

# Polk County Board 25 x 2025 Plan Presentation

Presented by:  
Polk County Energy Independence Team  
Polk County Renewable Energy Committee  
January 18<sup>th</sup>, 2011





# Polk County 25 by 2025 Plan

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## Background Info:

### Brief list of accomplishments to be proud of:

- **Proactive Property Committee and staff**  
–Have implemented and continue to implement energy efficiency projects
- **Engine idling policy**
- **2% annual fuel reduction resolution**
- **Performance contracts with Johnson Controls**
- **1<sup>st</sup> county in WI to pass a resolution in support of the 25% goal**
- **Goal of grant participation was to further enhance the efforts towards energy reduction**



# Polk County 25 by 2025 Plan

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## Background Info:

- Goal of the plan is to identify potential pathways to have 25% of Polk County Government's energy come from renewable sources by 2025 through a combination of energy efficiency and renewable energy
- Essentially a year long process
- Applied for this grant in 2009
- Awarded \$45,000 from the Office of Energy Independence
- Gathered and analyzed energy usage data
- Discussed and analyzed possible pathways to reduced energy usage and incorporation of renewable energies at monthly meetings
- Same grant that Osceola was awarded in 2009

## Benefits of grant participation

- Cost savings for county operations
- Opens up additional funding opportunities
- Centralized data on energy use
- Leading by example: for governments and citizens
- Comprehensive 15 year plan



## What was measured?

In order to know if you are making a difference in the future, you have to know where you are at in the present. This is why we measured:

- Fleet fuel usage from 2005-2009
- Natural gas and electrical usage for county-owned buildings, including leased/ rented facilities from 2005-2009

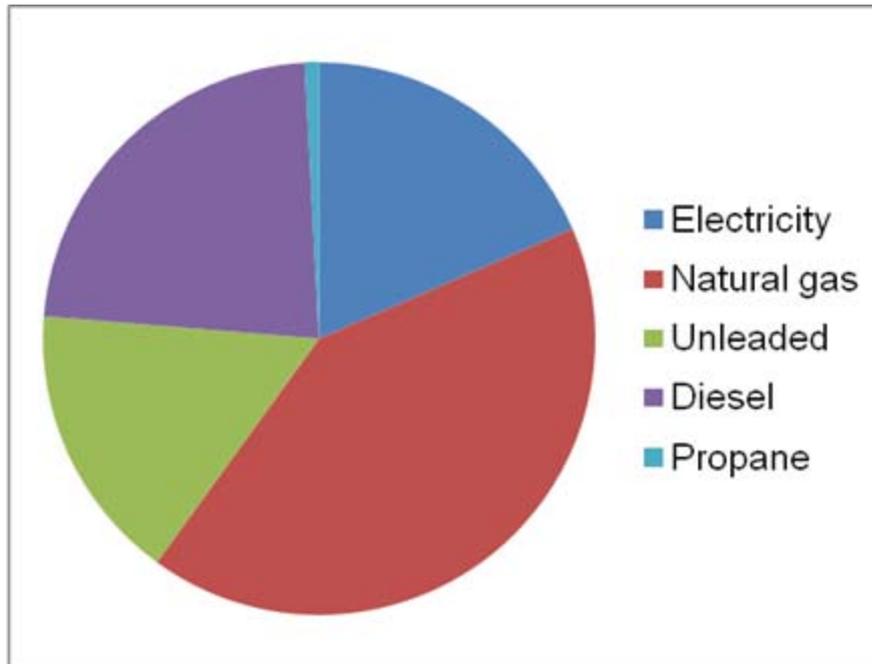




# Polk County Energy Baseline

## Total Consumption by Energy Type

<i>Energy type</i>	<i>Percent of total Btus</i>
Electricity	19%
Natural gas	42%
Unleaded	16%
Diesel	23%
Propane	1%

