
Electrical Power Supply Planning

August – October 2009

Choices must be made to ensure a reliable low-cost energy supply



Phil Lusk
Bob Kajfasz
City of Port Angeles
Department of Public Works and Utilities

Topics

- Background
 - Energy Accounting Basics
 - City Electrical Power Loads and Resources
 - Future Considerations
 - Questions/Comments
-

Bonneville Power Administration (BPA)

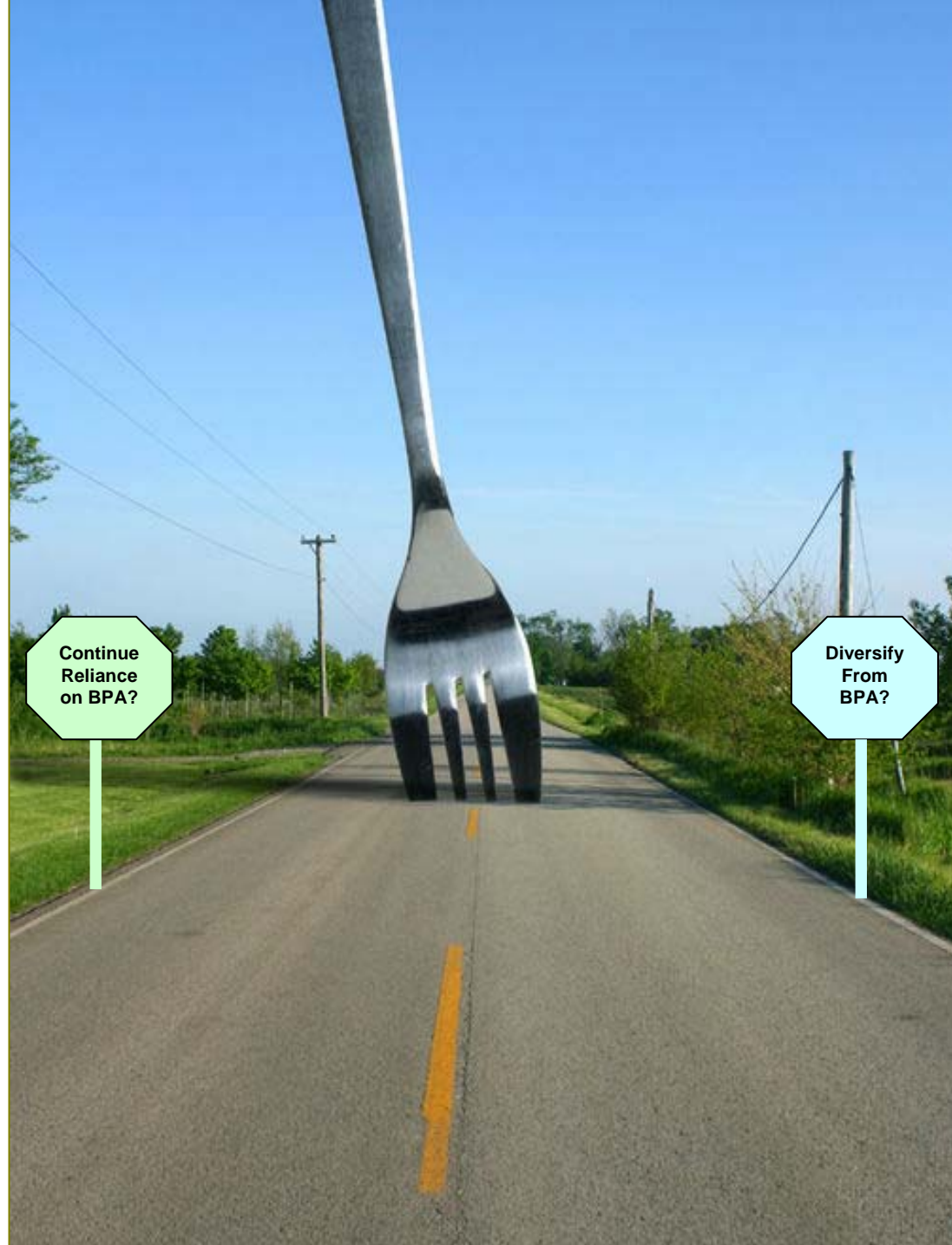
- New BPA electrical power sales agreement
 - “Tier 1” rate for low-cost federal-based resources
 - “Tier 2” rate for new load growth
 - Charges the incremental cost for new power plants that are much more expensive to build and operate
-

Tiered Rates Begin October 1, 2011

By November 1, 2009, the City is responsible for choosing how to provide for its future electrical energy growth

