

# Commercial Sector EEI Potential

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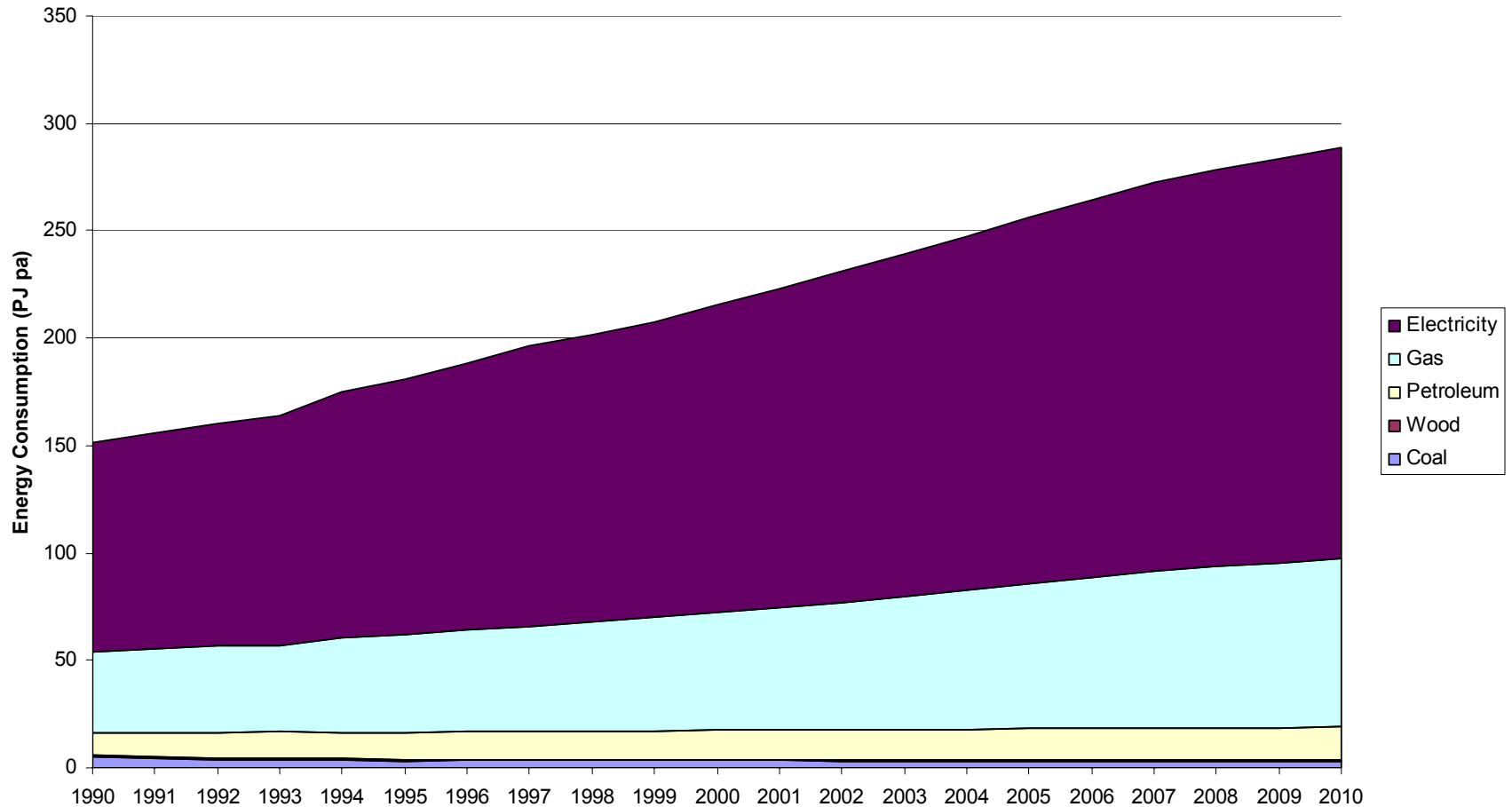
# Introduction

- EMET Consultants was commissioned to undertake a study to estimate EEI potentials in the Commercial Sector:
  - Wholesale & Retail Trade
  - Accommodation, Cafes & Restaurants
  - Communication Services
  - Finance & Insurance
  - Government Admin. & Community Services
  - Culture & Recreation / Personal Services

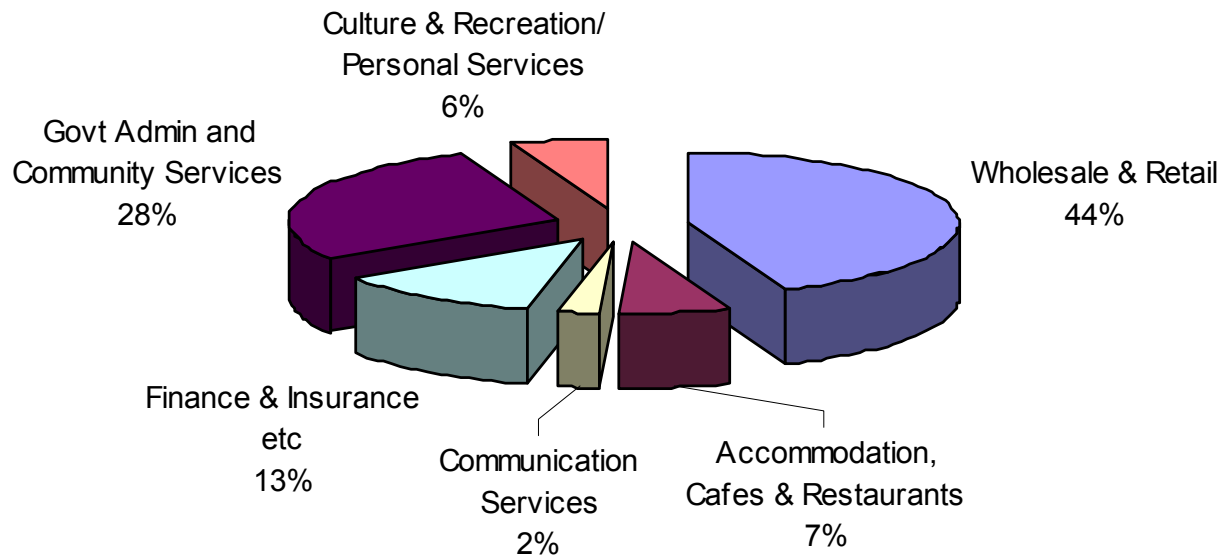


# Commercial Sector – Energy End Use

TRENDS IN ENERGY CONSUMPTION BY FUEL TYPE - BUSINESS AS USUAL



# Energy End Use by Sub-Sectors



# Resources used for analysis

- **Used EMET's existing databases, models and analysis tools for the Commercial Sector**
- **Database has 80 energy efficiency measures for the Commercial Sector, covering:**
  - Target component
  - Indexed costs and savings for the target
  - Scope, capture rate and other specific characteristics for measure
- **Existing tools and databases were updated to suit:**
  - The sub-sectors targeted in study
  - Efficiency, savings & costs for new technologies
  - Recently introduced energy efficiency initiatives

# Energy efficiency measures

Energy efficiency improvement (EEI) measures covered by database include:

- Thermal performance of building shell
- Heating, Ventilation and Air Conditioning
  - technical improvements and control
  - management, maintenance and operational improvements
- Lighting
  - technical improvements and control
  - management, maintenance and operational improvements
- Hot Water Services
- Lifts
- Other Services and Plant

