Energy Guidance Document

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Energy Guidance Document

- Purpose
- Background
- Goals
- Opportunities for Evaluation
- Potential Energy Conservation Measures
- Evaluation Methodology
- Conclusion/Summary

Purpose

- Decision making guide
  - Energy usage
  - Smart energy elements within regulations
- Provides
  - Foundational information on energy in the U.S. and Texas
  - Establishes goals
  - Identifies Opportunities for Evaluation
  - Establishes Evaluation Methodology

Background: US

- Majority of energy in US from non-renewable sources
  - Coal is most used for generation of electricity.
- Renewable energy sources
  - Less negative effect environmentally
  - Sources: Biomass, geothermal energy, hydropower, solar energy, and wind energy.

Background: Texas

- Produce more electricity than any other state
- Lead nation in wind-powered generation
  - 25% of U.S. wind powered electricity (2017)
  - More than both nuclear power plants since 2014.
- Largest energy-producing & consuming state
  - Industrial sector 50% of the energy consumed

2019 EIA Outlook

- US net energy exporter in 2020
  - Natural gas and NGPLs highest growth
- NGPLs production cost low = increased use
- Notable shift in electric generation fuels
  - historically low natural gas prices
  - larger shares of intermittent renewables;
  - additional retirements of less economic existing coal and nuclear plants

2019 EIA Outlook

- Increasing energy efficiency across end-use sectors keeps U.S. energy consumption relatively flat, even as the U.S. economy continues to expand.

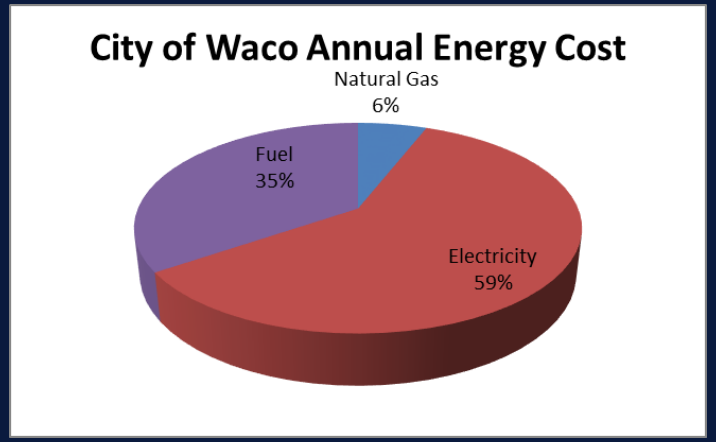
Guidance Goals for Waco

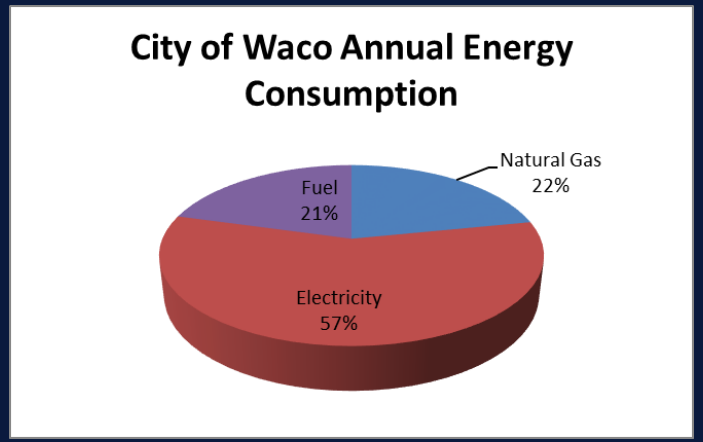
1. Lower energy costs through
   - Efficiency- using technology that requires less energy to perform the same function
   - Conservation- behavior that results in the use of less (energy, water, etc.)
   - Energy procurement/source selection
2. Reduced environmental impact, particularly air quality

Guidance Goals for Waco, cont'd

3. Responsible financial stewardship
   - ensure reliable, effective, and efficient services to Waco residents and businesses.
4. Support for circular economic principles which
   - Design out waste and pollution
   - Keep products and materials in use
   - Regenerate natural systems