New resources and technology, and additional conservation are needed

The choices made must ensure a reliable low-cost electric energy supply



Tier 2 Power Supply Options

- Continue reliance on BPA
 - **BPA Short-Term Rate Alternative**
 - BPA Load Growth Rate Alternative
 - BPA Vintage Wind Rate Alternative
 - Diversify from BPA
 - **Additional Energy Conservation**
 - Local Power Generation
 - Landfill Gas
 - Biomass Cogeneration
 - Purchase Power Agreement with Others
 - Market Purchase from Others
-

Energy Accounting Basics

- What is a BTU and KWh?
 - BTU is a British thermal unit; a basic energy unit
 - The amount of heat required to raise the temperature of one pound of liquid water by one degree from 60° to 61°Fahrenheit at a constant pressure of one atmosphere
 - About equal to one large kitchen match
 - KWh is a kilowatt-hour; a smaller energy unit used by electric utilities
 - About equal to 3413 BTU
 - If a 100-watt light bulb is on for 10 hours, the energy used is 1 KWh ($100\text{ W} \times 10\text{ h} = 1000\text{ Wh} = 1\text{ KWh}$)
-

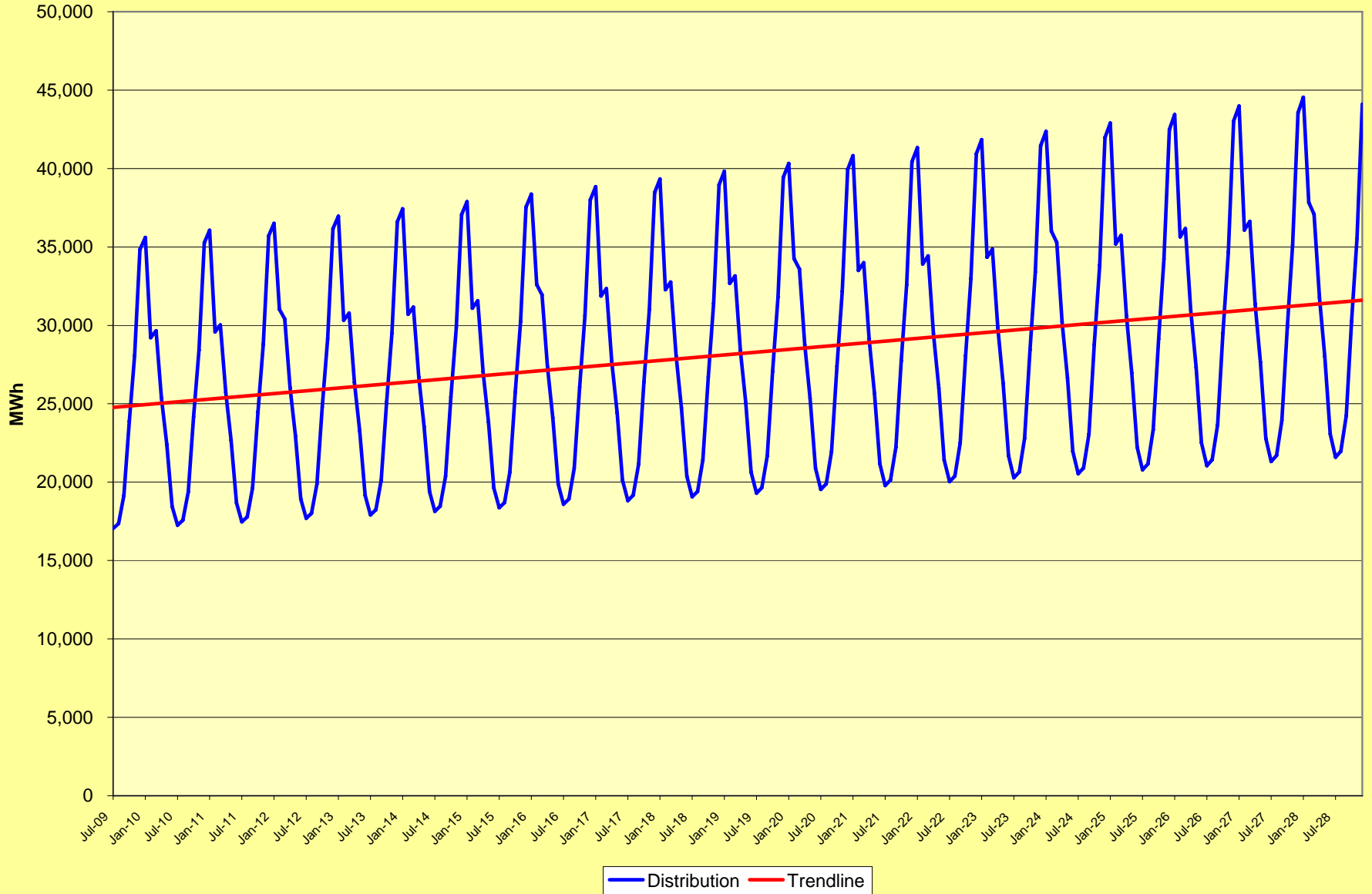
Energy Accounting Basics

- What is a MWh and aMW?
 - MWh is a megawatt-hour; a larger energy unit used by electric utilities
 - If 1000 100-watt light bulbs are on for 10 hours, the energy used is 1 MWh ($1000 \times 100 \text{ W} \times 10 \text{ h} = 1,000,000 \text{ Wh} = 1 \text{ MWh}$)
 - aMW is average megawatt; the average number of MWh used over a specified time period
 - If 8760 100-watt light bulbs are on for 10 hours for one year, the energy used is 1 aMW ($8760 \times 100 \text{ W} \times 10 \text{ h} / 8760 \text{ h/year} = 1 \text{ aMW}$) or enough energy to serve 550 average homes in Port Angeles in a year
-

Port Angeles Electric Utility Background

- Principal load centers
 - Industrial Transmission system
 - Located at the crook of the Hook
 - Distribution system
 - Everyone else
-