# Existing, New & Refurbished buildings

## Retrofits

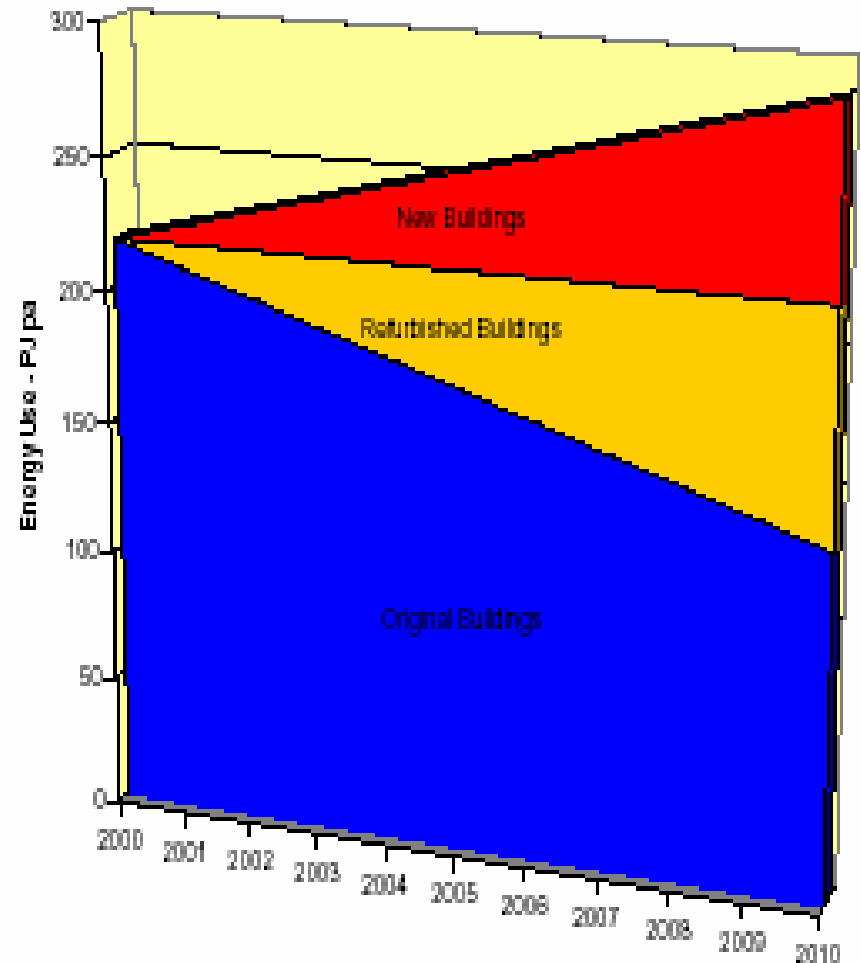
- No upgrade is planned during analysis period – costs are higher and scope is lower

## Refurbishments

- Provide better opportunities for EEI – costs lower and impact larger

## New Buildings

- Costs of implementing EEI lower – some measures only possible for new buildings

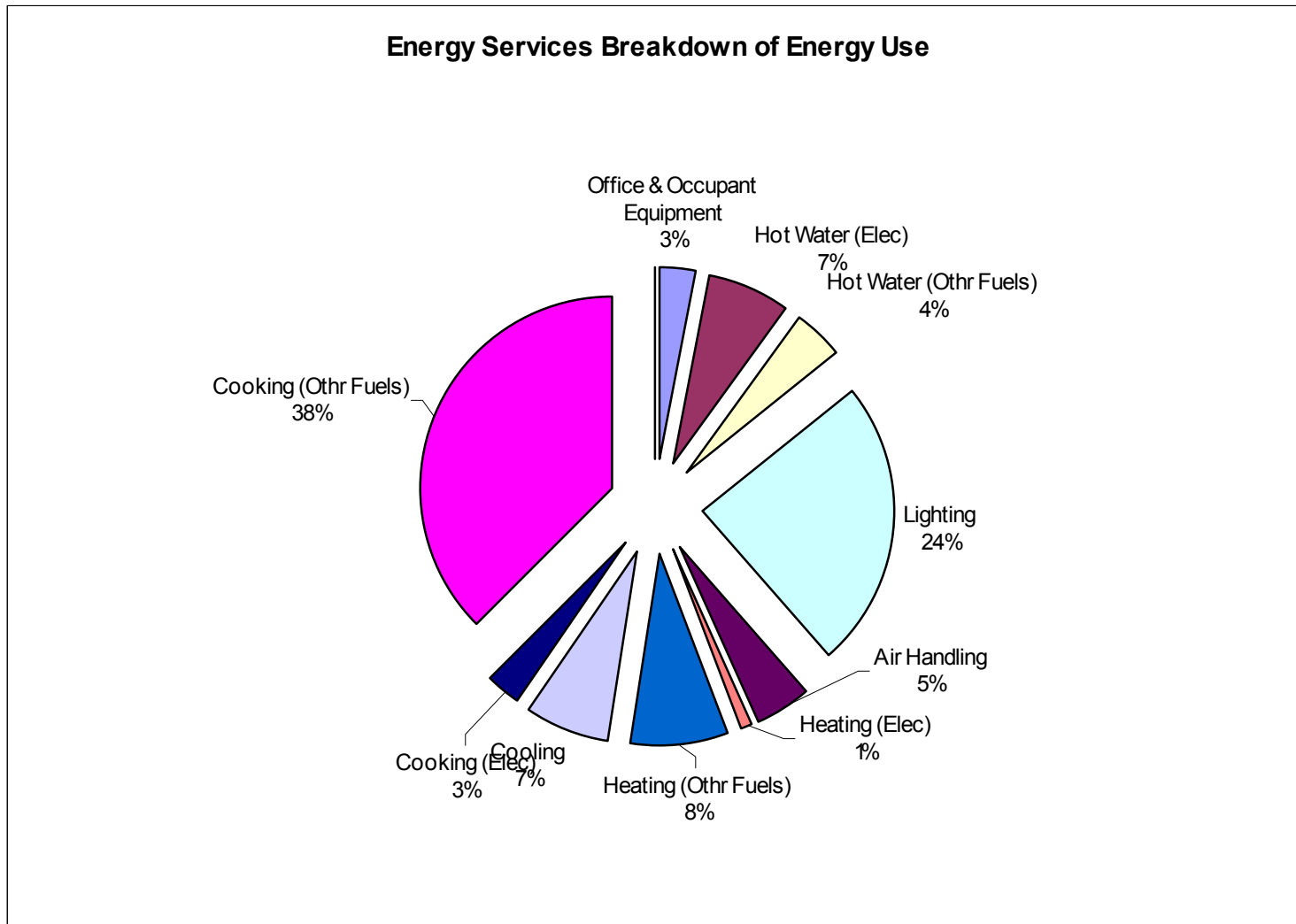


# Approach to EEI Potential estimates

## For each sub-sector analysed:

- Undertake energy services breakdown
- Run model for study period to identify impact of specific EEI measures – energy savings and costs
- Evaluate the overall impact and cost effectiveness for each EEI applied independently
- Rank (based on payback) and combine measures, and revise impacts based on interactive effects – gives raw estimate of EEI potential and costs
- Estimate BAU uptake of EEI and use this to estimate the net EEI potential beyond BAU

