



2009 SUMMER SEMINAR
CREATING OUR FUTURE



Creating Our Future: *Meeting the Electricity Technology Challenge*

Steven Specker
President and CEO

2009 Summer Seminar
August 3-4, 2009

The Electricity Technology Challenge



- **Defining the Challenge**
- **Understanding the Challenge**
- **Meeting the Challenge**

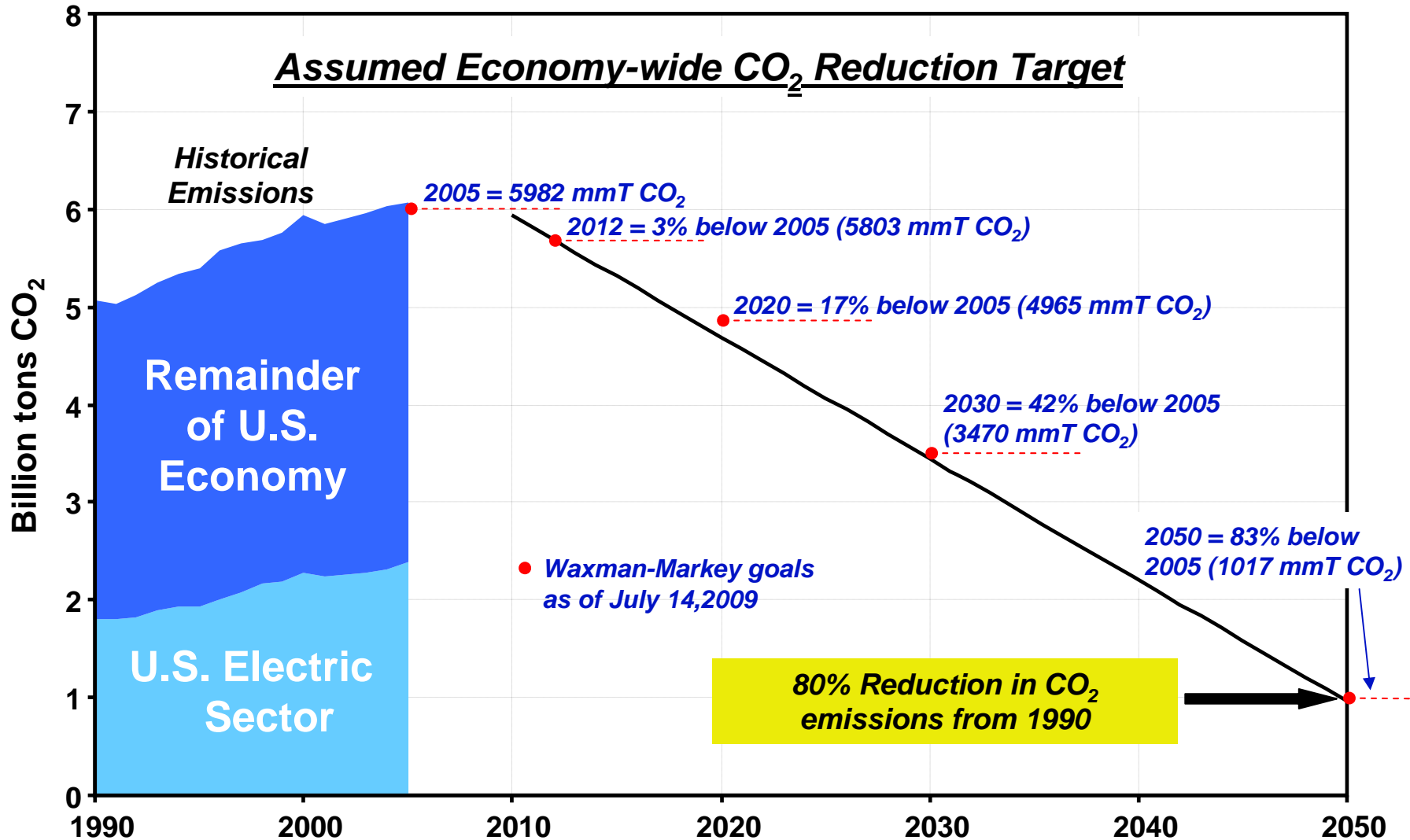
Defining the Technology Challenge



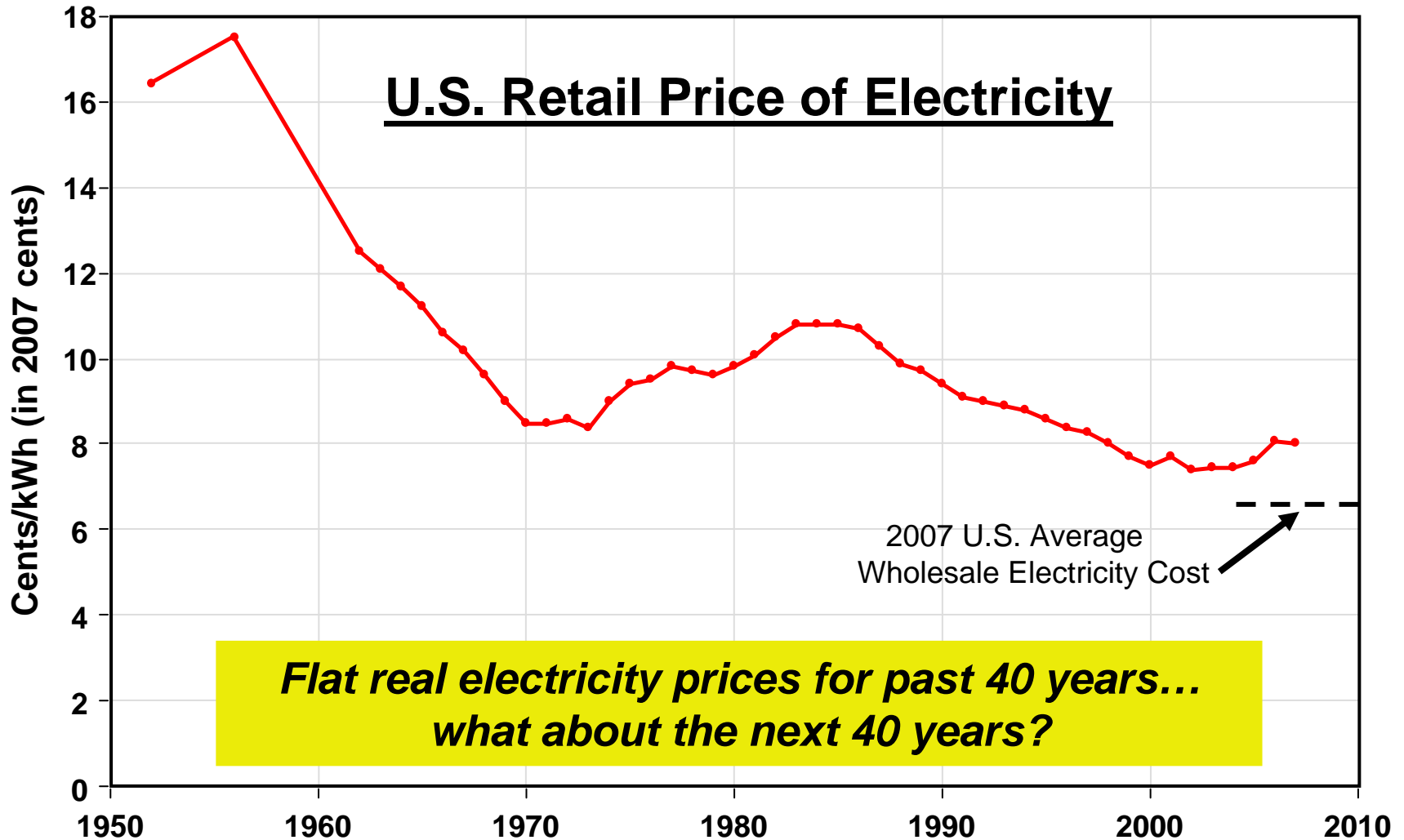
- ***De-carbonize the electricity infrastructure***
- ***Meet binding economy-wide CO₂ reduction targets***
- ***Provide reliable, affordable, and environmentally responsible electricity to consumers***

