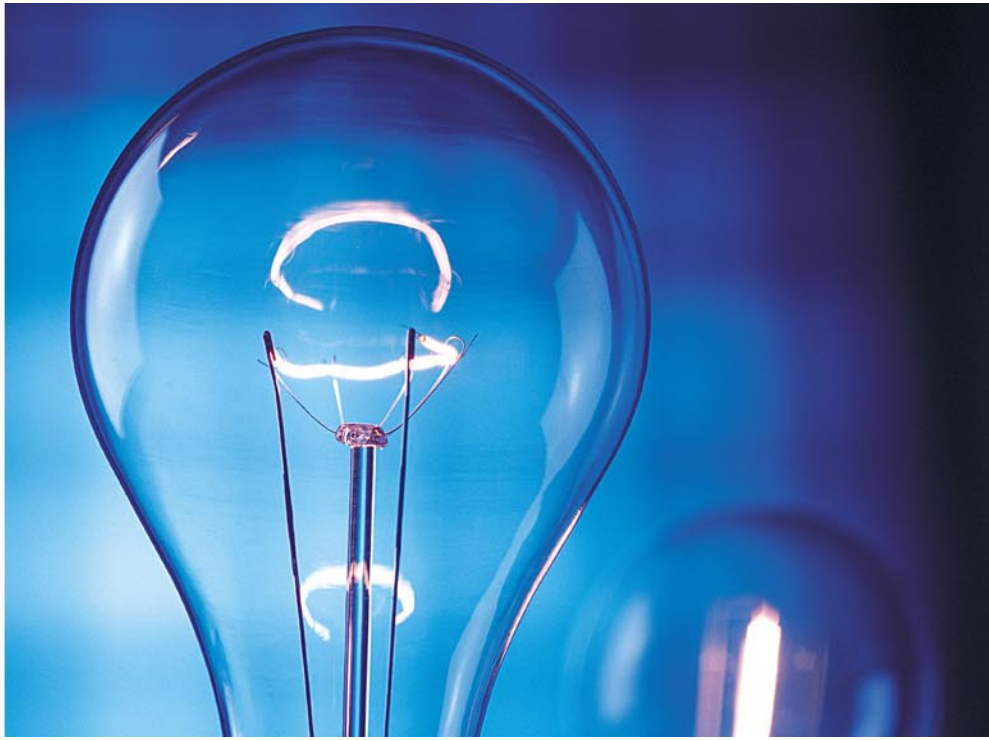

Regional Greenhouse Gas Initiative Experience Cost and Effectiveness

EPRI 19th Annual Energy and Climate Change Seminar
Washington, DC May 13 & 14, 2014

Mike Hachey, TransCanada Power

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In business to deliver

Comm/Ind Rates – Top 12 States in 2012

	State	¢/kWh	RGGI
1	HI	32.68	
2	AK	15.42	
3	CT	14.28	√
4	NY	13.82	√
5	MA	13.44	√
6	NH	12.91	√
7	CA	12.81	
8	VT	12.51	√
9	NJ	12.45	
10	RI	11.80	√
11	MD	10.20	√
12	ME	9.99	√

Source: US Energy Information Agency

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Electric Market Structure

NEPOOL ISO – CT, MA, RI, VT, ME, NH

- Primarily merchant generator
- Energy Mix - 46% gas, 33% nuc, 6% coal, 15% renew

NY ISO – NY

- 2/3 merchant, 1/3 power authority & utility
- Energy Mix – 6% gas, 35% gas/oil, 32% nuc, 3% coal, 18% hydro, 6% renew

PJM ISO – MD, DE

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RGGI – Key Elements

Initial annual cap set at 188 M Tons CO2 for 10 states

(4% above observed emission levels from 2000-2002)