# Case study – Wholesale & Retail Trade



# Wholesale & Retail – EEI measures

Initiative	Energy saving Potential (PJ pa)	Electricity Saving included (PJ pa)	Operating Cost Saving (\$M pa)	Implementation Cost (\$)	Simple Payback Period (yrs)
	Discounted	Discounted	Discounted		
LGHTS-7.2c	0.07	0.07	54.1	9.4	-0.2
LGHTS-7.2b	0.09	0.09	66.4	11.6	-0.2
LGHTS-7.1c	0.15	0.15	39.6	0.3	0.0
LGHTS-7.1b	0.19	0.19	48.7	0.4	0.0
HVAC-Option 5.1	0.42	0.20	9.1	0.0	0.0
HVAC-Option 3.1	1.38	0.27	15.2	0.0	0.0
LGHTS-8	1.03	1.03	26.2	0.0	0.0
PROC-Option 3.3	5.66	2.72	51.8	0.0	0.0
PROC-Option 2.3	3.78	0.99	80.9	0.0	0.0
OTHR-Option 5.2	0.66	0.66	16.9	0.0	0.0
OTHR-Option 4.1	0.00	0.00	0.1	0.0	0.0
OTHR-Option 5.1	0.50	0.50	12.7	0.0	0.0
LGHTS-2a	0.37	0.37	13.9	-3.9	0.3
LGHTS-2b	0.25	0.25	9.2	-2.6	0.3
LGHTS-2c	0.17	0.17	6.7	-2.1	0.3
HVAC-Option 1.4	0.09	0.04	1.8	-0.9	0.5
HVAC-Option 1.1	0.11	0.04	2.3	-1.8	0.8
LGHTS-4c	1.13	1.13	37.0	-30.4	0.8
LGHTS-7.2a	0.07	0.07	98.1	-96.1	1.0
LGHTS-7.1a	0.15	0.15	69.7	-73.2	1.0
LGHTS-4b	0.65	0.65	20.5	-22.1	1.1
LGHTS-4a	0.97	0.97	30.7	-33.2	1.1
PROC-Option 1.3	0.76	0.20	14.9	-25.3	1.7
LGHTS-3c	0.22	0.22	5.2	-9.2	1.8
PROC-Option 1.4	1.72	1.31	33.5	-68.0	2.0
HVAC-Option 1.2	0.23	0.09	4.1	-8.8	2.2
LGHTS-3a	0.58	0.58	13.2	-29.0	2.2
LGHTS-3b	0.38	0.38	8.8	-19.4	2.2
LGHTS-1.1c	0.87	0.87	19.3	-58.0	3.0
HVAC-Option 5.3	0.76	0.76	13.7	-43.3	3.2
LGHTS-1.1b	1.17	1.17	25.3	-88.1	3.5
LGHTS-1.1a	1.75	1.75	37.9	-132.1	3.5
LGHTS-5.2b	1.12	1.12	13.4	-48.4	3.6
LGHTS-5.2a	1.68	1.68	20.1	-72.6	3.6
<b>TOTALS</b>	<b>29.14</b>	<b>20.85</b>	<b>920.8</b>	<b>-846.9</b>	<b>0.9</b>