Two Key Metrics: CO₂ Emissions and Cost of Electricity

The CO₂ Challenge



The Cost Challenge



The Electricity Technology Challenge



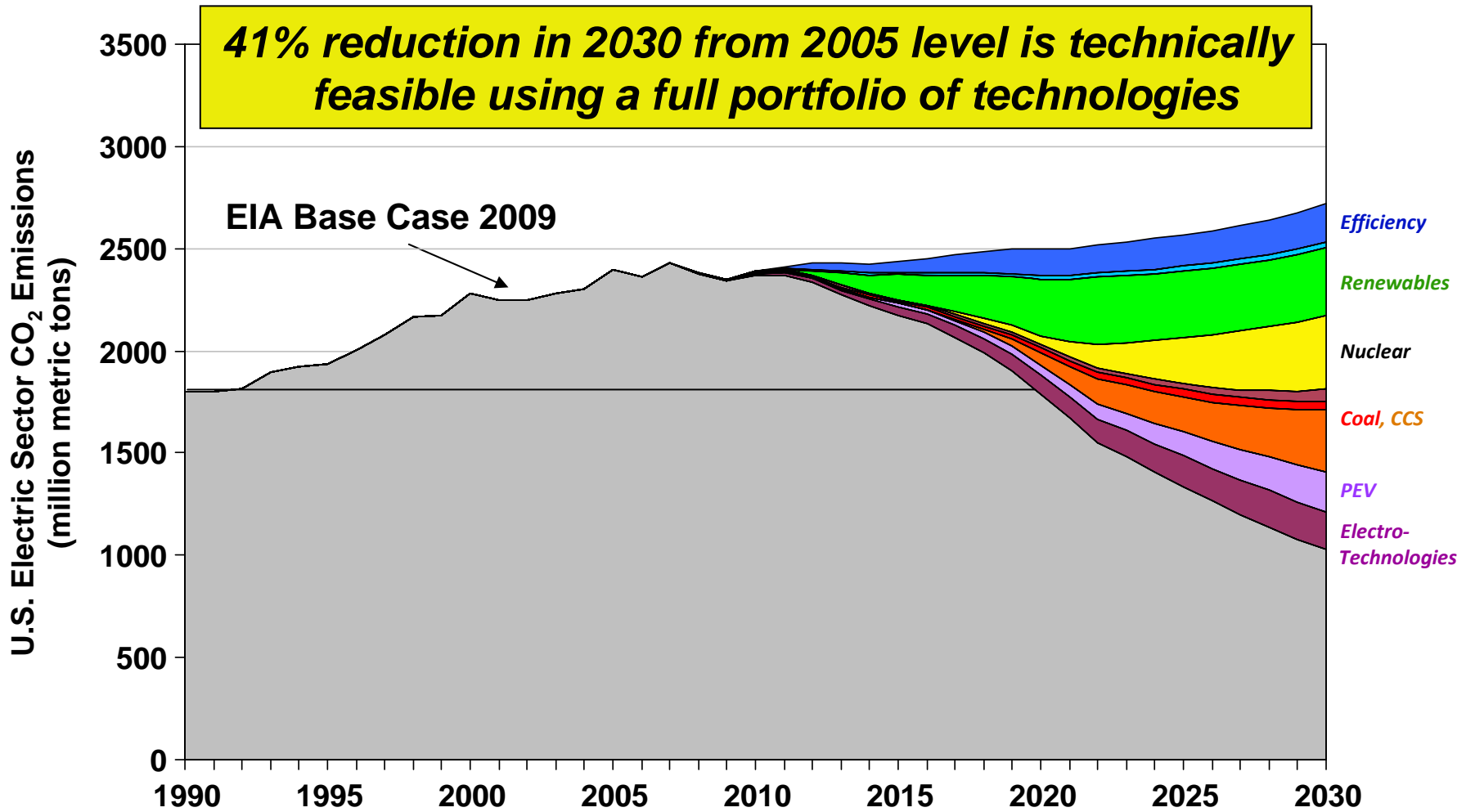
- Defining the Challenge
- **Understanding the Challenge**
- Meeting the Challenge

2009 Prism Technology Targets



	<i>Technology</i>	<i>EIA AEO Base Case</i>	<i>EPRI Prism Target</i>
	Efficiency	Load Growth ~ +0.95%/yr	8% Additional Consumption Reduction by 2030
	T&D Efficiency	None	20% Reduction in T&D Losses by 2030
	Renewables	60 GWe by 2030	135 GWe by 2030 (15% of generation)
	Nuclear	12.5 GWe New Build by 2030	No Retirements; 10 GWe New Build by 2020; 64 GWe New Build by 2030
	Fossil Efficiency	40% New Coal, 54% New NGCCs by 2030	+3% Efficiency for 75 GWe Existing Fleet 49% New Coal; 70% New NGCCs by 2030
	CCS	None	90% Capture for All New Coal + NGCC After 2020 Retrofits for 60 GWe Existing Fleet
	Electric Transportation	None	PHEVs by 2010; 40% New Vehicle Share by 2025 3x Current Non-Road Use by 2030
	Electro-technologies	None	Replace ~4.5% Direct Fossil Use by 2030

