

INDIANA UTILITY DEMAND & RATES FORECAST

Presented to:

Solar Energy Applications for Agriculture Workshop

Rochester, IN

Presented by:

Douglas Gotham

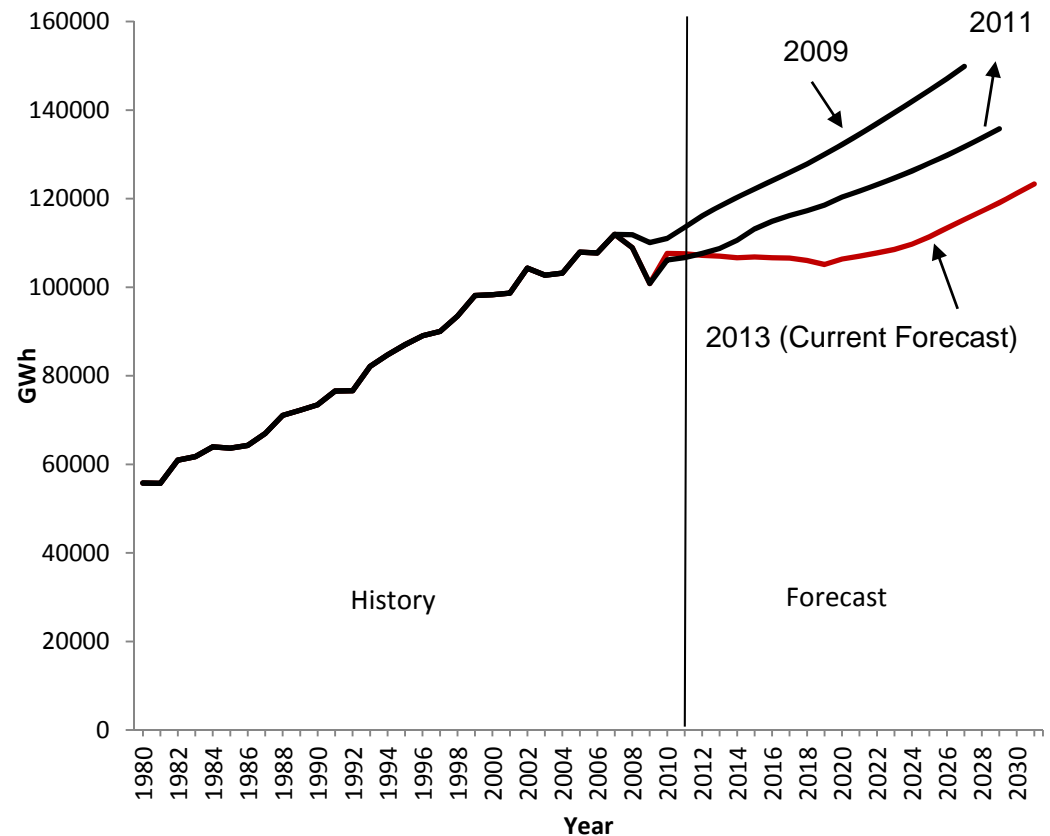
November 12, 2014

Forecast Highlights

- 2013 forecast growth is lower than in previous forecasts due to increases in efficiency
 - Higher prices reduce customer usage
 - Utility DSM
 - Efficiency standards
- Resource requirements are lower than in previous forecasts
 - Additional resources needed by 2016

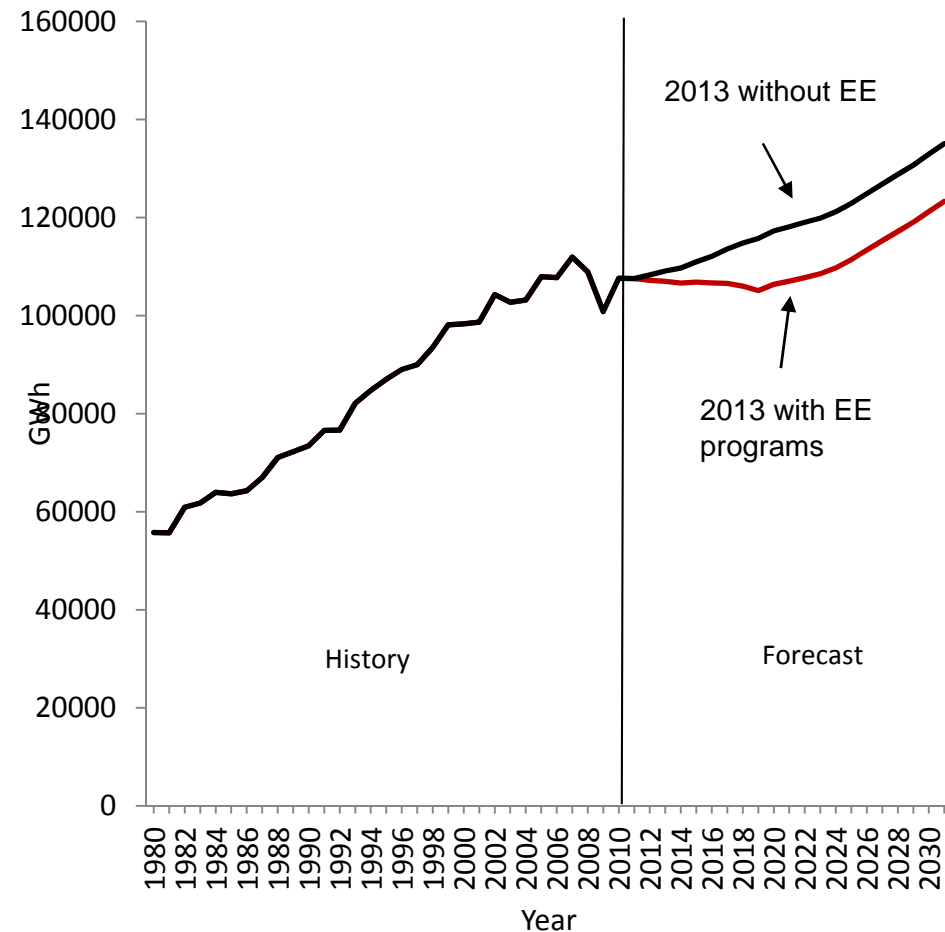
Indiana Electricity Requirements

- Retail sales by investor owned and not-for-profit utilities
- Includes estimated transmission and distribution losses
- Growth rates
 - 2013 forecast: 0.74%
 - 2011 forecast: 1.30%
 - 2009 forecast: 1.55%



