

# Nuclear Power Clean Air Analysis

Presentation to the  
Nuclear Research Energy Advisory Committee



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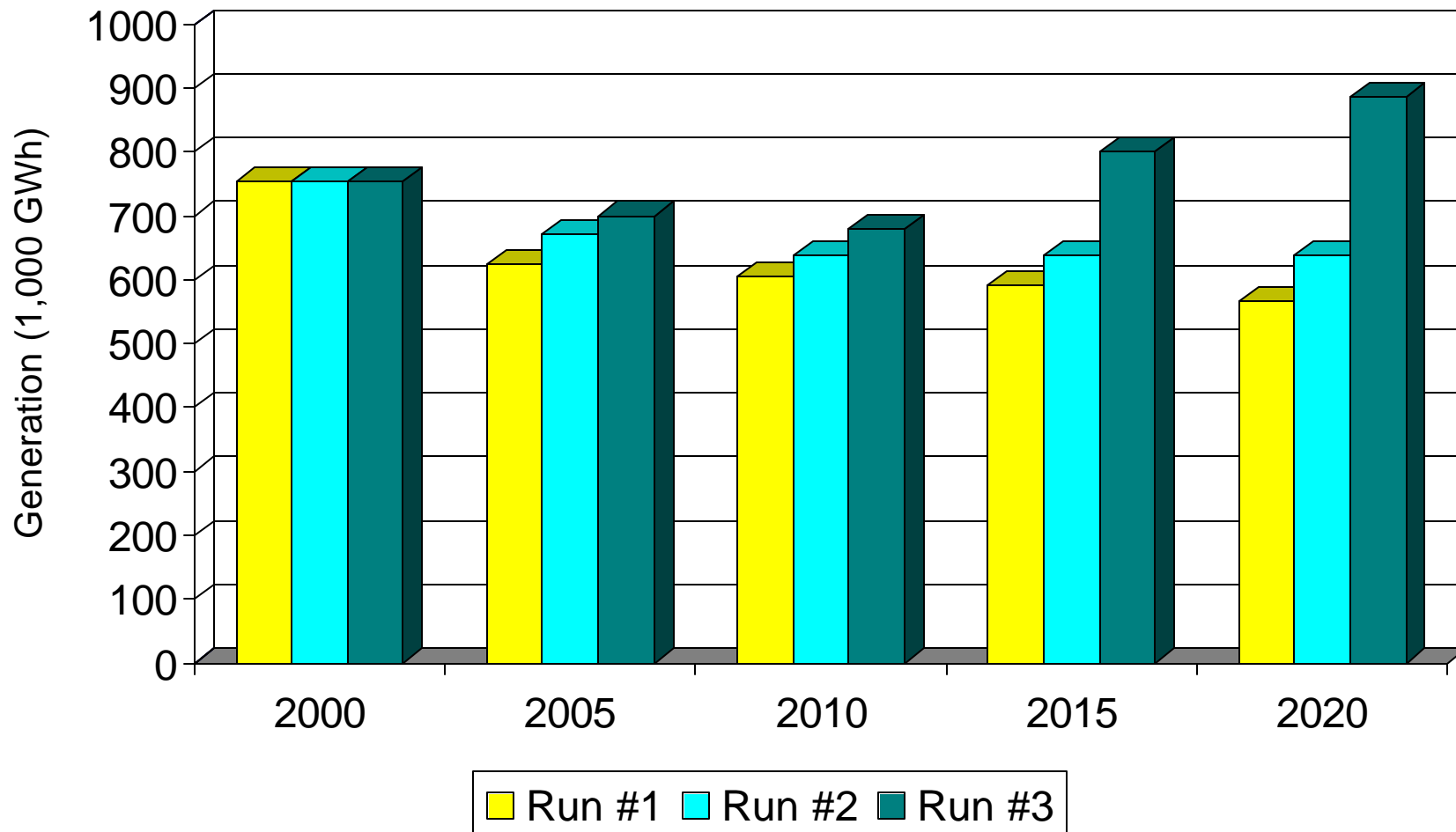