2009 Prism



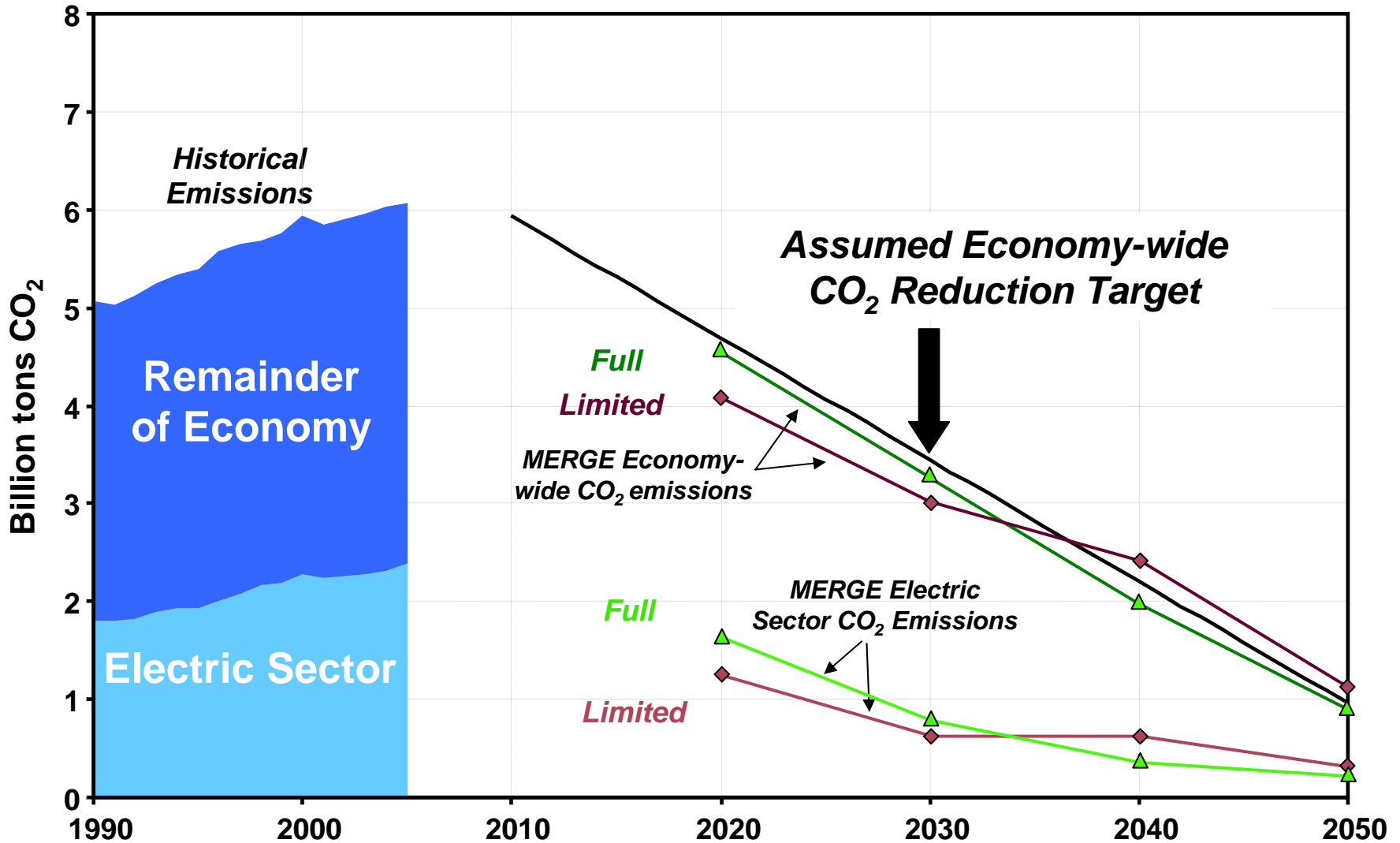
Technology Portfolios



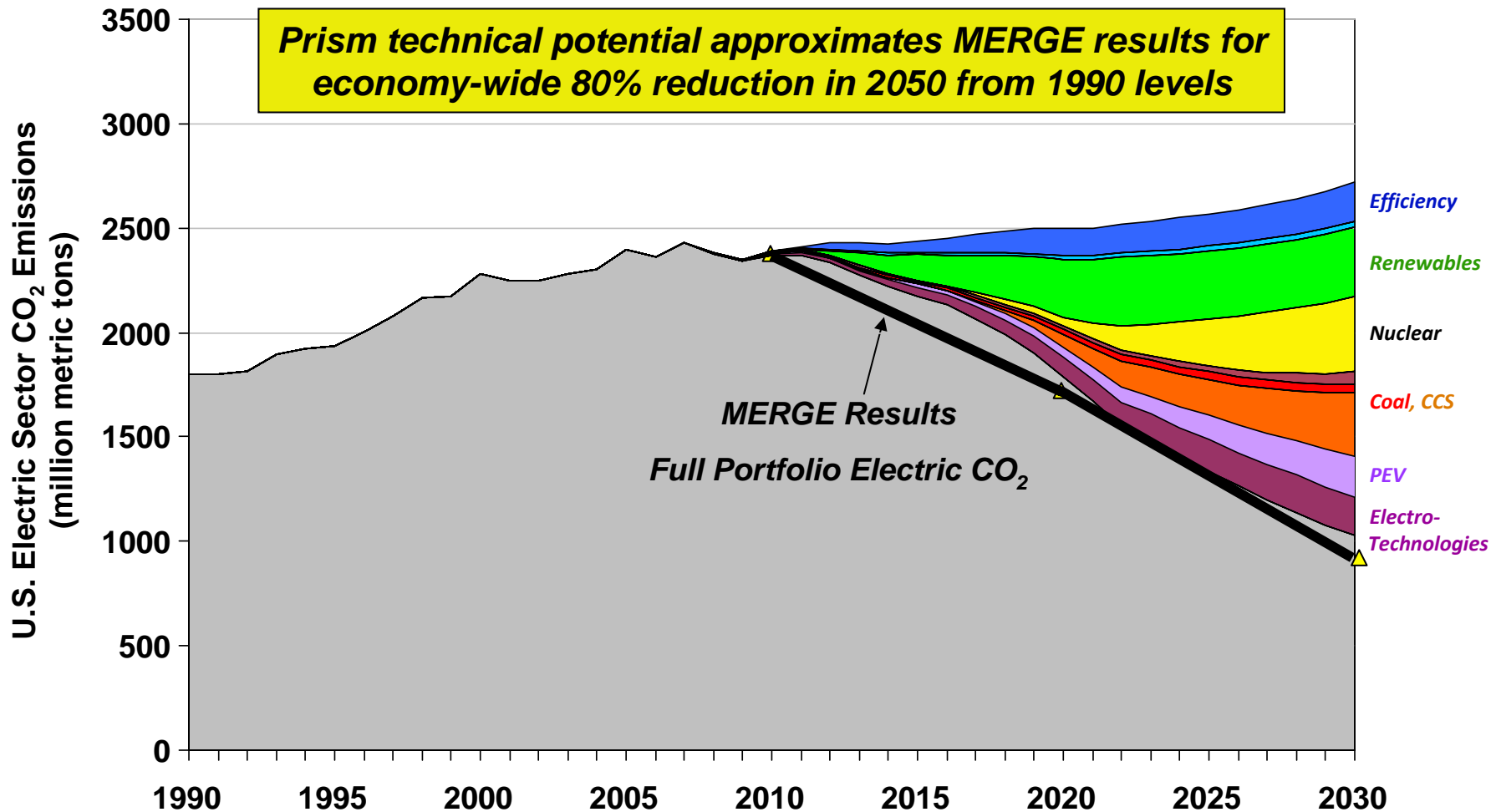
Two Technology Portfolios Modeled with MERGE

- **Full Portfolio**
 - Coal and Gas CCS available
 - Accelerated end-use efficiency
 - PEV's can expand
 - Nuclear production can expand
- **Limited Portfolio**
 - No CO₂ capture and storage (CCS)
 - No plug-in electric vehicles (PEV's)
 - Nuclear generation remains at existing levels