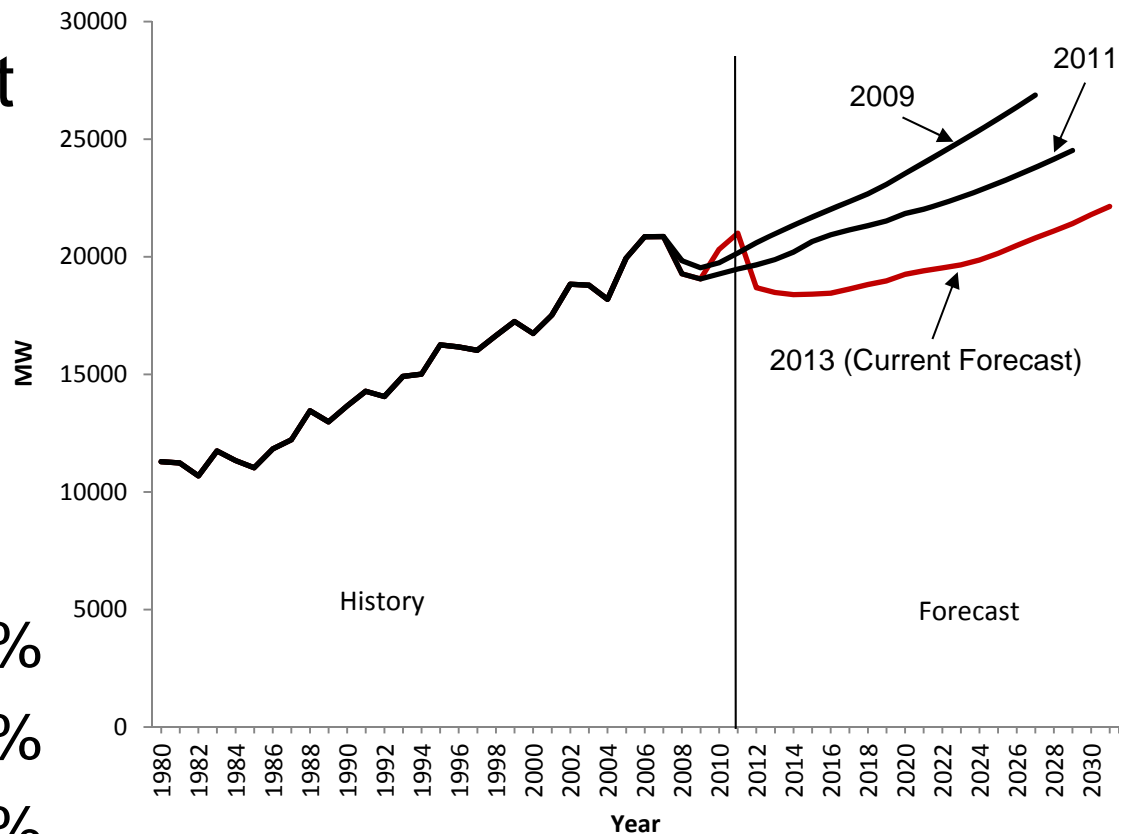
Energy Efficiency Programs

- SEA 340 will affect the forecast
- If the utility DSM programs are added back in, energy grows at 1.17% per year
- This does not include the impact of prices changing



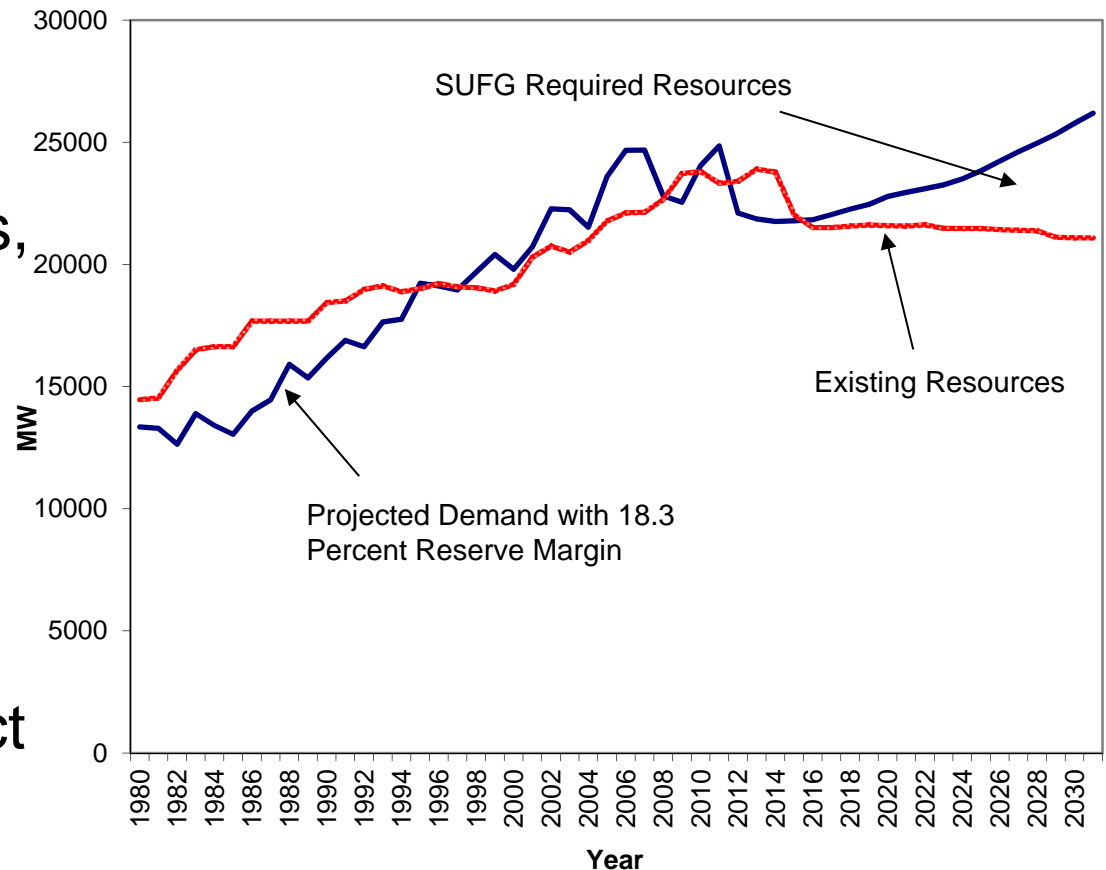
Indiana Peak Demand Requirements

- Peak demand is net of DSM (Energy Efficiency and Demand Response loads)
- Growth rates
 - 2013 forecast: 0.90%
 - 2011 forecast: 1.28%
 - 2009 forecast: 1.61%



