



# A Conversation about Energy Conservation

Unitarian Universalist Church of Indianapolis  
October 19, 2010

# Why conserve?

- \$\$\$
- Climate change
- Resource depletion

# Sources of Energy

- Natural gas
- Electric
- Gasoline
- Solar
- Human
- Coal
- Oil

# Uses for Energy

- Heating and Cooling Air  
Furnaces, boilers, A/Cs
- Lighting  
General, emergency, accent
- Water  
Heating, cooling

# Uses for Energy Continued

- Cooking, coffee
- Machines

Mowers, copiers, computers, refrigerators, sound systems, vacuum cleaners, cars/buses

# Basic Energy Concepts

- Heat wants to go to cold – Delta T
- Infiltration
  - Leaks
  - Exhaust fans
- Efficiency
  - Point of generation
  - Transportation
  - Point of use

# Basic Energy Concepts continued

- Interaction of systems, e.g., lights add to A/C load but help the furnace (cost of electric vs. gas)

# Use Less! No Cost!!

- Turn things off
- Take advantage of nature
  - Open doors and windows
  - Use natural light
  - Let the sun shine in in the winter

# Use Less! Tools to Consider

1. Timers
2. Motion sensors
3. Photo cells
4. Compact florescent bulbs
5. HPS bulbs
6. T-8 florescent bulbs
7. LED bulbs
8. Setback and remotely monitored thermostats \*\*\*
9. Weather stripping
10. On demand water heaters\*\*\*

# Use Less! Tools to Consider Continued

11. Insulation on pipes, ducts, tanks, and buildings
12. Insulated shades,
13. High efficiency furnaces, air conditioners, and refrigerators
14. Geothermal heat pump

# Use Less!

Continued

15. Storm windows,
16. Overhangs,
17. Reflective surfaces,
18. Photovoltaic electric,
19. Solar water heater,
20. Landscaping