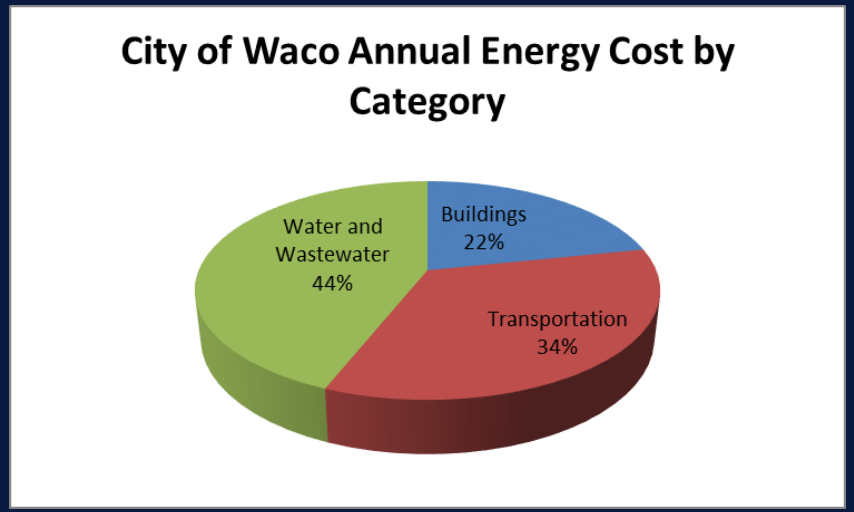
Opportunities for Evaluation: Citywide

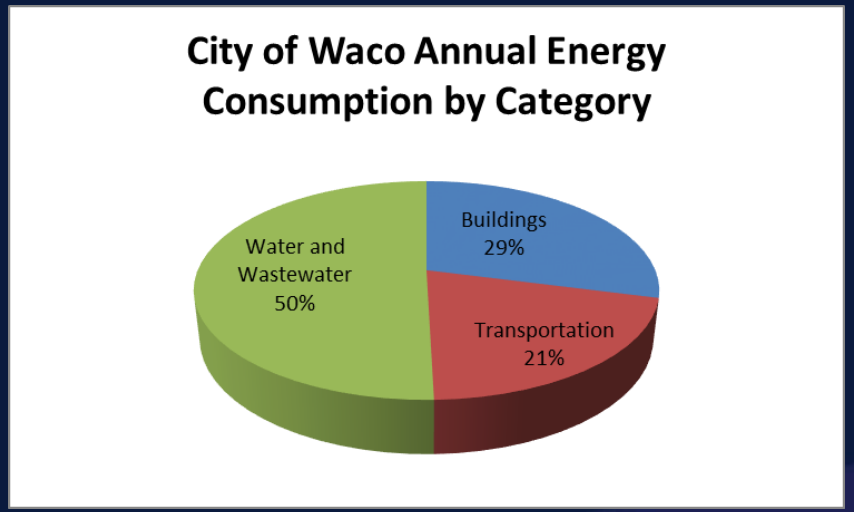




- Procuring electricity is vitally important to overall strategy
- Solicitation must consider renewable vs. non-renewable sources

