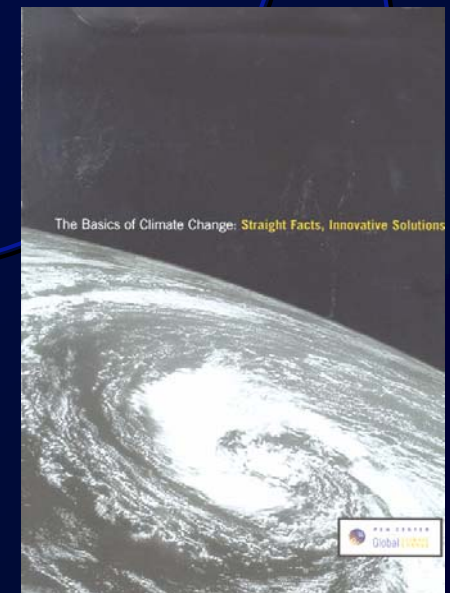




# + **The Pew Center on Global Climate Change**

- + • **Founded in May 1998**
- + • **Independent, non-profit, non-partisan**
- + • **Research (science and impacts, policy, economics, solutions).**
- + • **Education and outreach to opinion leaders**
- + • **Business Environmental Leadership Council (BELC)**

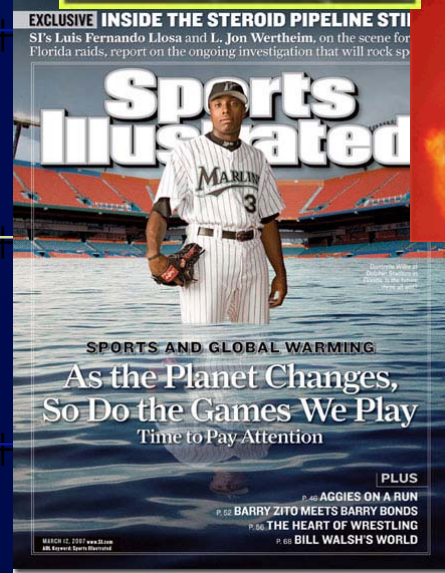


# + **Agenda**

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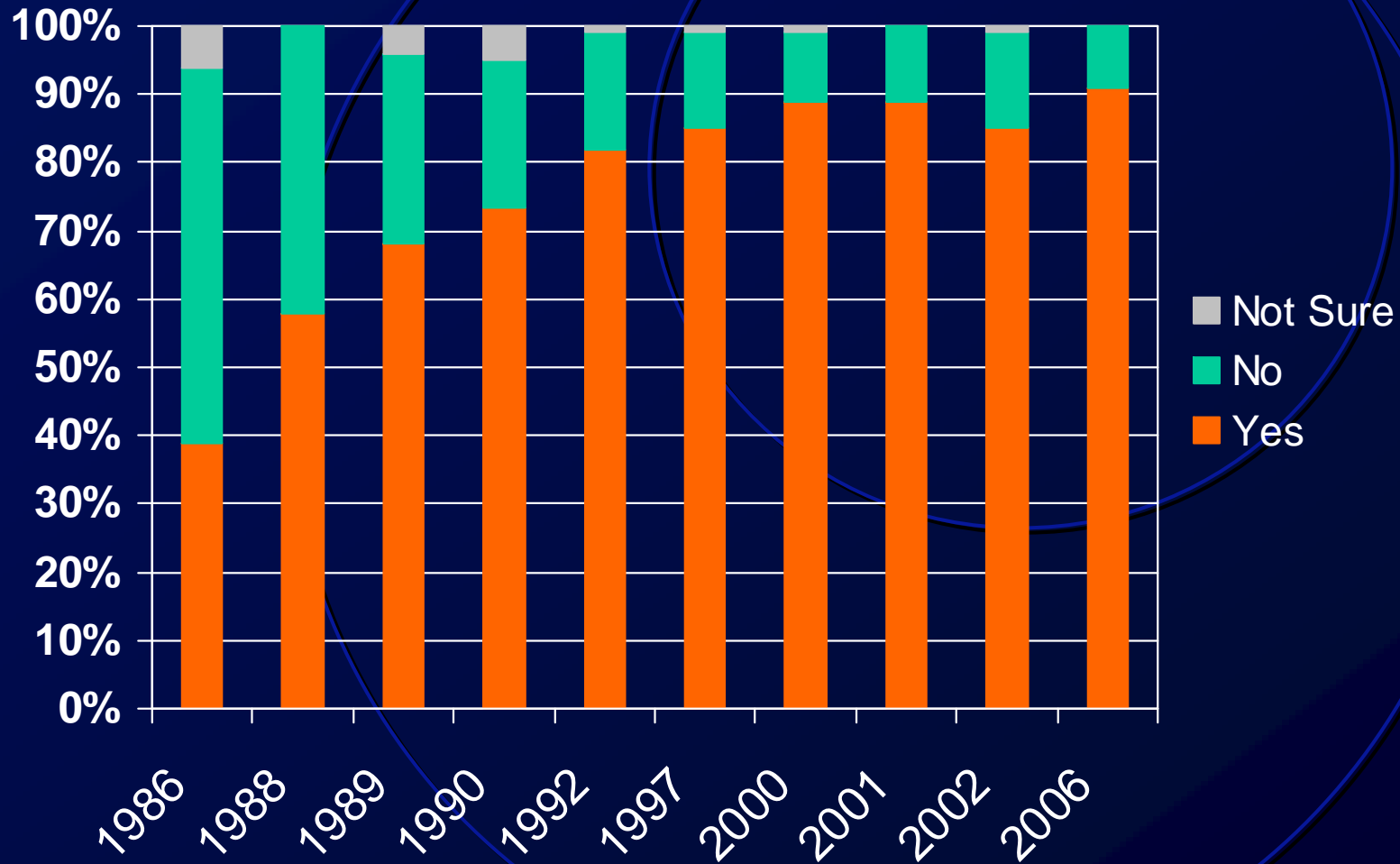
- + • **Public Opinion about Climate Change**
  - + – Trends in Awareness & Concern
  - + – Attitudes towards Policy Options
- + • **Electricity Rate Impacts of Climate Policy**
  - + – Boxer-Lieberman-Warner
- + • **Conclusions**

# Extensive Major Media Coverage



# Widespread Public Awareness

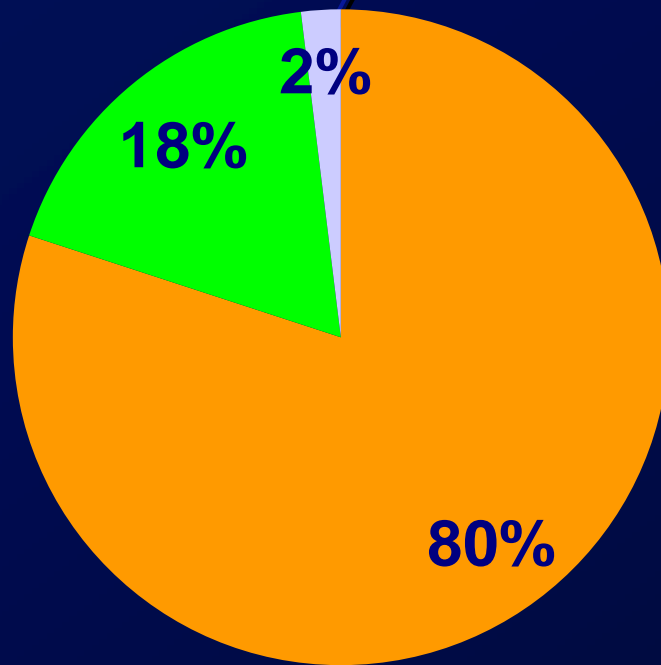
Q: Have you heard or read anything about the “greenhouse effect,” or not?



# Most People Believe the Earth Is Warming...

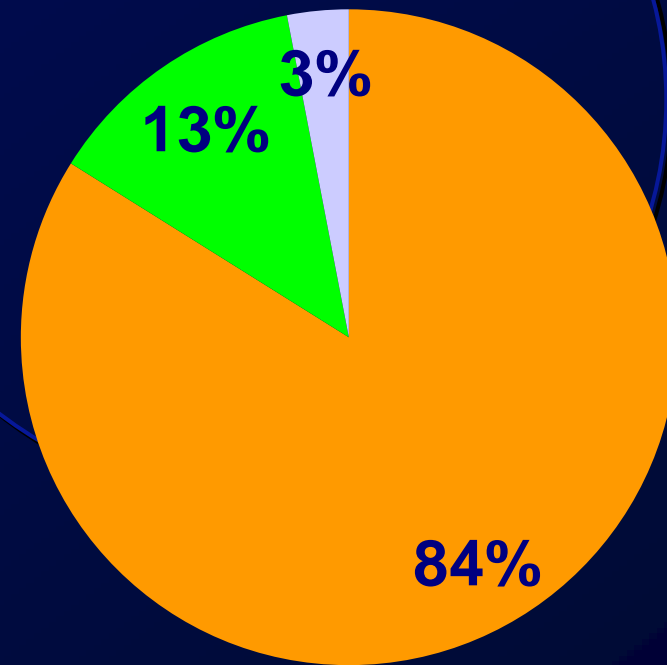
Q: What is your personal opinion on [global warming]?

OSU (2/98)



N = 753

ABC (4/07)



N = 1,002

■ Probably happening

■ Probably not happening

■ Don't know

## ...But Don't Perceive Scientific Consensus

Q: Do you think most scientists agree with one another about whether or not global warming is happening...?

	OSU		ABC	
	10/97	2/98	3/06	4/07
Most agree (%)	35	30	35	40
A lot of disagreement (%)	62	67	64	56
No opinion (%)	3	3	1	3

# Only About Half Blame Human Activity...

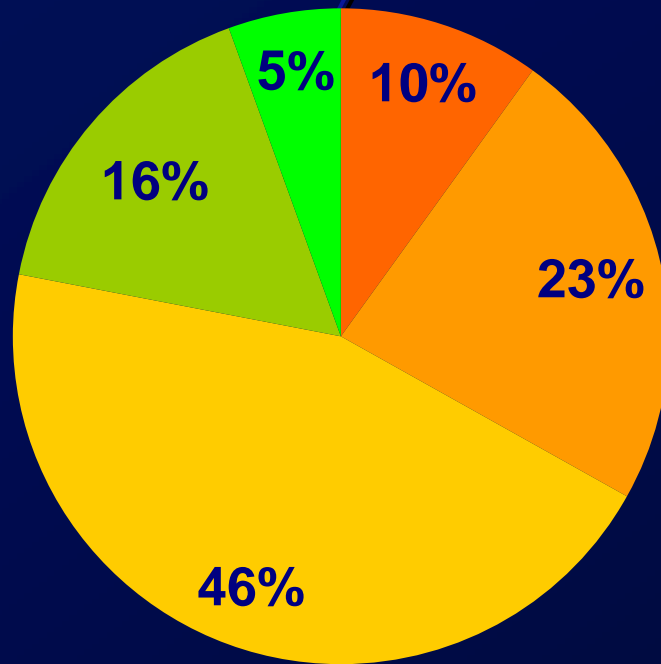
Q: Is there solid evidence the earth is warming?

