The U.S. Energy Information Administration (EIA) provides very important forecasts of energy prices, consumption, efficiency and so forth. The EIA produces short, long term and annual outlooks that are widely regarded as among the best and most independent forecasts of the state of the nation's energy use. The agency even has statutory authority to operate independent of political influence in order to ensure accurate forecasts.

And yet, the EIA forecasts are only forecasts. In an interesting publication published earlier this year, the EIA assessed its own previous forecasts to see how well it has done projecting everything from fuel prices to energy intensity to energy consumption. The answer is sometimes pretty well but sometimes consistently wrong over the past ten years. The most inaccurate projections over the past ten years are in energy prices: the agency neither forecast correctly the high cost per barrel of crude oil nor did it anticipate the global recession. And most recently, virtually no one foresaw the huge decline in natural gas prices we've seen in the past year or so. The agency's most accurate projections, by contrast, are in energy consumption in part because consumption patterns take awhile to catch up to shifts in prices so that they change less rapidly year over year.

The report is interesting to me on a number of levels. First, it's an indication of the seriousness of the EIA forecasting work that the agency spends significant time determining where it got things wrong in past forecasts. I'm always struck by how many politicians lambaste government workers for inefficiencies, bureaucratic bloatedness and so forth and how seldom government workers are praised for their professionalism. The EIA report evaluating its own forecasting capabilities is a good example of really sophisticated government work that is important and meaningful to countless analysts who need solid information about energy trends in order to make investments, craft policy and so forth. Second, the report demonstrates how difficult it is to project what will happen in energy markets five, ten, twenty and fifty years from now given how volatile and unpredictable prices can be. And prices, of course, have a huge effect — eventually — on energy consumption, energy efficiency, technological development and greenhouse gas emissions. Take the drop in natural gas prices, about which I've previously blogged. David Victor — in a very interesting post in the NY Times — estimates that the result of the fall in natural gas prices and the resulting shift away from coal usage in the electricity sector is that the U.S. has reduced greenhouse gas emissions by about twice as much as the emissions savings achieved through the European Union's cap-and-trade program. That's because electricity produced with natural gas emits about

half the greenhouse gases as electricity produced with coal. Some of the shift away from coal is also due to more stringent pollution control requirements that are making coal more expensive than natural gas but much of the shift is unrelated to direct governmental regulation and due instead to price changes in natural gas.

From a climate change perspective, the EIA forecast misestimations simply demonstrate what we already know: it's very tough to know with significant certainty what emissions will look like in coming years. On the good news front, U.S. emissions have been dropping faster than expected because of the drop in natural gas prices. But misestimations can and do go in the other direction as well: global emissions are increasing faster than the worst-case scenarios included in the Intergovernmental Panel on Climate Change Third Assessment, released in 2007. The increase is largely due to rapid emissions growth in China, even though China's energy intensity has been declining. Forecasts and scenario planning are obviously important and necessary to craft emissions policy. But, as the EIA report shows, at the end of the day they're only forecasts. Given the pace of emissions growth and the stalemate in global emissions policy, we have to hope that some of the assumptions contained in our most dire forecasts and scenarios are wrong in a way that overestimates emissions. But, as experience as showing us, it may be at least as likely that our assumptions produce global forecasts and scenarios that are too optimistic.