



# CHP

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- Review of CHP Program Offering
- Experiential Learnings
- Program Results to date
  - Sector analysis of projects
  - Review technical aspects of projects
  - Example of NYSERDA results
- Conclusion



# CHP Program Highlights



- Up to 50% Technical Assistance for Qualified Projects
- \$750/kW for projects < 150 kW
- Up to \$750/kW for projects > 150 kW





# CHP Learnings

BCR's are significantly lower than traditional efficiency

Some of the variables affecting BCR's –

- Spark spread (price of gas versus electricity)
- Hours of operation
- Utilization of the waste heat
- Maintenance

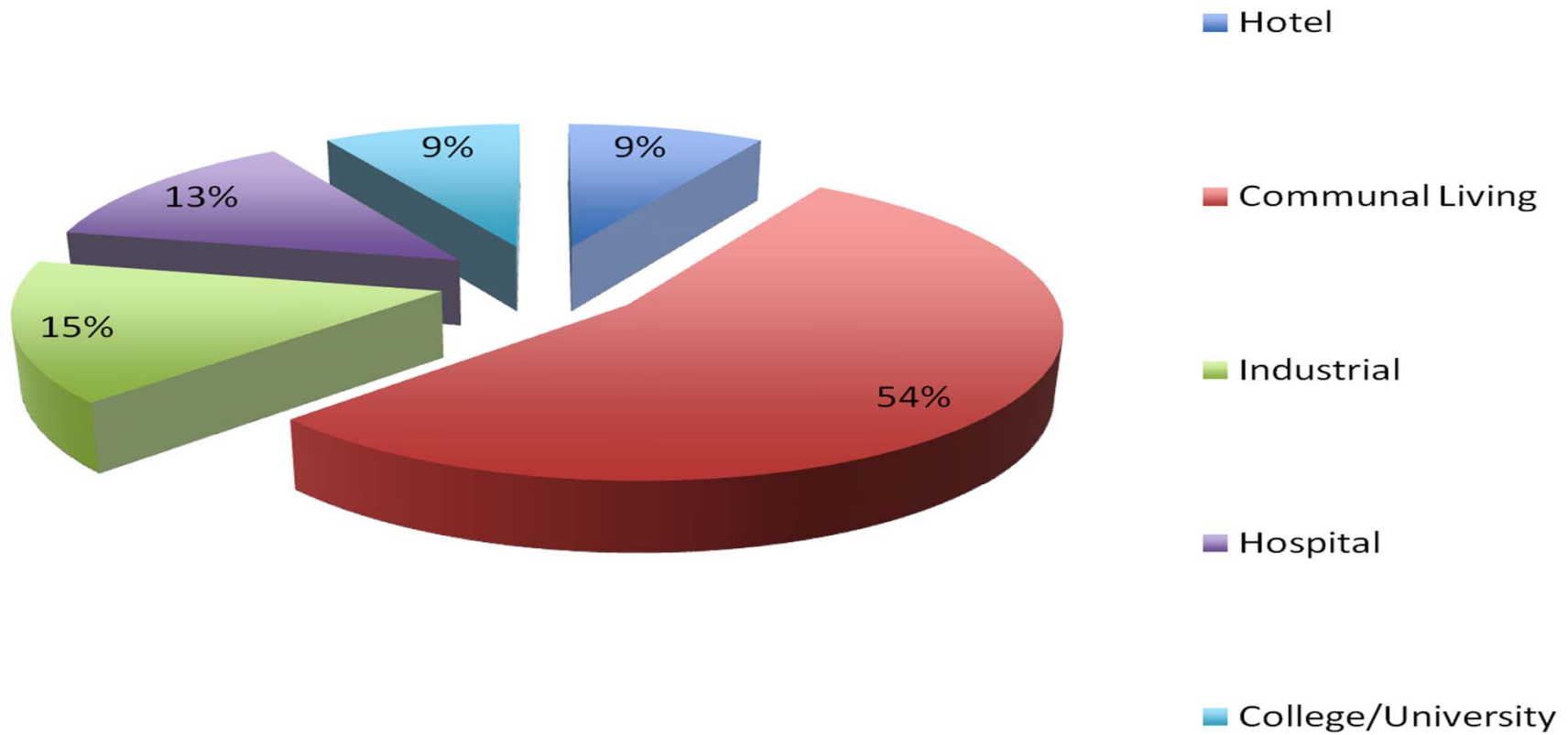
Small changes in variables have significant impacts to –