	6/06	7/06	1/07	4/08
<b>Yes (%)</b>	<b>70</b>	<b>79</b>	<b>77</b>	<b>71</b>
Because of human activity (%)	<b>41</b>	<b>50</b>	<b>47</b>	<b>47</b>
Because of environ. patterns (%)	<b>21</b>	<b>23</b>	<b>20</b>	<b>18</b>
<b>No (%)</b>	<b>20</b>	<b>17</b>	<b>16</b>	<b>21</b>
<b>Mixed/Don't know (%)</b>	<b>10</b>	<b>4</b>	<b>7</b>	<b>8</b>

# + ...But Many People Rate the Issue as Important

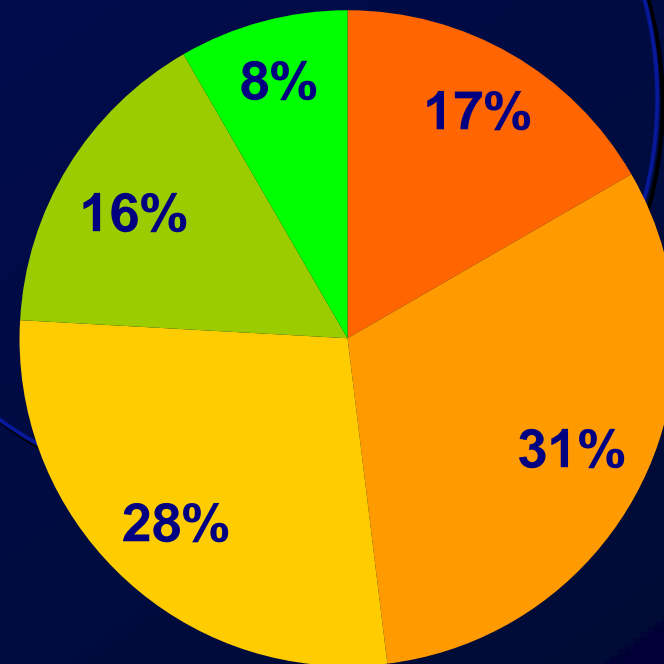
Q: How important is issue of global warming to you personally...?

OSU (2/98)



N = 753

ABC (4/07)

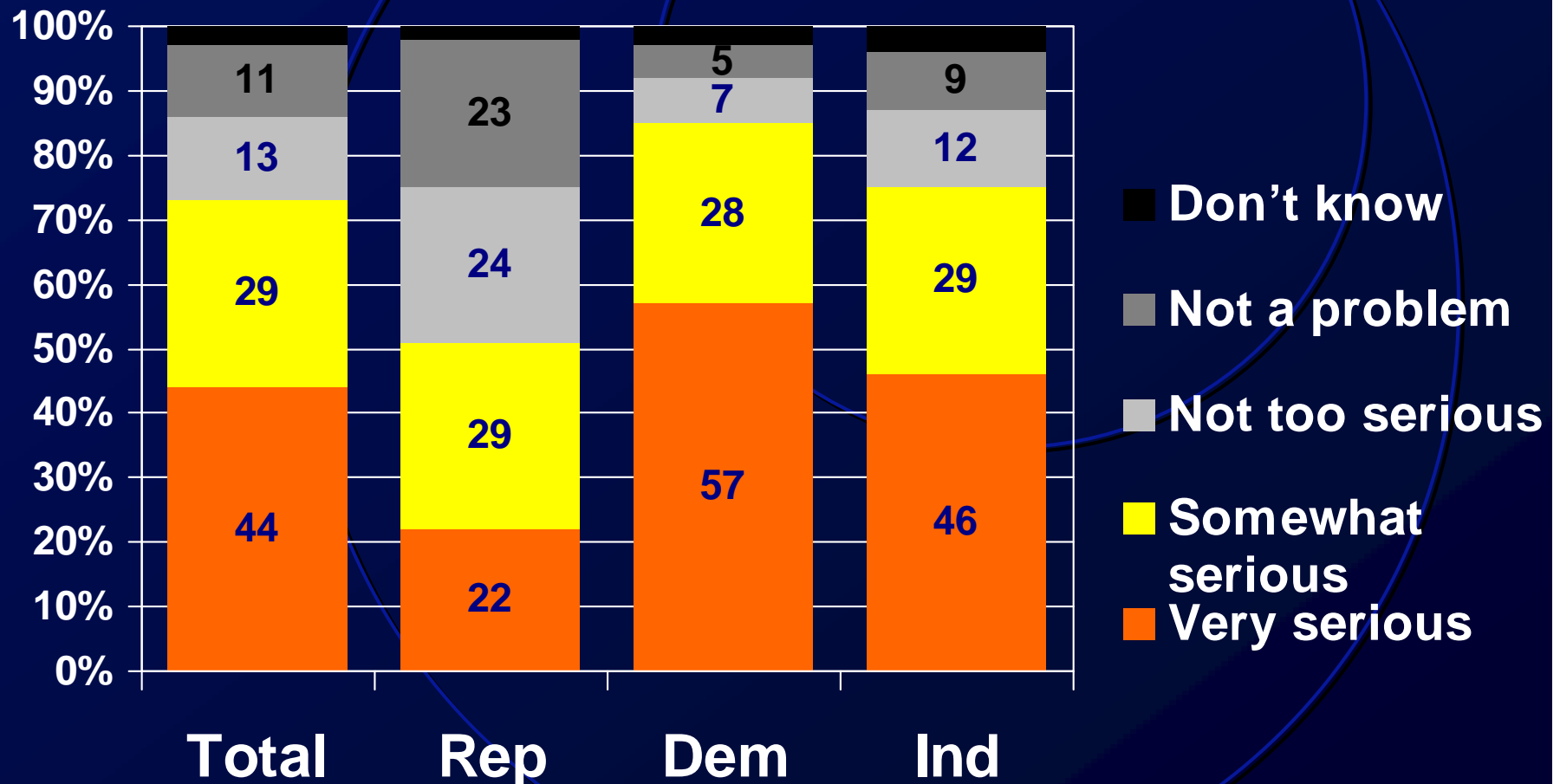


N = 1,002

Extremely Very  
Somewhat Not too  
Not at all

# ...With a Significant Partisan Divide

Q: In your view, is global warming a very serious problem, somewhat serious, not too serious, or not a problem?



# + A Majority Favors Action on Climate Change

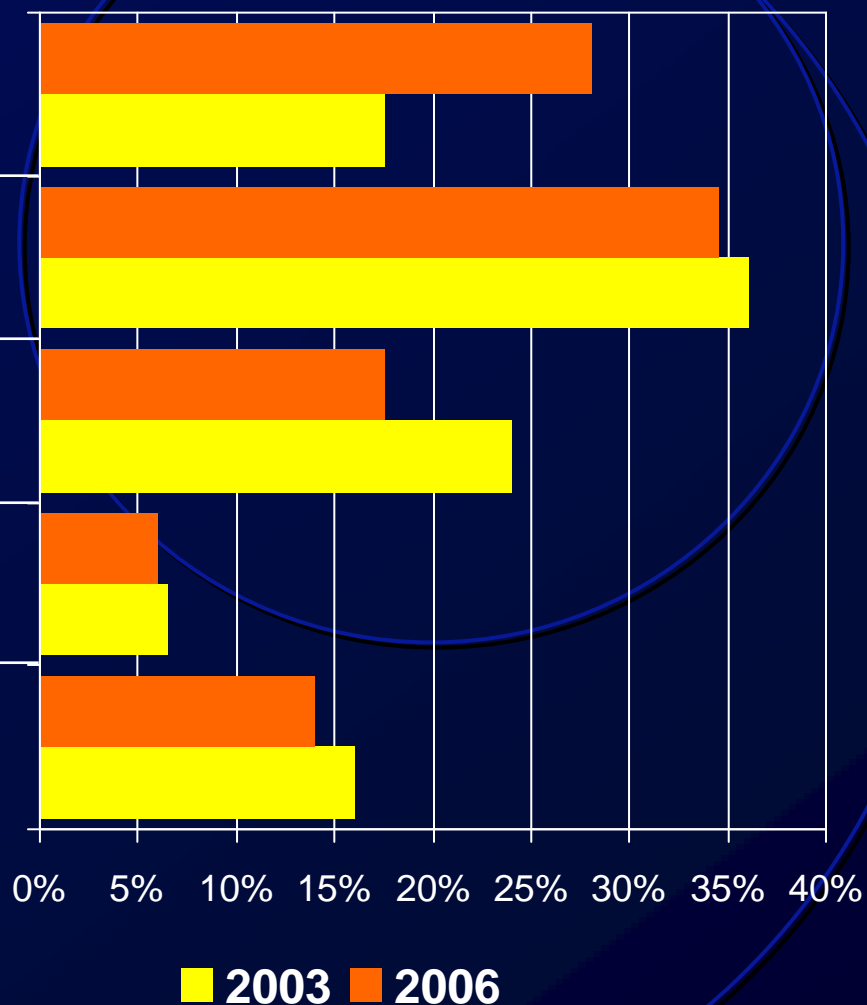
+ Global warming has been established as a serious problem and immediate action is necessary

+ There is enough evidence that global warming is taking place and some action should be taken.

+ We don't know enough about global warming and more research is necessary before we take any actions.

Concern about global warming is unwarranted.

+ No opinion



# How Are Mitigation Policies Viewed?

Q: Please say whether you generally favor or oppose...

	Gallup (3/07)		
	Favor (%)	Oppose (%)	No Opinion (%)
Auto Emission Stds	79	18	3
Industry Emission Stds	84	15	1
Expanding Nuclear Energy	50	46	4
Developing Solar & Wind	81	17	2
Controls on GHG Emissions	81	17	2