# Where to Start

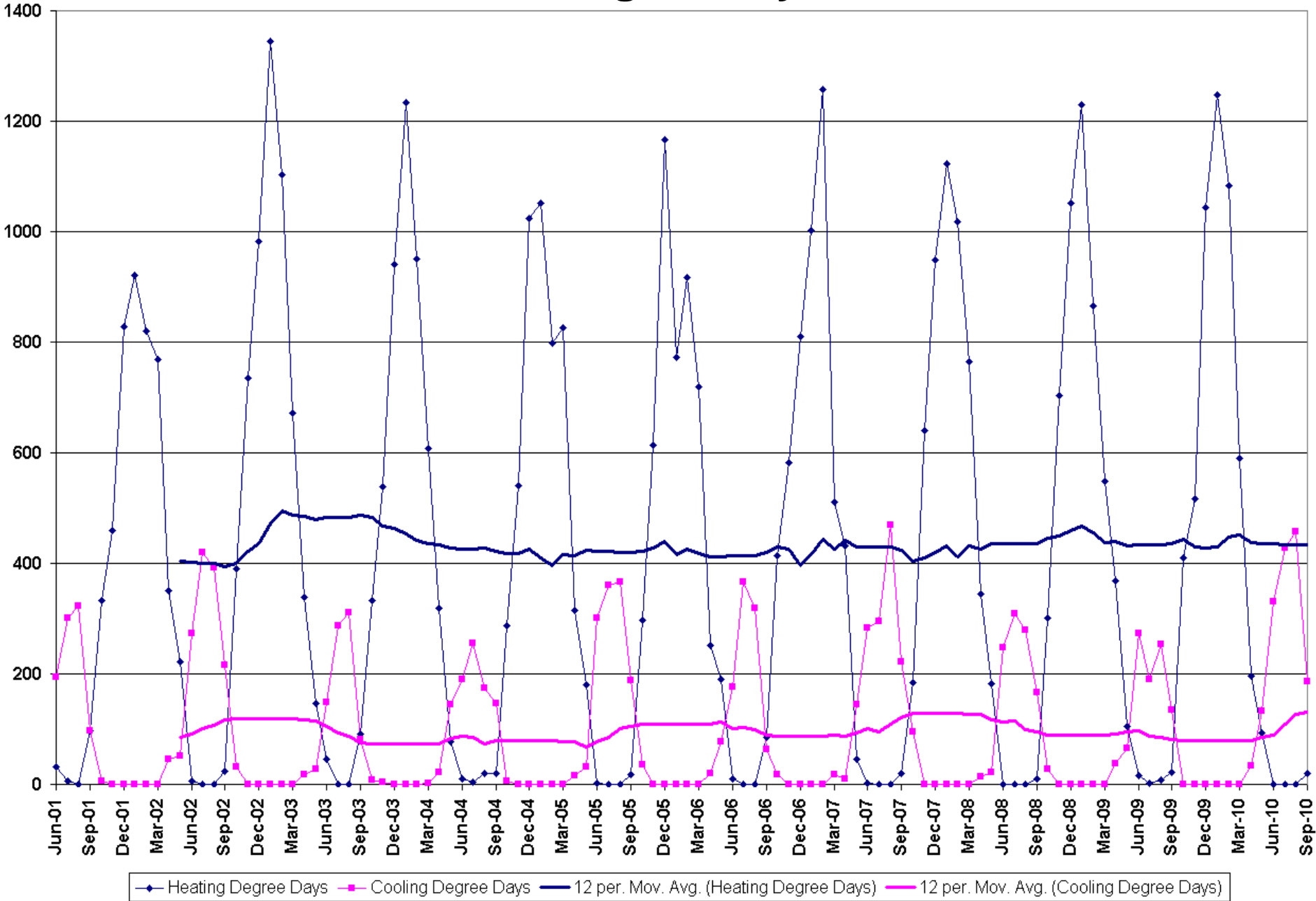
- Graph utility bills\*\*\*

Matt Bassett

# Degree Days

- $DD = (\text{Max Temp} + \text{Min Temp}) / 2 - 65F$ 
  - Heating Degree Days = Sum of negative DD
  - Cooling Degree Days = Sum of positive DD
- NOAA tracks this by city by week or month going back to 1997
  - [http://www.cpc.noaa.gov/products/analysis\\_monitoring/cdus/degree\\_days/](http://www.cpc.noaa.gov/products/analysis_monitoring/cdus/degree_days/)
- Useful to help understand the needed heating or cooling required