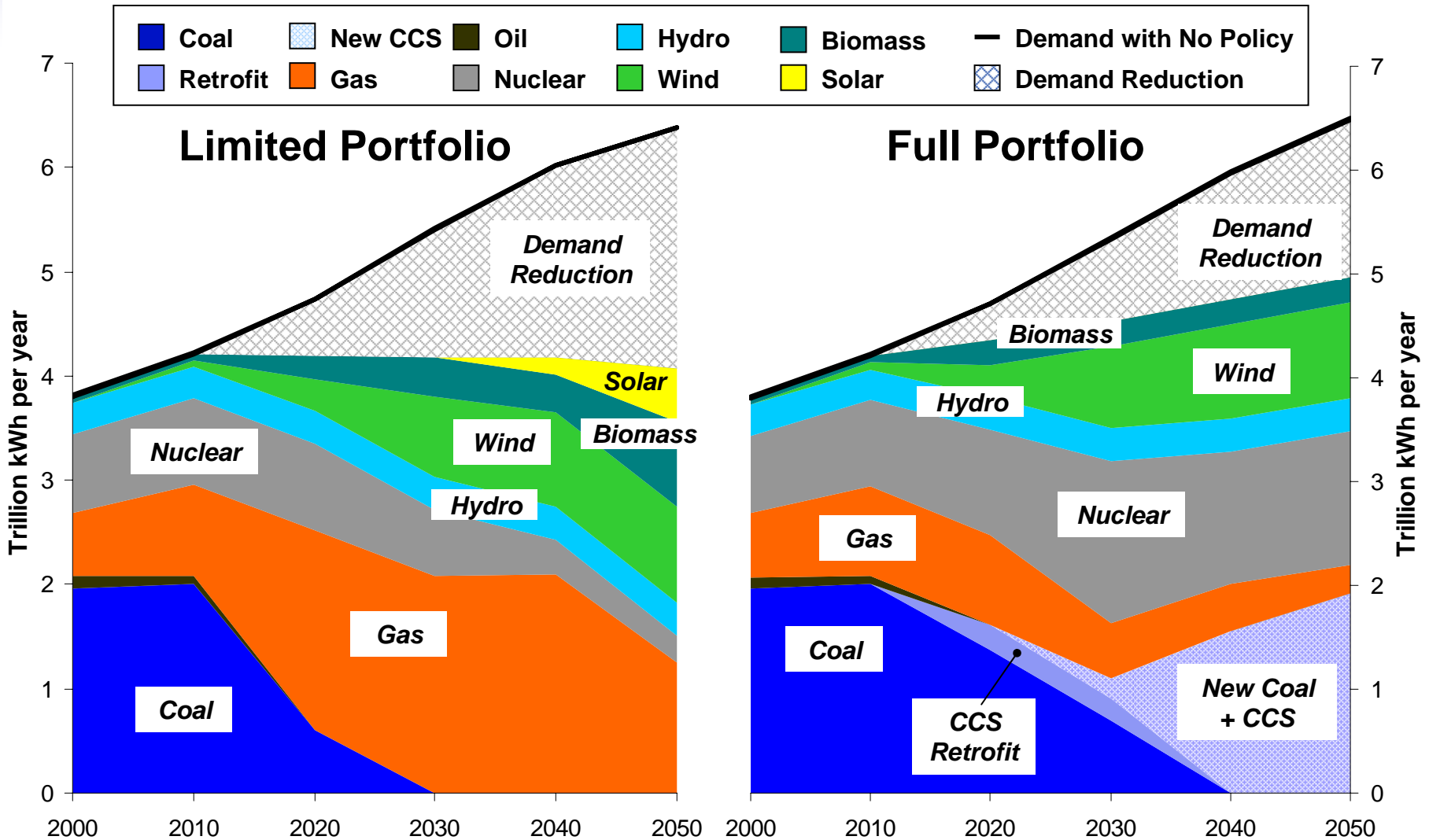
MERGE Electric Sector CO₂ Emissions



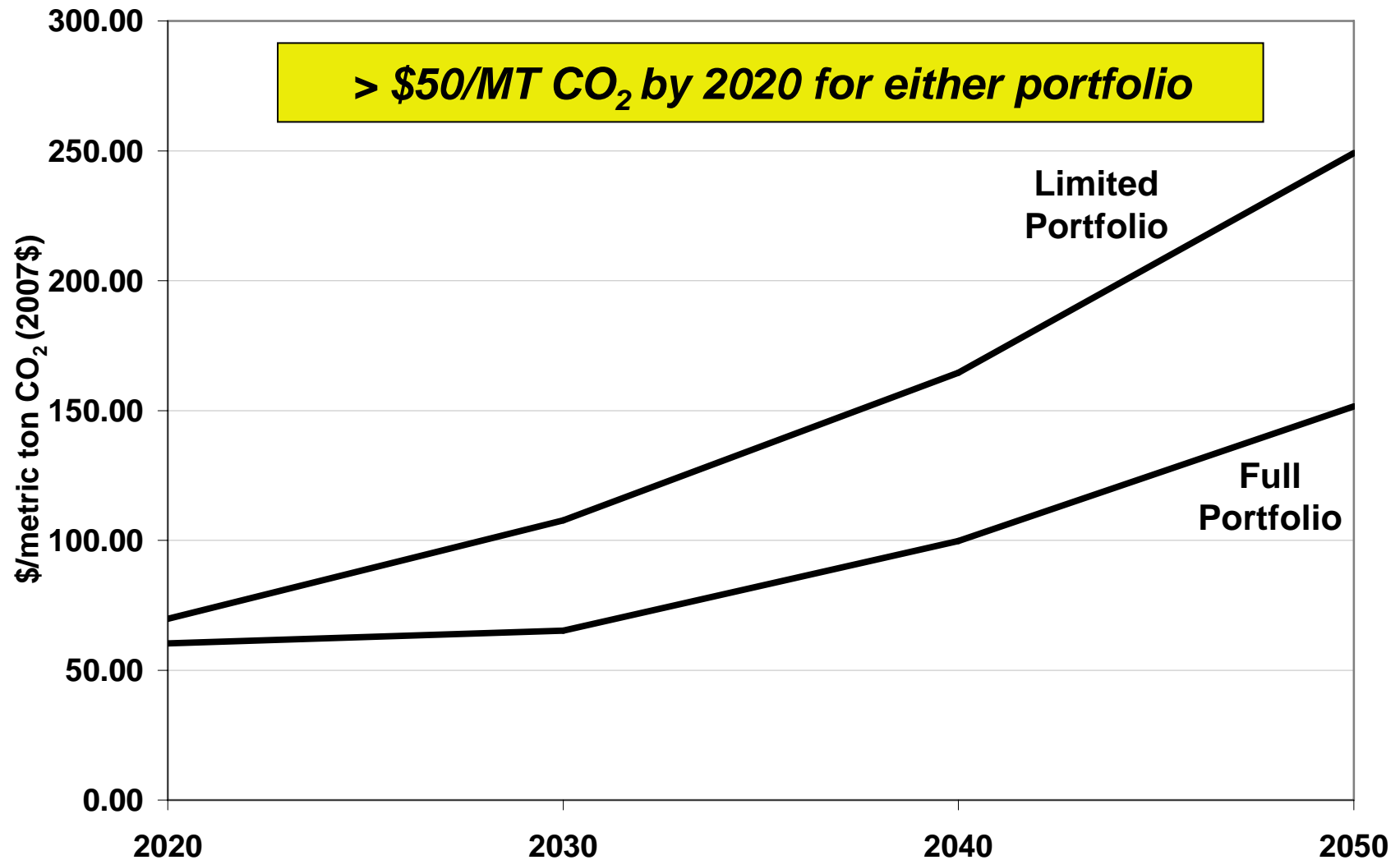
MERGE/Prism Emission Comparison



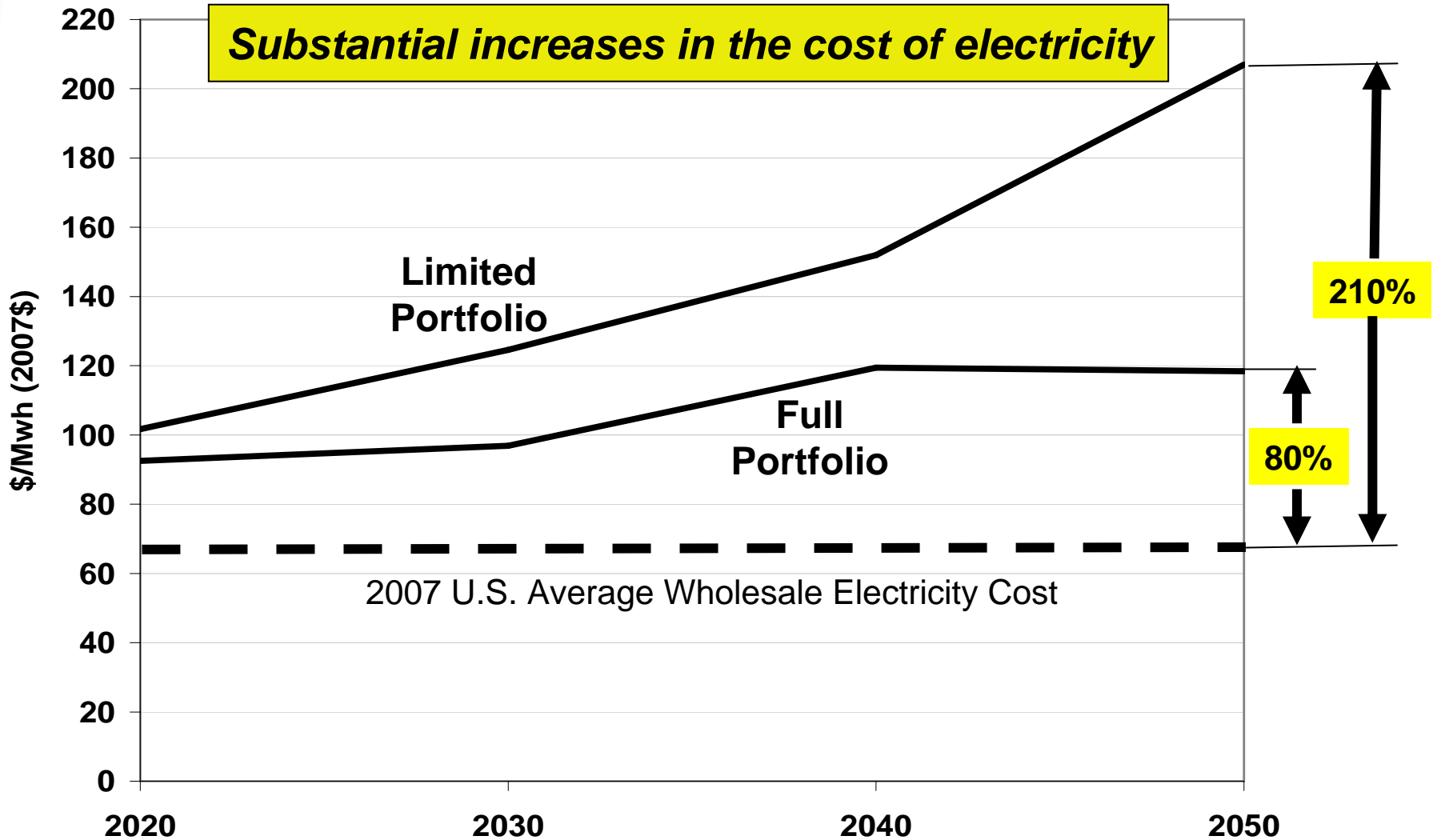
MERGE U.S. Electric Generation Deployment