N = 1,009

# How Are Mitigation Policies Viewed?

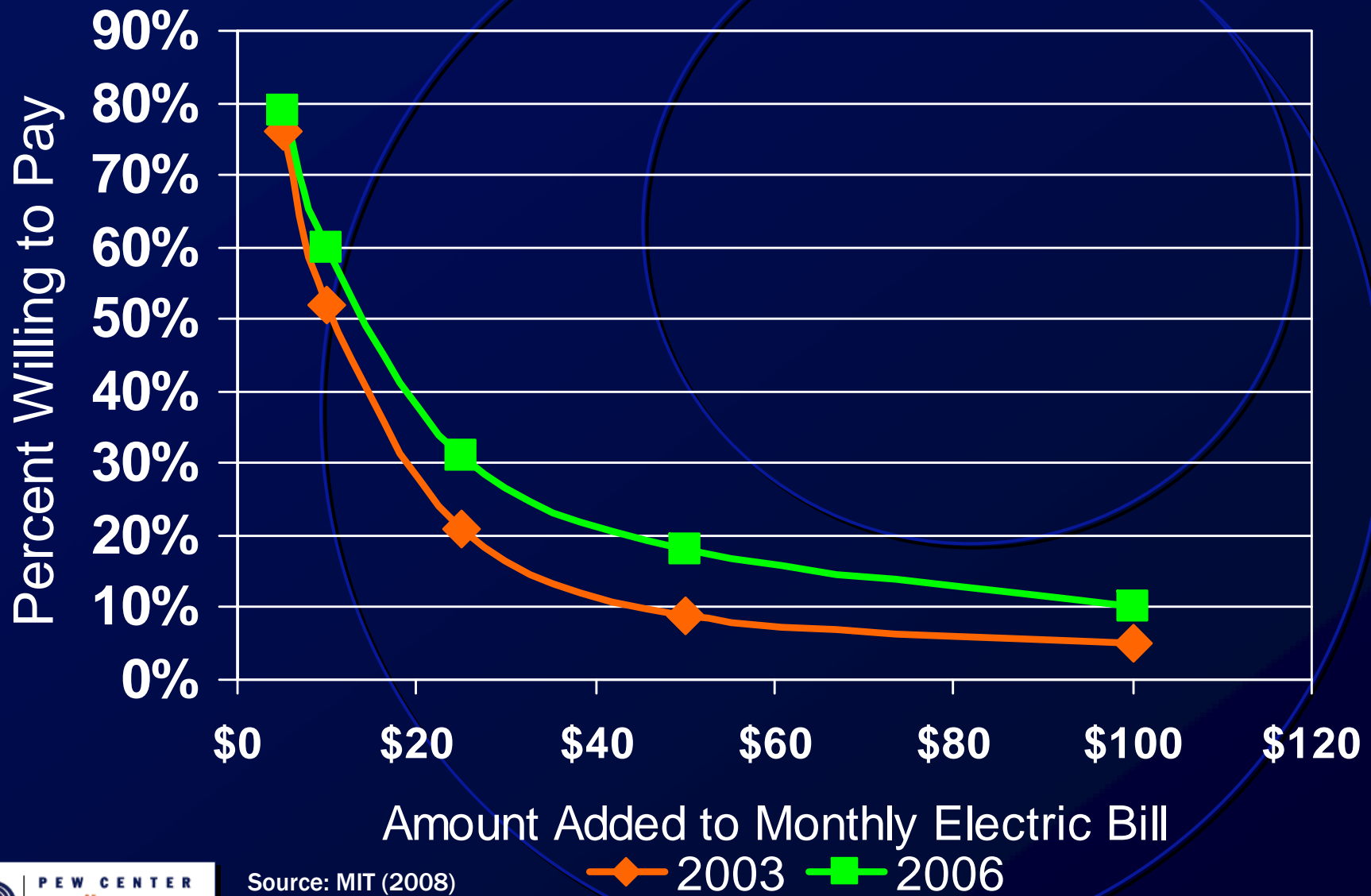
Q: Please tell me whether it's something the government should require by law, encourage with tax breaks but not require, or stay out of entirely?

ABC (3/07)

	Appliances use less electricity	Homes and offices use less electricity	Lower GHGs from power plants
Require (%)	36	30	62
Encourage (%)	43	51	26
Stay Out (%)	19	17	10
No Opinion (%)	1	9	9

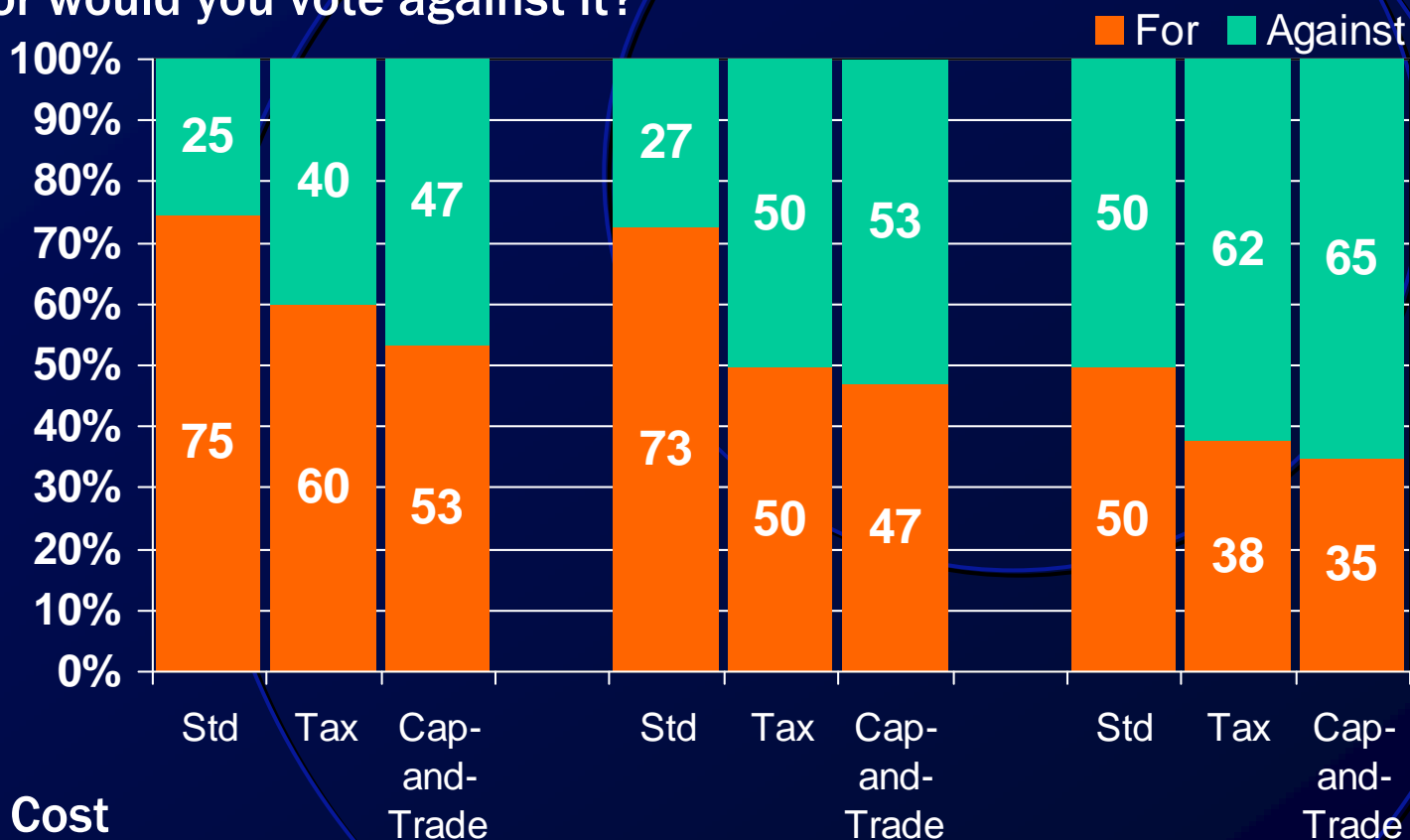
N = 1,002

# Willingness to Pay to "Solve" Global Warming



# Effect of Policy Type and Cost on Approval

Q: If an election were being held today, would you vote in favor of this policy or would you vote against it?



**Added Cost  
in 2020:  
CAGR:**

**\$2/month  
0.2%**

**\$10/month  
0.9%**

**\$70/month  
4.7%**

# Why Is Cap-and-Trade Less Popular?

What information influences public perception?

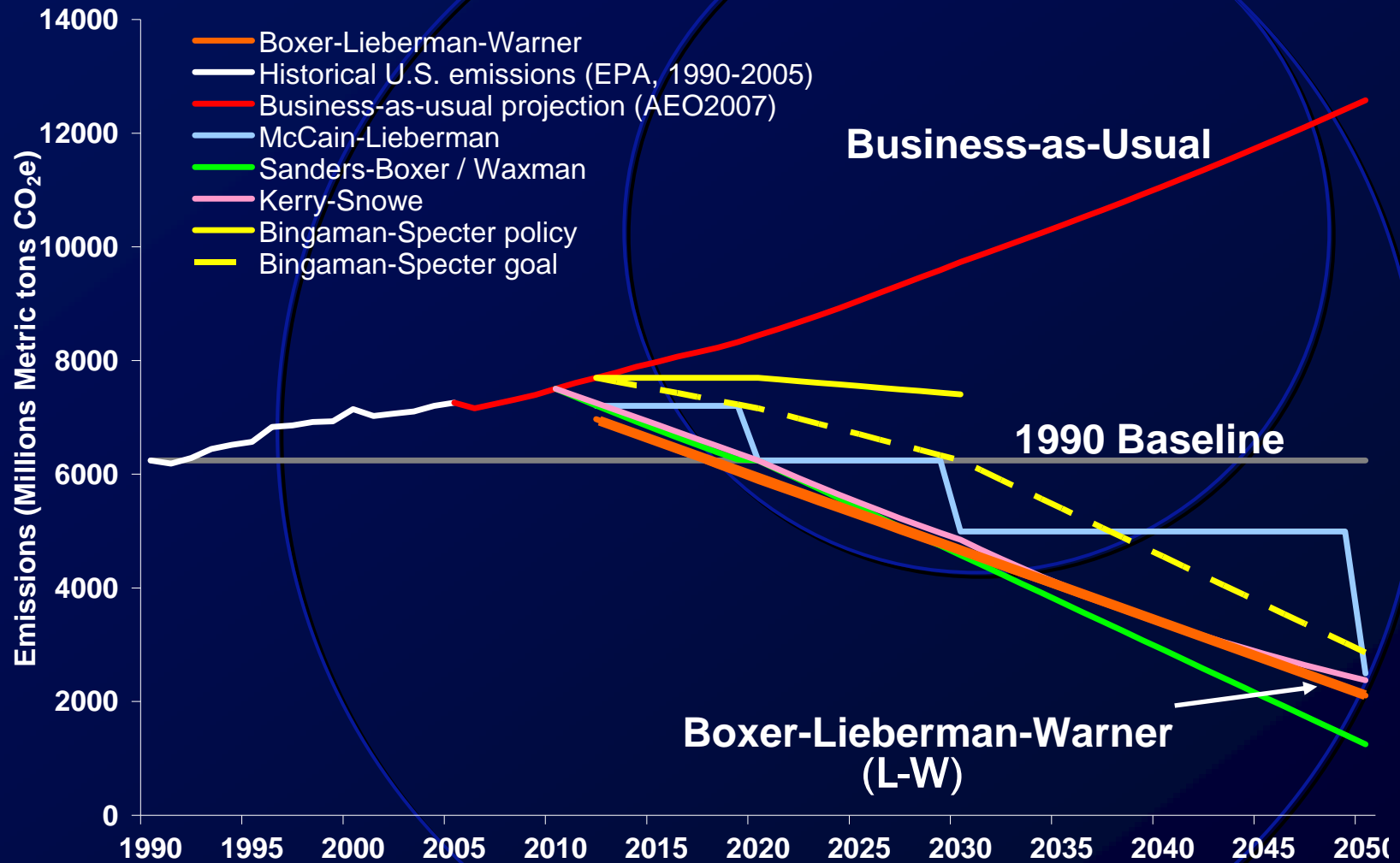
- Complexity?
- Monitoring?
- Enforceability?
- Efficiency?
- Free Allowance Allocation vs. Auction?
- ***Effectiveness!***
  - Experimental survey results show that telling respondents that cap-and-trade has worked in the US in the past significantly boosts approval while other messages do not

# + **Agenda**

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- + • **Public Opinion about Climate Change**
  - + – Trends in Awareness & Concern
  - + – Attitudes towards Policy Options
- + • **Electricity Rate Impacts of Climate Policy**
  - + – Boxer-Lieberman-Warner
- + • **Conclusions**