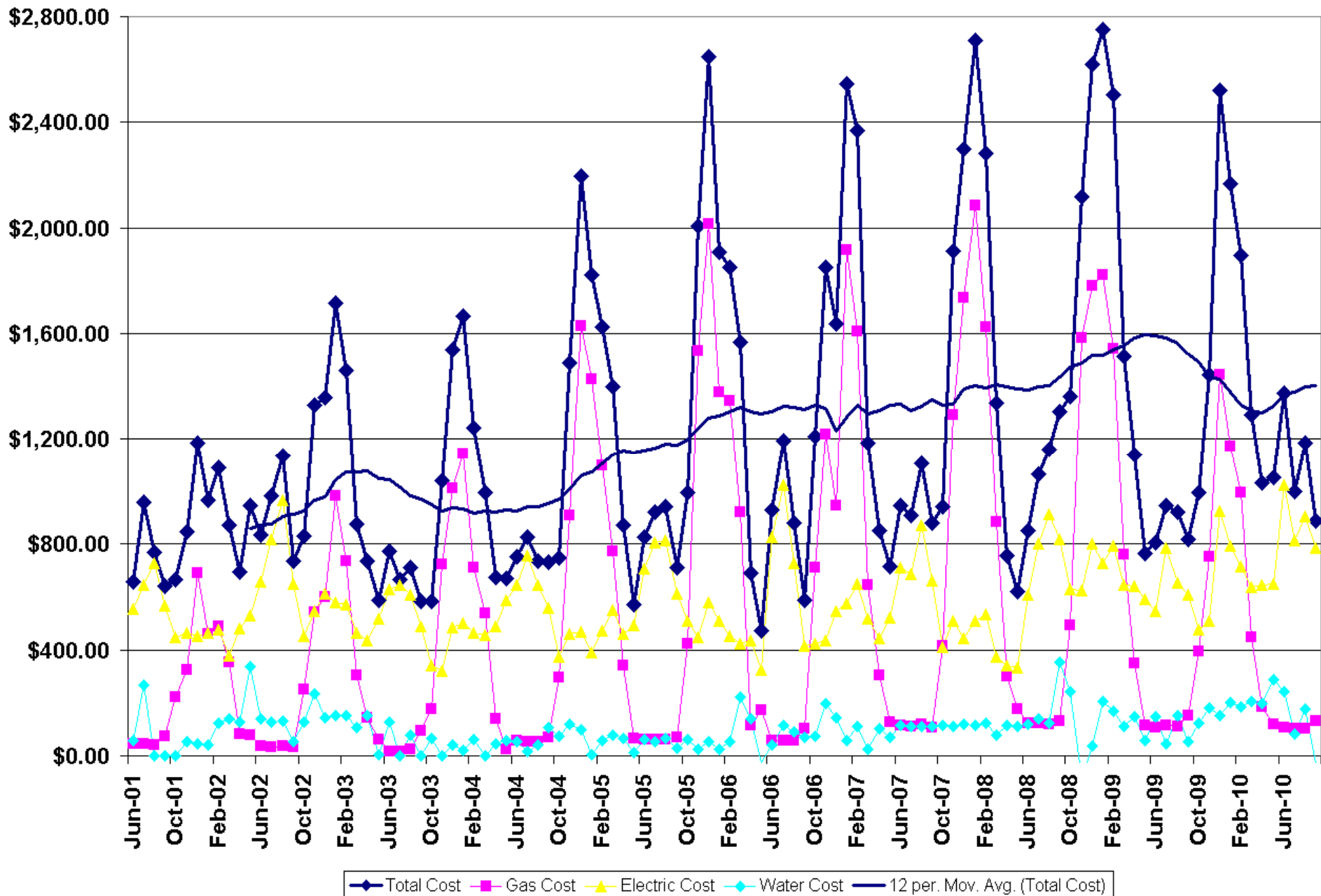
# Degree Days



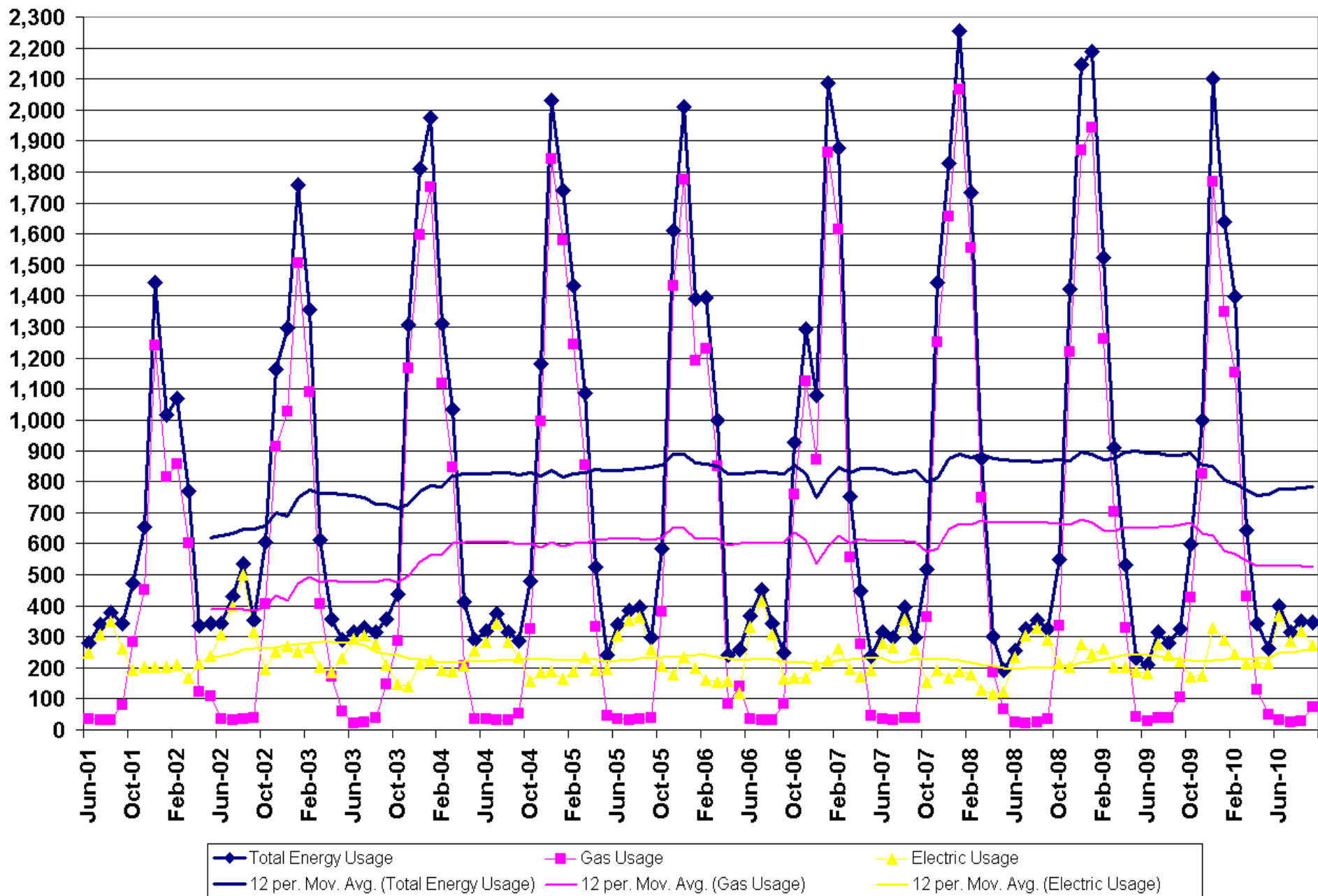
# Types of Graphs

- Trends of cost (with 12 month averages)
- Trends of usage (with 12 month averages)
  - 1 kWh = 0.03413 therms so gas and electric usage can be totaled
- Usage by particular building
- etc.