# Comparison of Model Run Projections For Year 2020

	<b>New Nuclear Capacity (GW)</b>	<b>Nuclear Capacity (GW)</b>	<b>Nuclear Generation (1000 GWh)</b>
<b>Run 1</b> (Base case run)	0	72	566
<b>Run 2</b> (DOE nuclear costs)	0	85	637
<b>Run 3</b> (DOE nuclear costs+ higher gas price run)	26	117	887
<b>Run 4</b> (EIA nuclear costs, Clear Skies Act constraints)	0	72	566
<b>Run 5</b> (DOE nuclear costs + Clear Skies Act constraints)	0	87	647
<b>Run 6</b> (DOE nuclear costs, Clear Skies Act constraints, higher gas price)	32	123	929

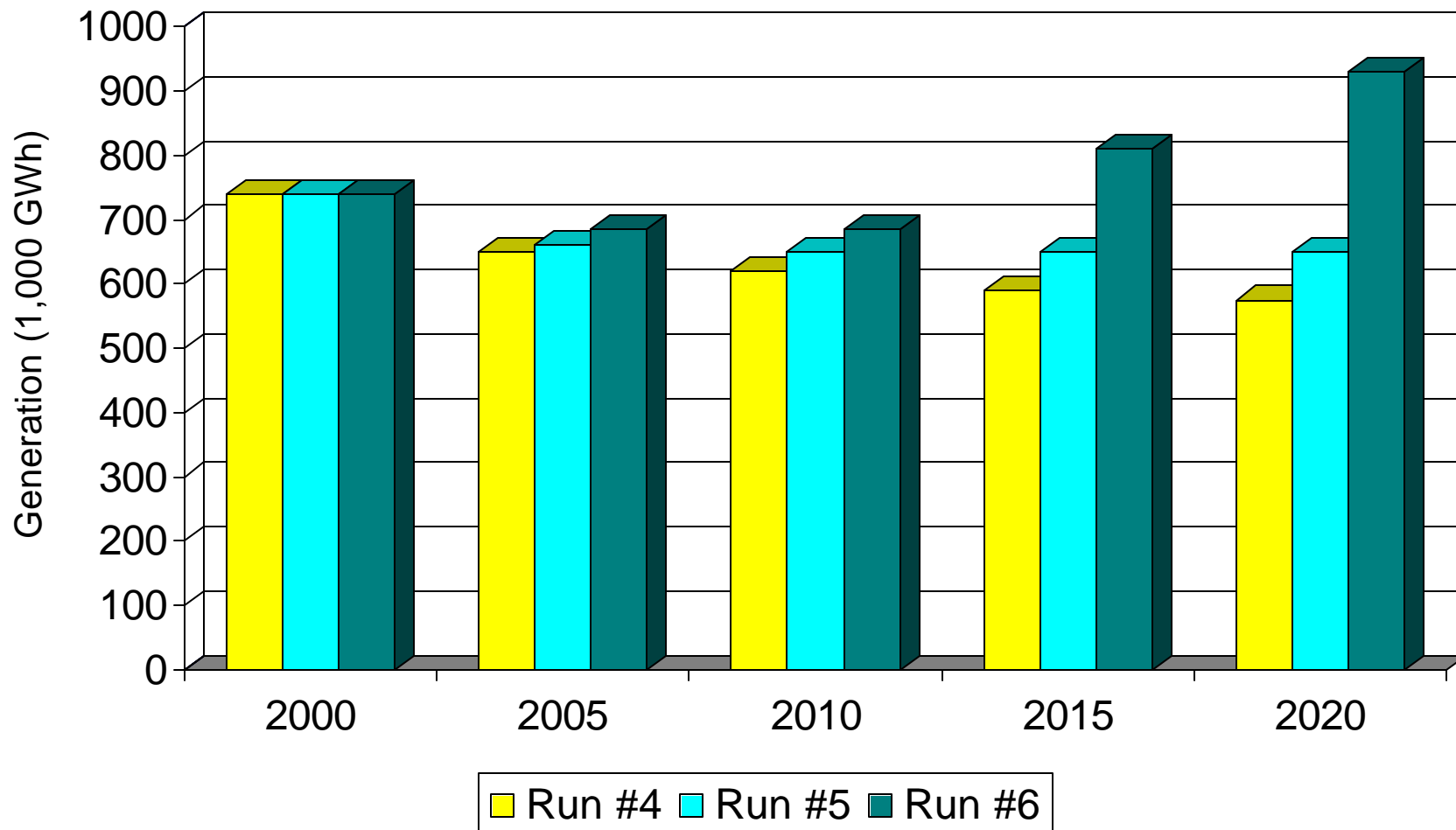


# Comparison of Projected Nuclear Generation





# Comparison of Projected Nuclear Generation





## Base Case Runs 1-6

- 1. Base case run using AEO 2000 nuclear cost assumptions - this is a run that takes into account current environmental regulations (national Acid Rain program to control SO<sub>2</sub> emissions, northeast's NO<sub>x</sub> SIP Call program to control NO<sub>x</sub> in the summer, etc.). We have already made this run and will be able to use it as a comparison to the other more optimistic nuclear runs.**
- 2. Base case run with optimistic nuclear cost assumptions provided by DOE -- this run would be used to compare to run #1 to show if any new nuclear units would be built and which units would be relicensed. A comparison will be made to run #1 to see if there are any emission reductions due to the more optimistic nuclear assumptions.**
- 3. Base case run with optimistic nuclear cost assumptions and gas price sensitivities - this run would then look at how increases in gas prices affect the relicensing and building of new nuclear units and what affects this may have on fossil fuel emissions.**



## **Base Case Runs 1-6 (cont.)**

- 4. Run with other proposed environmental programs capping SO<sub>2</sub>, NO<sub>x</sub>, and Hg using AEO 2000 nuclear cost assumptions - this run would look at one of the NEP environmental proposals that President Bush announced last week to control the emissions from fossil fuel fired power plants and the potential for relicensing and new nuclear builds. We have already completed this run and will be able to make comparisons to the run #1 which does not have the new environmental restrictions imposed on the power plants.**
