Remarks As Prepared

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Grace Notes

Thank you, Denis, for your kind introduction.

As some of you may know, I'm nearing the end of a 28-year career as a utility CEO. During that time, I have run companies in each of the three main regulatory structures – rate base/cost of service for both generation and wires, the integrated resource planning/PURPA model for generation and the competitive model for generation.

Each model was created with good intentions. Each model was, and is, at the mercy of politics. Like horseracing, gambling and prostitution in Nevada, electricity is too much fun for politicians to leave alone. That was true at the beginning of my career and remains true today.

My talk today will focus on my experiences with each model and my strong belief that competition with a market monitor is the best model.

Three Regulatory Models

<u>Rate Base/Cost of Service</u>

Rate base or cost of service regulation was the industry standard until the mid-1980s. This is the monopoly board model and the one most people still assume.

This model rests on the premise that the monopoly utility, with appropriate regulatory oversight, can plan to serve its customers' need in a economic fashion, choosing how much of which resources to buy or build, and recovering only its prudently incurred costs and a reasonable return.

> It favored coal-fired and nuclear baseload generation with low operating costs and high capital costs that could be recovered over the life of the unit.

It worked reasonably well during a period of predictable and sustained load growth and declining generation costs.

But when energy prices surged in the late 1970s, accompanied by high inflation and stagnant economic growth, rate base regulation of generation came under attack across much of the country.

Retail rates increased dramatically as the assumptions generally made in good faith by utilities in support of nuclear construction proved wildly inaccurate. Nuclear construction costs increased dramatically in the wake of Three Mile Island, but the cost challenge was far greater.

Load growth was far lower than projected.

Inflation was much higher.

High interest rates drove financing costs to unsustainable levels.

Oil prices fell rather than continuing to rise as forecast.

There was substantial technological progress – but in burning natural gas, not nuclear or coal.

As a consequence of increased rates, the “bargain” implicit in rate-based regulation was basically broken. State regulators began to disallow nuclear costs as imprudent or uneconomic.

This is when I began my CEO career in 1984 at a small utility called Central Maine Power (CMP).

The rate base model in New England was floundering over the cost of three nuclear plants undertaken by consortiums of 16 regulated and 60 cooperative and municipal utilities.

CMP, which had more than its total book equity invested in 6 percent of the Seabrook nuclear plant, was ordered to sell its stake at 15 cents on the dollar and “share” the loss with its customers.

The Seabrook investment nearly bankrupted CMP and did bankrupt the company who bought our stake – notwithstanding the deep discount.

And our experience was hardly unique: Nationwide after-tax write-offs totaled more than $17.5 billion.

As a result, policymakers and some in the industry began to question whether the generation of electricity was in fact a natural monopoly.

<u>PURPA/IRP Model</u>

In response to the cost overruns and higher rates, and partially in response to environmental demands, Congress enacted the Public Utility Regulatory Policies Act of 1978 (PURPA).

PURPA required utilities to buy energy from “qualifying facilities” at a cost not to exceed their “avoided cost.” PURPA was intended to diversify fuel supplies, to promote efficient production using indigenous fuels and to open the door to independent generators.

State regulators in many parts of the country expanded the model by adopting what came to be known as Integrated Resource Planning (IRP). The PURPA/IRP model attempted to avoid the perceived problem – construction overruns under rate base regulation – by forecasting a utility’s “avoided costs” over a 20-plus year period and allowing suppliers to bid against us. They believed the construction cost and operating risk would be shifted from customers to suppliers.

But in practice, this was no better for customers than the rate base model.

> In Maine, the same regulators who were burned by Seabrook insisted on using the estimated cost of Seabrook 2 as the proxy for avoided PURPA costs.
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> > As one of my executive vice presidents at the time observed, “They took the stupidest thing we ever did and required us to repeat it.”
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> The initial Maine PURPA contracts for wood-burning power plants rose to more than 14 cents per kilowatt-hour before they were settled out. To put it in perspective, this is more than the average customer pays now – almost 30 years later.
>
> The same pattern played out in Massachusetts, where I served as CEO of New England Electric and in New York, Connecticut and Pennsylvania.

The IRM model was biased toward gas and renewables built by those with the most political connections. It turned out that load growth, fuel price and technology costs were not easier for intervenors and regulators to forecast than they had been for utilities. Combining Soviet central planning with Chicago-style tort litigation does not yield efficient results.

