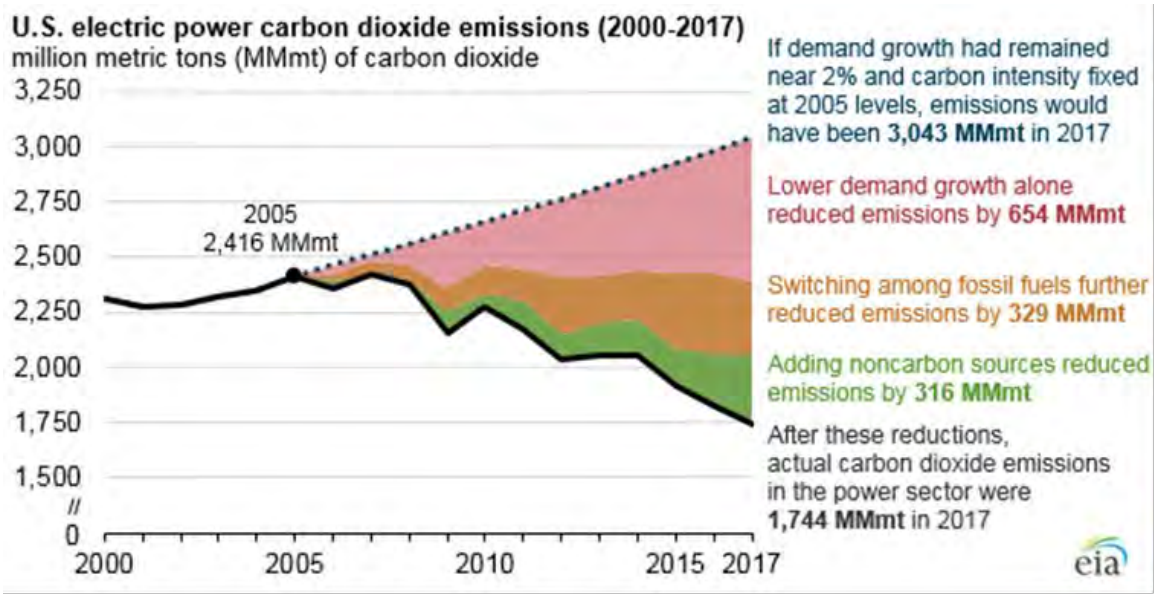
Indiana Electric Power Sector Emissions Reductions

The following chart was included in the October 29 "Today in Energy" posting by EIA[i]. This document details the results of a similar analysis for Indiana.

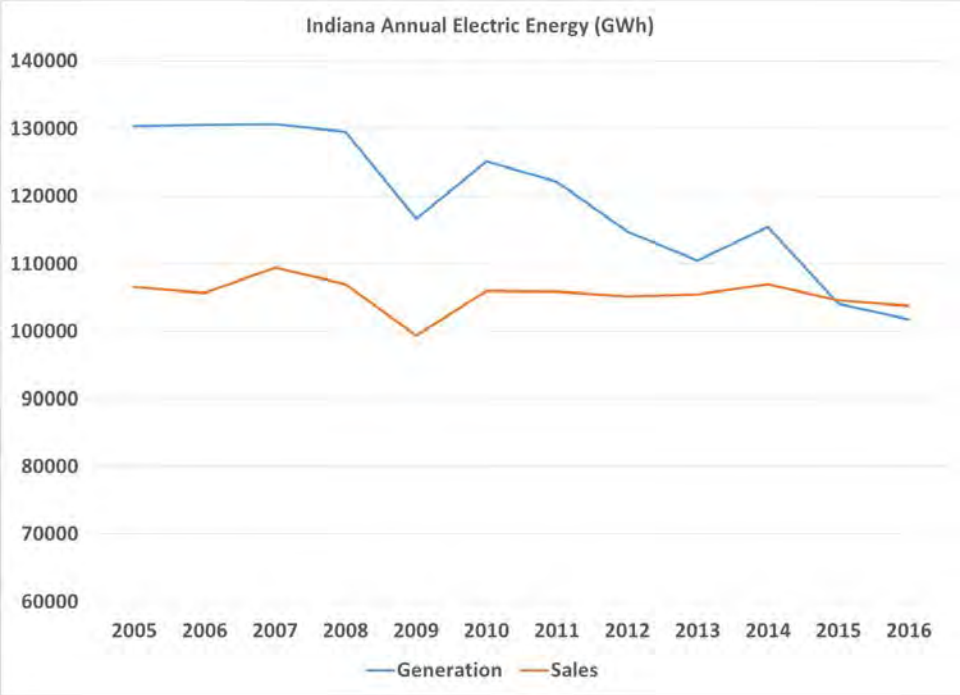


Historical EIA data on state emissions[ii], generation[iii], and sales[iv] form the basis for the analysis. While working with the data, it became apparent that there was another significant factor driving reductions in electric power CO2 emissions in Indiana: a significant drop in generation relative to sales.