# 110<sup>th</sup> Congress Cap-and-Trade Targets



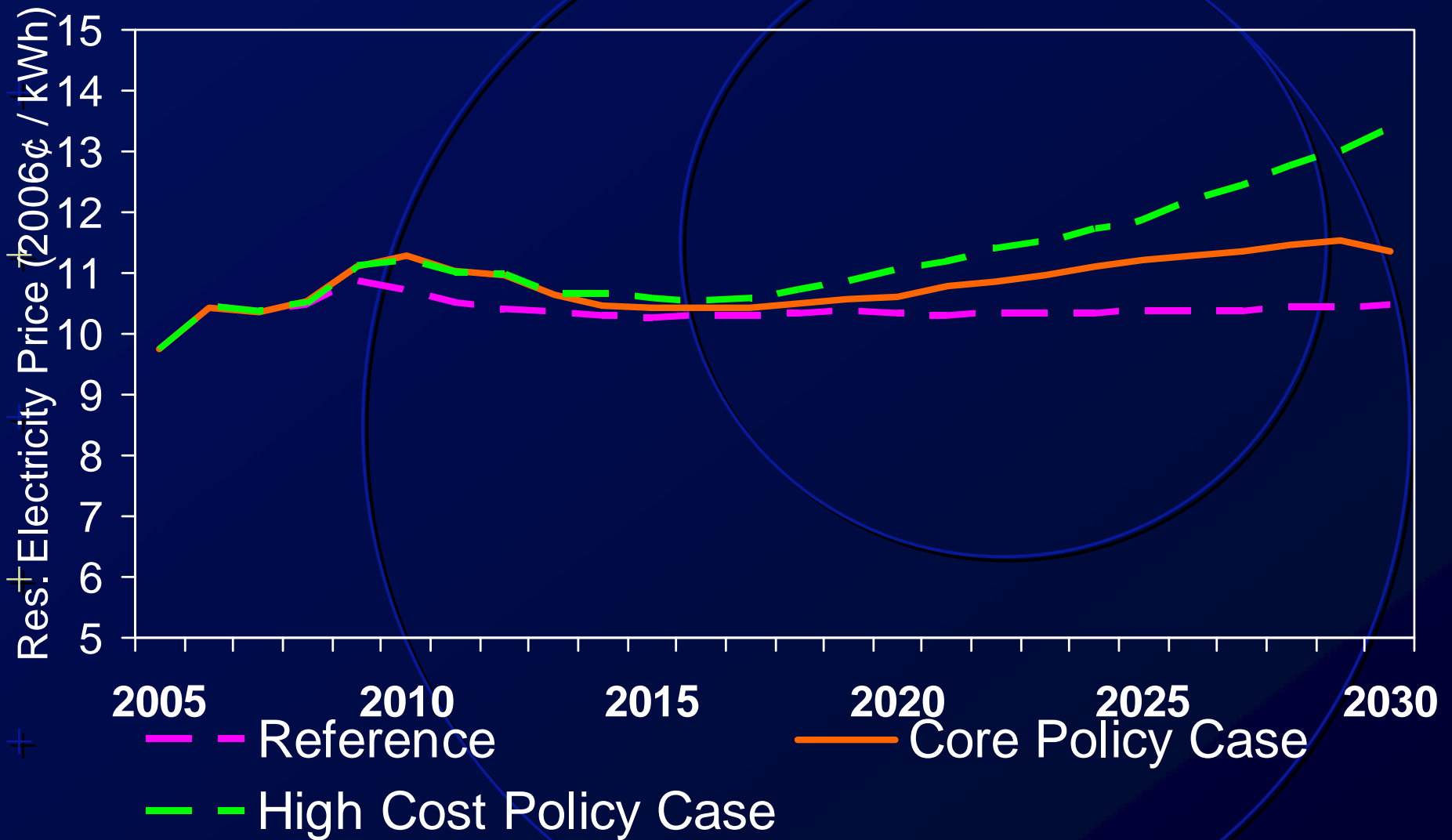
# Electricity Price Impacts Across L-W Models

## % Change in Electricity Prices vs. Reference Cases

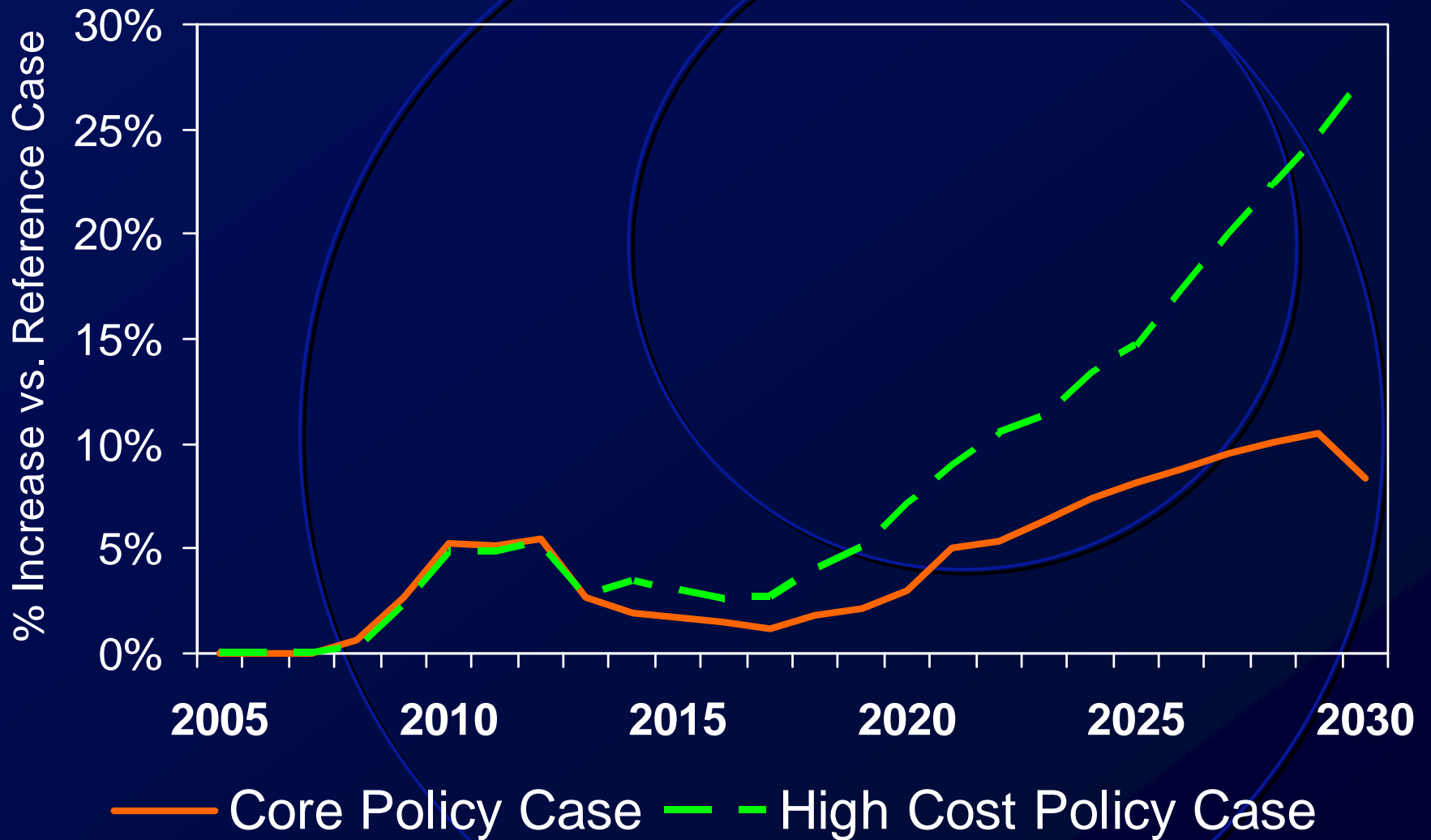
Modeling Exercise	2015	2020	2030	2050
EIA	2%	3%	8%	-
CATF	2%	5%	20%	-
ACCF-NAM (Low Cost)	13%	28%	101%	-
ACCF-NAM (High Cost)	14%	33%	129%	-
MIT - Offsets + CCS	30%	30%	14%	14%
EPA (ADAGE) Scenario 2	28%	32%	44%	27%
CRA - Scenario w/ Banking	20%	32%	42%	52%

Source: Pew Center on Global Climate Change (2008). "Insights from Modeling Analyses of the Lieberman-Warner Climate Security Act."

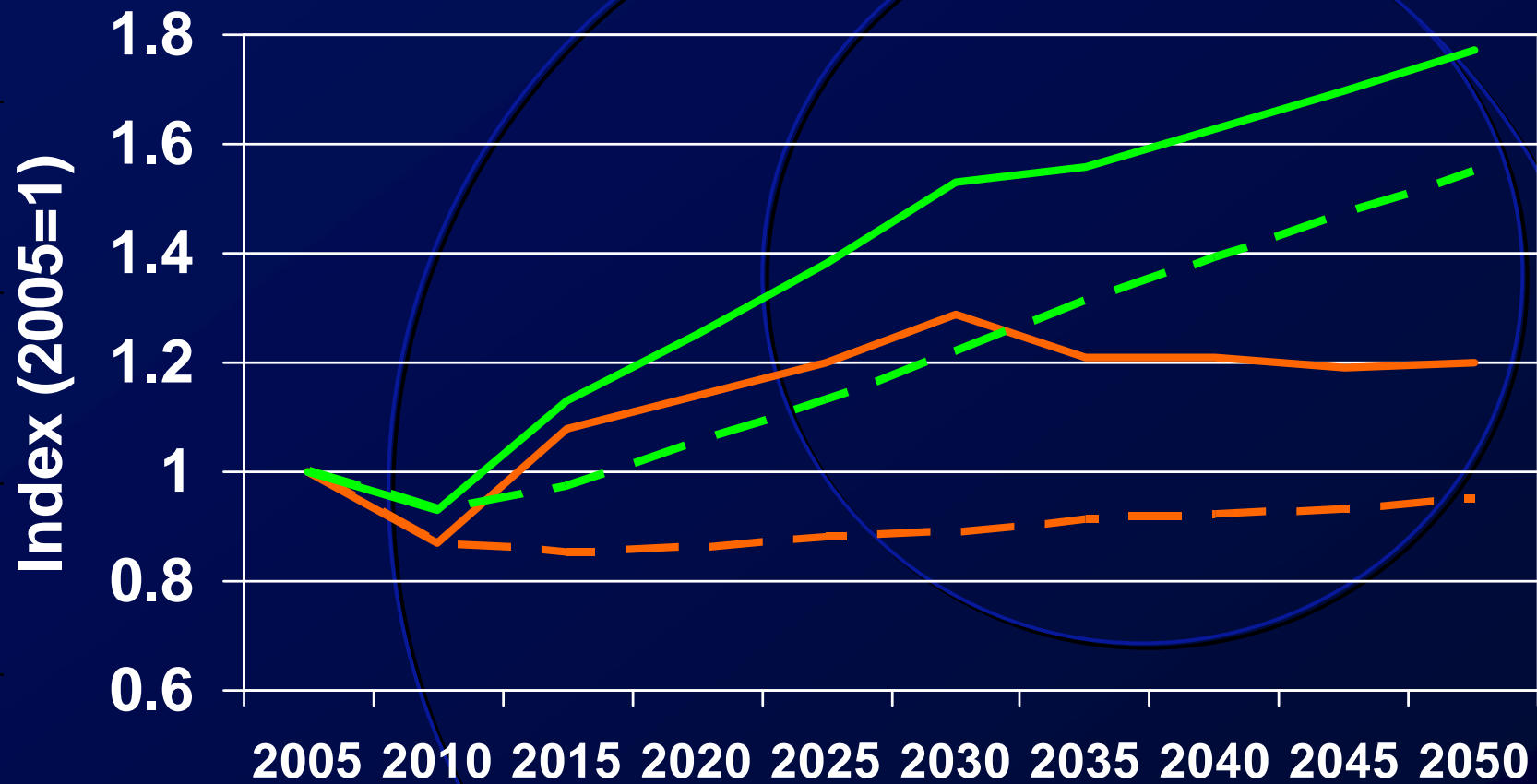
# Electricity Prices (EIA)