Cap would decline 2.5%/yr from 2015 – 2018 for 10% reduction

Allocated to states by emissions from affected sources

Allowances distributed via centralized auction

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Initial Experience

RGGI designers assumed CO2 emissions would *increase*

In fact, CO2 emissions from state generation *decreased* by 36%, retail sales *decreased* by 5% between 2005-2011

coal dropped from 21% of energy mix to 11%

gas increased from 25% to 39%

Consequently, RGGI cap did not bind, allowances traded at floor, significant inventory of banked allowances

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2012 Design Review - Reduction in Cap

2014 Cap reduced from 165 M to 91 M tons

Cap to decline 2.5%/yr from 2015 to 2020

"Cost containment reserve" to release additional allowances if price thresholds exceeded ($4, $6, $8, $10; '14, '15, '16, '17)

Cap apparently designed to bind at outset; but banked allowances will soften prices until exhausted

(see Figure 3, CRS Report for Congress)

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RGGI Auction Results 9/25/08 – 12/4/13

- 1st 22 auction average price: $2.25/ton
- 23rd auction price: $4/ton (@ 2014 price threshold)
  - CCR triggered; 5 M allowances released at $4
- 1st 20 auctions: 87% allowances to compliance entities
- Last 3 auctions: 47% to compliance entities
- Auction Proceeds: $1.7 Billion

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Economic Impacts – Analysis Group 11/15/11

- Reviewed $912 M spent on energy efficiency, renewables, low income assistance, job training, state general fund

- Modeled using GE MAPS and IMPLAN

- Study Claims:

  $1.6 B generator allowance costs produce:

  $2.1 B bill reductions + $1.1 B program funding

  = $1.6 B Net Impact to RGGI states

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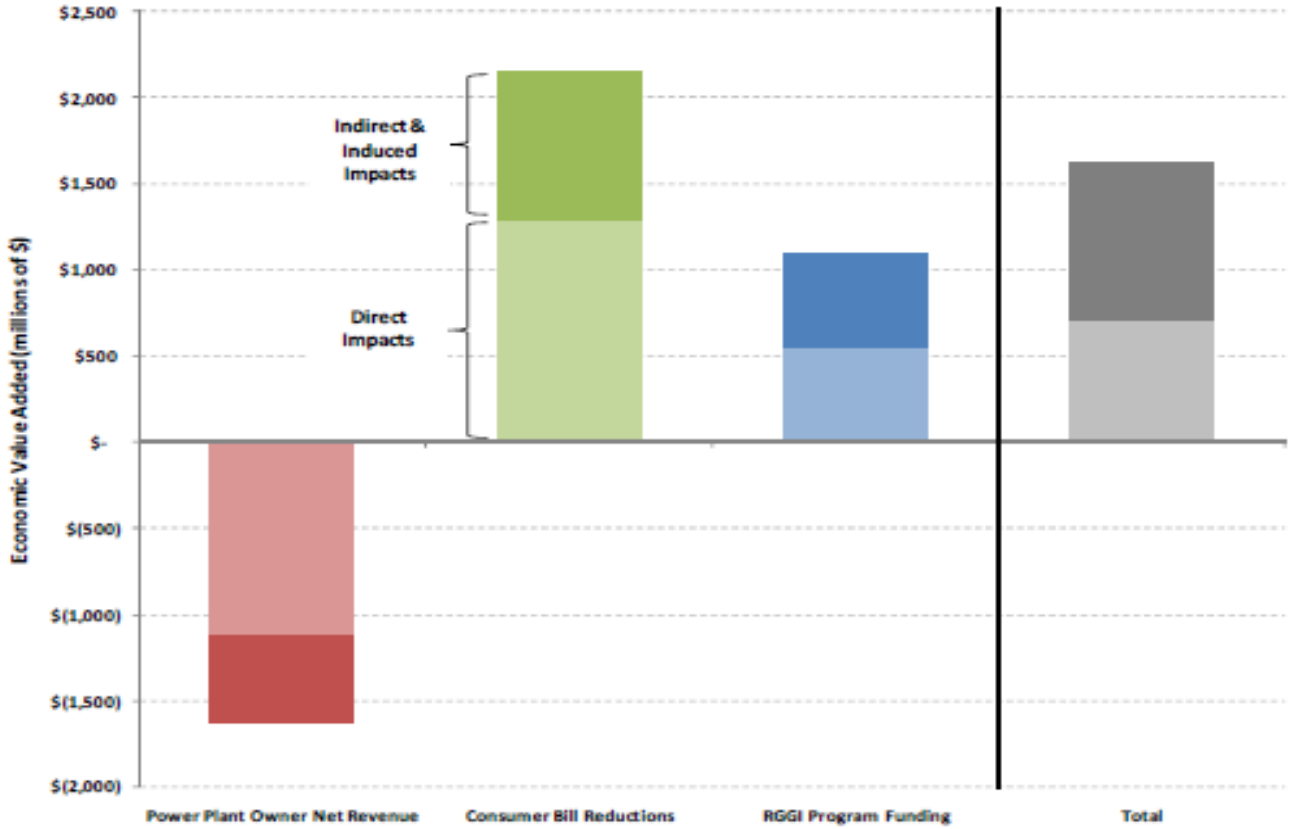
Study: Direct, Indirect & Induced Impacts