City of Port Angeles Distribution Utility 2009 - 2028 Energy Forecast

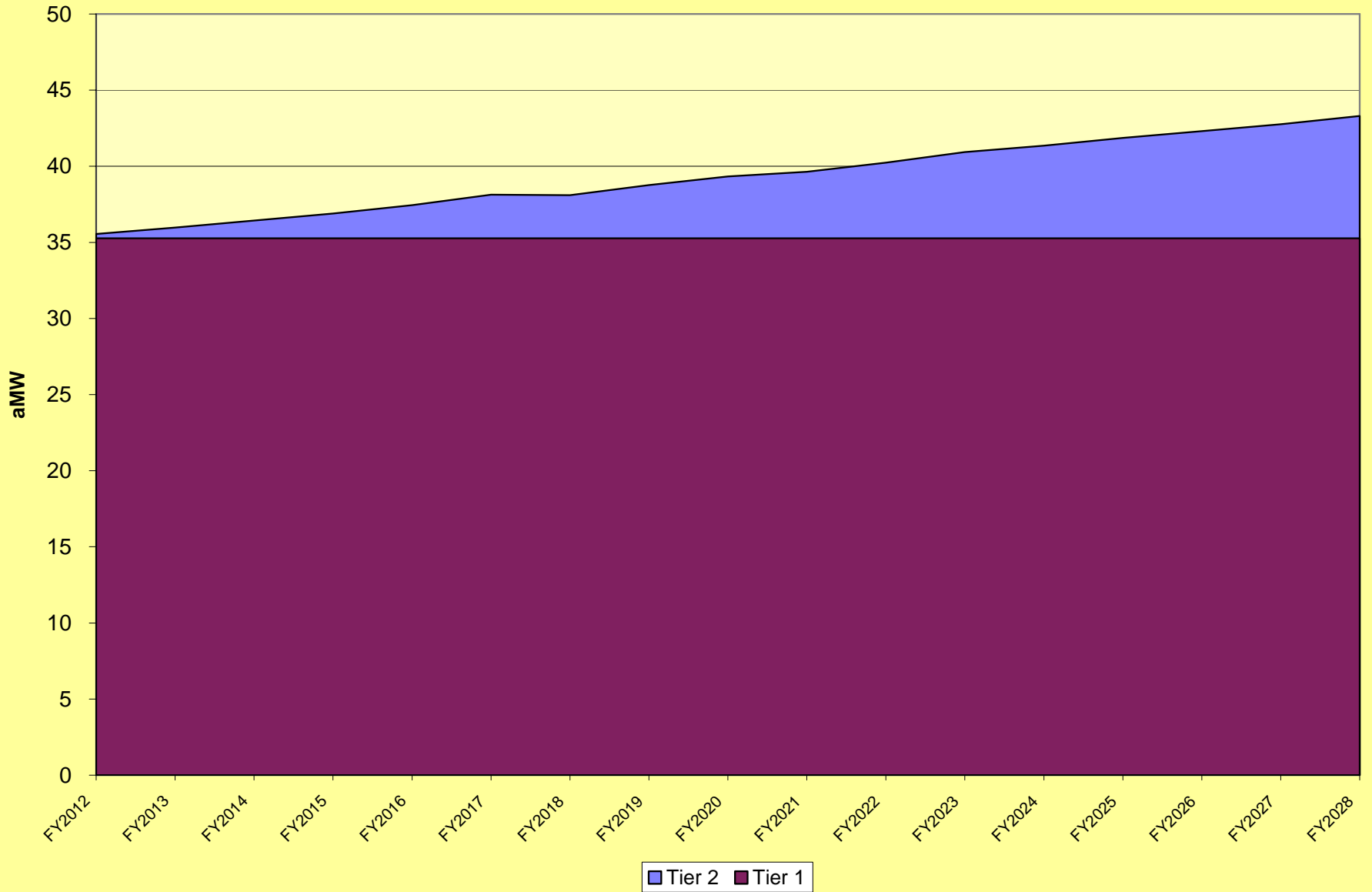


Tier 2 Power Requirements

- Could exceed BPA's Tier 1 allocation by 1.026 aMW in FY2014
 - ~\$500,000 in added wholesale power costs
- Depending on load growth, City may require more than 8 aMW of Tier 2 power by FY2028
 - ~\$7,000,000 in added wholesale power costs

NOTE: Wholesale power costs currently represent about two-thirds of the total electric utility operating expenses

City of Port Angeles Distribution Utility 2011 - 2028 Power Sources



Reduce “Gap” with Two Priorities?

- Seek all cost-effective conservation as the favored resource for meeting future loads
 - City Council directed staff to look for options to accelerate those energy savings in January 2010