# Electricity Price Impacts (EIA)



# Electricity Price & Expenditure Impacts (EPA)



Price (Ref)

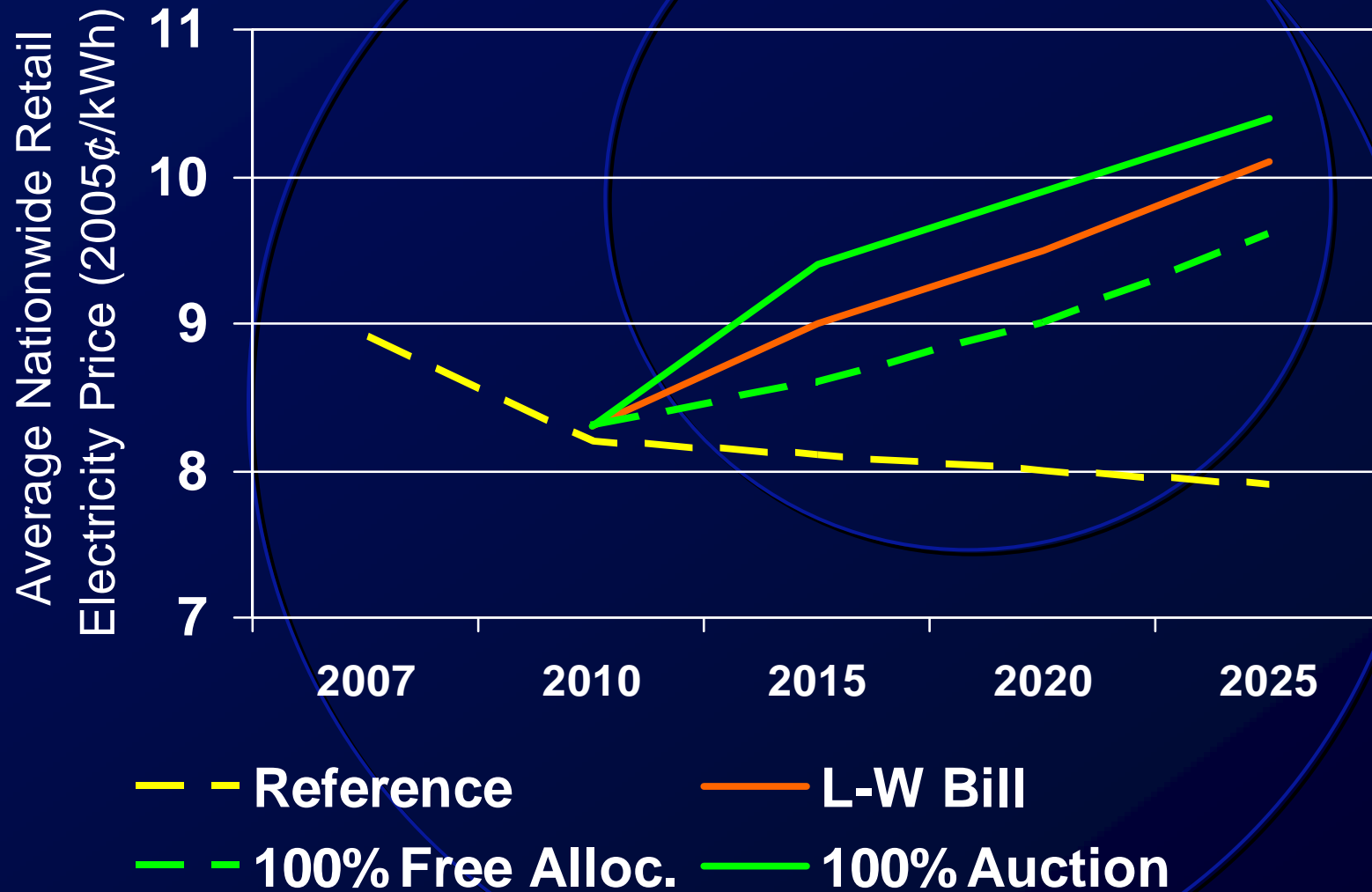
Price (Policy)

Expenditure (Ref)

Expenditure (Policy)

# Effect of Allowance Allocation

EPA Analysis of L-W Bill: Allowance Allocation



--- Reference                      — L-W Bill  
- - - 100% Free Alloc.            — 100% Auction

# + **Agenda**

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- + • **Public Opinion about Climate Change**
  - + – Trends in Awareness & Concern
  - + – Attitudes towards Policy Options
- + • **Electricity Rate Impacts of Climate Policy**
  - + – Boxer-Lieberman-Warner
- + • **Conclusions**

# + **Public Opinion on Climate Change**

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- + • **Widespread public awareness and media attention**
- + • **Most Americans think climate change is happening and are concerned**
- + • **Less than half the public accurately understands:**
  - + – **Scientific consensus**
  - + – **Human causation**
- + • **Significant partisan divide**

# + **Public Opinion on Mitigation Policies**

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- + • Majority wants action on climate change
- + • ~80% approval for climate policies
- + • Cap-and-trade is less popular with public than standards or taxes
  - + – Likely due to lack of knowledge of prior experience
- + • Public is willing to pay, e.g.
  - + – Large majority willing to pay \$2/month
  - + – Majority willing to pay \$5-10/month
  - + – Significant minority willing to pay \$10+/month

# Climate Change & Rate Impacts

- Federal Cap-and-Trade
  - EIA: 8-14% increase in electricity expenditure in 2025
  - EPA: 22% increase in electricity expenditures in 2025
- ~\$100/month in average electricity spending per household would likely increase by \$8-22 under cap-and-trade—this is within range of majority support

# + References

Energy Information Administration (EIA). (2008). "Energy Market and Economic Impacts of S.2191, the Lieberman-Warner Climate Security Act of 2007." See <http://www.eia.doe.gov/oiac/service/rpt/s2191/index.html>.

Environmental Protection Agency (EPA). (2008). "EPA Analysis of the Lieberman-Warner Climate Security Act of 2008." See <http://www.epa.gov/climatechange/economics/economicanalyses.html>.

Krosnick, Jon. (2008). "Public Attitudes, Perceptions, and Concern about Global Warming: Evidence from a New Survey." Presentation (July 11) Sponsored by the American Meteorological Society. See <http://www.ametsoc.org/atmospolicy/EnvironmentalScienceSeminarSeries.html>.

Massachusetts Institute of Technology (MIT). (2008). "A Survey of Public Attitudes towards Climate Change and Climate Change Mitigation Technologies in the United States: Analyses of 2006 Results." See [http://sequestration.mit.edu/pdf/LFEE\\_2007\\_01\\_WP.pdf](http://sequestration.mit.edu/pdf/LFEE_2007_01_WP.pdf).

Nisbet, Matthew C. and Teresa Myers. (2007). "Twenty Years of Public Opinion about Global Warming." *Public Opinion Quarterly* 71 (3): 444-470.

Pew Center on Global Climate Change. (2008). "Economy-wide Cap-and-Trade Proposals in the 110th Congress." See <http://www.pewclimate.org/docUploads/Cap&TradeChart.pdf>.

Pew Center on Global Climate Change. (2008). "Insights from Modeling Analyses of the Lieberman-Warner Climate Security Act." See <http://www.pewclimate.org/in-brief/l-w-modeling>.

Pew Research Center for the People and the Press. (2008). "A Deeper Partisan Divide Over Global Warming." See <http://people-press.org/report/417/a-deeper-partisan-divide-over-global-warming>.

Regional Greenhouse Gas Initiative (RGGI). (2005). "RGGI Region Projected Household Bill Impacts." See [http://www.rggi.org/docs/rggi\\_household\\_bill\\_impacts12\\_12\\_05.ppt](http://www.rggi.org/docs/rggi_household_bill_impacts12_12_05.ppt).

Ruth, Matthias et al. "Economic and Energy Impacts from Participation in the Regional Greenhouse Gas Initiative: a Case Study of Maryland." *Energy Policy* 36: 2279-2289.

Stanford University, Resources for the Future, and New Scientist. (2007). "Americans' Evaluations of Policies to Reduce Greenhouse Gas Emissions." See [http://woods.stanford.edu/docs/surveys/GW\\_New\\_Scientist\\_Poll\\_Technical\\_Report.pdf](http://woods.stanford.edu/docs/surveys/GW_New_Scientist_Poll_Technical_Report.pdf)

+ **For More Information**

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[www.pewclimate.org](http://www.pewclimate.org)  
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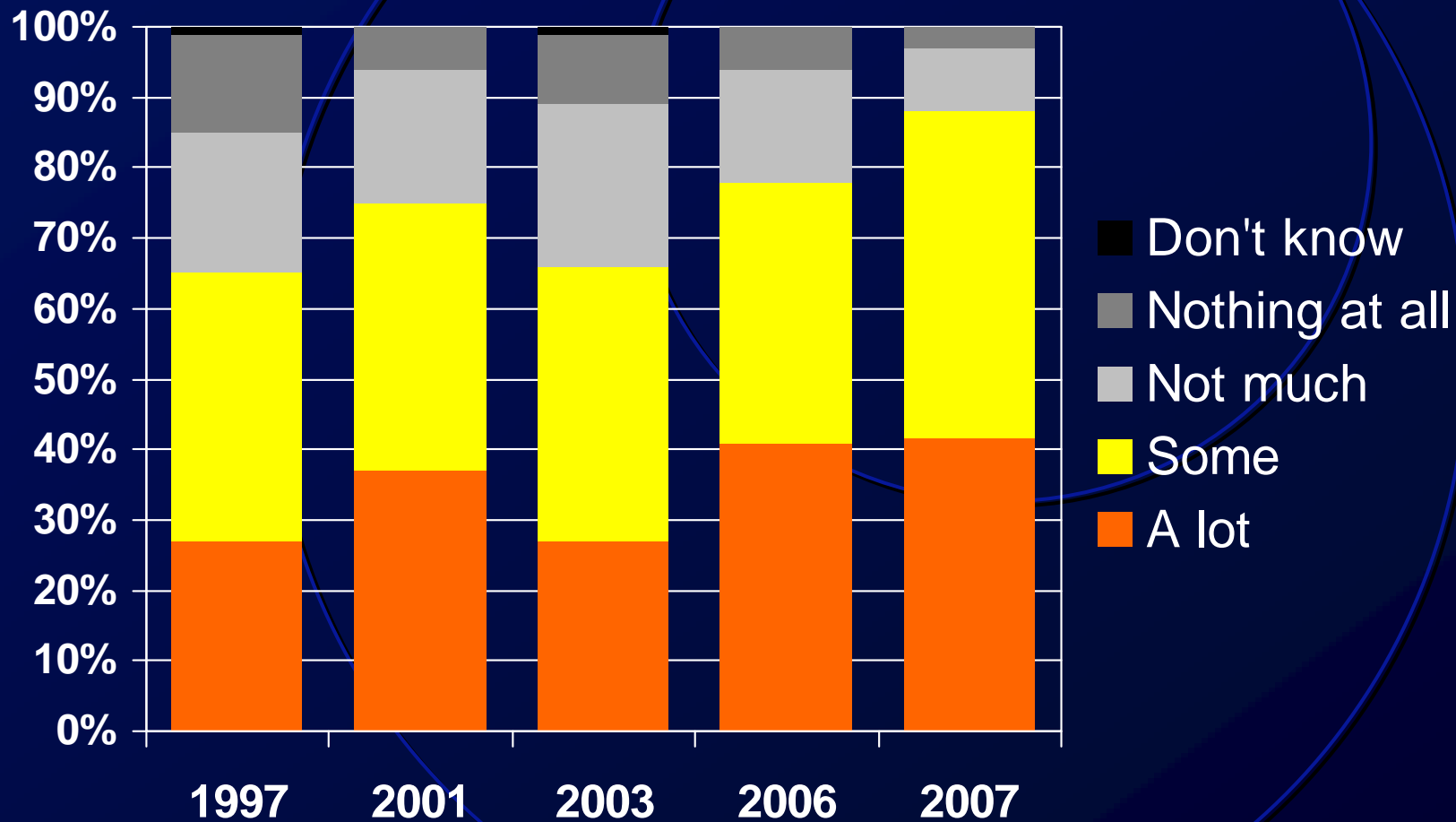
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# Appendix