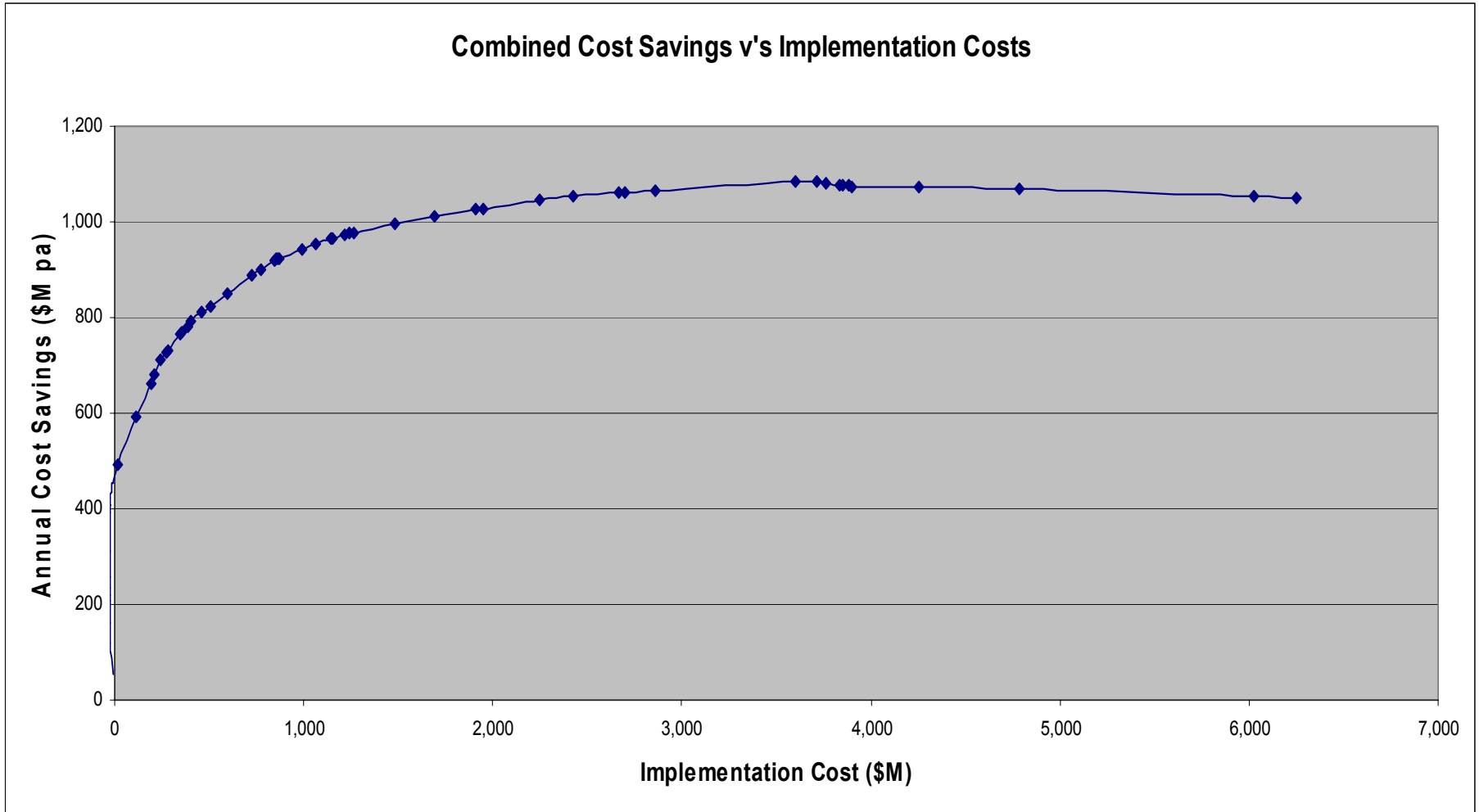


# Wholesale & Retail – EEI measures

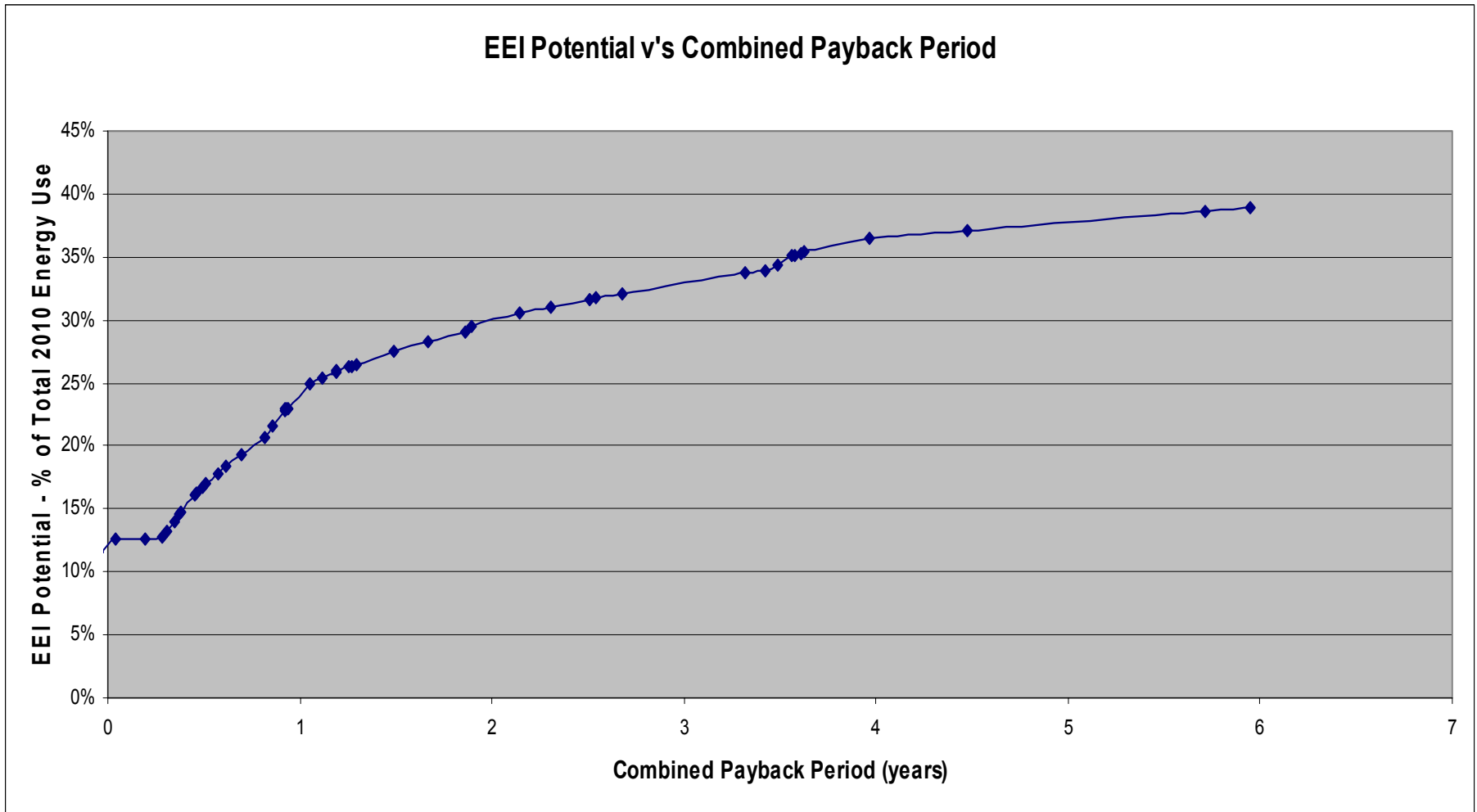
EEI measure	En. Saving (PJ pa)	Op. Cost Saving (\$M pa)	Cost (\$M)	Payback (Yrs)
.....	.....	.....	.....	.....
Retrofit solar water heating panels	1.72	\$33.5	\$68.0	2.0
HVAC – Application of outside air cycles, existing buildings	0.23	\$4.1	\$8.8	2.2
Lighting controls for Ext. & Common areas, retrofit existing buildings	0.58	\$13.2	\$29.0	2.2
Lighting controls for Ext. & common areas, refurbish existing buildings	0.38	\$8.8	\$19.4	2.2
Zone control of lighting, new buildings	0.87	\$19.3	\$58.0	3.0
HVAC – Retrofit features to improve operational efficiency, new buildings	0.76	\$13.7	\$43.3	3.2
Zone control of lighting, refurbish existing buildings	1.17	\$25.3	\$88.1	3.5
.....	.....	.....	.....	.....
<b>Totals</b>	<b>29.14</b>	<b>\$920.9</b>	<b>\$846.9</b>	<b>0.92</b>