 - Evaluate renewable energy & cogeneration
 - City Council expressed preference for resources located within City utility’s service territory
 - Staff was directed to continue evaluations and to report findings no later than September 2011
-

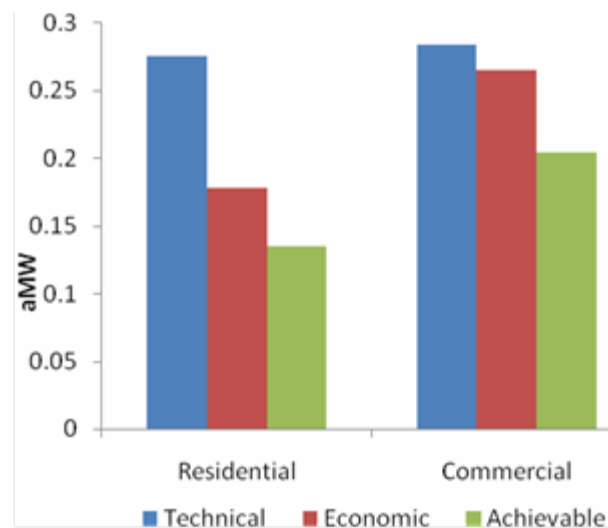
Conservation Program History

- Strong Residential Program since 2001
 - Lighting, weatherization, HVAC, showerheads
 - Program Benefits
 - Reduces energy consumption
 - 1.4%/year / 1.1 aMW **accumulated savings**
 - Direct Customer Savings
 - \$ 532,000/year
 - Total Economic Benefit w/ Multiplier Effect
 - \$1,235,000/year
-

Estimated Conservation Potential

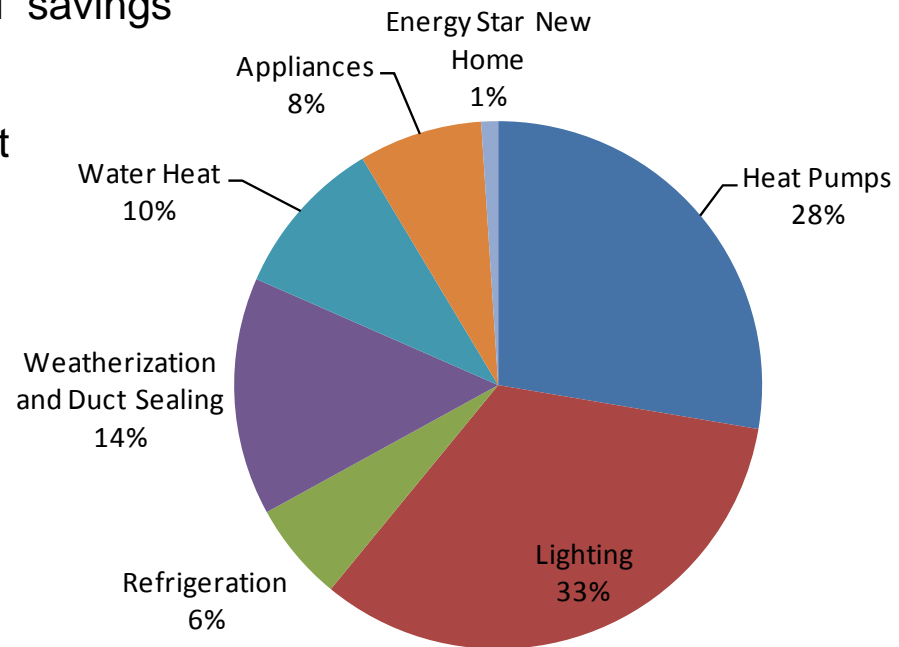
Achievable Conservation Potential (aMW)