Net Economic Impacts for the Ten State RGGI Region



Notes: Figures represent dollars discounted to 2011 using a 3% public discount rate.

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Analysis in question, however….

- Institute for Energy Research (3/6/12):

  Current costs certain, future benefits modeled

  Questionable multiplier effect from “tax and spend”

  Alleged benefits unrelated to greenhouse gases

  Claims massive benefits from government spending while not adequately modeling offsetting losses to sectors providing the revenue

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...and more

- Congressional Research Service:

  RGGI program's contribution to reducing GHG emissions is "arguably negligible"

- Inappropriate claim of Market Price Suppression benefits

  Not an economic benefit – shift of dollars

  Either supply reduces or demand increases

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Customer Impacts: Case Study

Manufacturing in Massachusetts

- 250,000 jobs in 2012
- Steady decline in manufacturers from 2002 – 2010
- ***For large manufacturers, the #1 reason for "Possibly leaving Massachusetts" is "Future Energy Costs"***

Source: Dukakis Center for Urban and Regional Policy, *Staying Power II, A Report Card on Manufacturing in Massachusetts*, September, 2012

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Future Cost Drivers for MA

Transmission Costs (source: NEPOOL Transmission Comm., 7/22/13)

+0.6 ¢/kWh by 2017

Regional Greenhouse Gas Initiative (source: RGGI press release 2/7/13)

+0.5 ¢/kWh by 2020

Renewable Portfolio Standards

+0.42 ¢/kWh by 2020 (calc: 7% inc. 2013-2020 x ACP REC cost)

1600 MW Solar Program (inc. net metering)

+1.5 ¢/kWh by 2020

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Comm/Ind Rates – Top States in 2020 (Est.)

	State	¢/kWh
1	HI	30
2	***MA***	***16.5***
3	AK	15.4

Fact: MA will add 3¢/kWh to C&I rates from solar (1600 MW), RGGI, RPS and transmission costs by 2020

Most other states do not define “leadership” in terms that mean highest cost (energy efficiency, solar, Cape Wind)

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New England Generation Emission Reductions

Year	NOx	SO_2 (kTons)	CO_2
2001	60	200	53,000
2011	25	57	47,000
Emission Reduction	58%	71%	11%

Source: ISO New England

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New York Generation Emission Reductions

Year	NOx	SO_2 (kTons)	CO_2
2000	90	280	56,000
2012	20	20	35,000
Emission Reduction	80%	94%	37%