- BCR's and impact to programs
- Green house gas emissions
- Financial viability of project for the customer



# A constant heat load is the first screen

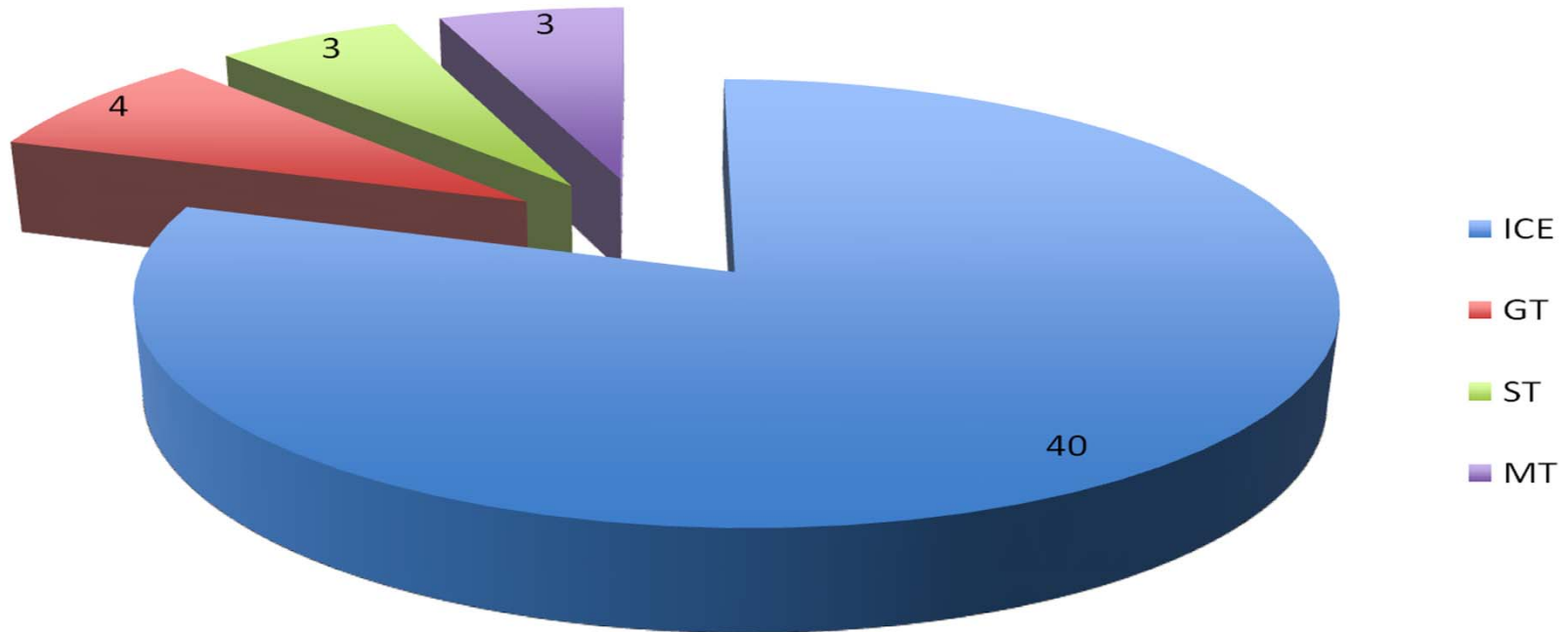
## Customer Segment





# Internal Combustion Engines are Most Common Technology

**Installed Engine Type**





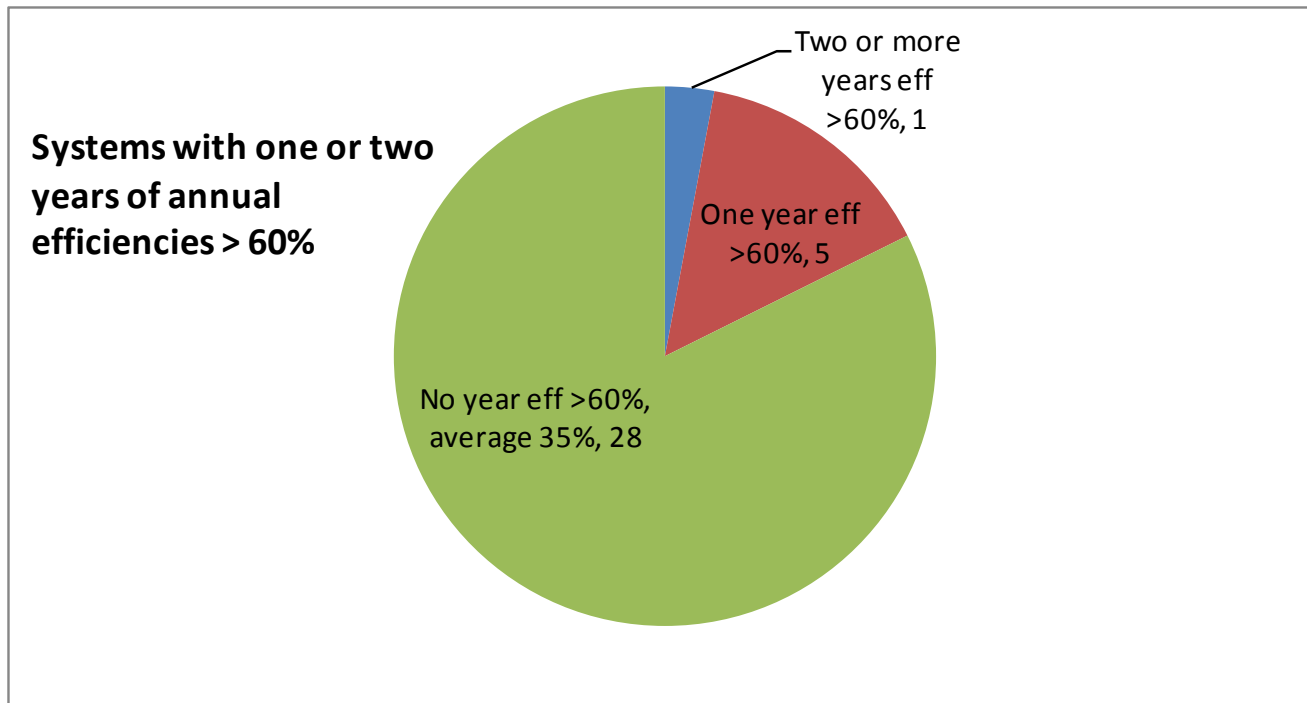
# BCR's remain challenging

Engine Type	Avg. Electric Efficiency	Total Efficiency with Heat Recovery	Avg BCR	Examples of Waste Heat Recovery
<b>Internal Combustion Engine (ICE)</b>	23%- 27%	42%- 88%	1.01-2.16	<ul style="list-style-type: none"> <li>• DHW</li> <li>• Heat dissipation</li> <li>• Space Heating</li> <li>• HW</li> <li>• DHW reheat</li> <li>• Absorber</li> <li>• Ice Melting</li> <li>• Dehumidification</li> </ul>
<b>Gas Turbine</b>	22%-24%	64%-71%	2.15-2.95	<ul style="list-style-type: none"> <li>• Steam</li> <li>• DHW</li> <li>• Space Heating</li> <li>• DHW Reheat</li> </ul>
<b>Steam Turbine</b>	45%	45%	1.28-5.97	<ul style="list-style-type: none"> <li>• Process Steam</li> </ul>
<b>Micro Turbine</b>	25.5%-29.9%	27.4%- 73.6%	1.23-2.74	<ul style="list-style-type: none"> <li>• Space Heating</li> <li>• Process Steam</li> <li>• DHW</li> <li>• Reheat</li> </ul>



# Challenges with CHP Program Performance

## Sampling of NYSERDA CHP Program Results



Source – Data pulled directly from NYSERDA reports by KEMA/ERS





# Conclusions

- CHP is for a niche market
- Net Benefits are well below program averages
- Negative impacts will result from improper applications
  - Increased green house gasses
  - Increased costs to customers
- Continuing Forward –
  - Efficiency is first fuel, then efficient generation where applicable
  - Target higher gain opportunities