# Wholesale & Retail – Raw Cost Curve



# Wholesale & Retail – Raw EEIP Curve



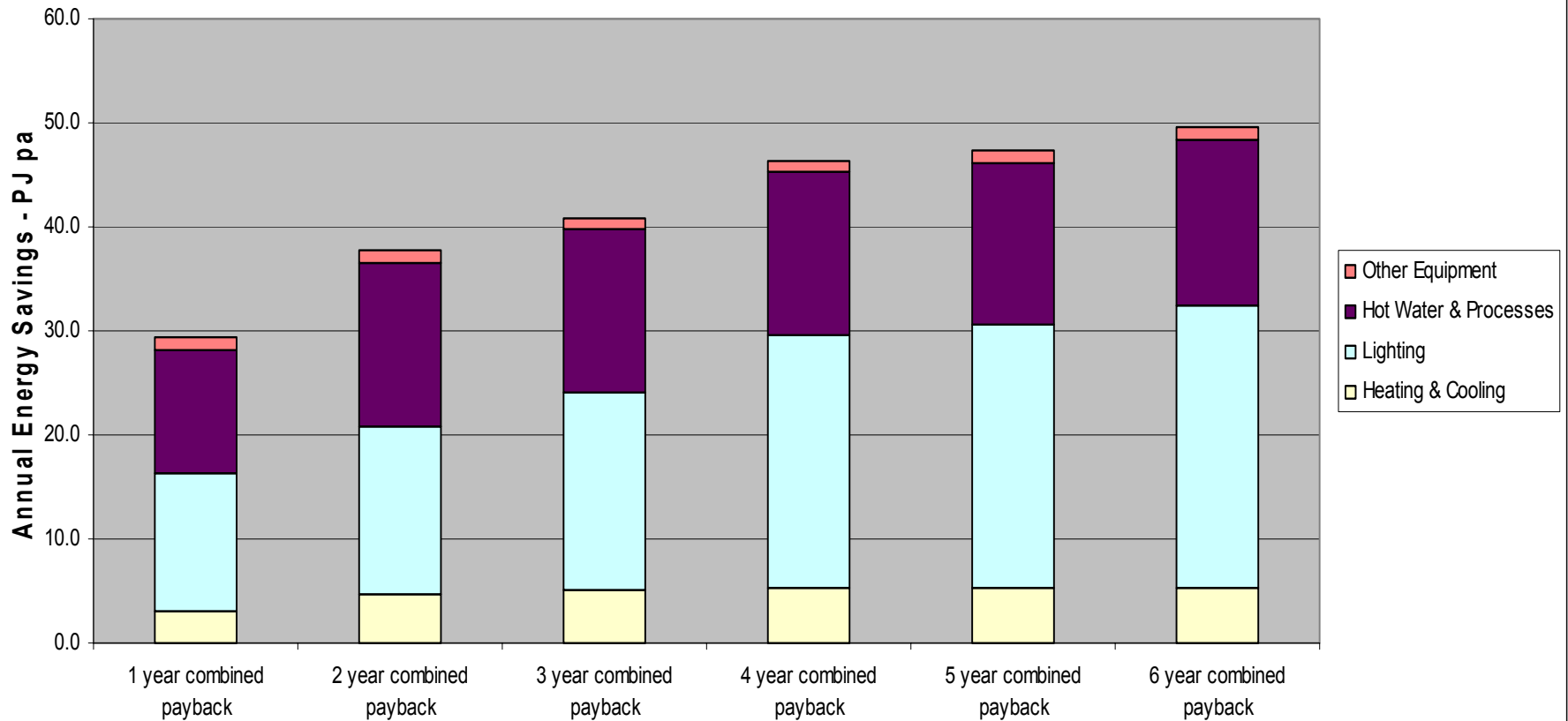
# Wholesale & Retail – EEIP Summary

<b>Combined Payback</b>	<b>Raw EEI Potential (PJ pa)</b>	<b>Raw EEI Potential (%)</b>	<b>Av. Life of Initiatives (Yrs)</b>
1 Year	29.3	23%	17.0
2 Year	37.7	30%	16.8
3 Years	40.9	32%	16.8
4 Years	46.4	36%	16.5



# Wholesale & Retail – EEI by type

Potential Energy Savings by Energy Application & Combined Payback Period



# Results summary for Commercial Sector (<=4 yr)

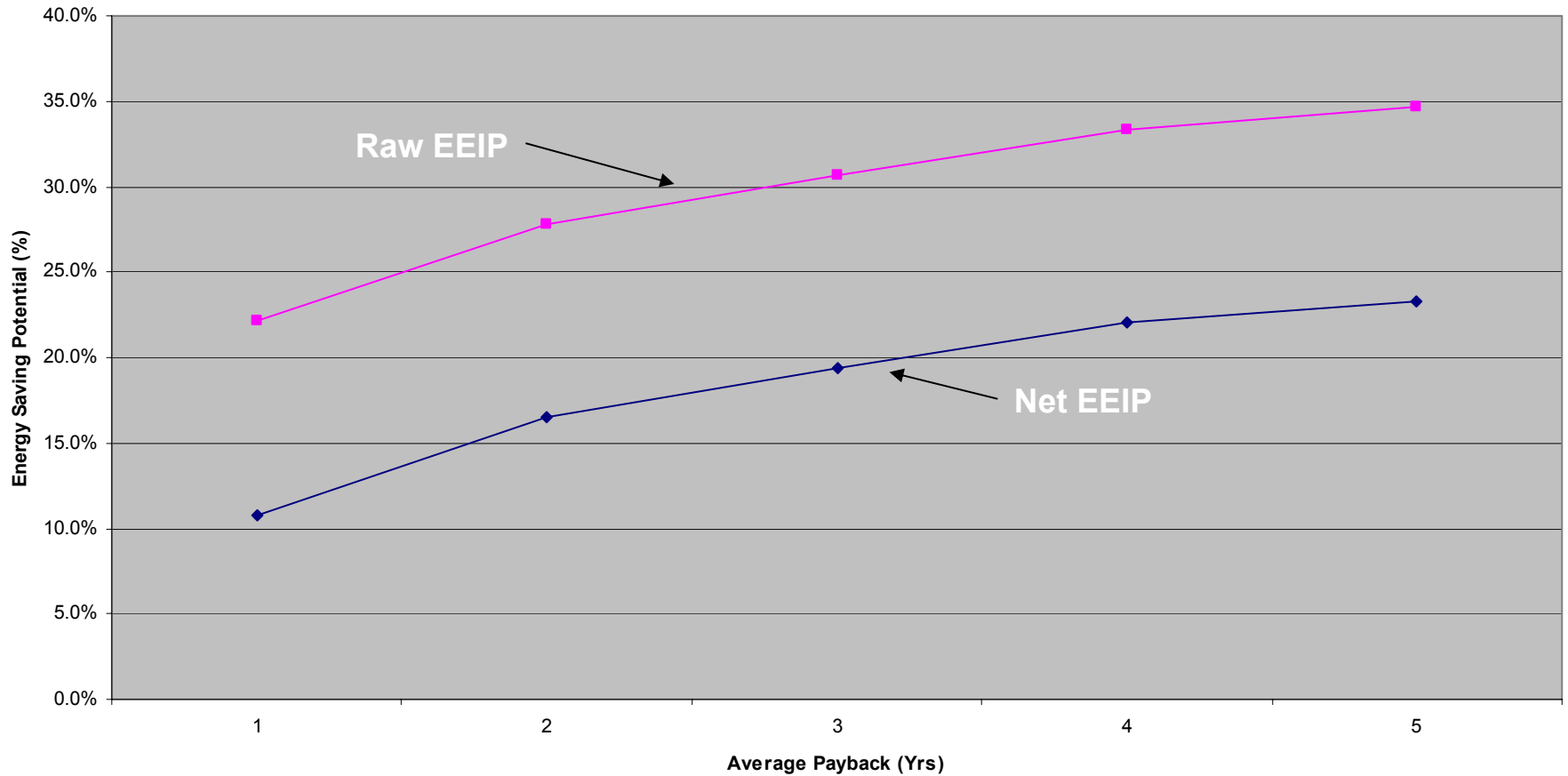
Sub-Sector	Savings (PJ)	BAU (PJ)	Net Savings (PJ)	Net Savings (%)	Avge. Payback (Yrs)
Wholesale & Retail	29.1	13.9	15.2	11.9%	0.92
Accommodation, Cafes & Restaurants	5.3	2.5	2.8	14.1%	1.19
Communications Services	1.1	0.5	0.5	7.6%	1.05
Finance, Insurance & Business	7.8	3.7	4.1	11.1%	1.04
Govt. Admin, Educat. Health & Community	15.8	9.8	6.0	7.3%	0.64
Culture & Rec, Personal Services	4.0	2.3	1.7	9.9%	1.01

# Results summary for Commercial Sector (4 yr av)

<b>Sub-Sector</b>	<b>Savings (PJ)</b>	<b>BAU (PJ)</b>	<b>Net Savings (PJ)</b>	<b>Net Savings (%)</b>
<b>Wholesale &amp; Retail</b>	46.4	13.9	32.5	25.5%
<b>Accommodation, Cafes &amp; Restaurants</b>	7.3	2.5	4.9	24.5%
<b>Communications Services</b>	1.5	0.5	1.0	14.2%
<b>Finance, Insurance &amp; Business</b>	11.0	3.7	7.4	20.0%
<b>Govt. Admin, Educat. Health &amp; Community</b>	24.3	9.8	14.5	17.8%
<b>Culture &amp; Rec, Personal Services</b>	6.0	2.3	3.6	21.7%