Indiana Resource Requirements

- Resources may be provided by conservation measures, contractual purchases, purchases of existing assets, or new construction
- Existing resources are adjusted into the future for retirements, contract expirations, and IURC approved new resources

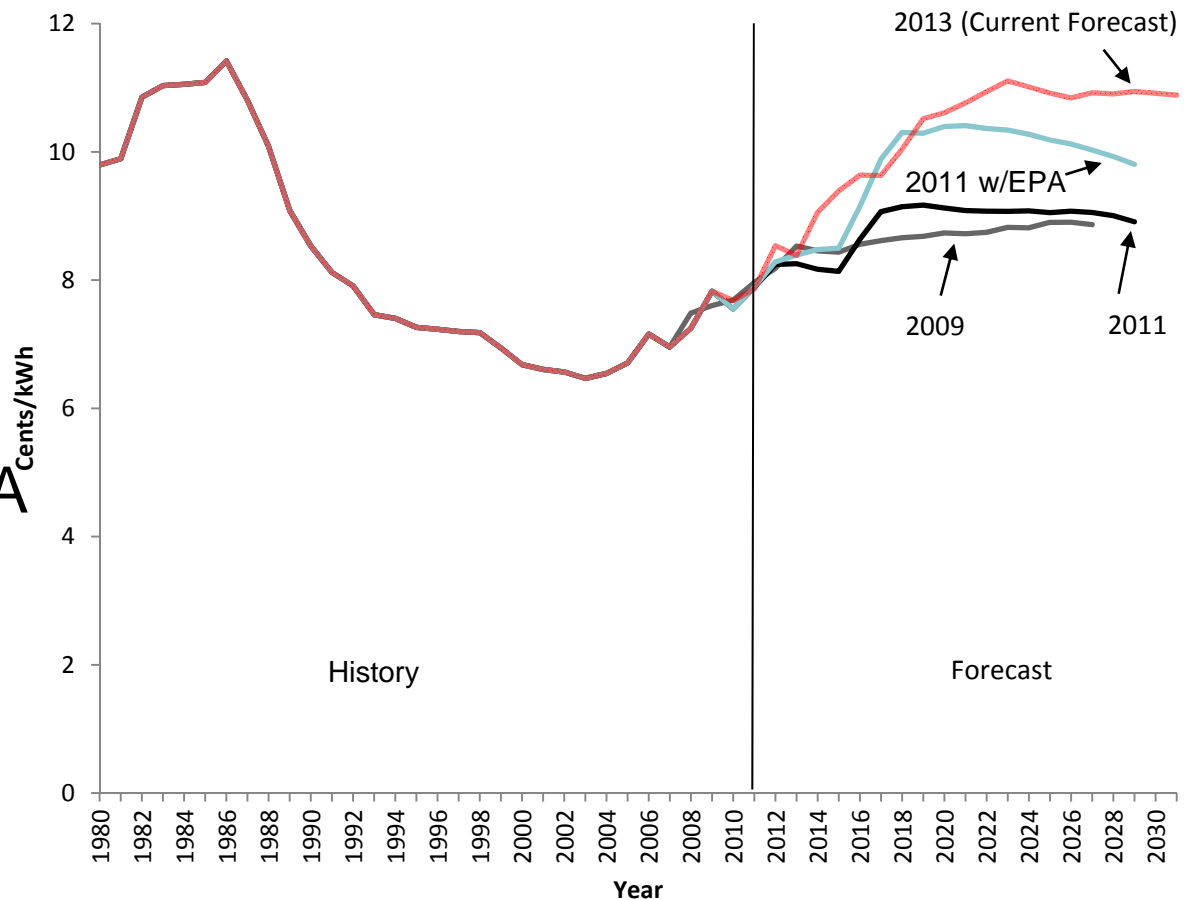


| | Uncontrolled Peak Demand ¹ | Demand Response ² | Net Peak Demand ³ | Existing/Approved Capacity ⁴ | Incremental Change in Capacity ⁵ | Projected Additional Resource Requirements ⁶ | | | | Total Resources ⁷ | Reserve Margin ⁸ (percent) |
|------|---------------------------------------|------------------------------|------------------------------|---|---|---|---------|----------|-------|------------------------------|---------------------------------------|
| | | | | | | Peaking | Cycling | Baseload | Total | | |
| 2011 | | | | 23,326 | | | | | | | |
| 2012 | 19,888 | 1,205 | 18,683 | 23,406 | 80 | 20 | 80 | 20 | 120 | 23,526 | 26 |
| 2013 | 19,777 | 1,296 | 18,481 | 23,899 | 493 | 10 | 30 | - | 40 | 23,939 | 30 |
| 2014 | 19,718 | 1,329 | 18,389 | 23,781 | -119 | 10 | 30 | - | 40 | 23,821 | 30 |
| 2015 | 19,769 | 1,357 | 18,412 | 22,034 | -1747 | 20 | 50 | - | 70 | 22,104 | 20 |
| 2016 | 19,823 | 1,371 | 18,452 | 21,512 | -523 | 130 | 160 | 120 | 410 | 21,922 | 19 |
| 2017 | 20,011 | 1,381 | 18,631 | 21,512 | 0 | 200 | 220 | 210 | 630 | 22,142 | 19 |
| 2018 | 20,208 | 1,390 | 18,818 | 21,568 | 56 | 190 | 240 | 460 | 890 | 22,458 | 19 |
| 2019 | 20,375 | 1,400 | 18,975 | 21,615 | 47 | 230 | 260 | 570 | 1,060 | 22,675 | 19 |
| 2020 | 20,663 | 1,407 | 19,256 | 21,590 | -25 | 320 | 310 | 650 | 1,280 | 22,870 | 19 |
| 2021 | 20,814 | 1,414 | 19,401 | 21,569 | -21 | 370 | 340 | 740 | 1,450 | 23,019 | 19 |
| 2022 | 20,944 | 1,416 | 19,528 | 21,619 | 50 | 390 | 360 | 790 | 1,540 | 23,159 | 19 |
| 2023 | 21,076 | 1,418 | 19,658 | 21,476 | -143 | 480 | 420 | 920 | 1,820 | 23,296 | 19 |
| 2024 | 21,281 | 1,419 | 19,861 | 21,469 | -7 | 510 | 480 | 1,060 | 2,050 | 23,519 | 18 |
| 2025 | 21,567 | 1,420 | 20,147 | 21,469 | 0 | 590 | 590 | 1,190 | 2,370 | 23,839 | 18 |