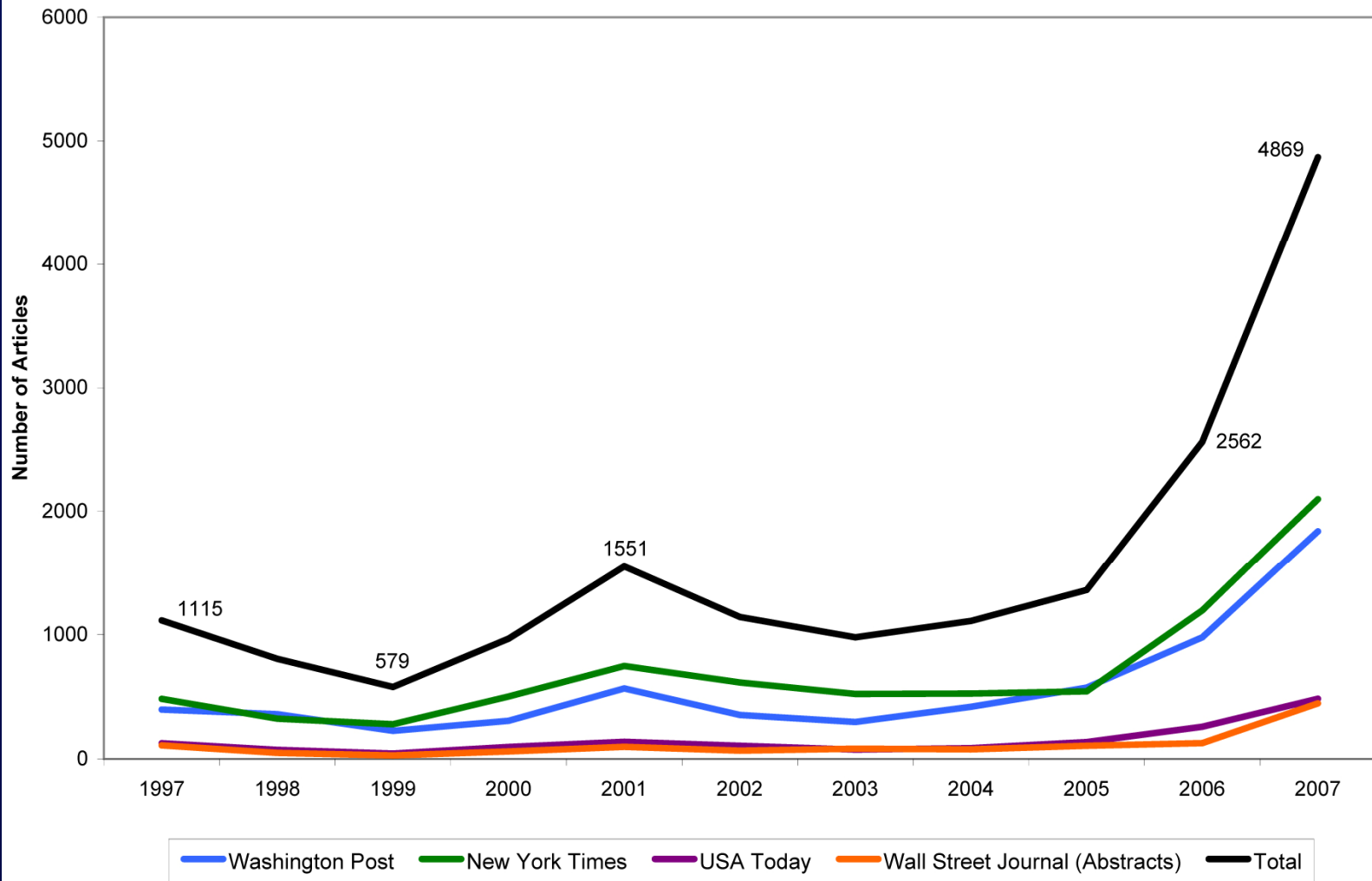
# Widespread Public Awareness

Q: How much have you heard or read about global warming?



# Spike in Media Coverage

Tracking the Trend: Climate Change or Global Warming References in Major Publications



# Most People Believe the Earth Is Warming...

Q: What is your personal opinion on [global warming]?

	OSU		ABC	
	10/97	2/98	3/06	4/07
Probably happening (%)	76	80	85	84
Probably not happening (%)	22	18	13	13
Don't know (%)	2	2	2	3
N	688	753	1,002	1,002

## ...But People Rate the Issue as Important

Q: How important is issue of global warming to you personally...?

	OSU		ABC	
	10/97	2/98	3/06	4/07
Extremely (%)	7	9	17	18
Very (%)	20	21	33	34
Somewhat (%)	47	49	32	30
Not too (%)	20	15	18	17
Not at all (%)	6	5	8	9
N	688	753	1,002	1,002

# Climate Is A Top Environmental Issue...

Q: What in your opinion is the single biggest environmental problem the world faces at this time [open-ended]?

	ABC	
	3/06	4/07
Global warming/greenhouse effect/climate change (%)	16	33
Air pollution (%)	13	13
Energy problems/dependence on fossil fuels/lack of oil (%)	8	6
Toxic substances in environment (%)	7	6
Water pollution (%)	6	5
All others (%)	50	37

## ...With a Significant Partisan Divide

Q: In your view, is global warming a very serious problem, somewhat serious, not too serious, or not a problem?

	Total	Rep	Dem	Ind
Very serious (%)	44	22	57	46
Somewhat serious (%)	29	29	28	29
Not too serious (%)	13	24	7	12
Not a problem (%)	11	23	5	9
Don't know (%)	3	2	3	4
N	1502	412	521	462

# Opinions on Speed of Action

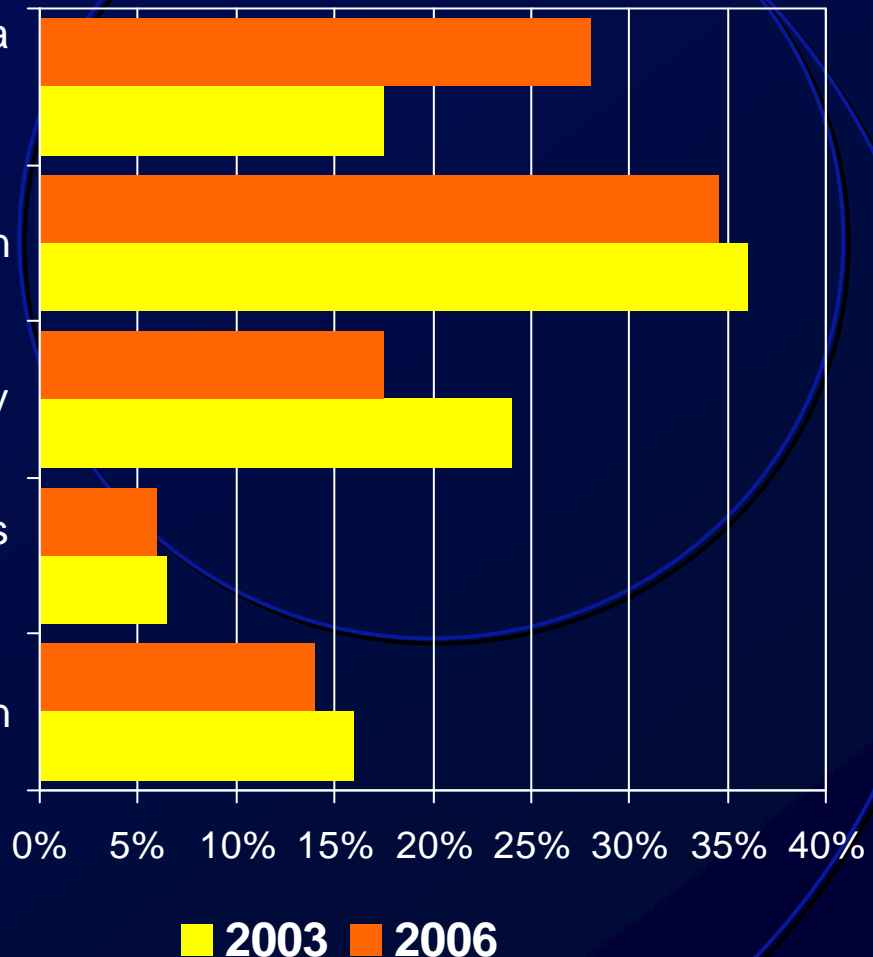
Global warming has been established as a serious problem and immediate action is necessary

There is enough evidence that global warming is taking place and some action should be taken.

We don't know enough about global warming and more research is necessary before we take any actions.

Concern about global warming is unwarranted.

No opinion



## + **Factors Associated with Approval of Policies**

---

- + • Lower expected household costs
- + • Democrat
- + • Self-described environmentalist
- + • Belief that global warming is probably happening
- + • Higher income
- + • Being a parent or guardian of children
- + • Living in Western US

# Partisan Divide Holding Strong

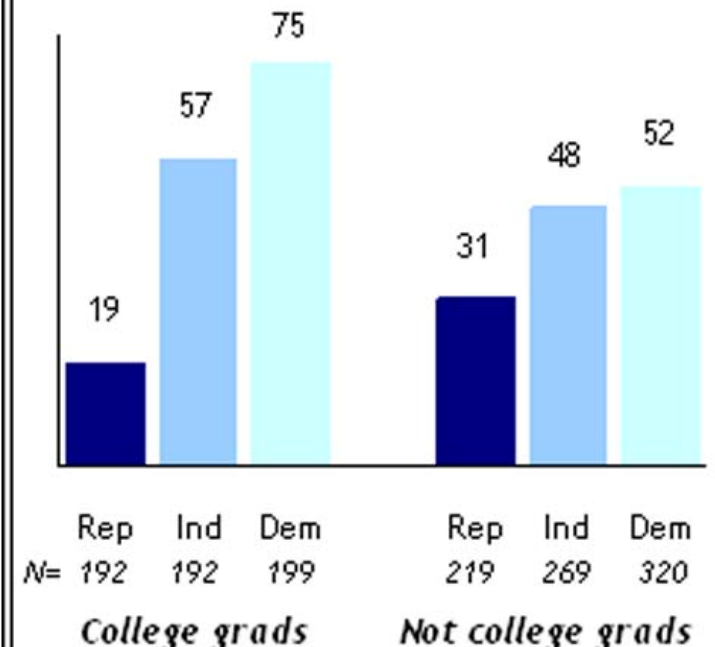
- Entrenched political views present challenges to getting message across

## Fewer Republicans Say the Earth is Warming

% saying there is solid evidence of global warming:	Jan 2007	April 2008	Change	2008 N
Total	77	71	-6	1502
Republicans	62	49	-13	412
Democrats	86	84	-2	521
Independents	78	75	-3	462

## Party and Education

Percent who believe global warming is happening because of human activity



# Widespread Public Awareness

Q: Global warming is a term used to describe changes in the earth's climate. How much have you heard or read about global warming—a lot, some, not much, or nothing at all?