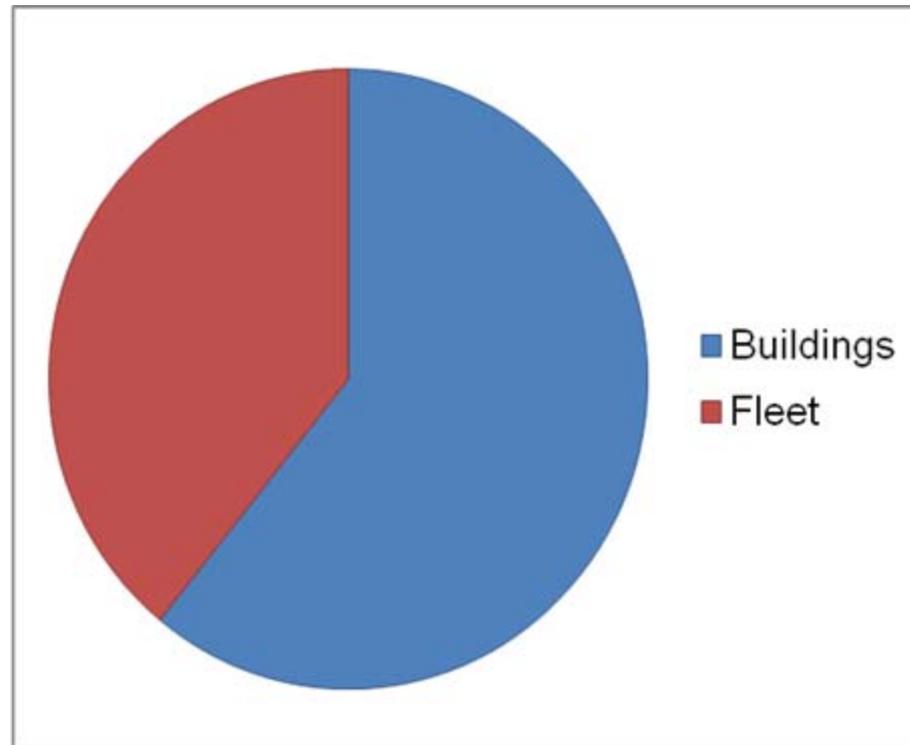




# Polk County Energy Baseline

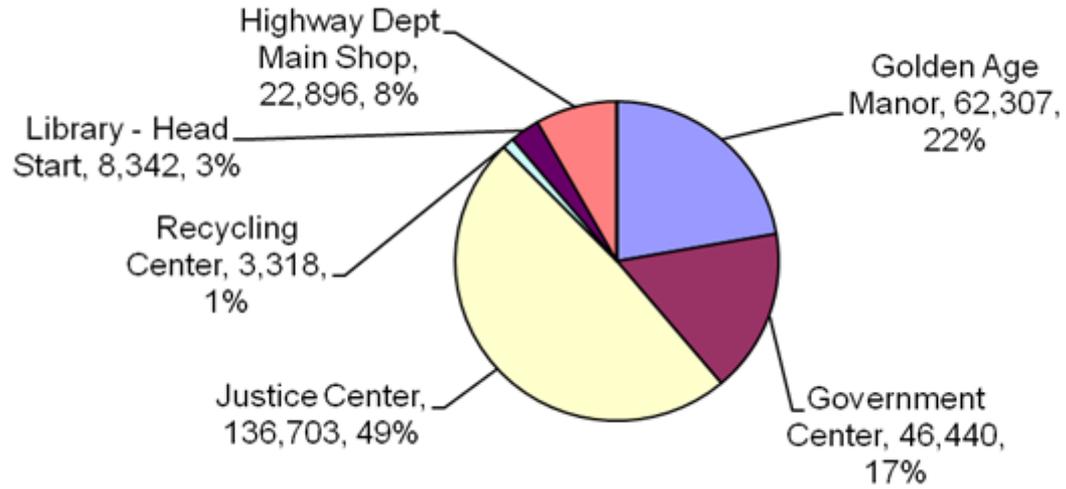
## Total Consumption by End Use

<i>Energy end use</i>	<i>Percent of total Btus</i>
Buildings	61%
Fleet	39%

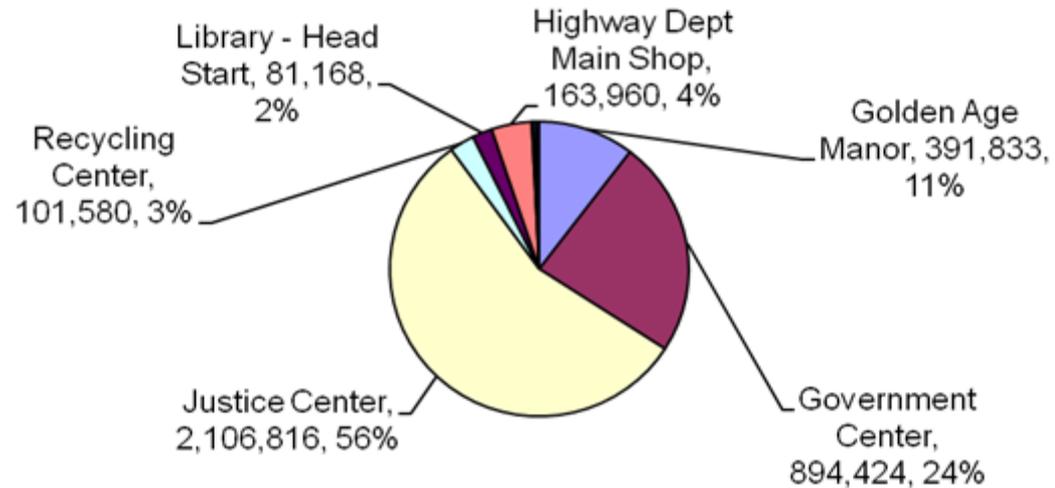


