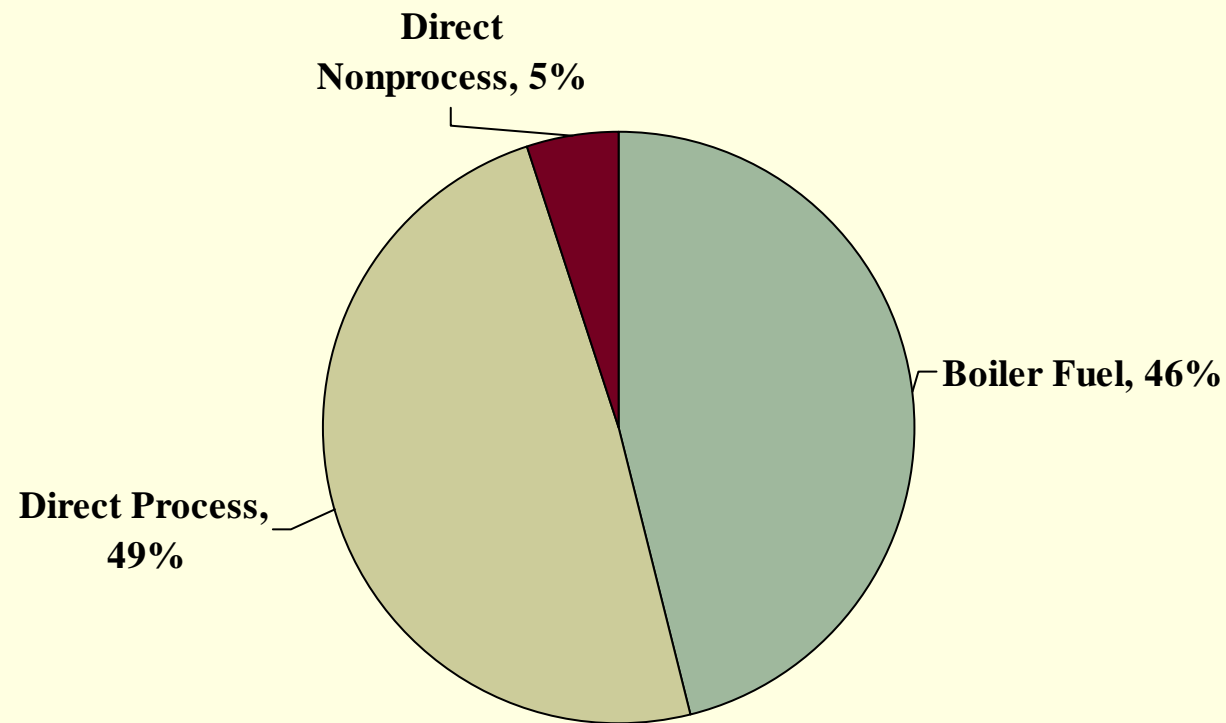
# Commercial Economic Potential by End Use



# Commercial Economic Potential by Building Type



# Industrial Economic Potential by End Use



# Study Conclusions

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- ❖ Large economic efficiency savings are available at costs less than traditional supply.
  - ❖ Electric  $\cong$  28% (low AC) - 33% (hi AC)
  - ❖ Natural gas  $\cong$  28%
- ❖ Capturing the majority of economic savings can be done at costs substantially lower than current and forecast supply costs.
- ❖ Large consumer benefits from reduced consumption and potentially reduced supply costs.

# Capturing Achievable Efficiency

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- ❖ A large portion of the economic potential can be captured very cost-effectively
- ❖ No single bullet — will require numerous strategies and services
  - ❖ Avoid “siloing”
  - ❖ Develop comprehensive portfolios addressing all important markets
  - ❖ Ensure coordination and integration — between administrators and fuels
  - ❖ Focus on customer service, don't establish barriers to simple, comprehensive, one-stop shopping services