| 2026 | 21,896 | 1,420 | 20,476 | 21,428 | -41 | 690 | 680 | 1,420 | 2,790 | 24,218 | 18 |
| 2027 | 22,222 | 1,420 | 20,801 | 21,400 | -28 | 930 | 750 | 1,530 | 3,210 | 24,610 | 18 |
| 2028 | 22,520 | 1,421 | 21,099 | 21,381 | -19 | 1,040 | 860 | 1,670 | 3,570 | 24,951 | 18 |
| 2029 | 22,833 | 1,421 | 21,413 | 21,108 | -273 | 1,160 | 970 | 2,090 | 4,220 | 25,328 | 18 |
| 2030 | 23,210 | 1,421 | 21,790 | 21,093 | -16 | 1,280 | 1,100 | 2,300 | 4,680 | 25,773 | 18 |
| 2031 | 23,558 | 1,421 | 22,138 | 21,085 | -7 | 1,360 | 1,200 | 2,520 | 5,080 | 26,165 | 18 |

- 1 Uncontrolled peak demand is the peak demand prior any load reduction from demand response programs being called upon.
- 2 Demand response is all the measures designed to shift load away from peak demand periods. These include interruptible and direct load control programs affecting peak demand.
- 3 Net peak demand is the peak demand after load reductions from demand response programs are taken into account.
- 4 Existing/approved capacity includes installed capacity plus approved new capacity plus firm purchases minus firm sales.
- 5 Incremental change in capacity is the change in existing/approved capacity from the previous year. The change is due to new, approved capacity becoming operational, retirements of existing capacity, and changes in firm purchases and sales.
- 6 Projected additional resource requirements is the cumulative amount of additional resources needed to meet future requirements.
- 7 Total resource requirements are the total statewide resources required including existing/approved capacity and projected additional resource requirements.
- 8 Resources may be required by individual utilities even if the state as a whole meets or exceeds the statewide reserve margin. Individual utility reserve margins are not allowed to fall below 6 percent.

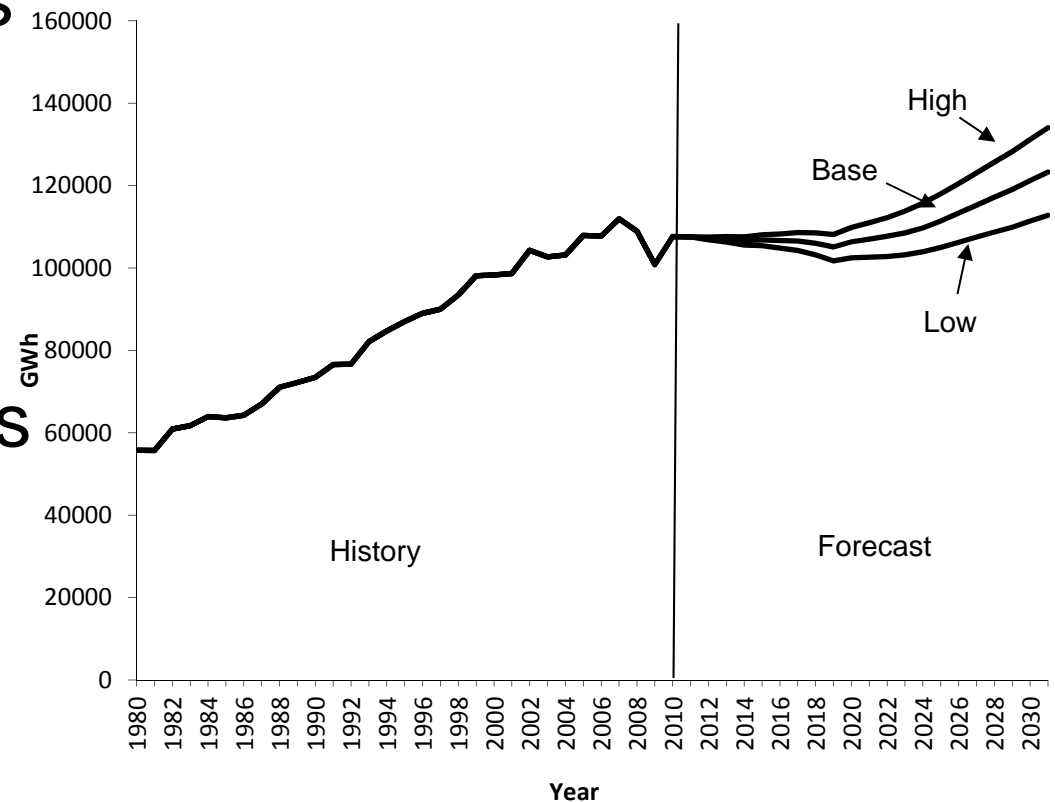
Indiana Real Price Projections (2011 \$)

- Effect of inflation removed
- Includes the cost of new resources
- Includes expected cost of finalized EPA rules
 - MATS
- Non-finalized rules are not included