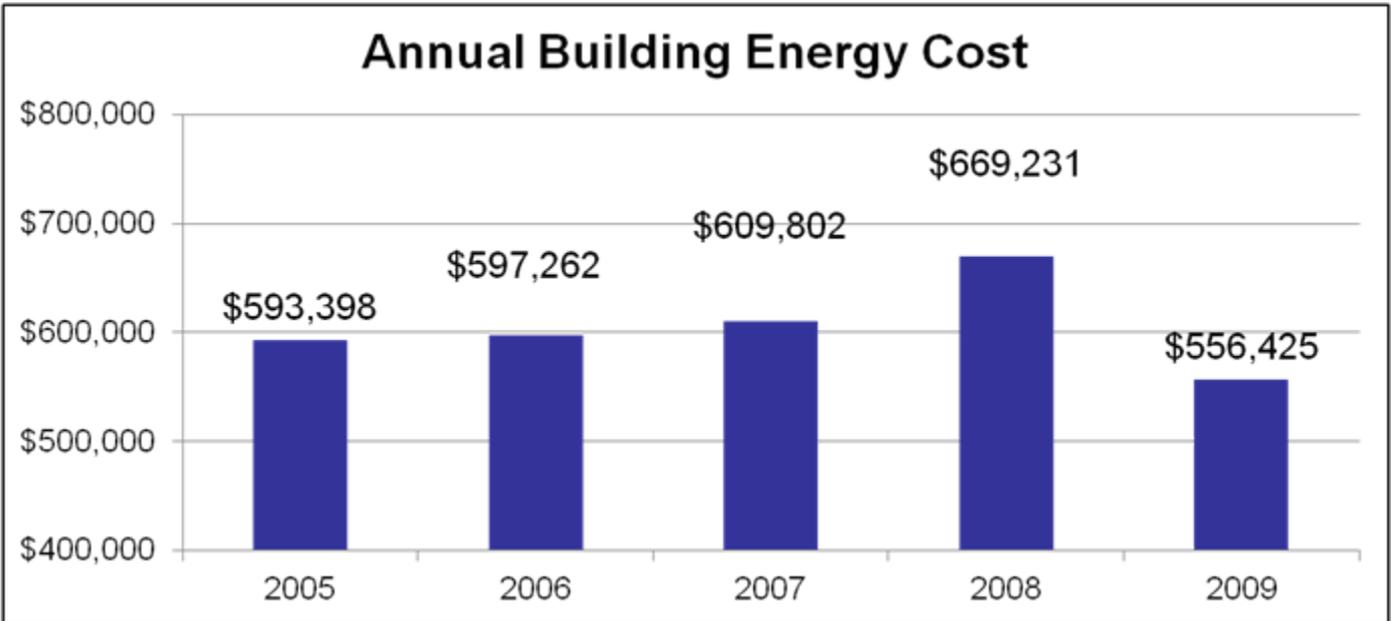
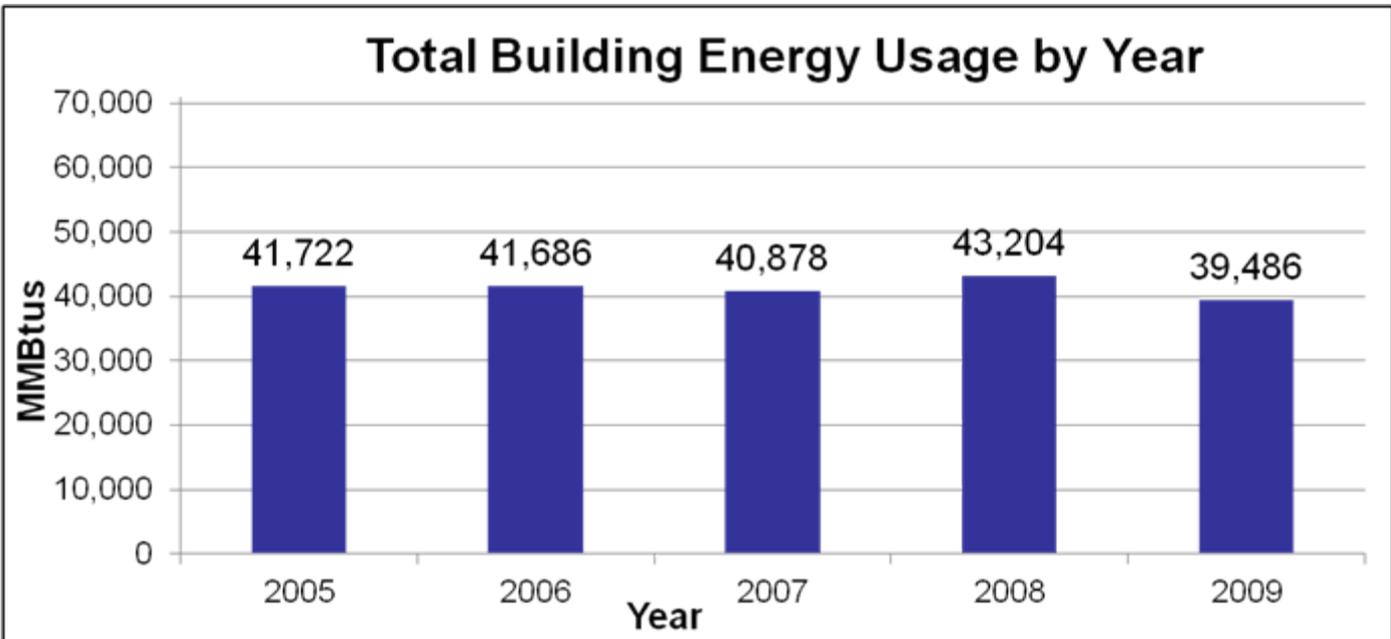
61% of energy is used in buildings, here is the breakdown:

### Average Annual Natural Gas Usage by Building (42%)



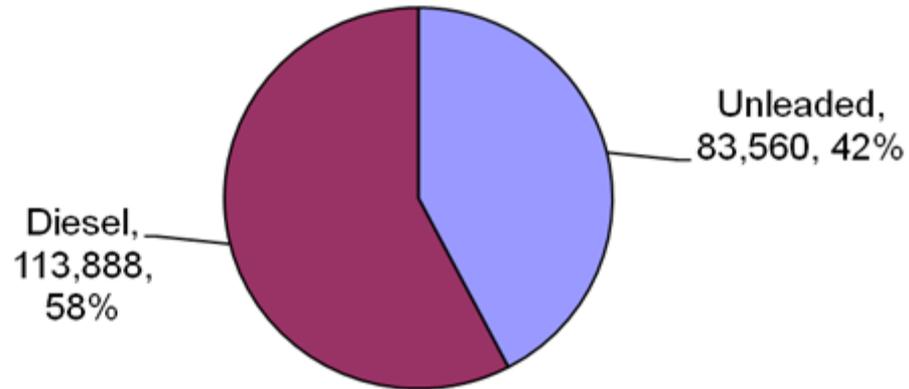
### Average Annual Electrical Usage By Building (19%)