- 5. Run with other proposed environmental programs capping SO<sub>2</sub>, NO<sub>x</sub>, and Hg using optimistic nuclear cost assumptions provided by DOE - this run would look at one of the NEP environmental proposals that President Bush announced last week to control the emissions from fossil fuel fired power plants and the potential for relicensing and new nuclear builds. It will be useful to compare this run to run #4 to see if the more optimistic nuclear assumptions yield more relicensing and new builds.**



## **Base Case Runs 1-6 (cont.)**

- 6. Run with other proposed environmental programs capping SO<sub>2</sub>, NO<sub>x</sub>, and Hg using optimistic nuclear cost assumptions provided by DOE and sensitivities on gas prices - this run would look at one of the NEP environmental proposals that President Bush announced last week to control the emissions from fossil fuel fired power plants and the potential for relicensing and new nuclear builds. It will be useful to compare this run to run #4 and #5 to see the affect of higher gas prices on the relicensing and building of new nuclear units.**



# Cost and Performance Characteristics of New Nuclear Technologies for EPA modeling in IPM (1999\$)

	Alternative Base Case Advanced Nuclear (IPM)		
	2005-2009 (1350MWe)	2010-2014 (1090MWe)	2015 and After (1090MWe)
Lead Time (months)	48	48	36
Availability (%)	87	93	94
Forced Outage Rate	Current average	Current Average	Current average
Heat Rate (Btu/kWh)	9,800	9,800	9,700
Capital (\$/kW)	\$1,400	\$1,210	\$1,040
Variable O&M (\$/MWh)	\$12/MWh	\$11/MWh	\$10/MWh

## Nuclear Relicensing

20 year license extension costs  
Capital Cost of (\$/kW)

At 30-year mark PWRs will assume a cost of \$175M for  
steam generator change out