The forecasted avoided costs never materialized, and the long-term contracts soon became above-market obligations foisted on captive customers much like the nuclear costs had been during the rate base era.

Ultimately, these retail rate increases prompted the push for restructuring and competition.

When the transition to competitive markets came, stranded costs from PURPA contracts were often greater than those associated with rate base construction generation.

> In the Southeast, they were about 40 percent of stranded costs.
>
> In the Northeast, they were about 50 percent.
>
> In California, they were almost 75 percent.

The total stranded costs nationwide from PURPA contracts, regulatory assets and generating assets fall between $100 billion and $200 billion according to most estimates – although some have the figure as high as $500 billion.

<u>Wholesale and Retail Competition</u>

Congress took a further step toward opening up electricity markets and encouraging competition when it enacted the Energy Policy Act of 1992 (EPACT). EPACT granted the Federal Energy Regulatory Commission (FERC) authority to require utility-owned transmission lines to be opened to all generators, even those that competed with the transmission owner’s own generation.

FERC subsequently implemented EPACT in 1996 with Order No. 888, which set the stage for independent system operators and true interstate wholesale competition.

And many states – New York, all of New England, Pennsylvania, Illinois, California and Texas – went the next step of allowing retail customers to shop and requiring the wires to be common carriers.

> I joined Unicom, a predecessor to Exelon, in 1998, immediately after the passage of the Illinois restructuring act.
>
> The Illinois law sought to create a competitive generation sector – one that would shift the risk of generation decisions, construction cost overruns and operational failures to shareholders and away from customers.

The early days of competition were not without its problems – most visibly the California electricity crisis in 2000 and, of course, Enron.

However, the experience in other parts of the country has been much better. The success and stability of Independent System Operators (ISOs) and Regional Transmission Operators (RTOs) have demonstrated not only that open access can succeed, but also that it can create deep, liquid and reliable wholesale markets.

Today, the U.S. has seven organized wholesale electricity markets across about one-half of the states that serve roughly two-thirds of U.S. electricity consumers.

In addition 16 states, including Pennsylvania, have competitive retail markets. This represents nearly 45 percent of electricity demand.

> In Pennsylvania, nearly 75 percent of non-residential customers have switched suppliers and more than 1 million customers are actively shopping for electricity suppliers.

The wholesale and retail markets are bringing real benefit to consumers.

> They have improved the operating performance of existing generating units and reduced their cost of operation
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> > An example of markets improving operating performance is in the number of days a refueling outage takes. It takes nuclear plants in competitive markets 35.7 days on average to refuel, compared to 44.8 days for their traditionally regulated counterparts, through the operating discipline that markets impose. Less time to refuel means more time to participate in the market.
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> They have significantly reduced wholesale prices from what they would have been, saving consumers money.
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> > From the onset of competition in 1997 to 2010, customers in RTOs have seen their rates increase at lesser rates than those not in RTOs. During this time, residential customer rates have increased by 0.3 percent in RTO's compared to 3.5 percent in non-competitive states.
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> And, they encourage innovation, efficiency and growth of renewable energy.

> Nearly 80 percent of U.S. installed wind capacity is located in regions with organized markets, while these areas have only 44 percent of U.S. wind energy potential, albeit in response to state mandates.
>
> In PJM's Reliability Pricing Model (RPM) auction in May, clean energy resources, including renewable, energy efficiency and demand response, made up nearly three-fourths of new capacity.

Of course, competition has its own biases. Competitive markets tend to favor the low capital cost generation – usually gas.

Exelon 2020

The evidence to date is clear: Markets are delivering more than cost savings and reliability; they are also delivering clean energy. We believe that they will continue to be the best mechanism for delivering clean, reliable and affordable electricity.

This belief is borne out by our Exelon 2020 analysis. Exelon 2020 is our plan to achieve the dual objectives of meeting our generation targets and load obligations while also reducing, offsetting or displacing our entire carbon footprint by 2020.

> It serves as our resource plan, as a guide to our investment decisions and as our framework for public policy advocacy.
>
> Since its inception in 2008, we have reduced our carbon footprint by 6.3 million metric tons, or 56 percent.

Each year, we develop a supply curve to show the costs of various supply technologies, taking into account current market conditions. In the past, this curve has been primarily focused on options for reducing greenhouse gases.