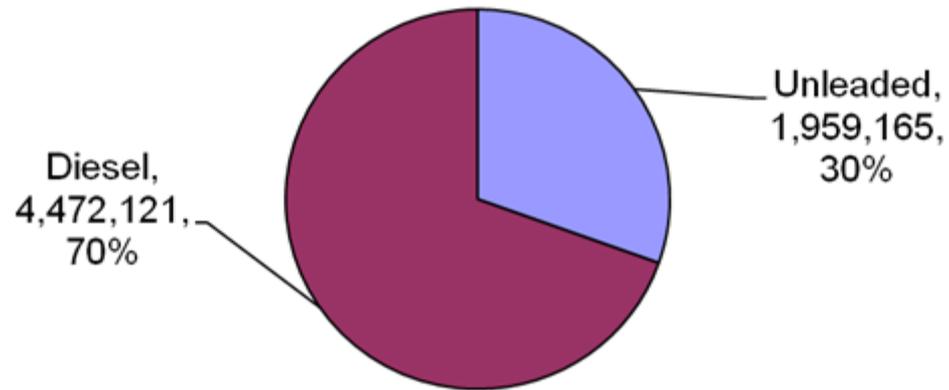


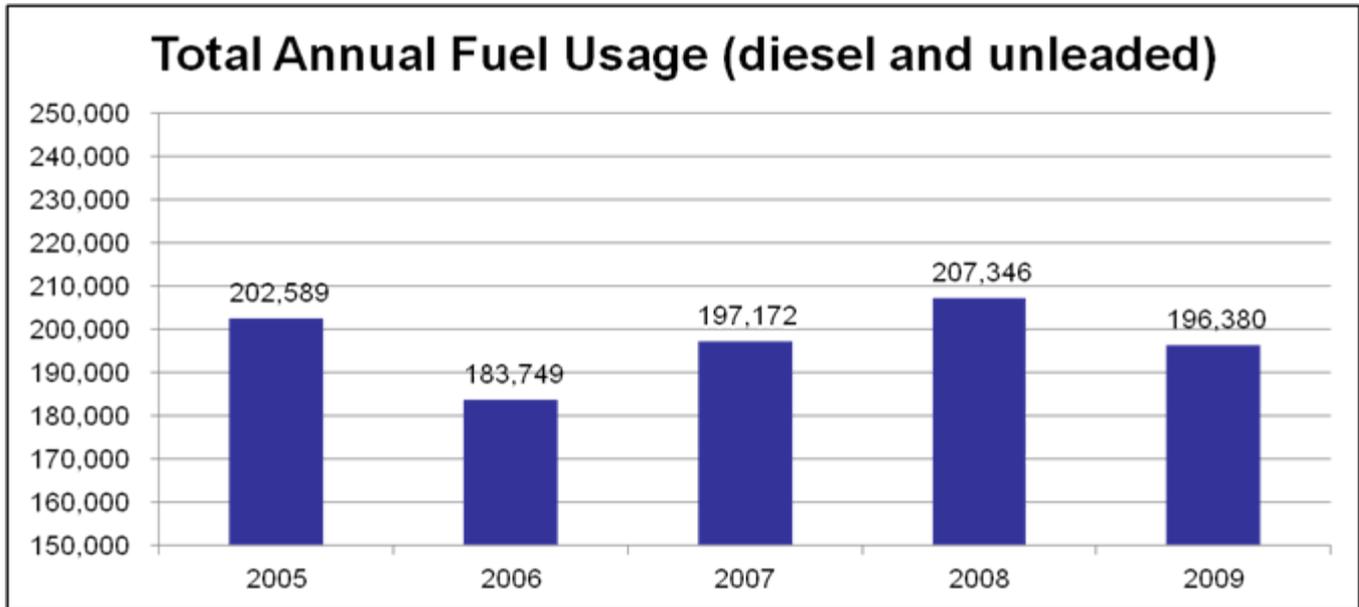
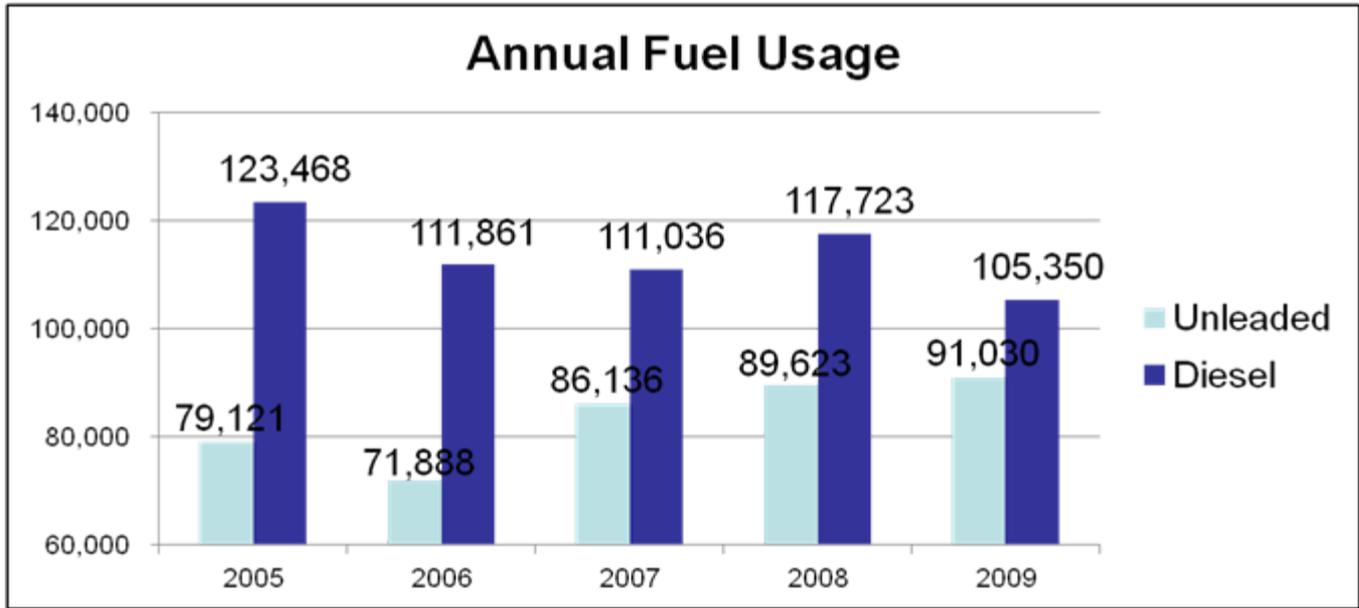
# 39% of energy used is vehicle fuel, here is the breakdown:

Average Annual Usage in Gallons 2005-2009



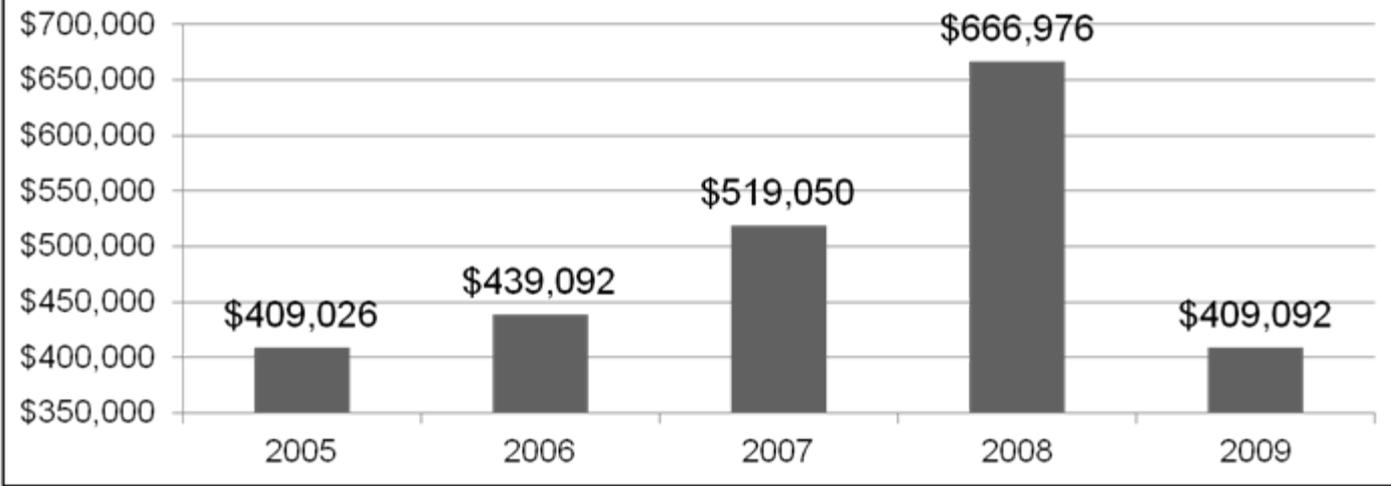
Total Usage in Gallons 2005-2009



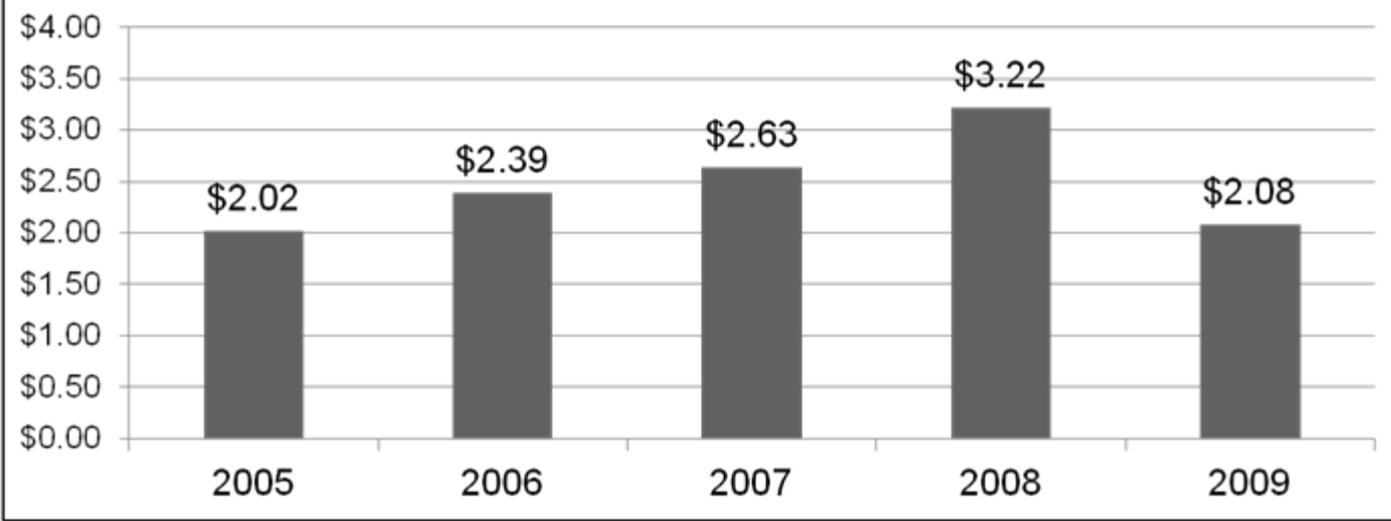




## Annual Cost of Vehicle Fuel



## Average Annual Price Per Gallon



# Example

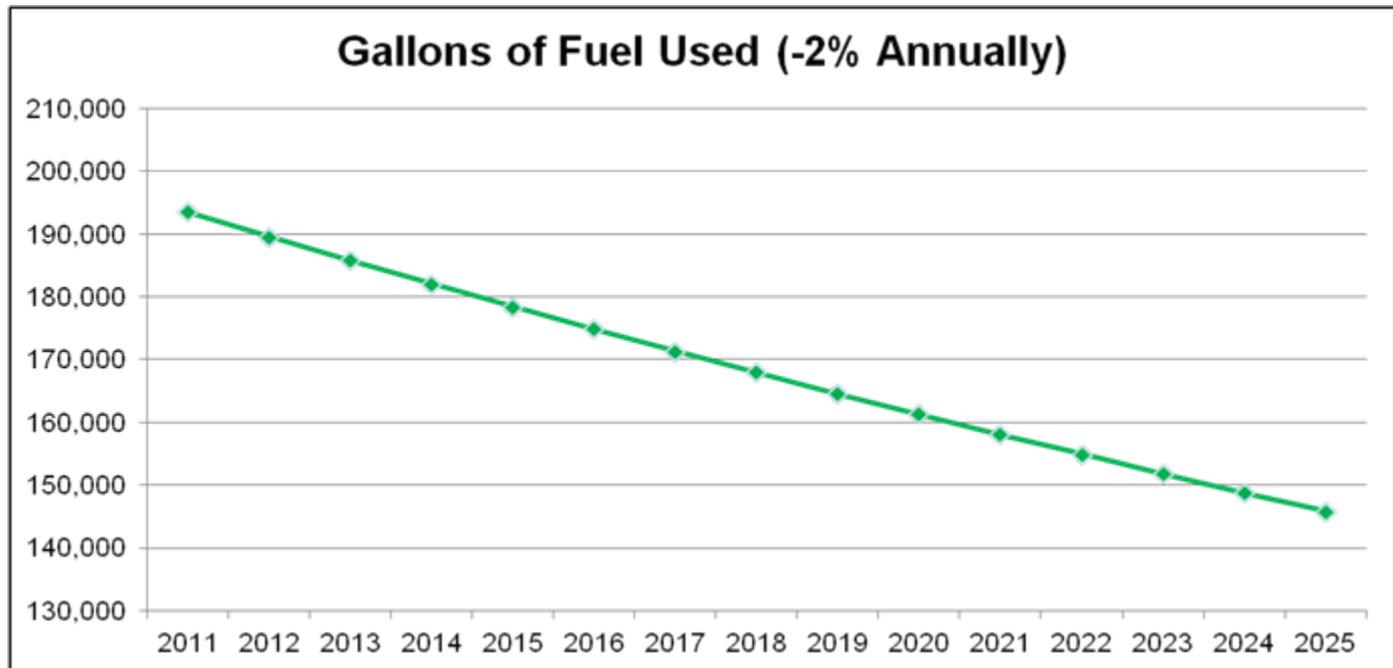
**How 2% resolution affects usage and cost to county**

**197,448 total gallons on average used of diesel and unleaded annually between 2005 and 2009.**

**2% annual reduction would be as follows, if started in 2011:**

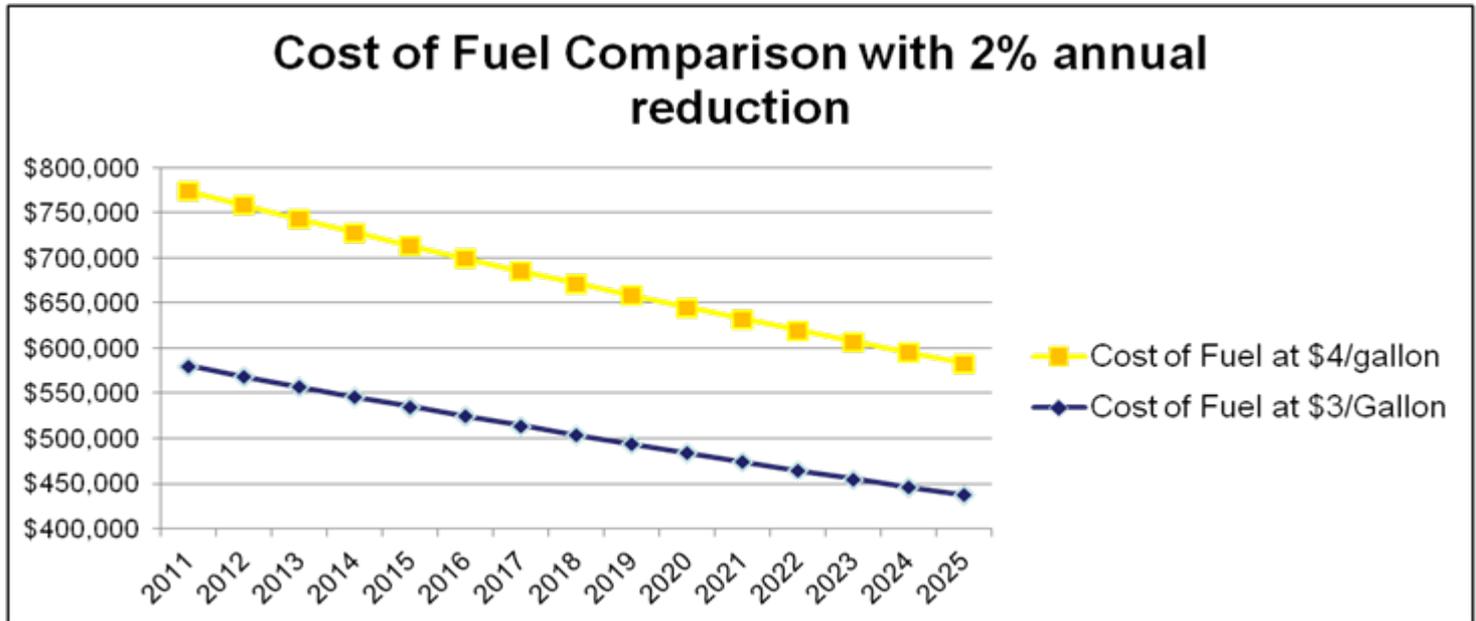
**2011 = -3,949 annual reduction in gallons; 193,499 total gallons used**

**2025 = -2,976 annual reduction in gallons; 145,828 total gallons used**





Another way to look at this is that if Polk County implemented the 2% annual fuel reduction policy, if the price goes from \$3/gal to \$4/gal between now & 2025, we would be paying about the same amount for fuel even though we are using nearly 50,000 gallons per year less.