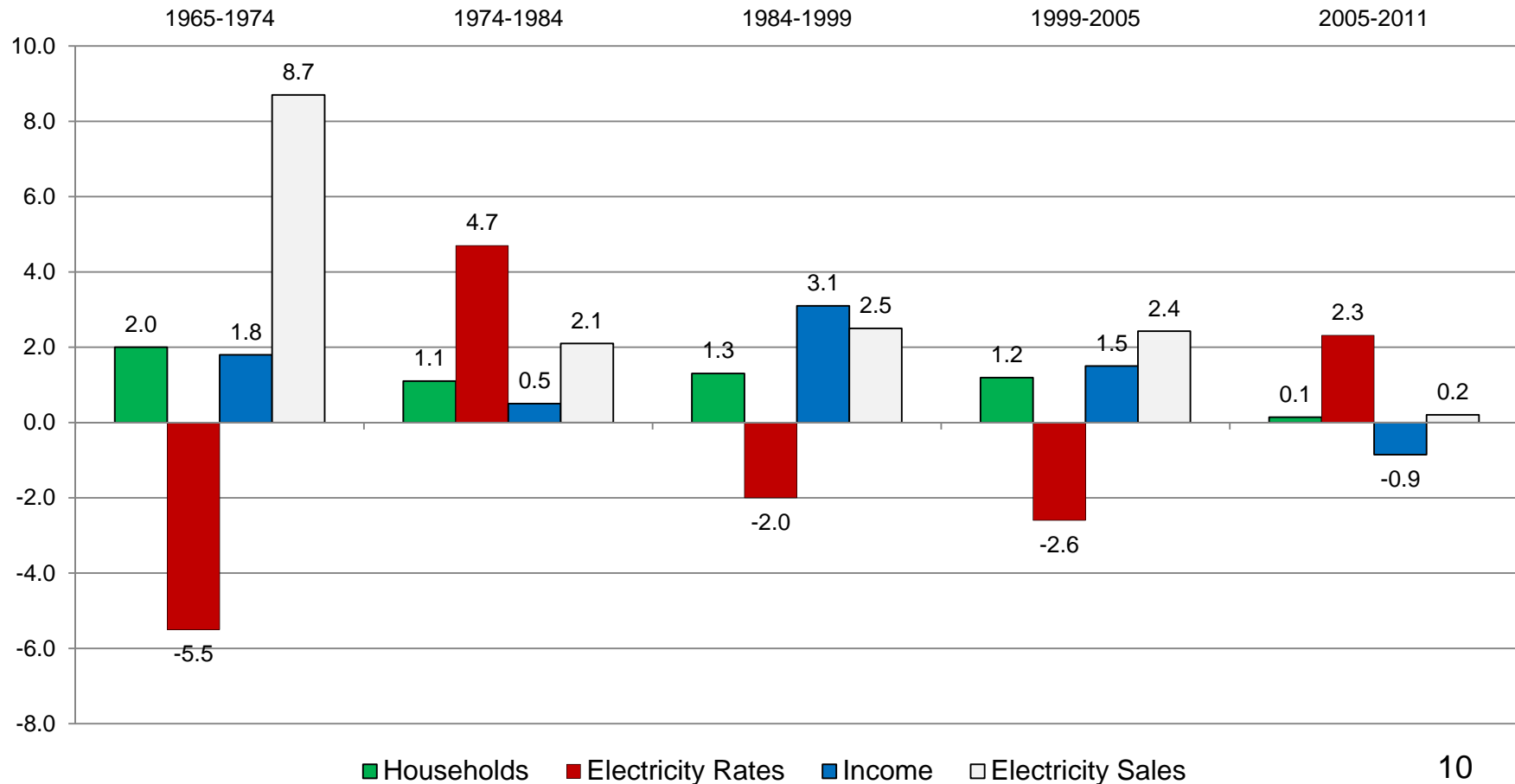


Alternative Scenarios

- Any forecast contains uncertainty
- CEMR provides alternative low and high growth econometric forecasts
- Low and high growth scenarios are intended to give a plausible bound to uncertainty



Residential Trends (Annual Percent Change)