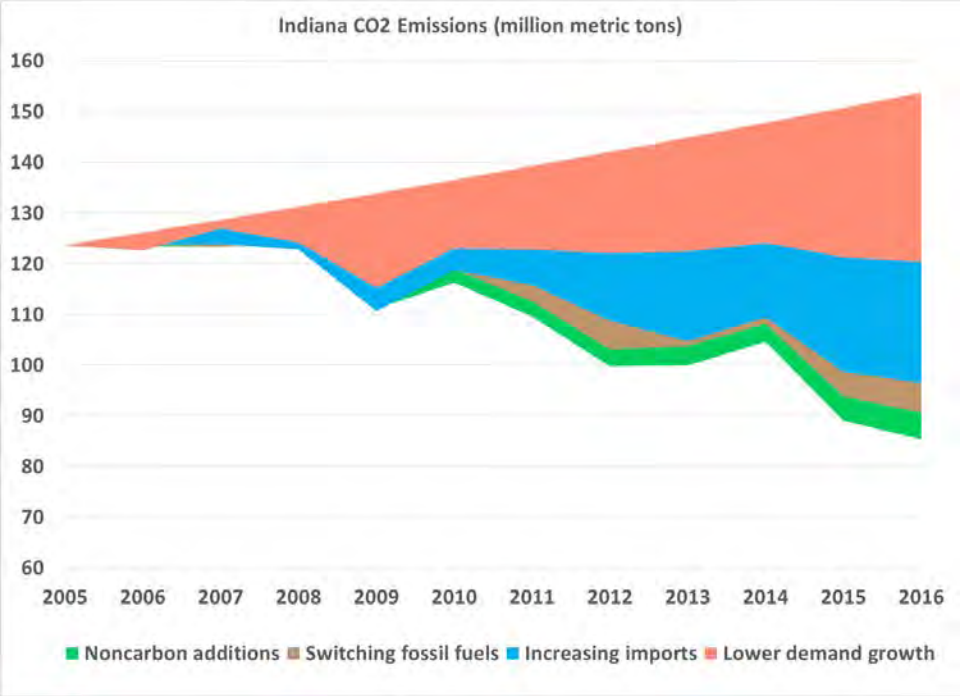
Comparing generation to sales to determine whether a state is a net exporter is problematic for a couple reasons. First, customer self-generation, including co-generation, will show up in generation but not in sales. Similarly, transmission and distribution losses affect generation but not sales. For example, Hawaii is neither an importer nor an exporter, yet EIA data indicates that its generation exceeds its sales.

Historically, Indiana's generation numbers have exceeded its sales numbers by about 20-25%. Recently, generation has fallen while sales have been relatively constant, as is shown below. Indiana has become a net importer, which has resulted in a significant fraction of the state's reduction in CO2 emissions. To the degree that the source of the imported energy is fossil-fueled, there would be an increase in emissions from other states[1].

[1] It is not possible to identify the source of the imported energy. It is likely to come from a mix of wind power (Indiana utilities have purchased power agreements for 438 MW of out-of-state wind) and natural gas-fired generators that compete with Indiana coal units in the wholesale markets.



The resulting chart of CO2 emissions is shown below. If demand/generation had grown at 2% annually from 2005 to 2016 (complete data for 2017 is not available at the state level) and carbon intensity had remained constant, statewide power sector CO2 emissions would have been 154MMmt. Lower demand growth then results in a reduction of 33MMmt. The shift away from in-state to out-of-state generation results in an additional reduction of 24MMmt. Switching among fossil fuels for in-state generation reduces emissions by 6MMmt and in-state non-carbon sources accounts for 5MMmt. This results in the actual 2016 emission level of 85MMmt.



[i] Energy Information Administration, https://www.eia.gov/todayinenergy/detail.php?id=37392
[ii] Energy Information Administration, https://www.eia.gov/electricity/data/state/emission_annual.xls
[iii] Energy Information Administration, https://www.eia.gov/electricity/data/state/generation_annual.xls
[iv] Energy Information Administration, https://www.eia.gov/electricity/data/state/sales_annual.xlsx