	11/97	06/01	9/03 <sup>a</sup>	5/06 <sup>a</sup>	4/07 <sup>a</sup>
A lot (%)	27	37	27	41	42
Some (%)	38	38	39	37	47
Not much (%)	20	19	23	16	9
Nothing at all (%)	14	6	10	6	3
Don't know (%)	1	—	1	—	—
<i>N</i>	953	1050	675	1241	1052

# Global Warming: Not Viewed as a Threat

**Table 17.** Which of the following statements reflects your view of when the effects of global warming will begin to happen? They have already begun to happen. They will start happening within a few years. They will start happening within your lifetime. They will not happen within your lifetime, but they will effect future generations. They will never happen.

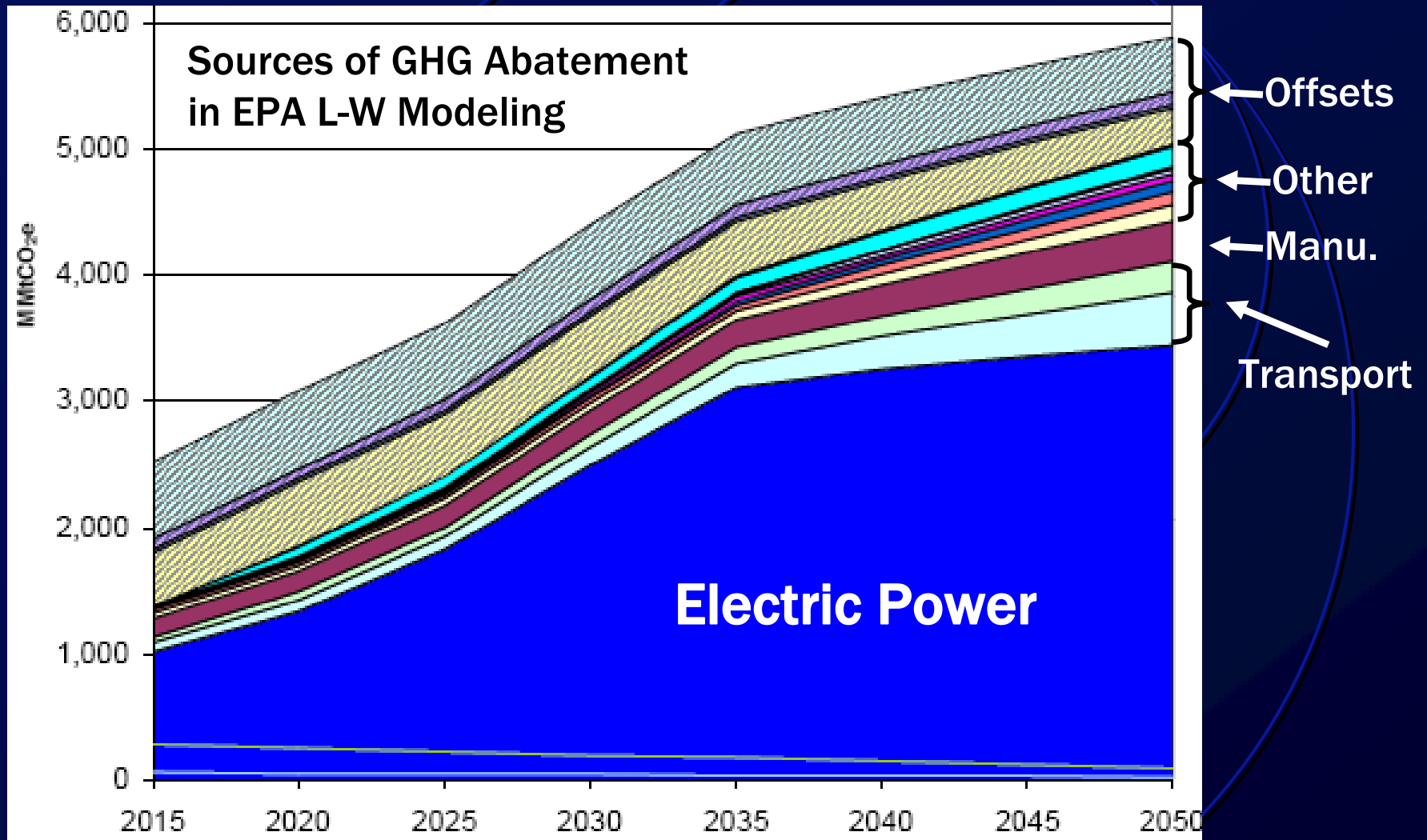
	Gallup							
	11/97	03/01	03/02	03/03	03/04	03/05	03/06	03/23–3/25/07
Have already begun (%)	48	54	53	51	51	54	58	60
Will start within few years (%)	3	4	5	6	5	5	5	4
Will start within lifetime (%)	14	13	13	12	12	10	10	7
Will not happen in lifetime, but effect future generations (%)	19	18	17	17	18	19	15	15
Never happen (%)	9	7	9	10	11	9	8	11
Don't know/refused (%)	7	4	3	4	3	3	3	3
<i>N</i>	1,003	1,060	1,006	1,003	1,005	1,004	1,000	1,007

**Table 18.** Do you think that global warming will pose a threat to you or your way of life in your lifetime?

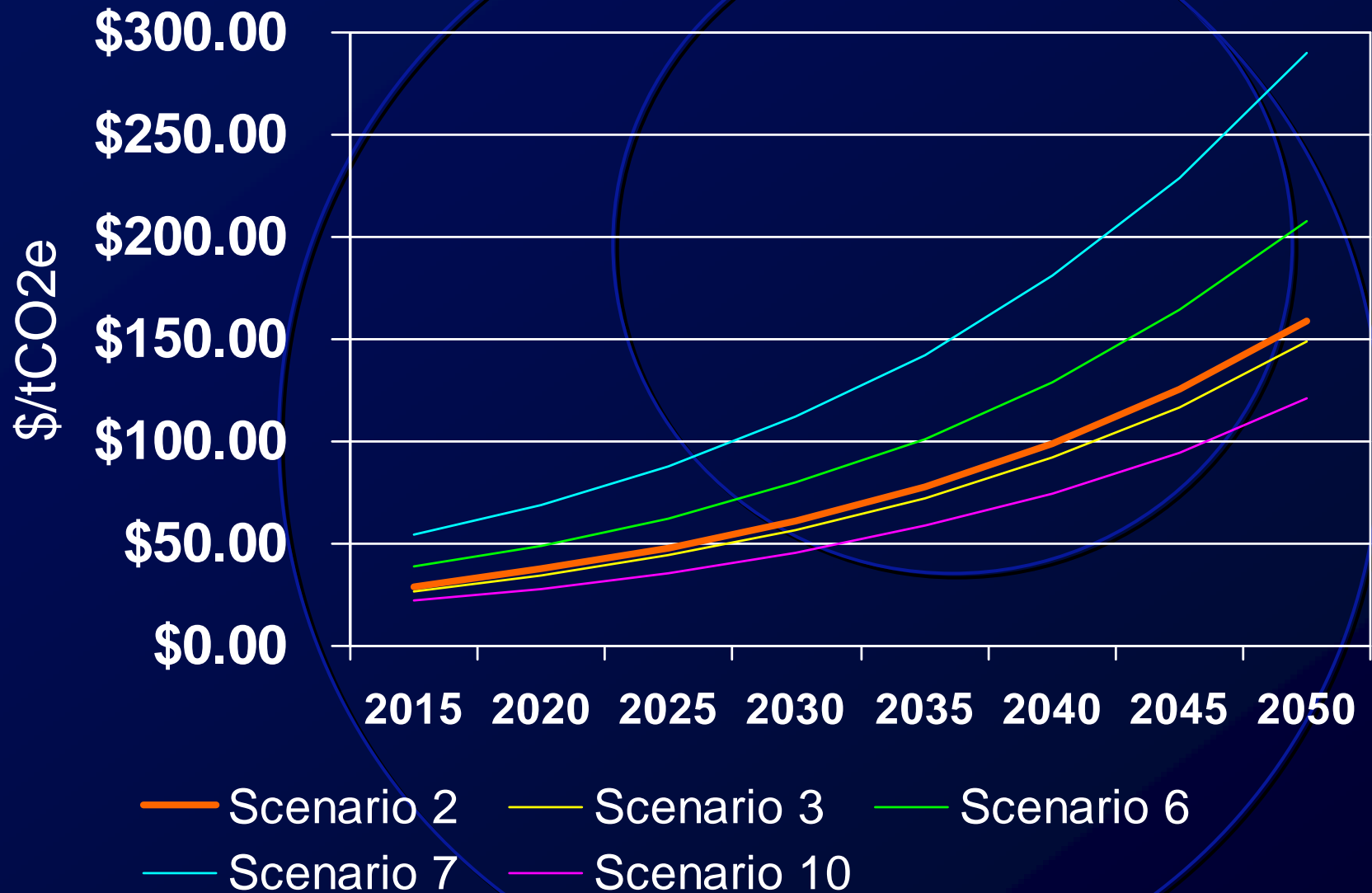
	Gallup	Gallup <sup>a</sup>		ABC <sup>b</sup>	Gallup <sup>a</sup>
	11/97	03/01	03/02	06/05	03/06
Yes (%)	25	31	33	33	35
No (%)	69	66	65	66	62
Don't know/refused (%)	8	3	2	1	2
<i>N</i>	1,003	1,060	1,006	1,002	1,000

Matthew C. Nisbet and Teresa Meyers, "Poll Trends: Public Opinion About Global Warming," *Public Opinion Quarterly*, Vol. 71, No. 3, Fall 2007.