This year we expanded the curve to include options for reducing other pollutants (NOx, SO2 and toxics).

We modeled four scenarios for PJM, three of which are being discussed by policymakers and the fourth, a result of our Exelon 2020 analysis and commitment to competitive markets. Each was examined for compliance with the Clean Air Act, ensuring reliability, keeping costs affordable and making progress toward cleaning up the stack.

In each scenario, the horizontal axis of the curve represents generation in terawatt-hours. The width of this bar in each scenario reflects the reliability implications of opting for more intermittent resources (technologies that don't run when the sun doesn't shine and the wind doesn't blow).

The vertical axis reflects the levelized cost of energy represented in each of the curves. This axis illustrates the difference among those options that will be incented to come online by the market and those that will need subsidies to compete in the market.

> The first scenario, we call the Sweet Spot. (See slide 2 below.) The Sweet Spot reflects the fact that properly designed competitive markets will ensure that the stack is cleaned in the most effective manner. No new mandates or subsidies are needed – only that EPA Clean Air Act regulations go into effect.

In this scenario, the oldest, least efficient, biggest-polluting coal- and oil-fired plants retire, due to the economics of cheap natural gas and the costs of installing long-overdue emissions controls.

The power that is lost from these plants is mostly replaced by existing gas plants, which are currently running well below full capacity. Nuclear uprates (i.e., getting more power from existing plants) and energy efficiency make up the remainder of retiring fossil capacity.

Although coal retires, coal is not killed. 25 gigawatts of coal install new environmental controls to add to the 44 gigawatts that are already controlled.

It shows that more generation (other than uprates) isn't needed until late this decade given current energy efficiency programs, modest load growth and RPS mandates.

It also shows that while complying with EPA regulations is not without cost, it can be done at prices that are still very reasonable and can be done without sacrificing reliability.

The Sweet Spot's prices are about $12 per megawatt-hour higher than where the market is currently trading in today's dollars. This is far less than the National Research Council's finding that the societal cost of pollution from NOx, SO_2 and particulates is $120 per megawatt-hour for the dirtiest plants, the ones we assume will shut down in this scenario.

Although not created to solve the carbon problem, the Sweet Spot reduces carbon dioxide by 40 million tonnes from business as usual.

King Coal (See slide 3 below.) assumes that all coal plants, including the ones that don't make economic sense to retrofit, are retrofitted with scrubbers or other technologies to comply with the Clean Air Act. It assumes that the cost of these pollution control technologies is subsidized by including them in the rate base.

This would come at a much greater cost of $100, versus near-term forwards at PJM West Hub of approximately $55 per megawatt-hour (both in today's dollars).

Keeping this generation online results in $1.5 billion in extra costs for PJM consumers – a 40 percent increase over the Sweet Spot.

In terms of carbon, King Coal emits 30 million more tonnes of carbon dioxide than the Sweet Spot.

Our other two cases, Big Wind and Playing Favorites (See slide 4 below.), examine whether it's possible to clean up the generation fleet without more environmental controls on coal and oil.

Each scenario assumes that EPA regulations are not in place, but that policymakers try to reach the clean air goals of the regulation through other policy mechanisms – specifically a renewable portfolio standard and a clean energy standard.

Big Wind advocates the subsidized construction of wind with the hope of either displacing or forcing the retirement of enough existing coal generation to meet the Clean Air Act objectives.

Playing Favorites assumes a mandate of portfolio options commensurate with a 25 percent clean energy standard – a policy that was en vogue in Washington late last year and early this year as an alternative to cap-and-trade.

> The analysis shows that neither of these scenarios would comply with the Clean Air Act. SO2 and toxics levels are much higher and come at much higher costs to consumers.
>
> Big Wind costs consumers $15 billion annually – a 325 percent increase over the Sweet Spot, and Playing Favorites costs an additional $10 billion – a 285 percent increase.
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> Although each scenario reduces carbon 90 million tonnes more than the Sweet Spot, it comes at great cost to the consumer: $125 per tonne for Big Wind and $110 per tonne for Playing Favorites. In comparison, the Waxman-Markey cap-and-trade bill was estimated to cost between $15 and $25 per tonne.
>
> And in each scenario, although some coal retires, uncontrolled fossil generation remains in the supply – 26 gigawatts in Big Wind and 15 gigawatts in Playing Favorites.