# Commercial Sector – EEI potential curve



# Commercial sector EEI potentials

**Questions?**



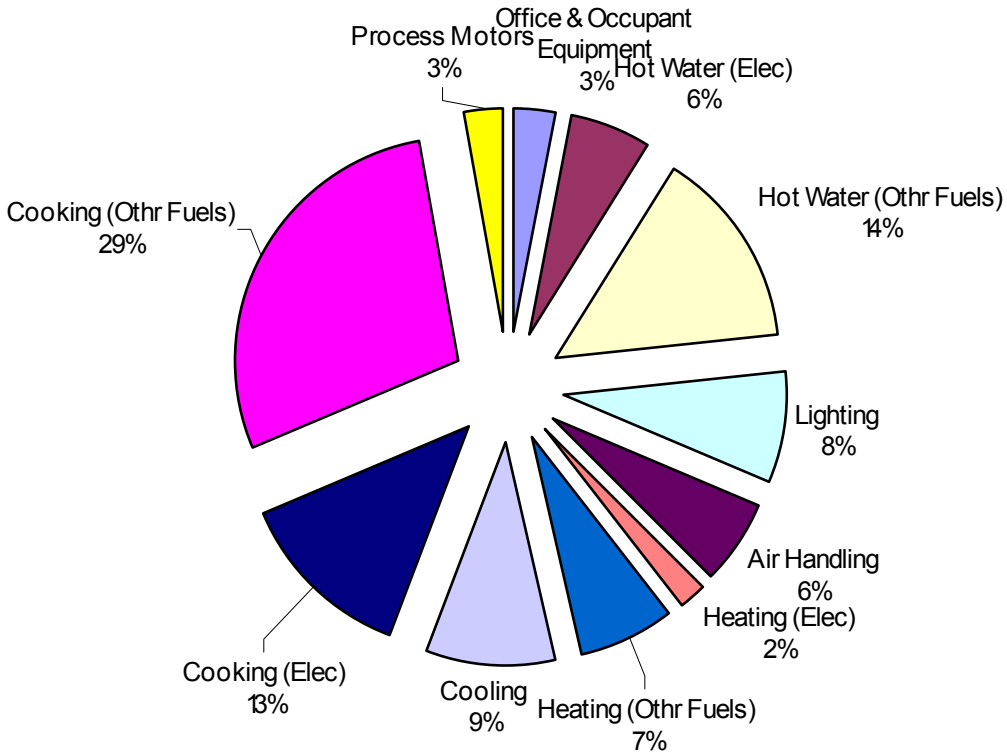
# Additional slides

- Following slides provide additional data on individual case studies, to assist with response to possible questions