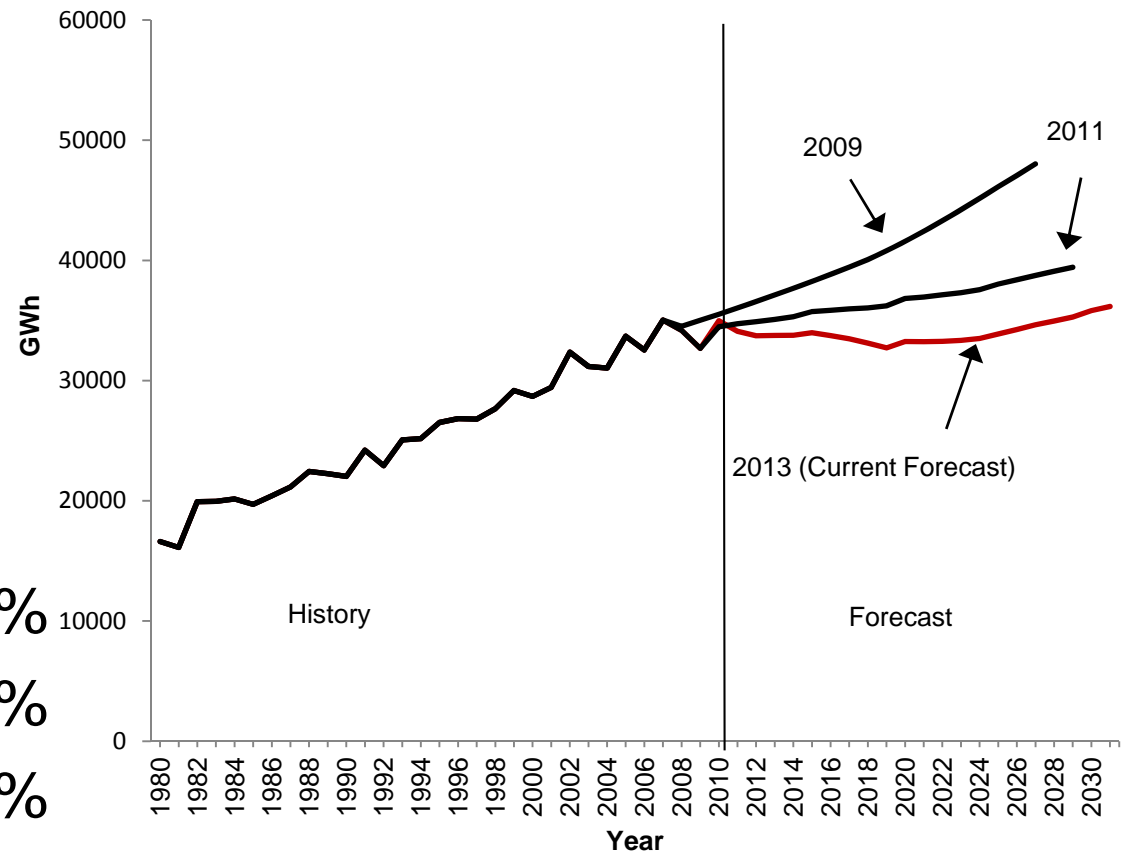


Residential Drivers

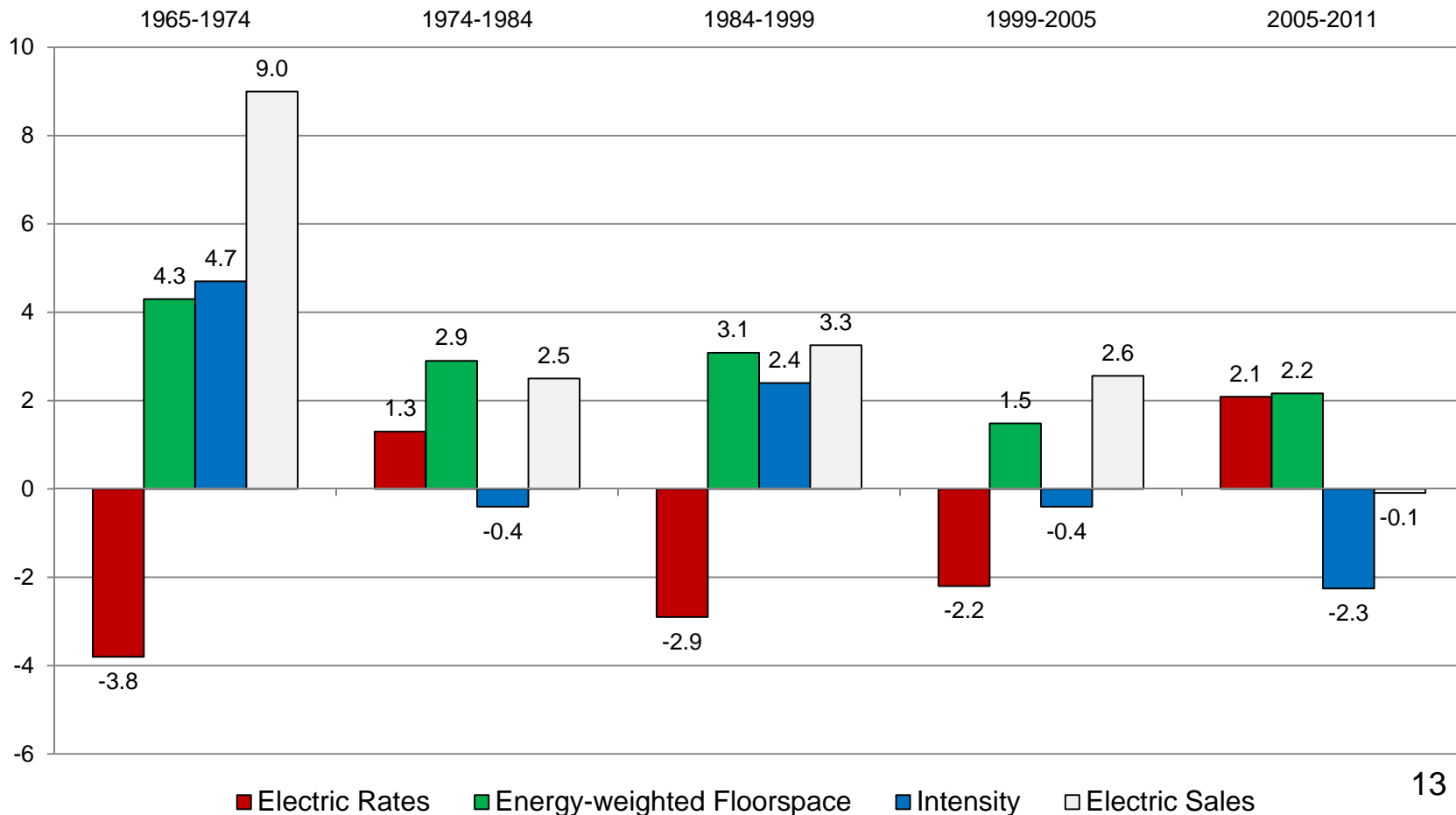
- Households grow at an average of 1.17 percent per year (was 1.00 percent in 2011 forecast)
- Real personal income grows at an average rate of 2.73 percent per year (was 2.80 percent in 2011 forecast)
- Real electric rates increase at an average of 1.34 percent per year (increase occurs in first ten years)

Residential Electricity Sales

- Estimated from:
 - demographics
 - households
 - energy prices
- Growth rates
 - 2013 forecast: 0.37%
 - 2011 forecast: 0.71%
 - 2009 forecast: 1.75%



Commercial Trends (Annual Percent Change)