Source: 2013 NYISO Power Trends

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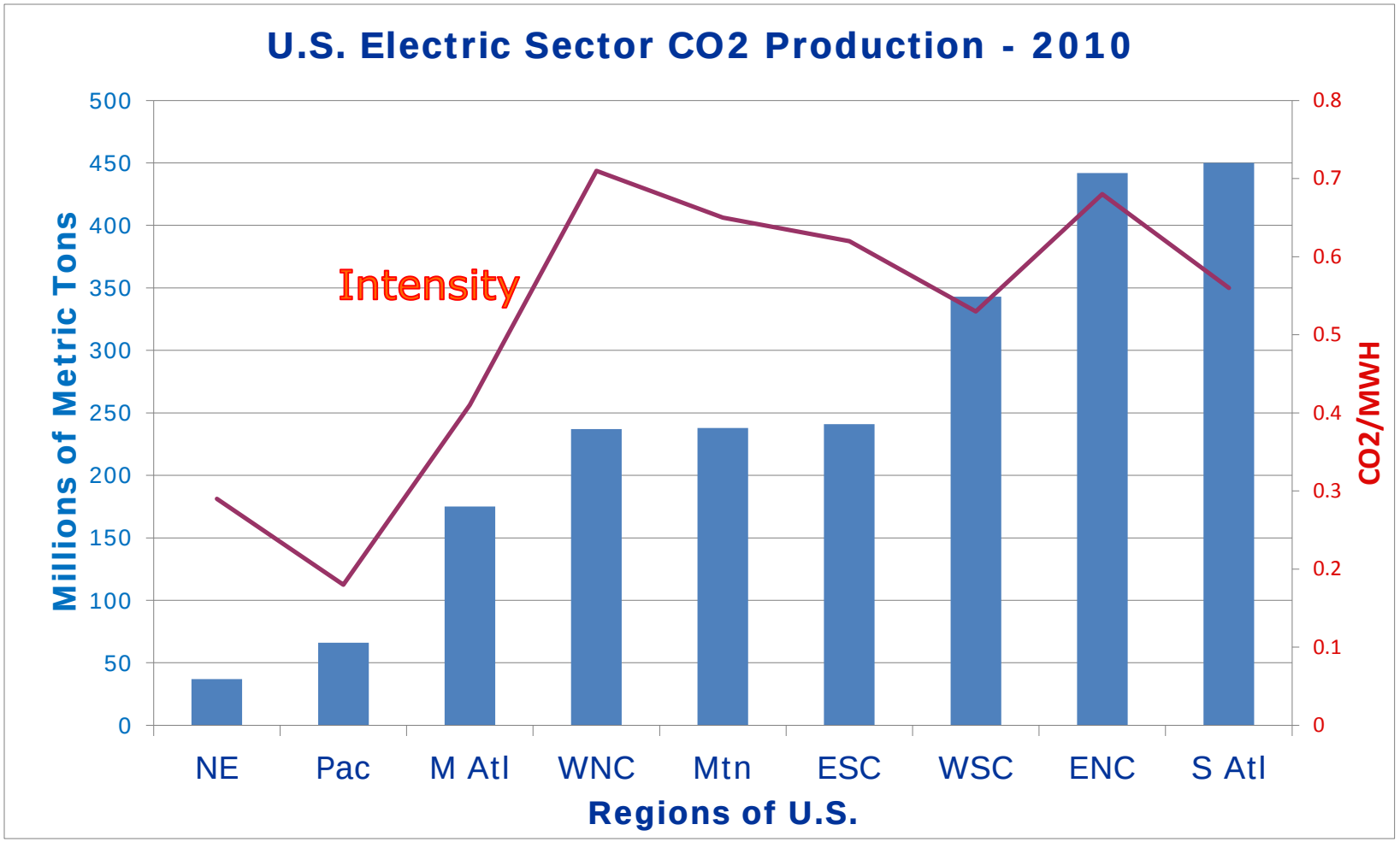
CO2 Production by Electric Generation – U.S.