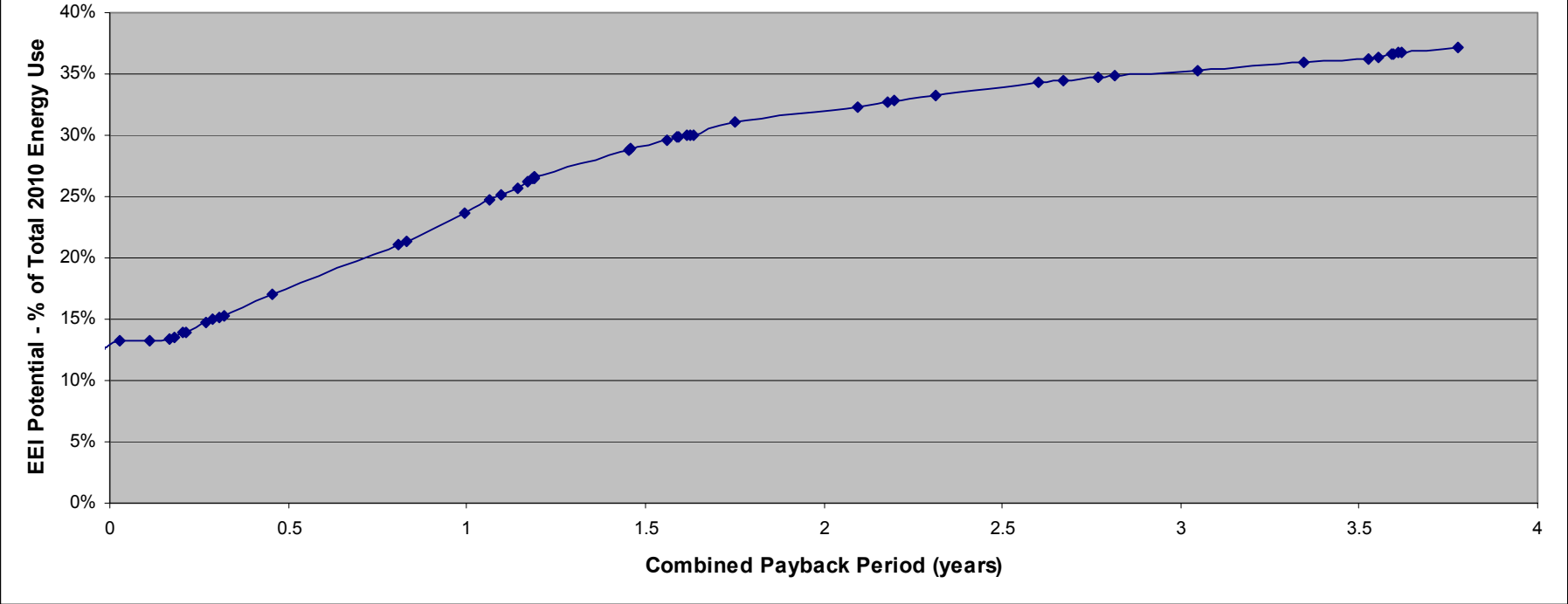
# Accommodation, Cafes & Restaurants

Energy Services Breakdown of Energy Use



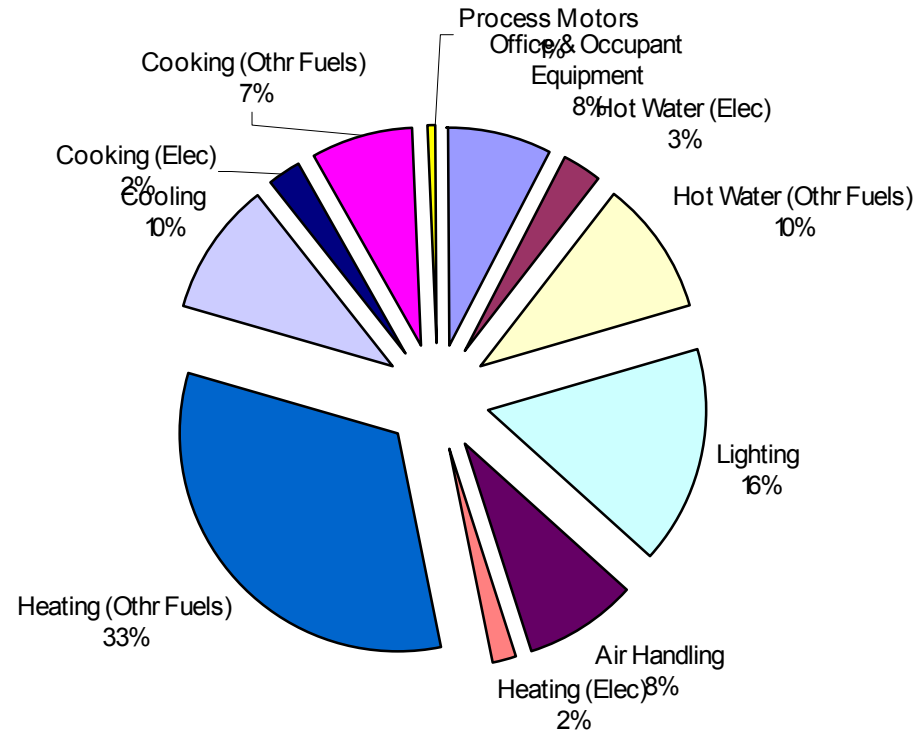
# Accommodation, Cafes & Restaurants

EEI Potential v's Combined Payback Period

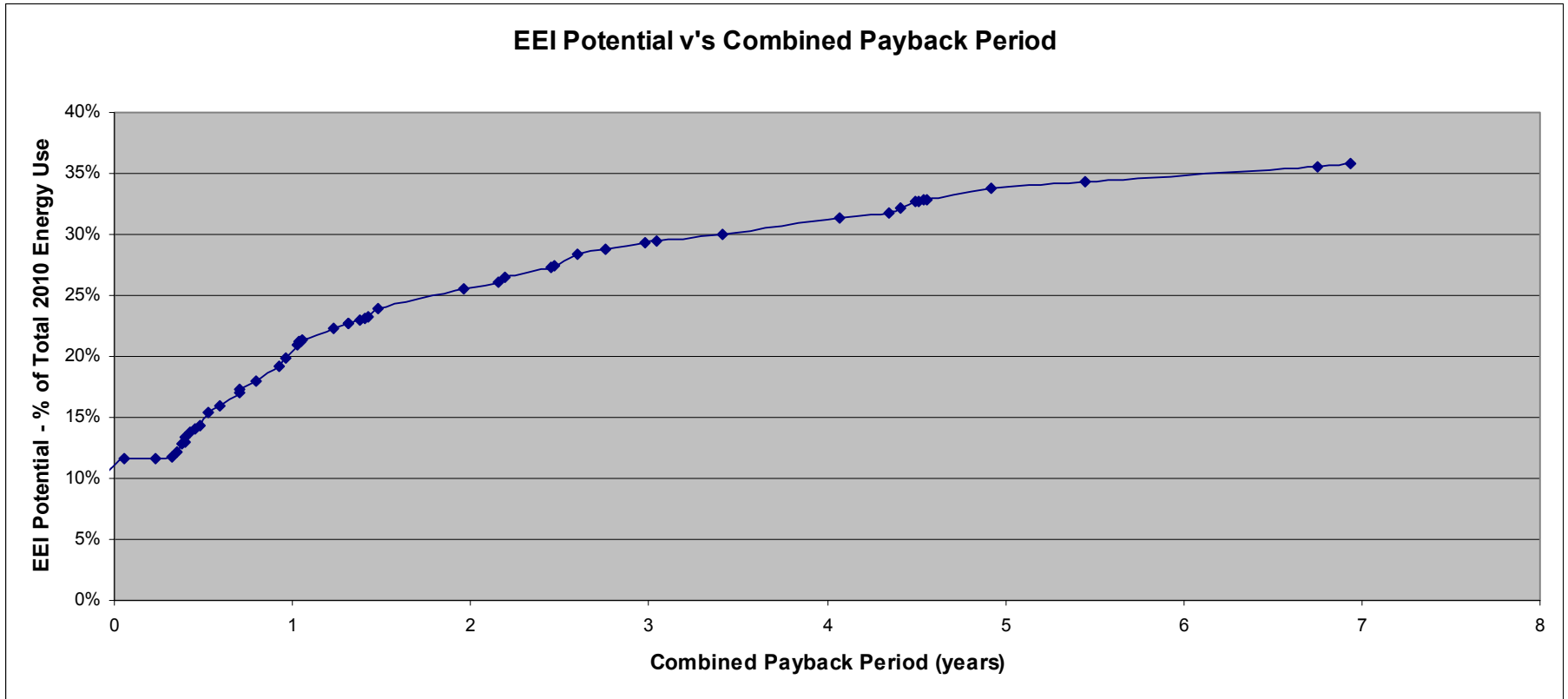


# Finance & Business

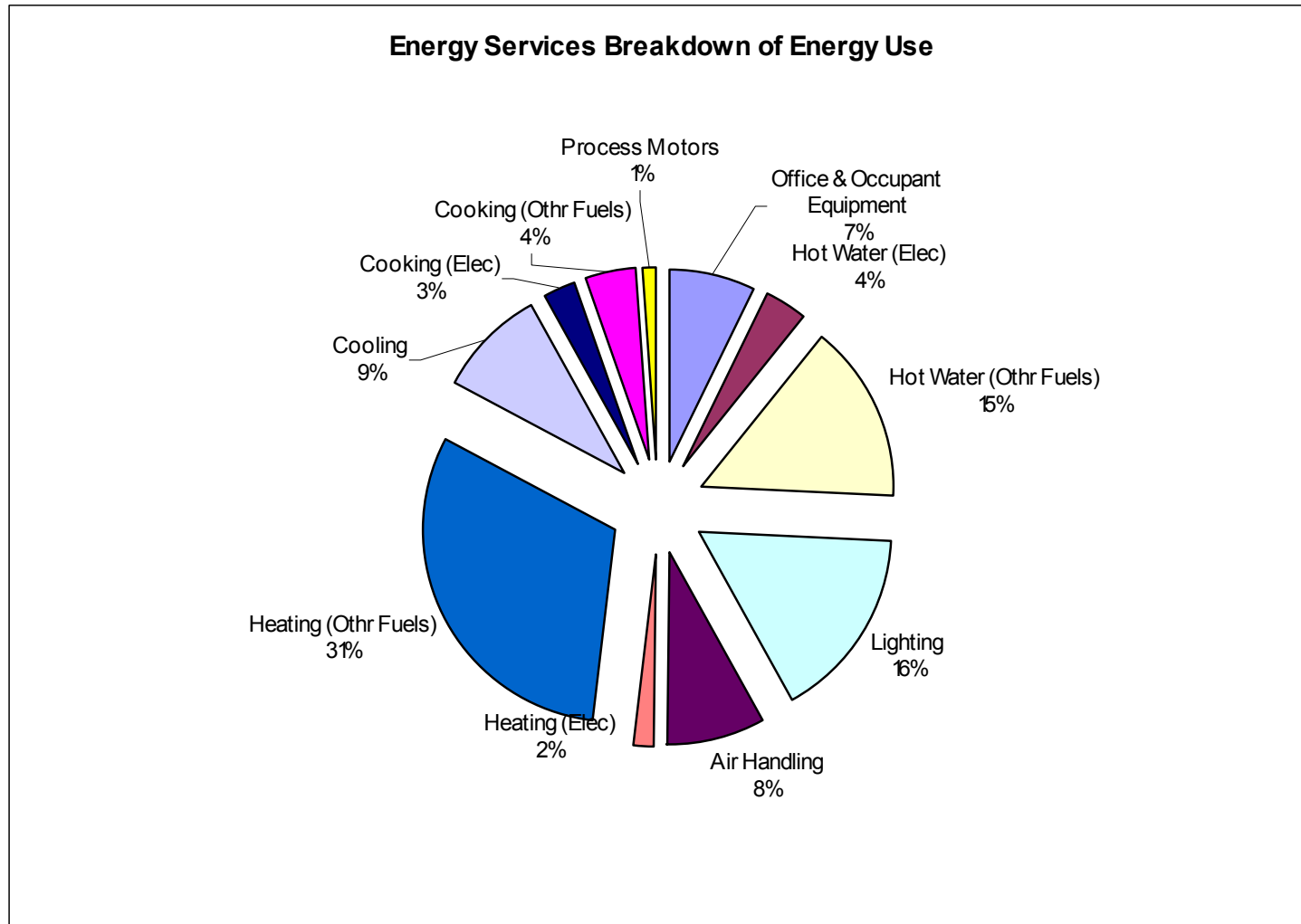