Opportunities for Evaluation





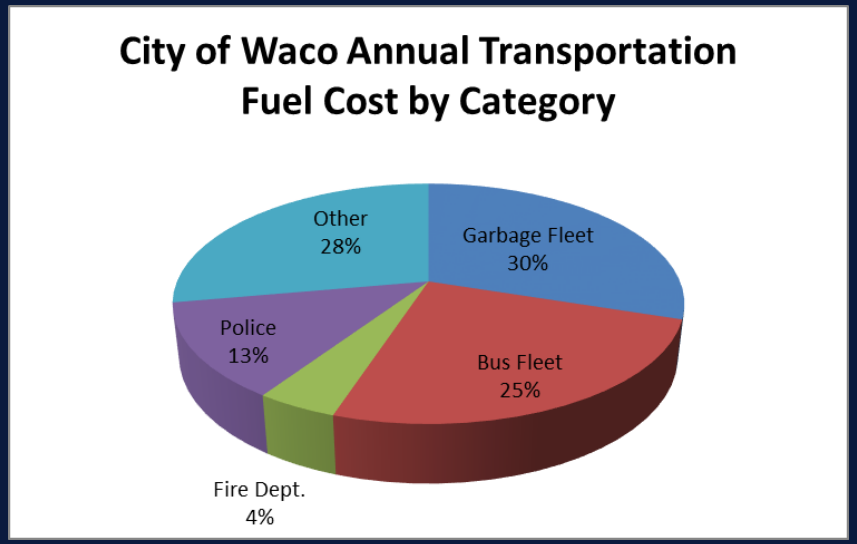
Opportunities for Evaluation: Buildings

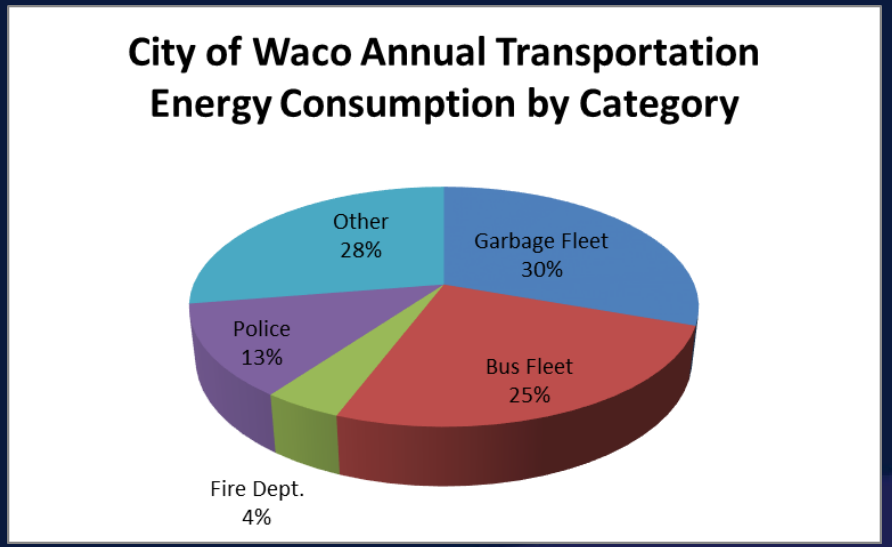
- 29% of consumption; 25% of cost
- Aging buildings opportunity for capital improvements
  - higher efficiency HVAC, lighting systems, etc.
  - Natural gas heating vs electrical
- Solar panels & LEED design elements in both renovated & new buildings

Opportunities for Evaluation: Utilities

- Largest user & cost
  - Electric powered pumping systems.
- CIP replacing aging, inefficient system.
  - Technological advances can reduce electrical consumption (eg. methane use)
- Wastewater effluent to surface water inventory address portion of statewide water supply shortfall
- Water conservation reduces water production (energy) cost

Opportunities for Evaluation: Fleet





Opportunities for Evaluation: Fleet

- 34% of cost and 21% of consumption
- Budget: Lifecycle costs analysis
- Keys:
  - Evaluation of infrastructure support costs
    - EV charging stations
    - CNG fueling stations
  - Plan for disposal of used batteries

Opportunities for Evaluation: Fleet

- Recommendation USDOE: Electric vehicle readiness planning effort
  - Goals and timelines
  - Inventory
  - Opportunities for improvement
  - Partnerships with various stakeholders
  - Education and Outreach
- Similar planning for other alternate sources
- Sustainable Resource Practices Advisory Board

Potential ECMs

- Buildings
  - Codes; Audits; Upgrades; Design; Onsite Generation
- Infrastructure
  - Efficiency; Demand mitigation; Onsite Generation
- Transportation
  - Vehicles; Charging Stations; Signals; Street Lights
- Municipal Regulations
  - Subdivision Regs; Zoning; ED incentives
- Power Supply
  - Contracts; Waste to Energy

Development & maintenance of detailed inventory critical to developing ECMs (Appendices)

Evaluation Methodology

- NIST Handbook 135 and Annual Supplement
  - guides to applying Life-Cycle Costing (LCC)
- Discounted Payback (DPB)
- NIST BLCC program
- Systematic analysis identifies ECMs that
  - improve the environmental footprint of the city
  - save tax dollars

Next Steps

- Apply for Grant Funding for charging stations.
- Negotiate electricity contract; priority to renewable
- Continue building audits
- Complete initial survey information (appendices)
- ID projects in partnership w/ selected electricity provider
- Revision of development regulations to encourage renewable energy systems in new developments

Summary

- Purpose
  - establish goals
  - identify opportunities for evaluation
  - establish methodologies to perform the evaluation
- Not a strategic plan– an evolving guide
- Achieves energy consumption that
  - Is environmentally friendly
  - fiscally responsible, and
  - consistent with City Council's desire to deliver quality public services to Waco's residents and businesses.