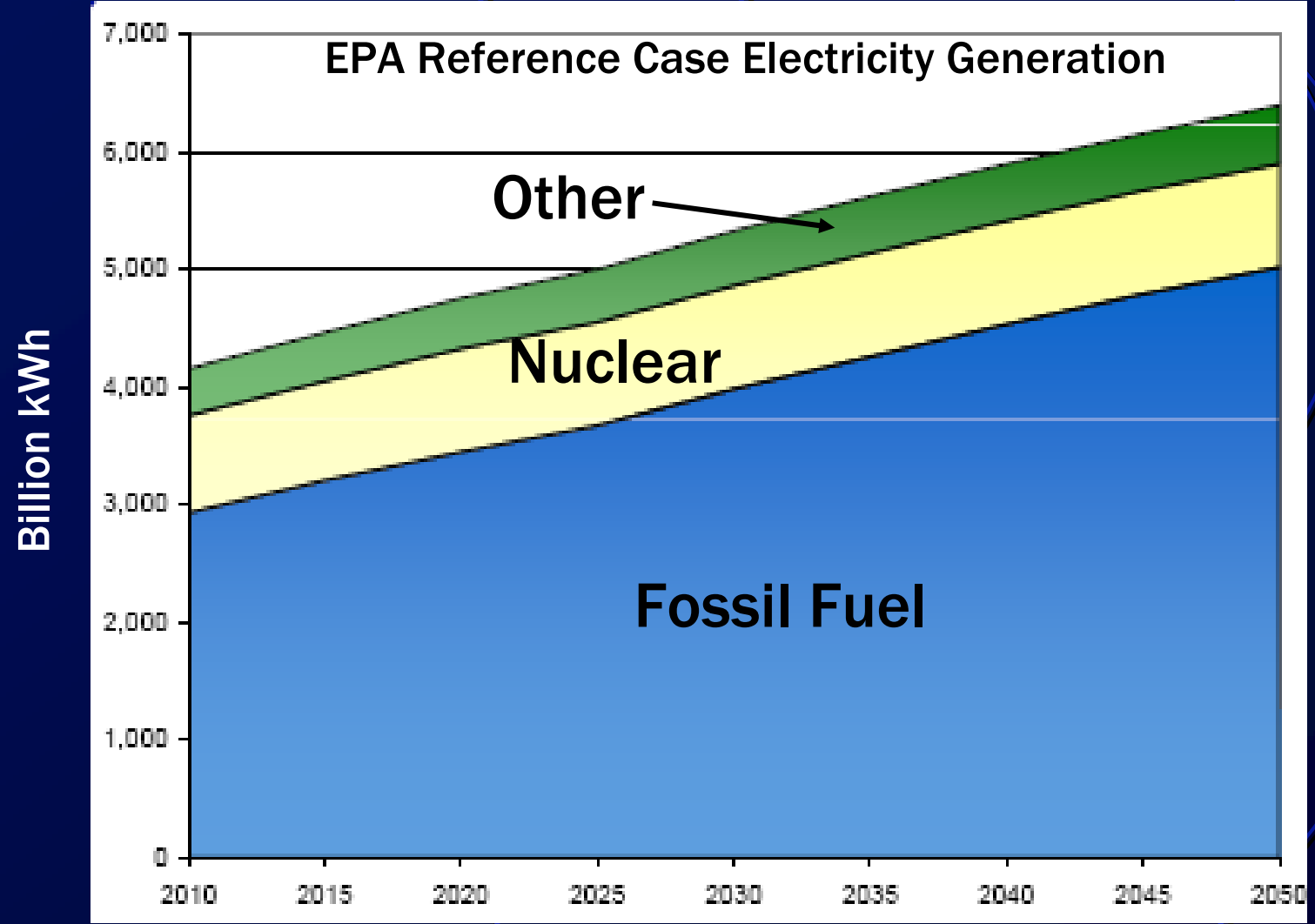
# Mitigation from Electric Power Sector



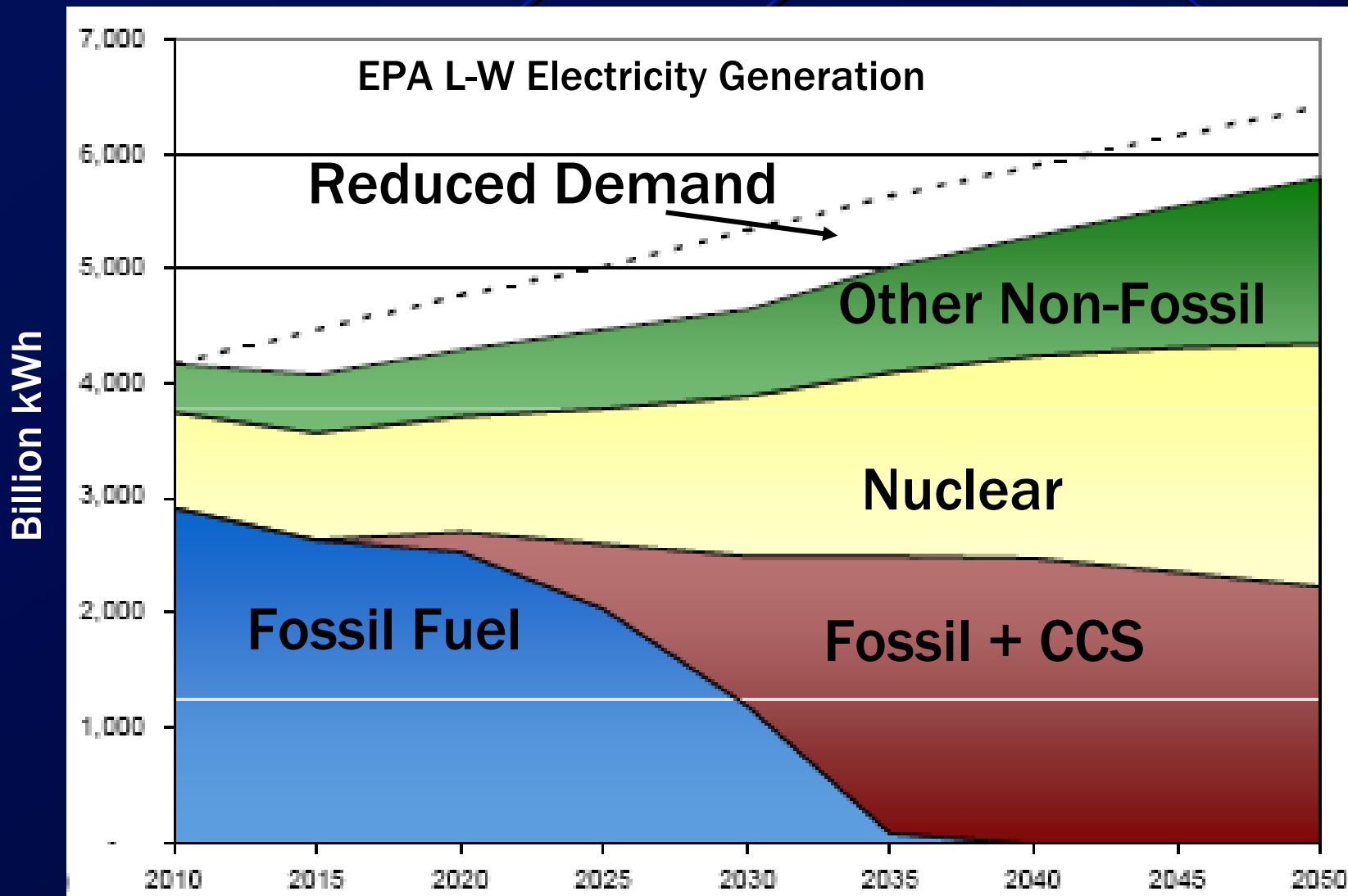
# EPA L-W Carbon Price Forecast



# Reference Case Electricity Generation



# Electricity Generation under Cap-and-Trade



## **RGGI Background**

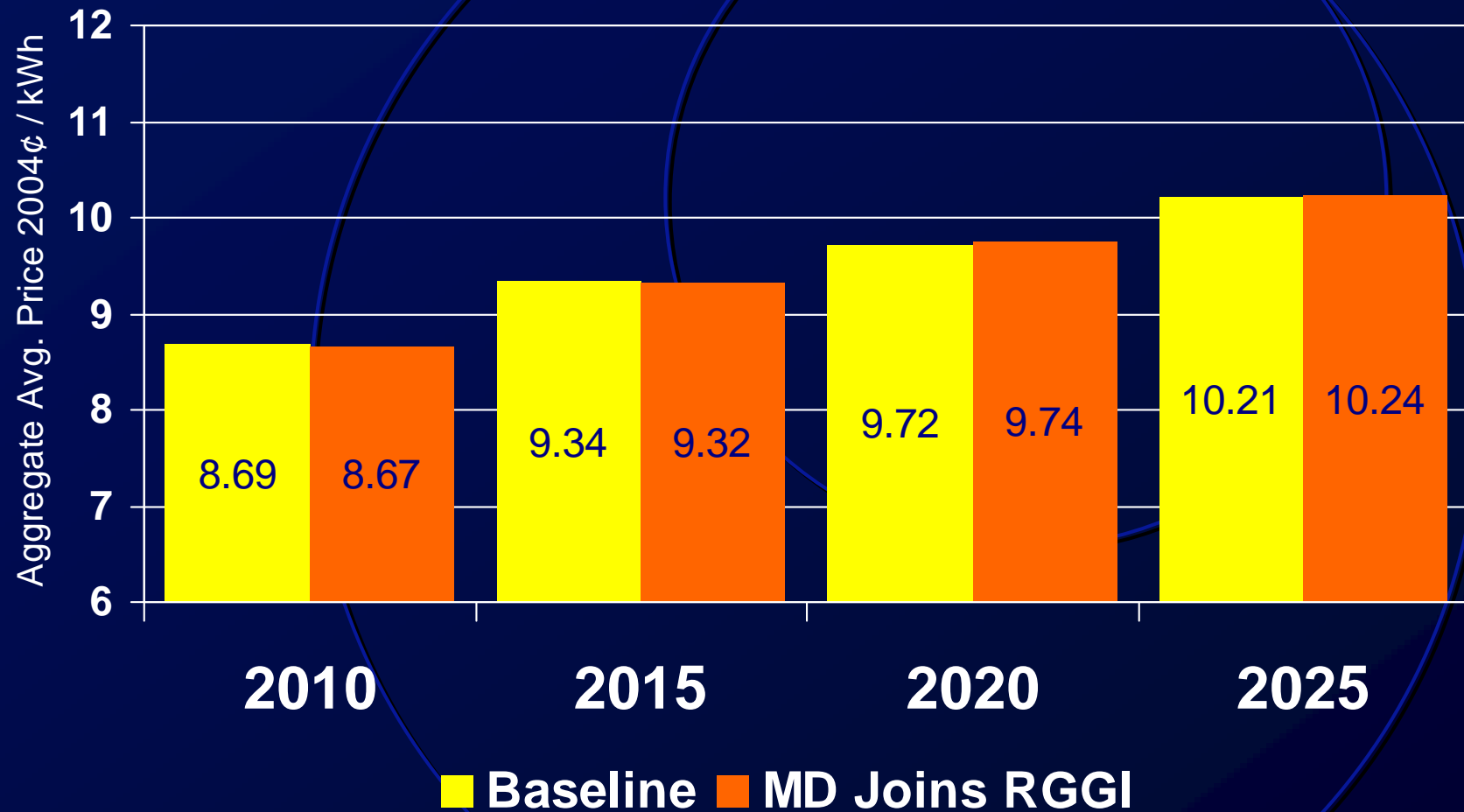
- First US cap-and-trade program for GHG emissions
- Begins in 2009
- Includes 10 northeastern states from MD to ME
- Covers electricity generators within the region
- CO<sub>2</sub> capped and ramped down to 10% below initial cap levels by 2019
- Most states adopted 100% auction
- $\geq$  25% of allowance value devoted to consumer benefit and strategic energy investments

# Energy Efficiency & RGGI Price Impacts

Projected RGGI Region Household Bill Impacts (\$/yr)

	Before EE Savings		After EE Savings			
			Participating Households		If EE Savings Evenly Distributed	
	2015	2021	2015	2021	2015	2021
RGGI	2.90	5.45	-92.54	-153.67	-30.51	-50.24
RGGI + 2X EE	0.77	2.16	-189.59	-314.99	-65.85	-108.84

# RGGI: the Case of Maryland



# EU ETS and Electricity Prices

Prices for Electricity, Coal, Natural Gas and EUAs 2005-2007