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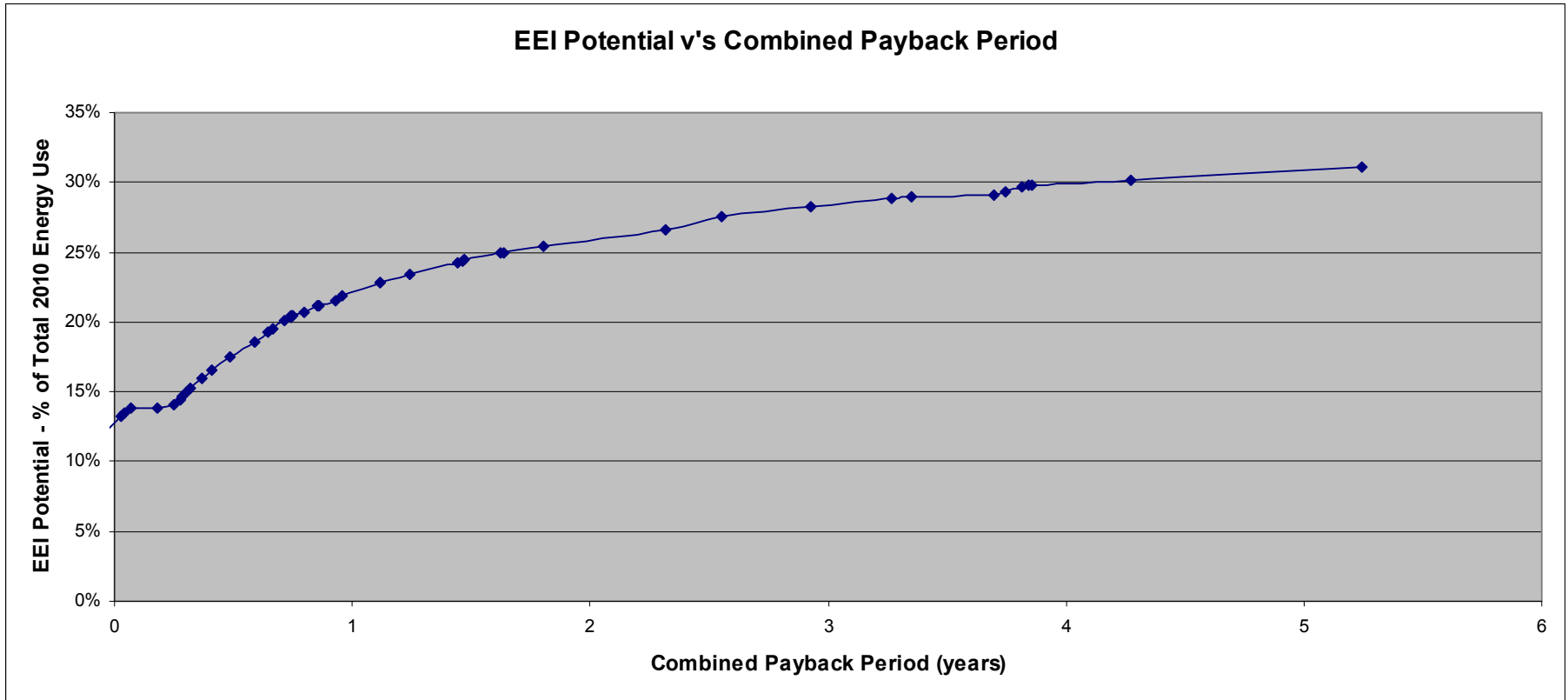
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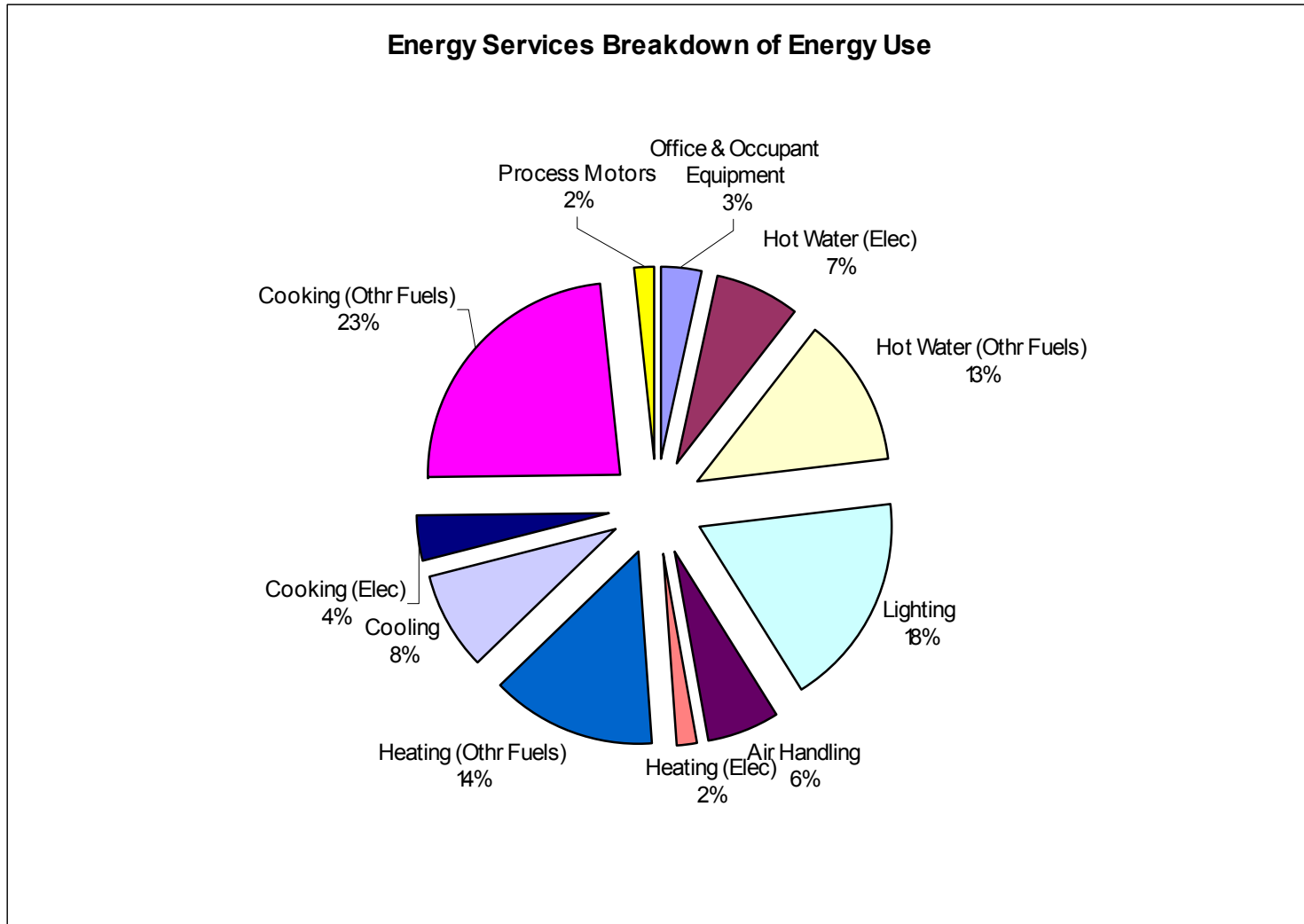
# Govt. Admin, Education, Health & Community



# Govt. Admin, Education, Health & Community



# Culture & Recreation, Personal Services



# Culture & Recreation, Personal Services