The Sweet Spot, which allows the market to work, is clearly the best scenario from cost, reliability and clean standards.

> It costs much less than the other scenarios while meeting the decades-old Clean Air Act requirements and ensuring grid reliability.
>
> King Coal, although it meets the Clean Air Act, does not transform the generation mix.
>
> Big Wind and Playing Favorites cost at least $10 billion more and do not come close to meeting the Clean Air Act requirements even though they both assume that 25 percent of the generation in each scenario would be emission-free.
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> Letting the market work, not imposing new mandates and subsidies, is the right way to transition the generation fleet to clean energy while maintaining reliability and affordability.
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> The market, properly reflecting all the costs of energy, makes better choices for electricity supply than other options. And the cost of other approaches can be huge.

Market Meddling

However, even though markets are working and delivering real benefits to consumers, politicians cannot help themselves from meddling with them. There is one thing Republicans and Democrats agree on these days: messing with markets by finding ways to force uneconomic generation into them.

Illinois and New Jersey – both states my company operates in – have passed or tried to pass legislation that would incent the building of new generation without market mechanisms in the name of jobs.

In Illinois, some legislators wanted to build a 600-megawatt Integrated Gas Combined Cycle coal plant with some carbon capture and sequestration. The cost to build the plant would be over $3 billion.

The capacity price needed to make the plant economic would be in excess of $1500 per megawatt-day; currently the capacity market trades between $25 and $30 per megawatt-day.

This unit could not run enough to be economic, but someone would have to pay to bring it to market – in this case, Illinois ratepayers.

The unit would bid below market (because it is being paid outside of the market), and collapse the overall clearing price for the market.

New Jersey has passed legislation to do the same thing, except with a new natural gas plant. At least the plants are closer to economic, but the bidding behavior will be anti-market. This summer, FERC ruled on the New Jersey situation and came down on the side of competitive markets, rejecting the anti-market bidding for these plants.

This meddling trend is not restricted to Illinois and New Jersey, but is happening in state capitals across the country. Illinois and New Jersey show it is supported by the extremes of both parties – by a liberal, populist Democrat, Pat Quinn, and a conservative Republican, Chris Christie.

Conclusion

The history of the last 30 years, fairly remembered, makes clear that central planning efforts using customers' money – whether done by utility executives, regulators or even legislators – have not produced economic results.

It also makes clear that none of these models will be employed consistently. Politics will always be part of each model. Regulators and legislators have too many goals to let the models work as they should.

Competitive markets are delivering for customers and the environment. Markets are providing affordable, reliable electricity to consumers and they are making the transition to clean energy without picking expensive technology winners and losers.

I am reminded of Winston Churchill's quip that democracy is the worst form of government except all the other ones that have been tried. I think the same can be said of the competitive model.

Thank you. I am happy to answer any questions you may have.