MERGE CO₂ Price Results



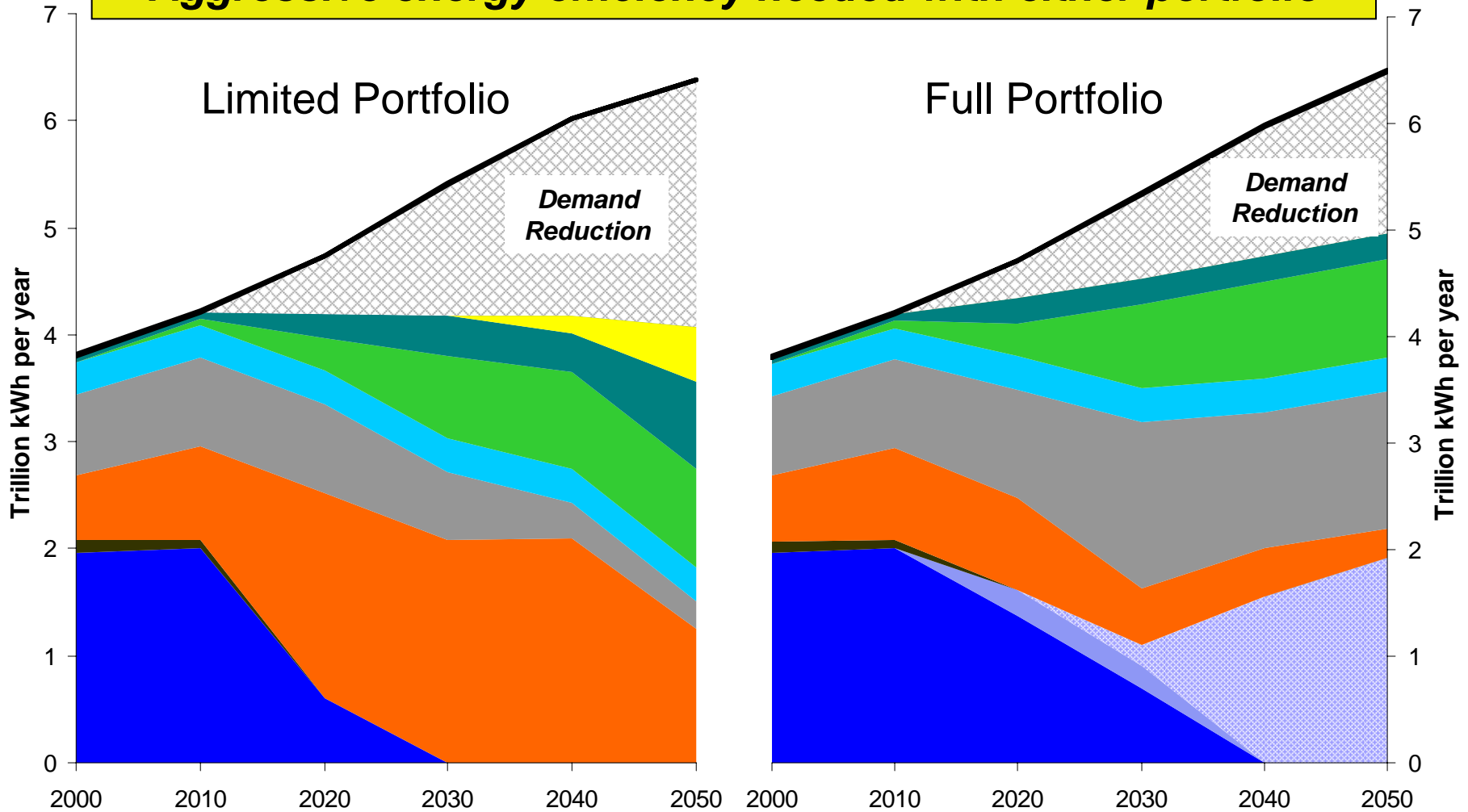
MERGE Wholesale Electricity Cost Results



Technology Insight – Energy Efficiency



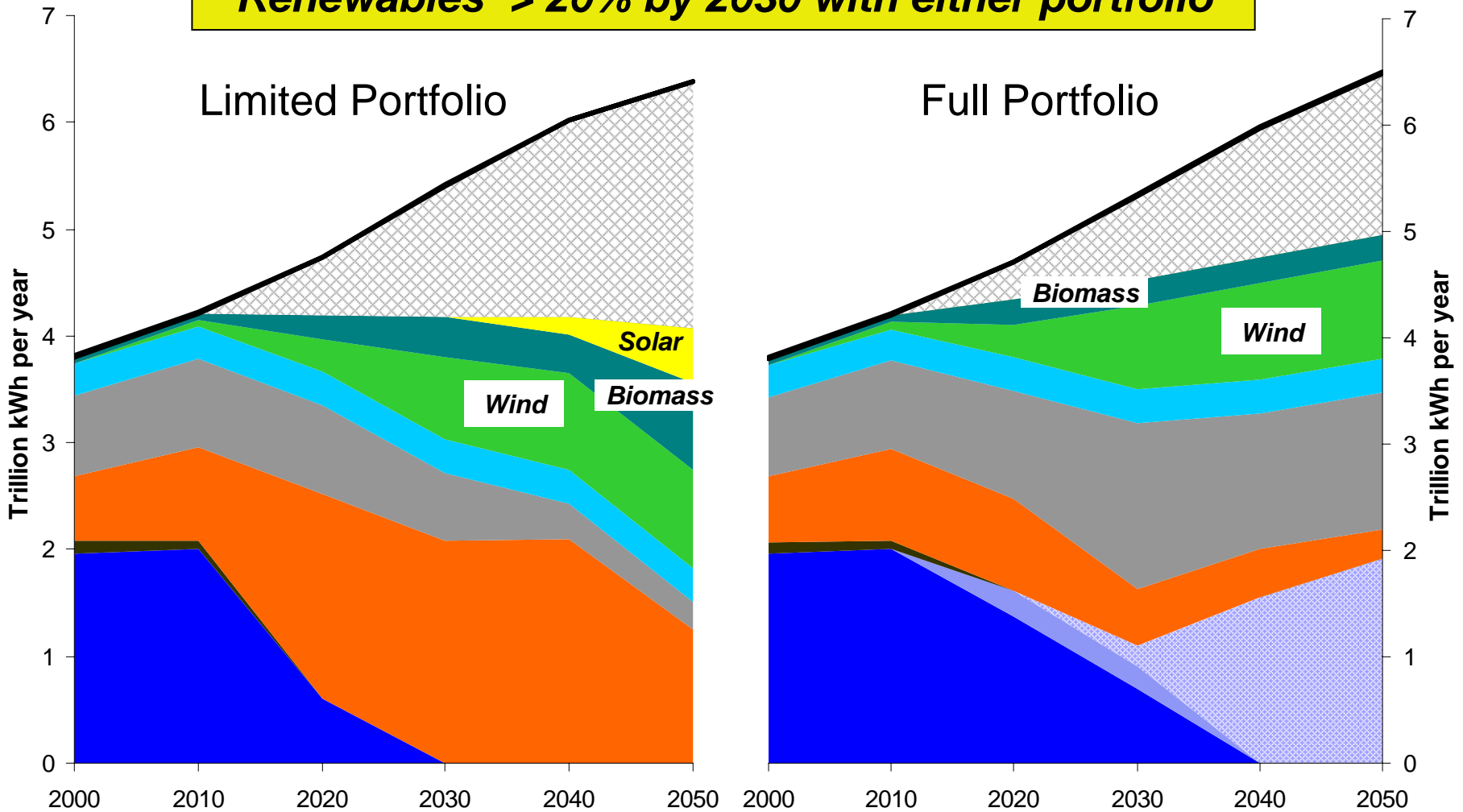
Aggressive energy efficiency needed with either portfolio