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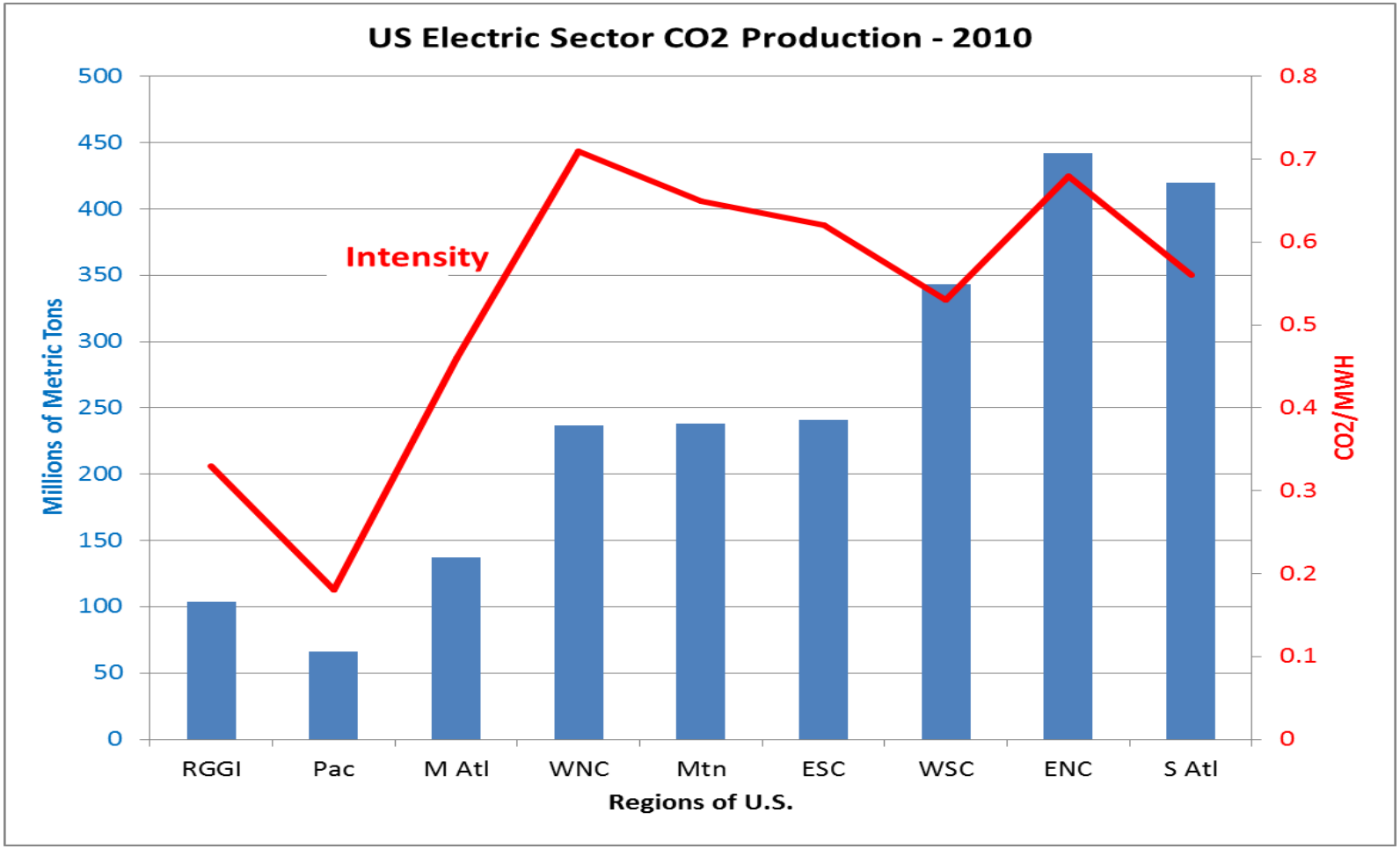
RGGI State CO2 Production Breakout



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Go forward thoughts – and Brattle Proposal

Avoid piece-meal regional programs that disadvantage and potentially displace cost-sensitive electric customers; i.e. manufacturers

Establish carbon price – ISOs collect – eliminate speculation, broker fees, cost uncertainty

Minimize impact on electric customers by fully, and directly, refunding carbon charges imposed on generators back to consumers

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Thank you!

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