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Wharton Energy Conference

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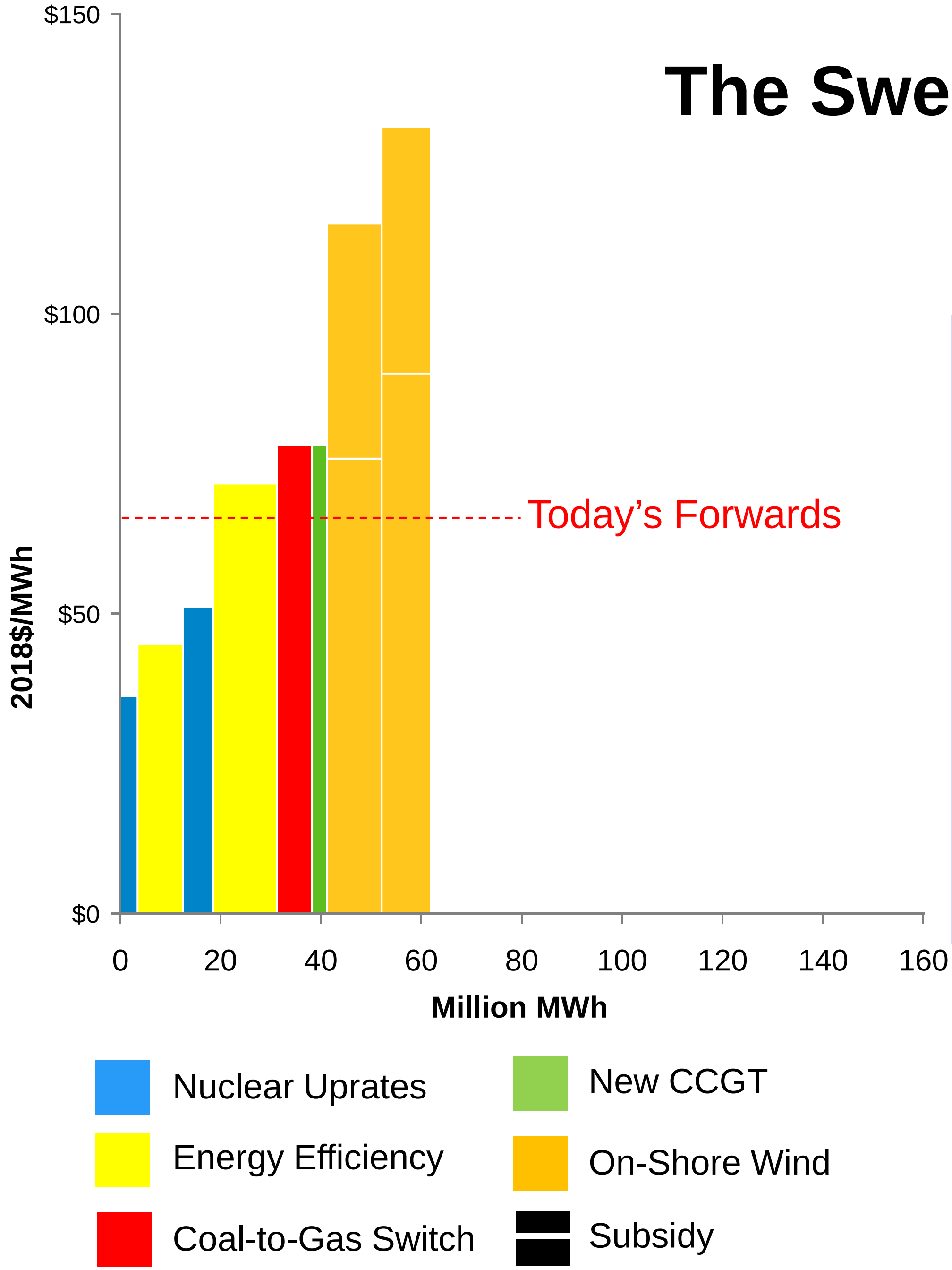
The Sweet Spot



Impact on PJM

NO_x, SO_2 and Toxics	**Clean Air Act Compliant**
Coal Impact	11 GW of coal retired
Reliability	10 GW of generation added
Affordability (2018$)	$3.5 billion incremental annual cost
Carbon Emissions	440 million tonnes of carbon