Technology Insight - Renewables



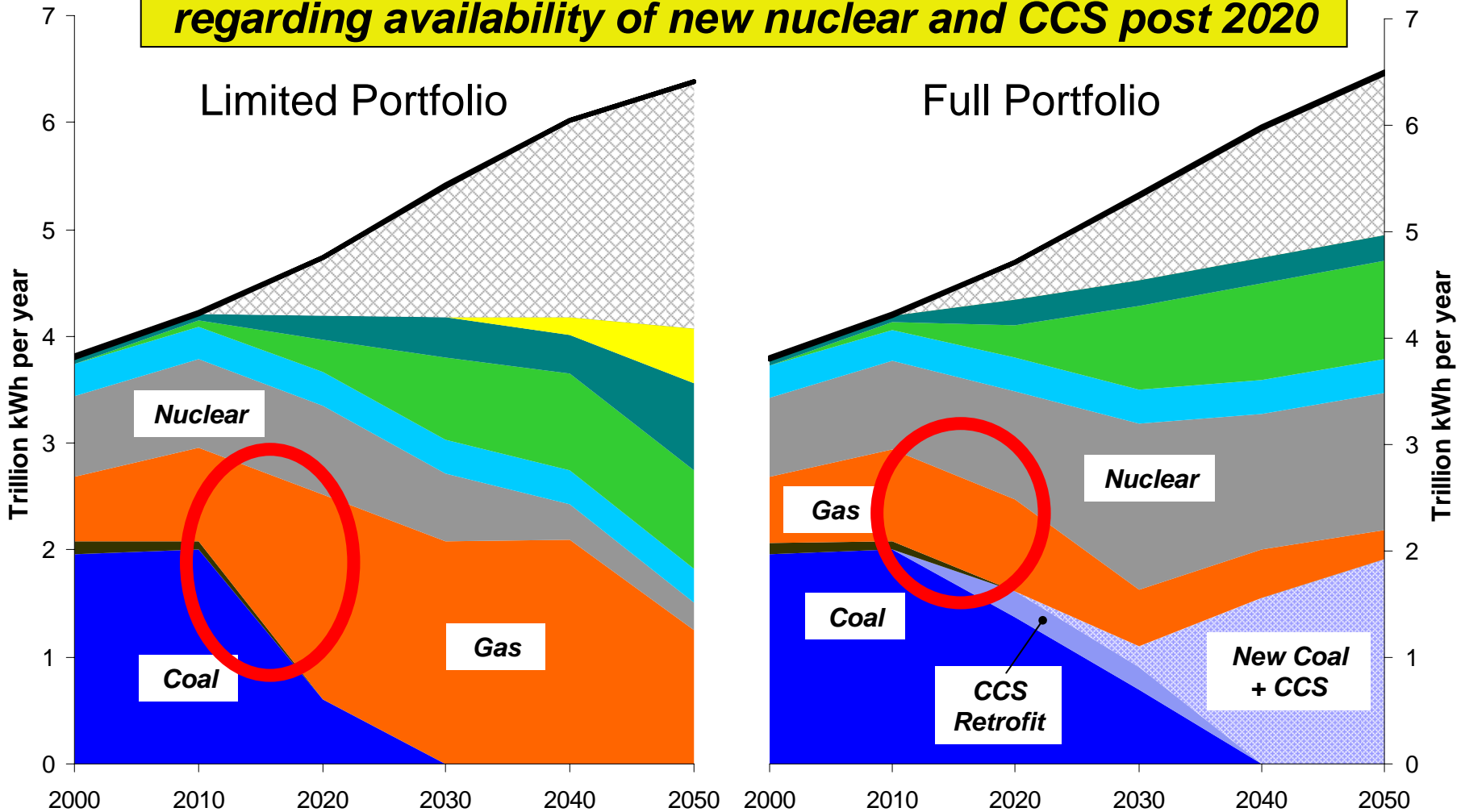
Renewables > 20% by 2030 with either portfolio