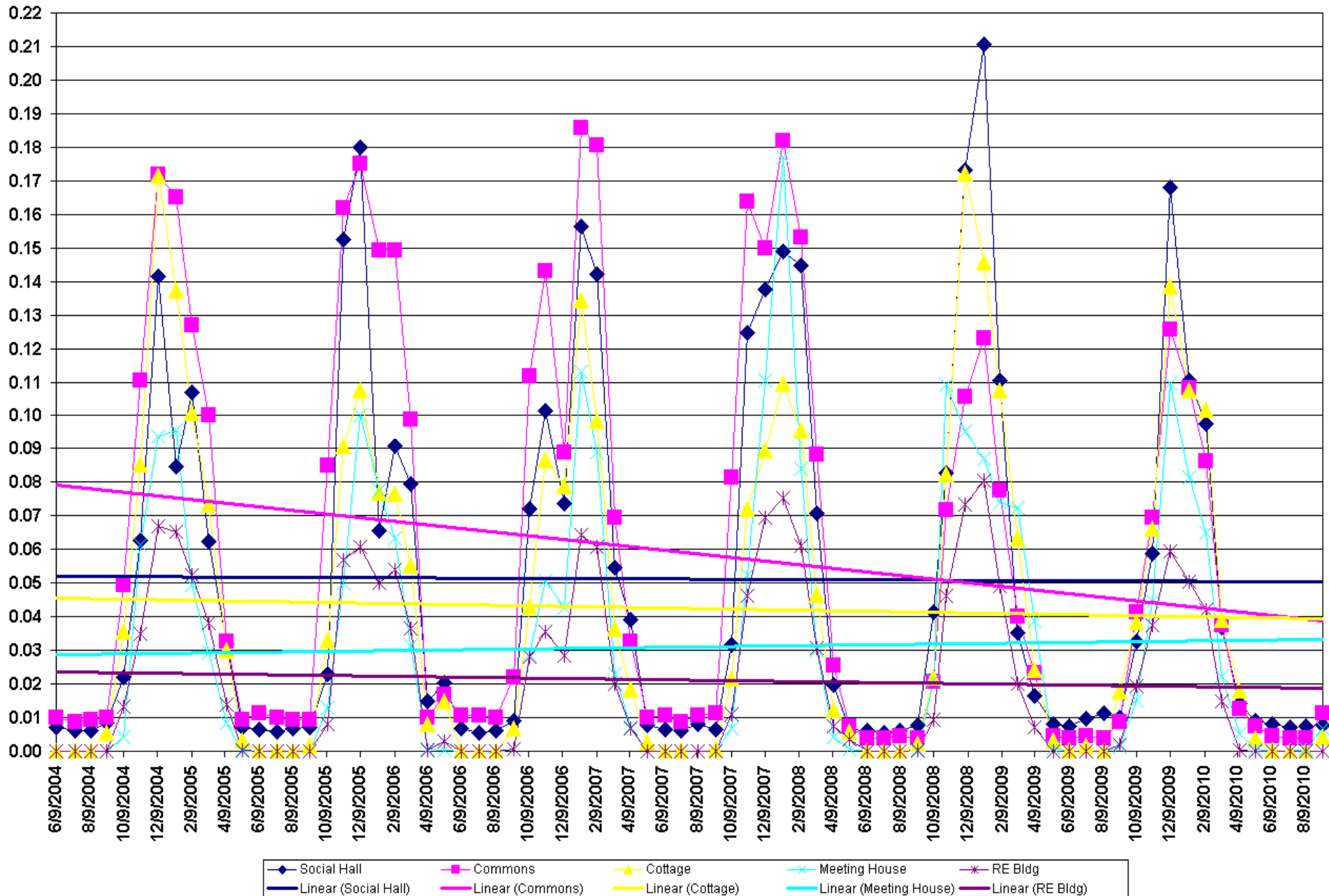
# Total Monthly Utility Expenses (and 12-month average)



# Total Monthly Energy Usage (& 12-month average) (Therms)



# Monthly Therm Usage per SqFt by Building



# Why Track Utility Usage?

- Until you can see the waste, you don't know where to go after it
- Once you make improvements you can see the impact

# Where to Start continued

- Do a facility “energy” audit\*\*\*

Jelling Lai and John Milligan

# Where to Start continued

- Do the obvious, easy and inexpensive things first
- Reduce infiltration – exhaust fans, leaks in building, weather stripping
- Use less/turn it off
- Delta T – setback thermostats

# Where to Start Continued

- Purchase “green” electric
- Prioritize cost effectiveness of options
- Just do it!

# Unique Issues with Churches

- Crowds, then no one
- Unpredictable schedules
- Management/ownership
- Maintenance
- Lack of money
- Various needs and desires of customers
- Pianos and organs

# Goal for Our Churches

- Reduce energy consumption by 30% in three years

# Open Discussion

- Questions
- Comments
- Stories
- Plans

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