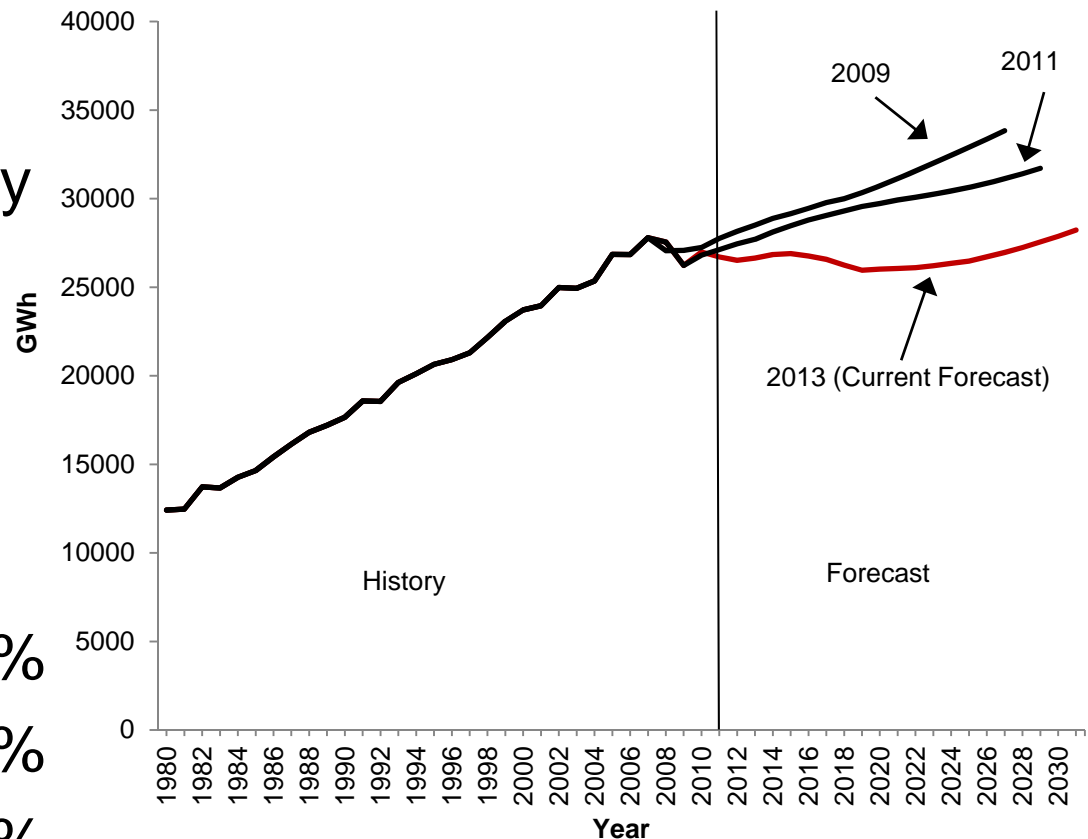


Commercial Drivers

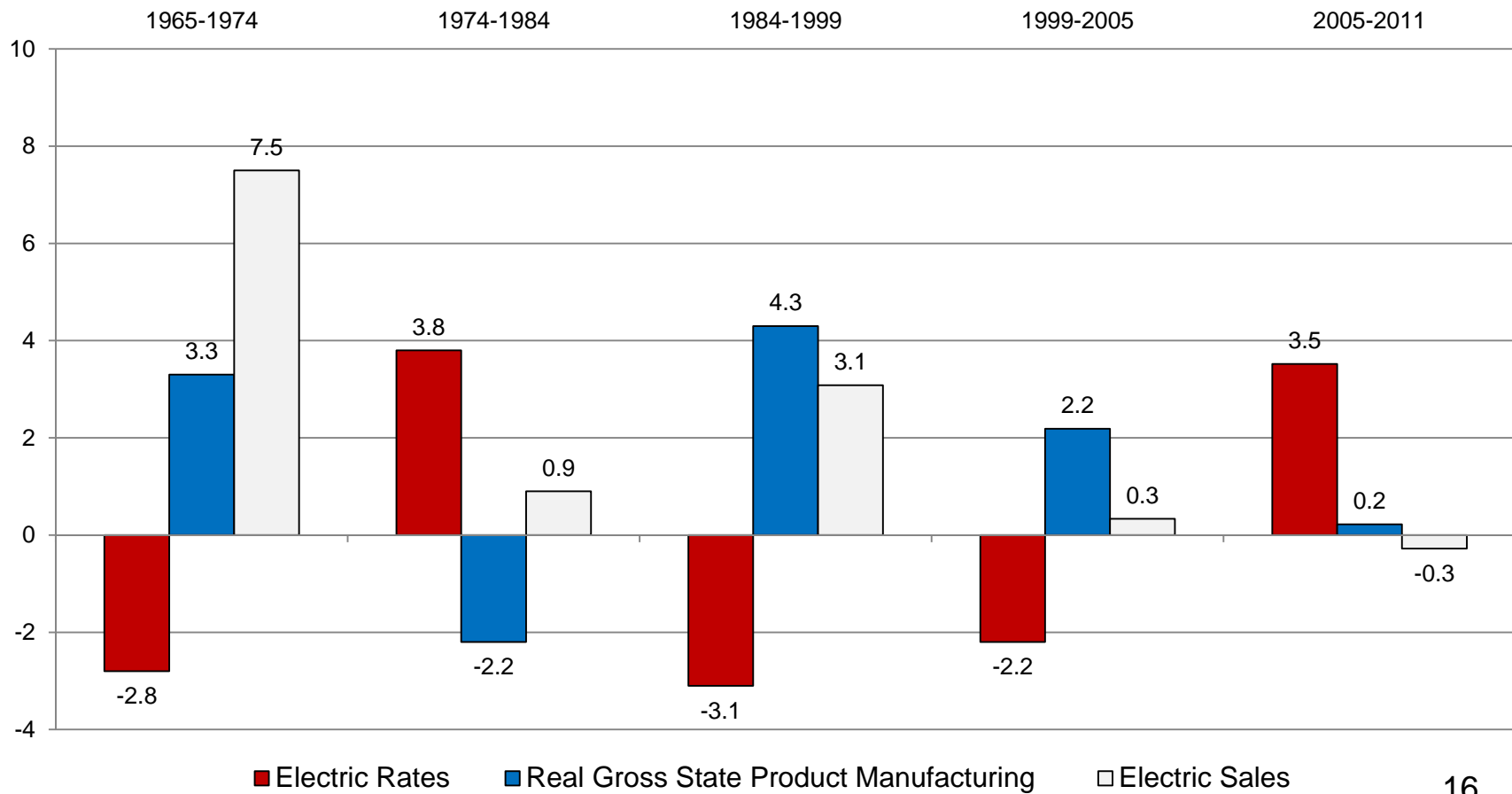
- Energy-weighted floor space grows at an average rate of 0.90 percent per year (was 1.18 percent in 2011 forecast)
- Non-manufacturing employment grows at an average rate of 0.97 percent per year (was 1.31 percent in 2011 forecast)
- Real electric rates increase at an average of 1.43 percent per year (increase occurs in first ten years)

Commercial Electricity Sales

- Estimated from:
 - floor space inventory
 - end use intensity
 - employment
 - energy prices
- Growth rates
 - 2013 forecast: 0.33%
 - 2011 forecast: 0.89%
 - 2009 forecast: 1.18%