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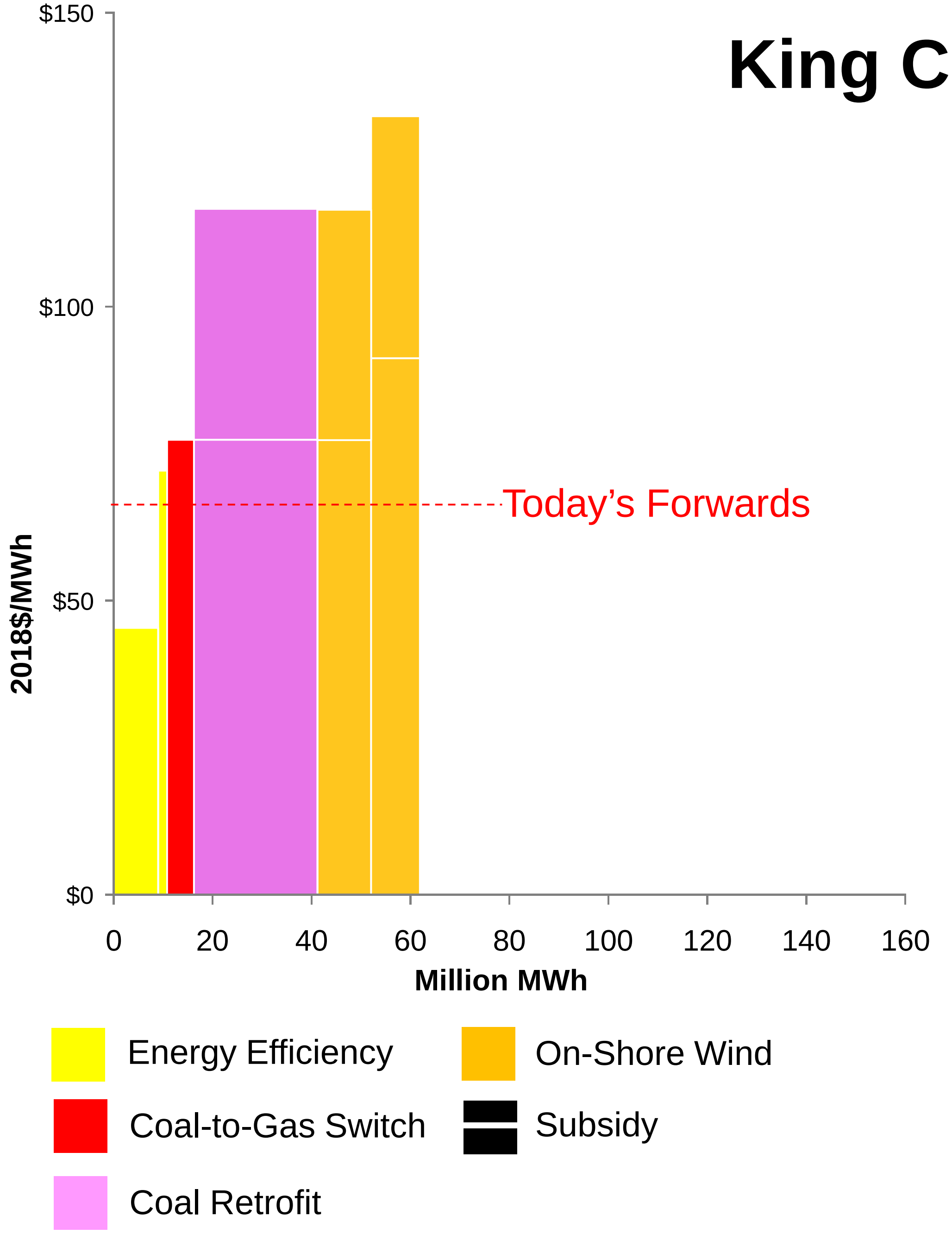
King Coal



Impact on PJM

NO_x, SO_2 and Toxics	**Clean Air Act Compliant**
Coal Impact	No coal is retired
Reliability	+18.5 GW of generation added or retrofitted
Affordability (2018$)	40% increase over Sweet Spot
Carbon Emissions	30 million additional tonnes

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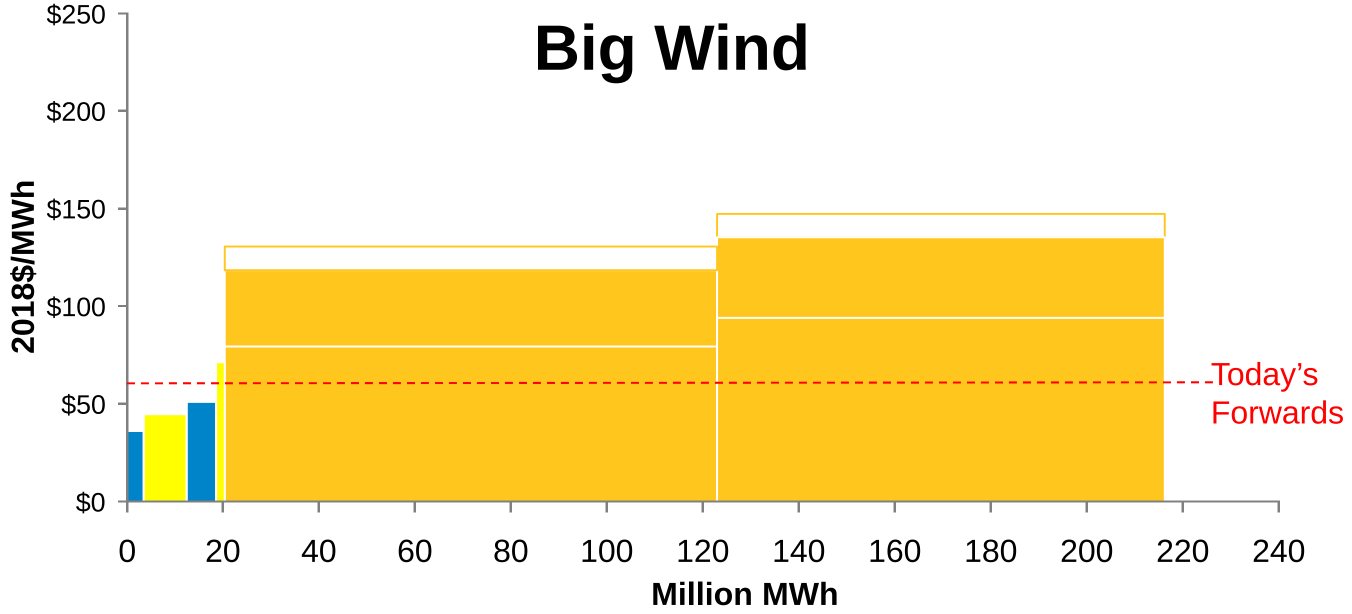