Year	Reduction	Annual Gallons	\$3/gallon	\$4/gallon	\$5/gallon
2005-2009		197,448	\$592,344	\$789,792	\$987,240
2025	-2,976 gal	145,828	\$437,484	\$583,312	\$729,140
Savings		51,620	\$143,013	\$206,480	\$258,100

# Discoveries

- **Our Justice Center, which is our newest building, has by far the highest energy intensity per square foot of all our buildings (nearly double our government center). However the Justice Center is a 24/7 operation. The Justice Center provides a great opportunity for future savings.**
- **The lack of standardized fuel usage tracking within the county**
- **Golden Age Manor is currently under separate facilities management from all other county-owned facilities**
- **Lack of infrastructure for alternative replacement vehicle fuels, such as E85 and bio-diesel, in Polk County**
- **Not many easy decisions to get to the 25% renewable energy by 2025, even with energy efficiency projects.**
- **Amount of energy used and costs period!**



# Pathways to 25 x 25

## Pathways selected to reach 25% goal

- Low-hanging fruit efficiency measures
- 2% annual fuel reduction
- New windows at Golden Age Manor and Library/Head Start building
- Lighting projects
- Replace one steam boiler with a hot water boiler at Government Center
- IT virtualization of servers and PC's
- Waste oil furnaces at Highway Shop and Recycling Center
- New highway department campus (efficiencies and renewables)
- Solar Hot Air at Recycling Center

# Optional Pathways

- 4-day work week for county employees
- Wind turbines of various sizes (micro, 100kW, 1.6MW)
- Wood boilers in Gov't Center and Golden Age Manor
- Justice Center and Golden Age Manor solar hot water
- Purchase of green electricity



# Projects Selected – Explanation

## Definitive Pathways to 25%

### 1. Planned projects

- New windows at Golden Age Manor
- New windows at Library/Head Start
- IT Virtualization of PC's and servers
- Lighting Projects
  - ADC
  - Gov't Center
  - Justice Center
  - Highway Shop
  - Law Enforcement Garage

### 2. Low-hanging fruit efficiency measures from F.O.E audits

- Most of the recommended actions that had a “High” priority ranking in the audits were things that were inexpensive and had a quick return on investment



# Projects Selected – Explanation

## 3. 2% annual fuel reduction

- The 2% annual fuel reduction was a resolution passed by the Polk County board and should be implemented.

## 4. Replace one steam boiler with a hot water boiler at Government Center

- Steam boilers are much more efficient than hot water

## 5. Waste Oil Furnaces at Highway Shop and Recycling Center





# Projects Selected – Explanation

## 6. New highway department campus (efficiencies and renewables)

- The Energy Independence Team thought that the current highway shop for Polk County would be replaced by 2025. As part of this plan, a goal was set for the new highway shop to be 50% more energy efficient than the current facility and that 25% of its energy usage come from renewables.



## 7. Solar Hot Air at Recycling Center



# Projects Selected – Explanation

## Possible Pathways to 25%

- 1. Replace natural gas steam boilers in Government Center and Golden Age Manor with wood-fired boilers**  
These 2 measures get us over 100% of the goal
- 2. Purchasing various scale wind turbine(s)**
  - Potential demonstration project at our Recycling Center as it has prime visibility in the county being right on Hwy 8. Just one large-scale turbine would generate more electricity than Polk County Gov't currently uses.



# Projects Selected – Explanation

## Possible Projects:

### 3. Justice Center solar hot water system

- Since the Justice Center is by far the largest user of natural gas in all Polk County buildings, we investigated ways we could offset some natural gas usage with solar hot water. We had a solar site assessment done to determine cost and feasibility. The reason this is only a possible project is due to the upfront cost and the current 25 year payback period.

### 4. Purchase of renewable electricity

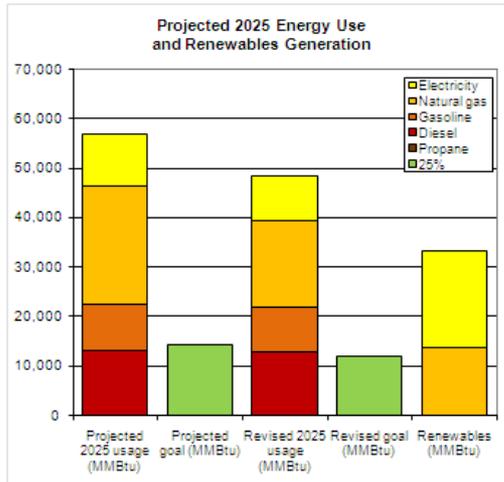
- This pathway was considered because it does not require the county to purchase any infrastructure.