	Annual Average	10-year	20-Year
Residential	0.14	1.4	2.8
Commercial	0.20	2.0	4.1
Total	0.34	3.4	6.87



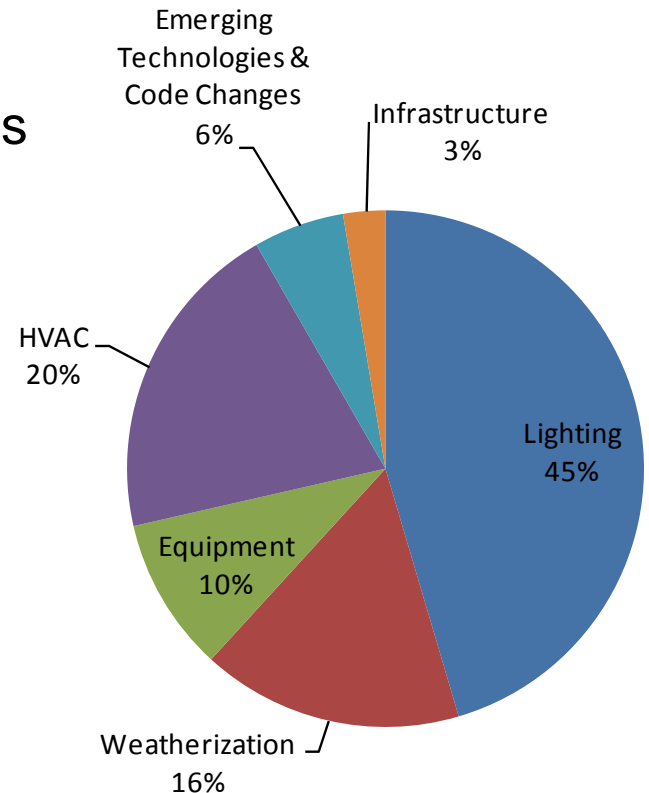
Future Residential Savings – 0.14 aMW/year

- Heat pump upgrades and conversions
 - Much has already been done, but significant potential still remains
- Lighting
 - CFLs can provide significant savings at low cost and at no-cost post-2014 when standard incandescent bulbs will be phased out
 - New technologies may provide additional savings
- Weatherization and Duct Sealing
 - Many homes have been weatherized, but still an opportunity to do more
- Water Heating
- Appliances and Refrigeration
 - Refrigerator/freezer decommissioning



Future Commercial Savings – 0.20 aMW/Year

- Lighting
 - Low implementation costs and lots of potential
- Weatherization and HVAC
- Emerging Technologies and Code Changes
 - Not much can be achieved by electric utility
- Equipment
 - Refrigeration
 - Motors and controls
- Infrastructure
 - Municipal water and waste water pumping
 - Street, roadway and yard lighting



Action Plan Summary

- Implement increased conservation program beginning January 2010
 - 2x increase over current levels
- Commit the resources to achieve the goals
 - A two-fold budget increase is needed
 - Enhanced incentives
 - Marketing/promotion
- Design and plan new or revised programs
 - Set program goals and targets
 - Identify and engage all parties (e.g., customers and vendors)
- Establish enhanced measurement and verification protocols

Action Plan – Near Term (5 years)

- Residential program
 - Heat pump (standard and ductless)
 - Lighting (CFLs & L.E.D lamps in future)
 - Weatherization
 - Appliances
- Commercial program
 - Lighting
 - Retrofit and new construction
 - Target small retail and office complexes
 - Small building weatherization
 - Buildings using zonal electric heat
 - Appliances, especially refrigeration and laundries
 - Specialty programs such as *Energysmart Grocer*

Summary

- City Council decision for Tier 2 power
 - November 1, 2009 deadline
 - Conservation has been an effective resource
 - Likely most cost-effective means of meeting initial Tier 2 power requirements
 - Customer and indirect multiplier effect benefits will help strengthen the local economy
 - Program will only work if YOU participate
-

Thank you ... Questions?

Phil Lusk
City of Port Angeles
Department of Public Works and Utilities

360.417.4710

plusk@cityofpa.us