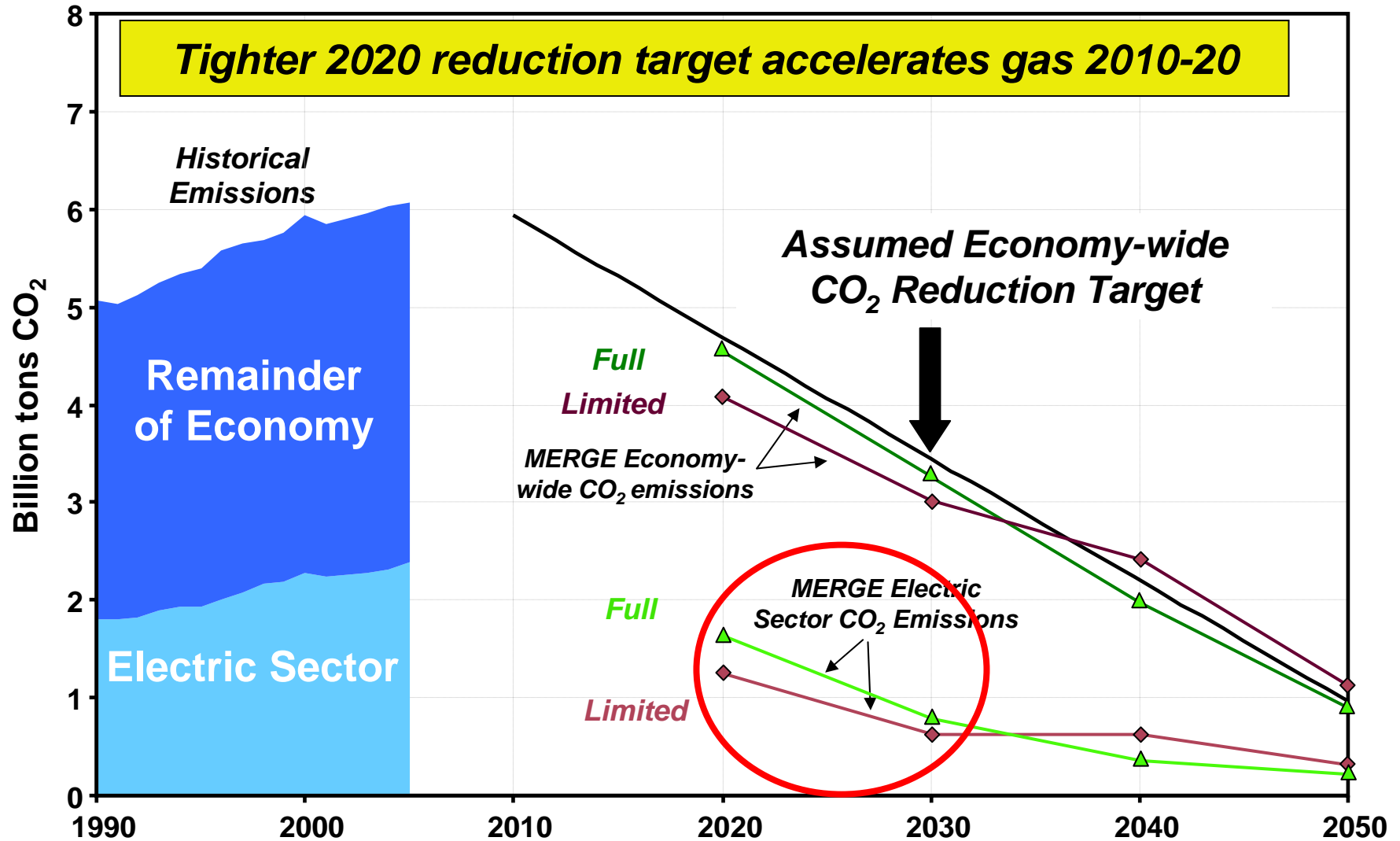
Technology Insight – Nuclear and CCS



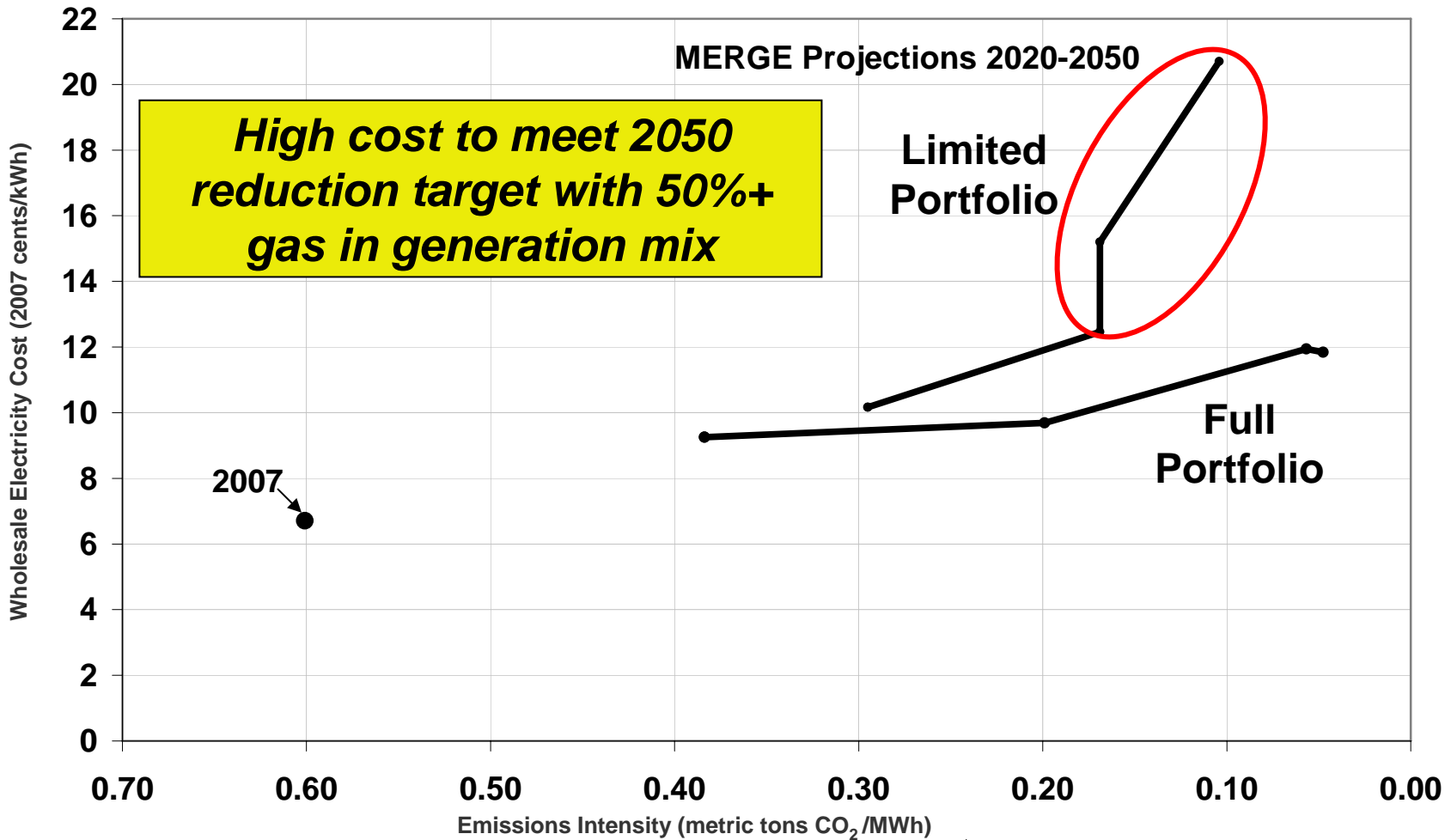
Gas expands rapidly 2010-2020 if uncertainty exists regarding availability of new nuclear and CCS post 2020



Technology Insight - Gas



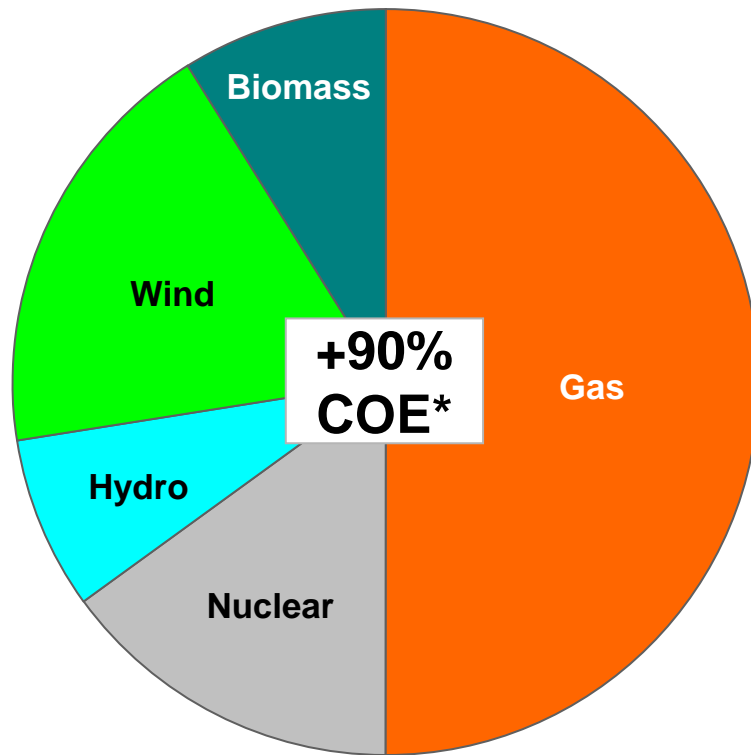
Technology Insight – Gas



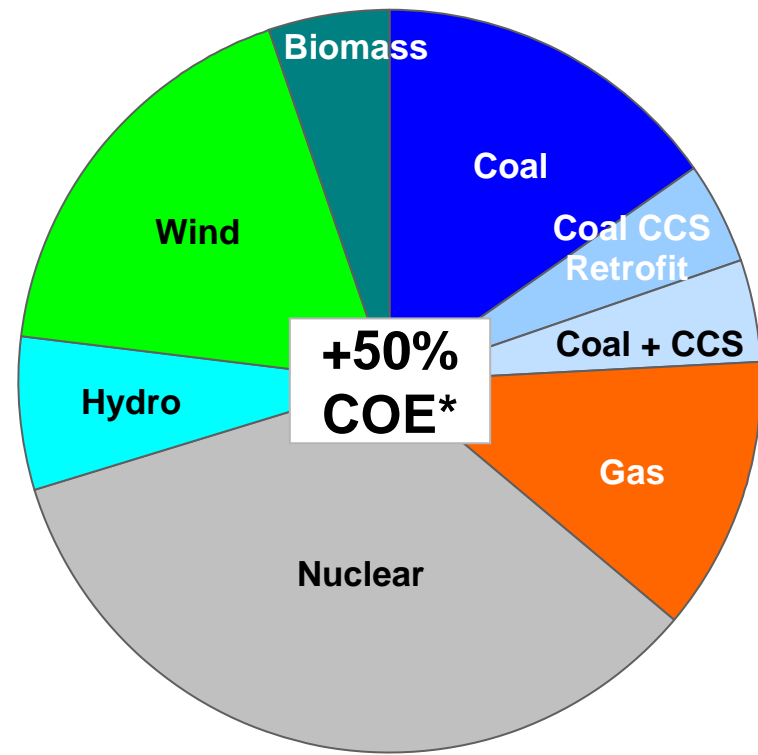
Generation Mix and Electricity Cost* in 2030



Remarkably different futures...and only 20 years away!