# Polk County 25 x 2025 Plan

## Projects Selected – Explanation Possible Projects: All Possible Projects

PORTFOLIO SUMMARY				
Installed cost before incentives	Incentive amounts	Present value cost with incentives	lbs CO <sub>2</sub> avoided from fossil emissions	Percent of goal achieved (see below)
\$ 18,055,928.00	\$ 31,800.00	\$ 13,307,976.23	(194,646)	276%



Projected 2025 usage (MMBtu)	57,161
Revised 2025 usage (w/ efficiency) (MMBtu)	48,533
Revised 25% 2025 renewables goal (MMBtu)	12,133
Sum of renewable measures (MMBtu)	33,464
Percent of goal achieved	276%

		MEASURES					
	Name	Savings-to-investment ratio	Savings/generation	Installed cost before incentives	Incentive amounts	Present value cost with incentives	avoided from fossil emissions
10%	R Wisconsin RPS	--	-282378 k/w/h	--	--	--	-477,783
	R Purchased renewable electricity	#DIV/0!	0 k/w/h	\$ -	--	\$ -	-
On	R New Highway Dept Campus	0.02	23425 therms	\$ 12,000,000	\$ -	\$ 9,192,000	28,245
On	E Fleet Efficiency Standards	#DIV/0!	1819 gallons diesel	\$ -	\$ -	\$ -	9,463
On	E lew lighting in Justice Center Garag	17.59	1826 k/w/h	\$ 800	\$ -	\$ 800	68
On	E New highway shop lights	33.02	38705 k/w/h	\$ 800	\$ -	\$ 1,395	223
On	E ow Replacement at Golden Age M	0.42	5474 therms	\$ 154,675	\$ -	\$ 154,675	6,409
On	E ADC Lighting Upgrades	13.14	8190 k/w/h	\$ 1,000	\$ 300	\$ 680	47
On	E day work week for county employe	#DIV/0!	8359 therms	\$ -	\$ -	\$ -	10,716
On	E Justice Center Efficiency Measure	#DIV/0!	21755 therms	\$ -	\$ -	\$ -	25,899
On	E vovernment Center boiler replacem	0.08	8350 therms	\$ 500,000	\$ -	\$ 383,000	9,776
On	E ghway Department Waste Oil Furn	3.76	6750 therms	\$ 12,153	\$ -	\$ 21,195	7,903
On	R Micro wind turbines	0.19	12500 k/w/h	\$ 32,500	\$ -	\$ 24,895	72
On	R Small scale wind turbines	0.25	50000 k/w/h	\$ 100,000	\$ -	\$ 76,800	289
On	E Energy Golden Age Manor High Pr	23.90	22400 k/w/h	\$ 1,000	\$ -	\$ 888	586
On	E enter Focus On Energy High Prior	21.48	1360 therms	\$ 1,000	\$ -	\$ 766	1,763
On	E Center Focus On Energy High Prio	57.81	3515 therms	\$ 1,000	\$ -	\$ 766	4,584
On	E ad Start Focus On Energy High Pri	5.82	5500 k/w/h	\$ 1,000	\$ -	\$ 888	137
On	E j Dept Focus on Energy High Prior	#DIV/0!	1290 therms	\$ -	\$ -	\$ -	1,575
On	E rg Center Focus On Energy High P	#DIV/0!	2560 k/w/h	\$ -	\$ -	\$ -	15
On	R Justice Center Solar Hot Water	0.00	16000 therms	\$ 750,000	\$ 31,500	\$ 474,929	18,733
On	R ood fired boilers at Golden Age Ma	0.00	61650 therms	\$ 1,000,000	\$ -	\$ 661,000	72,180
On	R Wood fired boilers at Gov't Center	0.00	46000 therms	\$ 1,000,000	\$ -	\$ 661,000	53,857
On	R Purchase of a 1.6MW Turbine	0.00	5300000 k/w/h	\$ 2,500,000	\$ -	\$ 1,652,500	30,597

# Additional Projects Considered

- Geothermal, LEED, Energy Star Certification on a new highway department campus
- E85, biodiesel, and natural gas for fleet vehicles
- Geothermal installation at Justice Center
- Solar Tubes: done during roof replacements and/or maintenance
- Window coverings
- LED Exit Lighting
- Outdoor lighting improvements
- Low-hanging fruit:
  - Employee habit changes
  - Adjusting thermostats
  - Focus On Energy “High Priority” items



# Existing Unknowns:

## Necessary Information for Future

- The monumental unknown of energy prices in the future for fossil fuels and alternative energies.
- Technological improvements in renewables and energy efficiencies in the next 15 years
- Political will of citizens and elected officials towards renewable energy and energy efficiency
- Budgets for the county government
- Renewable capacity and feedstocks in Polk County



# Action Steps

- Investigate renewable energy and energy efficiency options when replacing equipment or facilities (life-cycle costs)
  - New highway shop
  - Vehicle replacements
- Implement the planned projects (and continue using Focus On Energy)
- Additional metering of facilities to monitor energy usage more precisely
- Develop and implement an employee energy awareness program to help improve habits for reduced energy usage
- Continue the practice of actively tracking energy usage that began with this plan
- Continue with performance contracts for energy efficiency
- Update purchasing policies at county
- Review, evaluate, and update this plan to keep it relevant and in decision makers thoughts



# Polk County

## Energy Independence Team

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### Energy Independence Team Members

- Jeff Peterson – Chair of Renewable Energy Committee
- Tom Engel – Vice-Chair of REC
- Marlin Baillargeon – Secretary of REC
- Kathryn Kienholz - REC member and County Supervisor
- Jay Luke - REC member and County Supervisor
- Kim O'Connell - REC member and County Supervisor
- Tim Anderson – County Planner
- Gary Dado – EIT member
- Bob Kazmierski – County UWEX CNRED Agent
- Linda Leef - REC member
- Kathleen Melin - REC member
- Debbie Peterson – Dept Head for Buildings Dept
- Ryan Sterry – Former Polk County UWEX Ag Agent
- Gregg Westigard - REC member



# Polk County Energy Independence Team

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## Special Thanks:

**Special thanks to Debbie Peterson from the Buildings Department and Kathy Bohn from the Highway Department for all the work they did to help with this plan! Without their help, this plan would not have come together!**