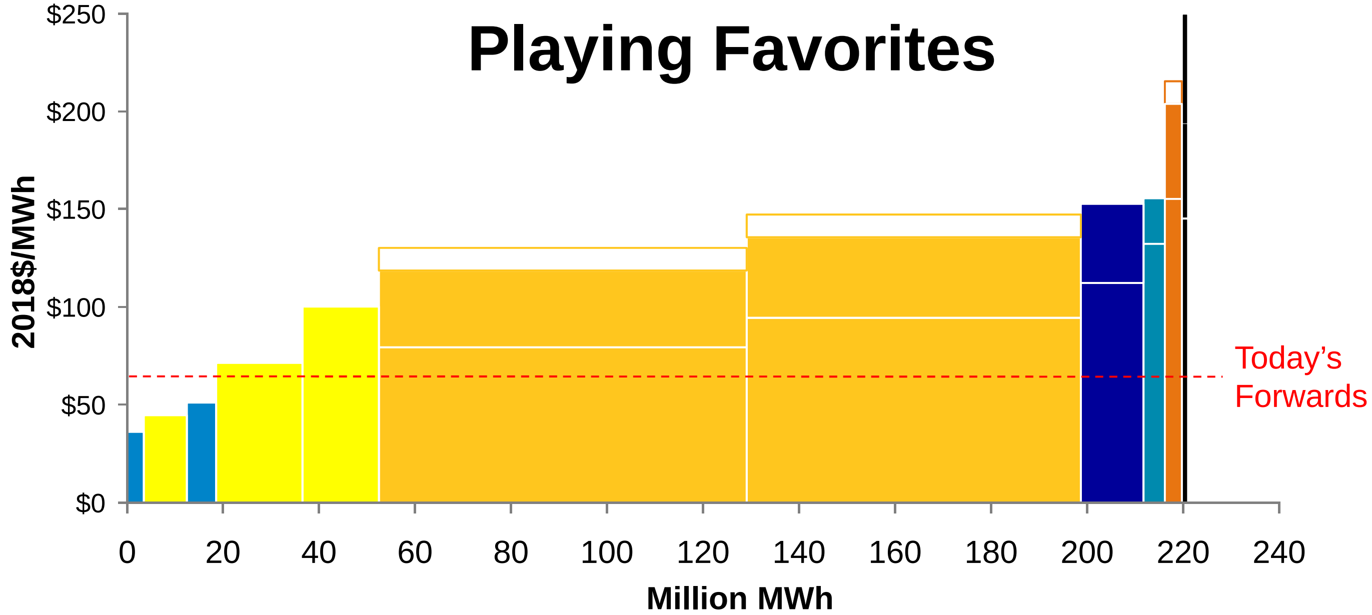

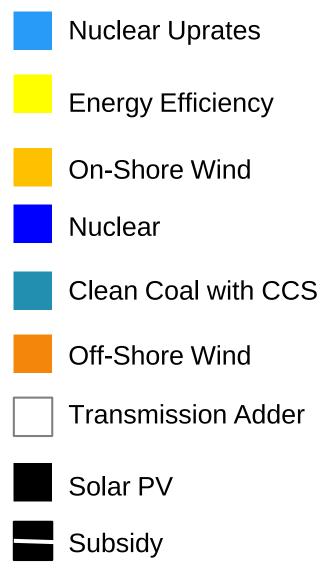

Both options much more costly and not Clean Air Act compliant

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