Limited Portfolio



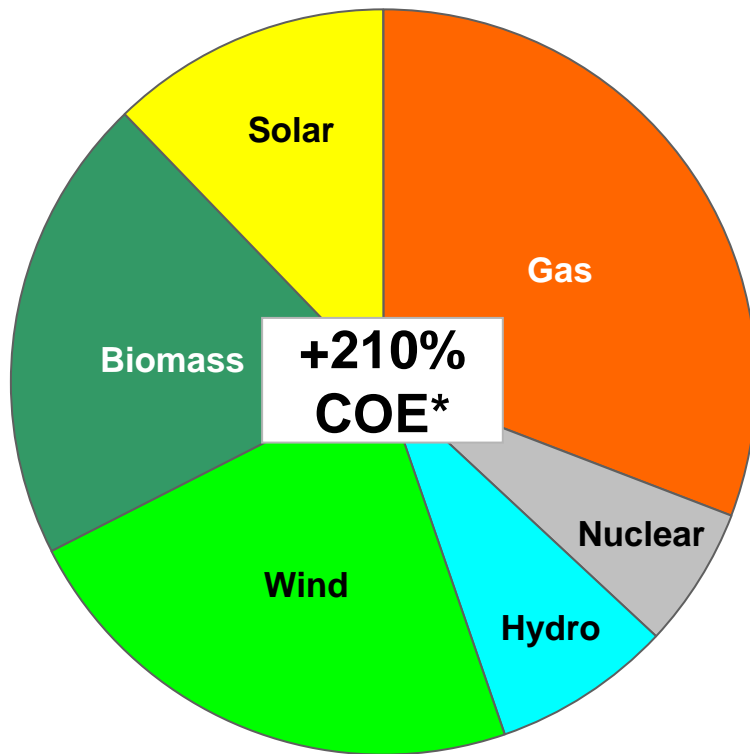
Full Portfolio

* Cost of electricity increase relative to 2007

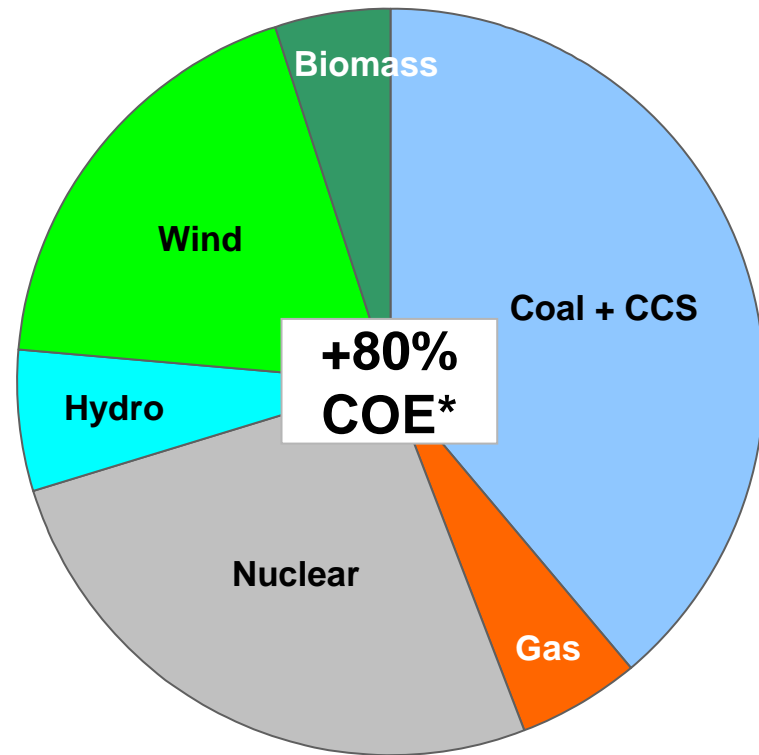
Generation Mix and Electricity Cost* in 2050



Totally different futures in 2050



Limited Portfolio



Full Portfolio

* Cost of electricity increase relative to 2007

The Electricity Technology Challenge



- Defining the Challenge
- Understanding the Challenge
- **Meeting the Challenge**

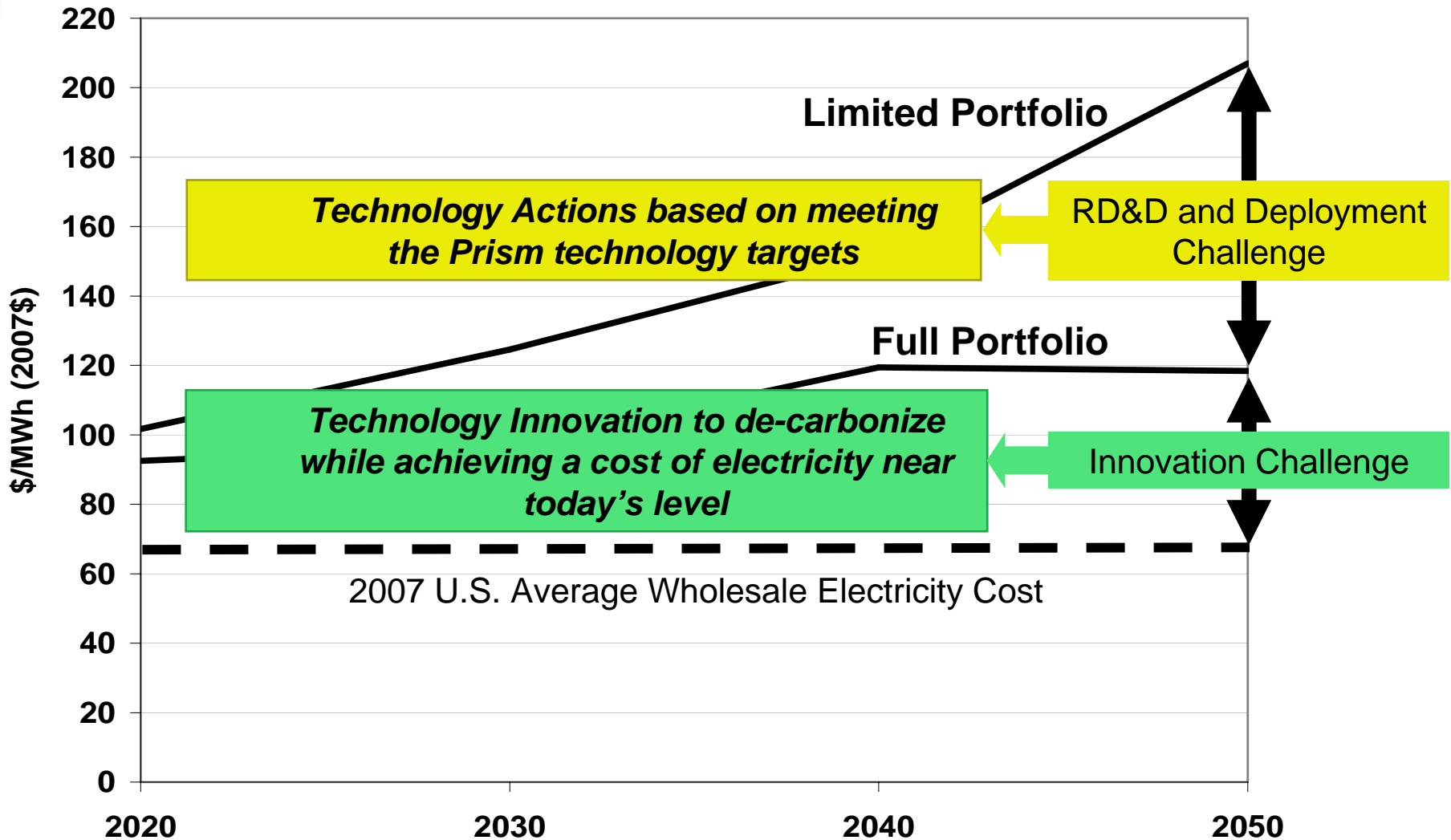
Meeting the Challenge



- ✓ ***De-carbonize the electricity infrastructure***
- ✓ ***Meet binding economy-wide CO₂ reduction targets***
 - ***Provide reliable, affordable, and environmentally responsible electricity to consumers***

***CO₂ Reduction Targets Can be Met ...
The Challenge is Affordability***

Meeting the Challenge



Conclusion