Industrial Trends (Annual Percent Change)



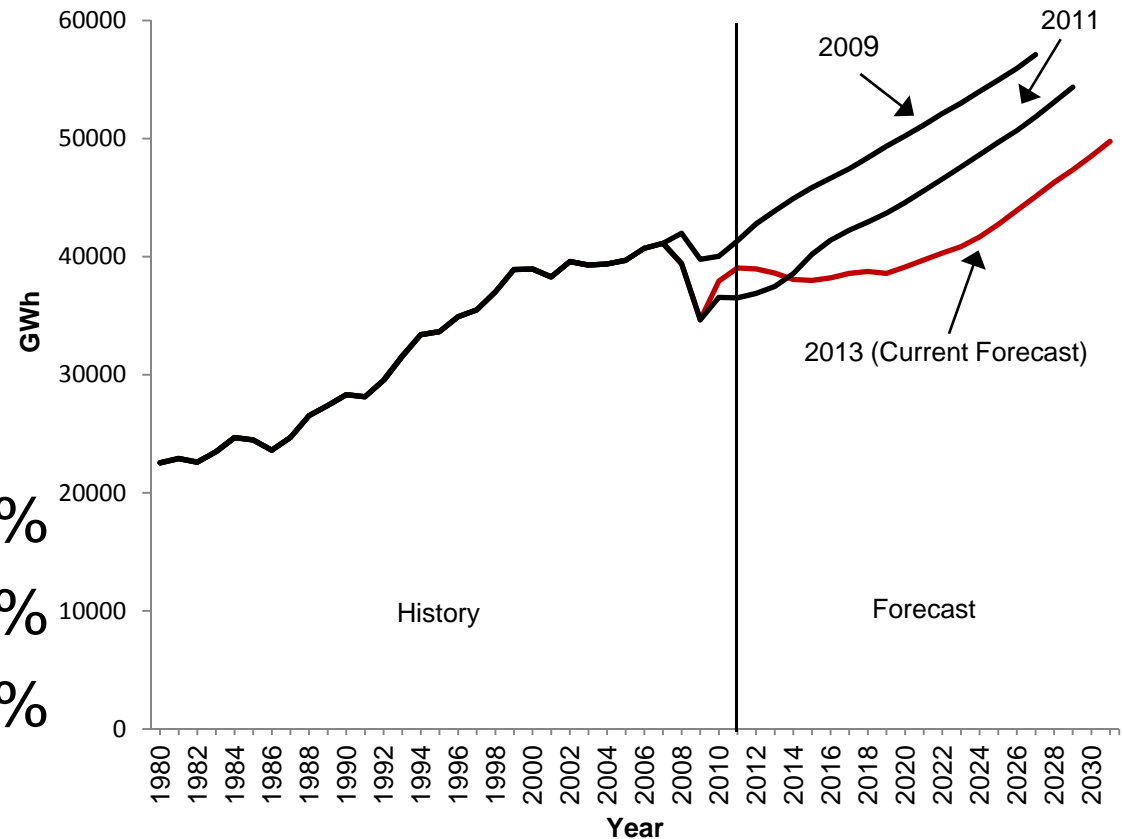
Industrial Drivers

- Manufacturing GSP grows at an average rate of 2.86 percent per year (was 3.95 percent in 2011 forecast)
- Real electric rates increase at an average of 1.56 percent per year (increase occurs in first ten years)

| SIC | Name | Current Share of GSP | Current Share of Electricity Sales | Current Intensity | Forecast Growth in GSP Originating by Sector | Forecast Growth in Electricity Intensity by Sector | Forecast Growth in Electricity Sales by Sector |
|-------|-------------------------------|----------------------|------------------------------------|-------------------|--|--|--|
| 20 | Food & Kindred Products | 4.73 | 5.83 | 0.58 | 3.40 | -1.16 | 2.24 |
| 24 | Lumber & Wood Products | 2.63 | 0.66 | 0.12 | 3.40 | -0.94 | 2.45 |
| 25 | Furniture & Fixtures | 3.09 | 0.47 | 0.07 | 1.57 | -1.09 | 0.49 |
| 26 | Paper & Allied Products | 1.83 | 2.94 | 0.76 | 3.40 | -0.88 | 2.52 |
| 27 | Printing & Publishing | 3.44 | 1.24 | 0.17 | 3.40 | -2.19 | 1.21 |
| 28 | Chemicals & Allied Products | 16.41 | 19.98 | 0.58 | 3.40 | -1.59 | 1.81 |
| 30 | Rubber & Plastic Products | 3.66 | 5.76 | 0.74 | 2.85 | -1.03 | 1.82 |
| 32 | Stone, Clay, & Glass Products | 3.13 | 5.08 | 0.77 | 1.57 | -0.77 | 0.80 |
| 33 | Primary Metal Products | 7.59 | 27.01 | 1.68 | 0.76 | 0.59 | 1.35 |
| 34 | Fabricated Metal Products | 5.95 | 6.39 | 0.51 | 3.20 | -1.27 | 1.92 |
| 35 | Industrial Machinery & Equip. | 10.42 | 4.62 | 0.21 | 2.74 | -1.20 | 1.54 |
| 36 | Electronic/Electric Equipment | 5.18 | 5.87 | 0.54 | 0.71 | -0.62 | 0.09 |
| 37 | Transportation Equipment | 20.01 | 8.97 | 0.21 | 3.61 | -1.07 | 2.54 |
| 38 | Instruments/Related Products | 4.20 | 1.01 | 0.11 | 1.57 | -1.86 | -0.29 |
| 39 | Miscellaneous Manufacturing | 2.27 | 1.20 | 0.25 | 1.57 | -3.32 | -1.75 |
| Total | Manufacturing | 100.00 | 100.00 | 0.47 | 2.86 | -1.20 | 1.66 |

Industrial Electricity Sales

- Estimated from:
 - GSP by industry
 - energy prices
- Growth rates
 - 2013 forecast: 1.29%
 - 2011 forecast: 2.11%
 - 2009 forecast: 1.63%



Further Information

- Doug Gotham
 - 765-494-0851
 - gotham@purdue.edu
- www.purdue.edu/discoverypark/energy/SUG/