



# Potential Impacts of Cap and Trade on Louisiana Ratepayers: Preliminary Results

*Louisiana Public Service Commission*

*Business and Executive Session*

*May 13, 2009*



David E. Dismukes  
Center for Energy Studies  
Louisiana State University

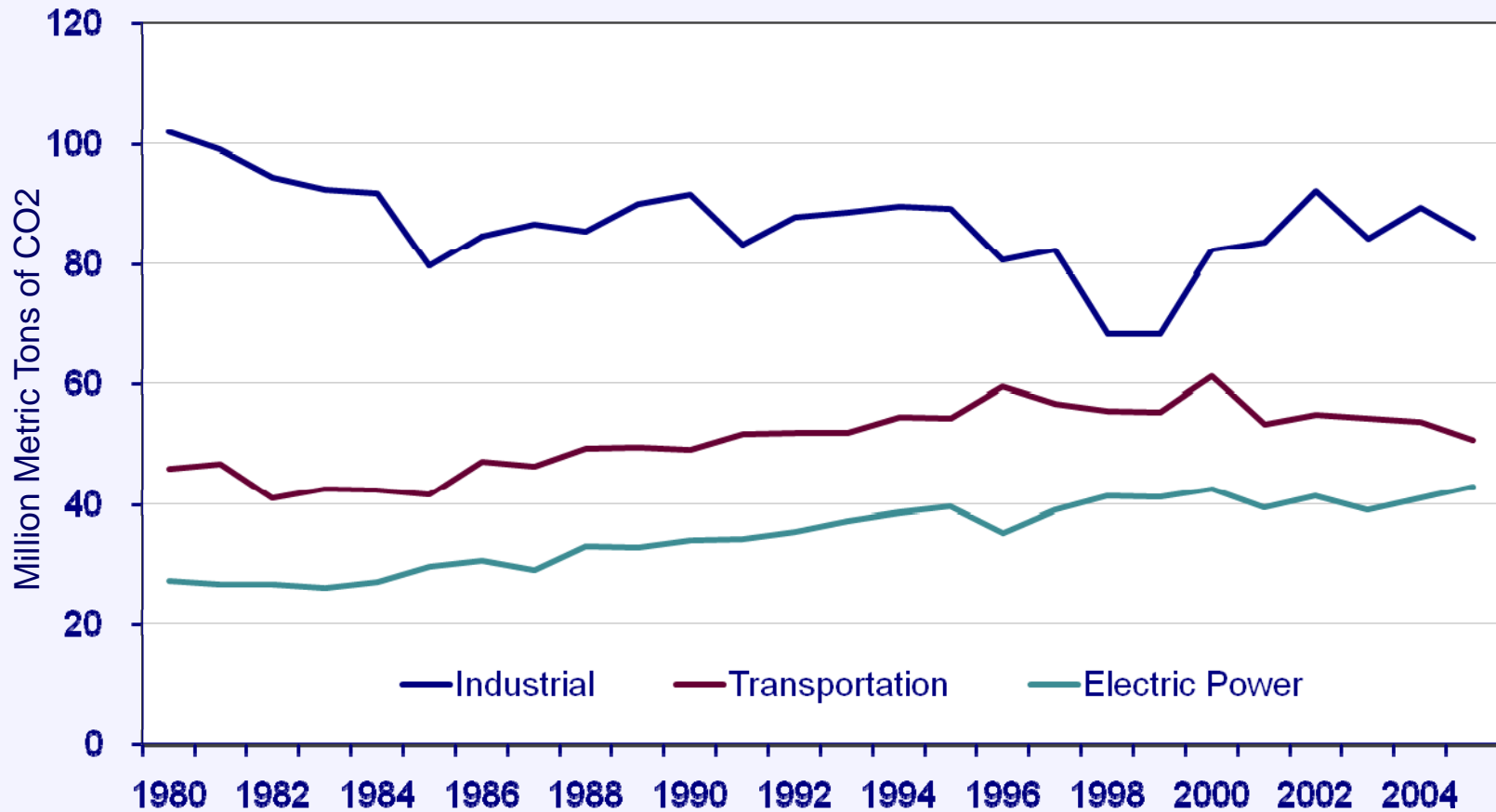
- CES is current examining the implications of climate change regulations on Louisiana industry.
- This work is being sponsored by the Louisiana Department of Economic Development
- Tasks:
  - Estimate Statewide GHG inventories.
  - Assess potential implications of federal policies on Louisiana.
  - Provide recommendations for strategically positioning Louisiana on any resulting opportunities.
- Power generation is one important sector included in the study.



Center for Energy Studies

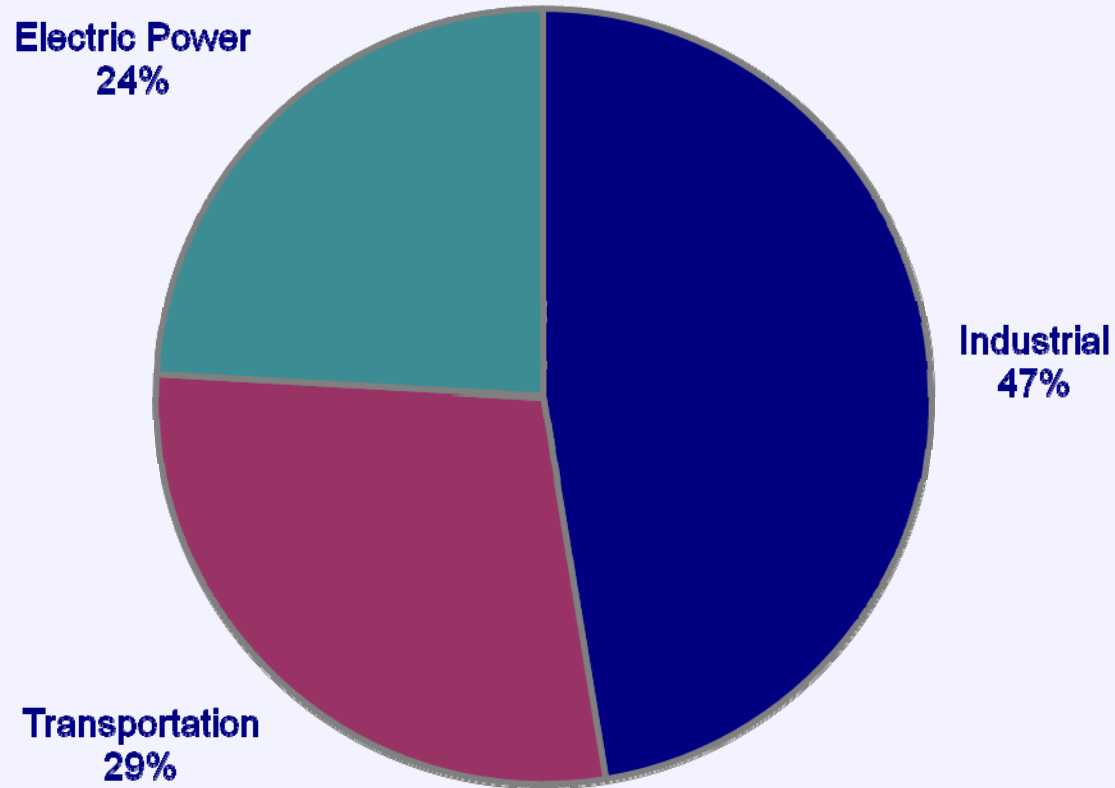
## Louisiana CO2 Emission Trends

**Louisiana carbon emissions have been driven primarily by moderate amounts of growth in transportation and electric power generation sectors.**



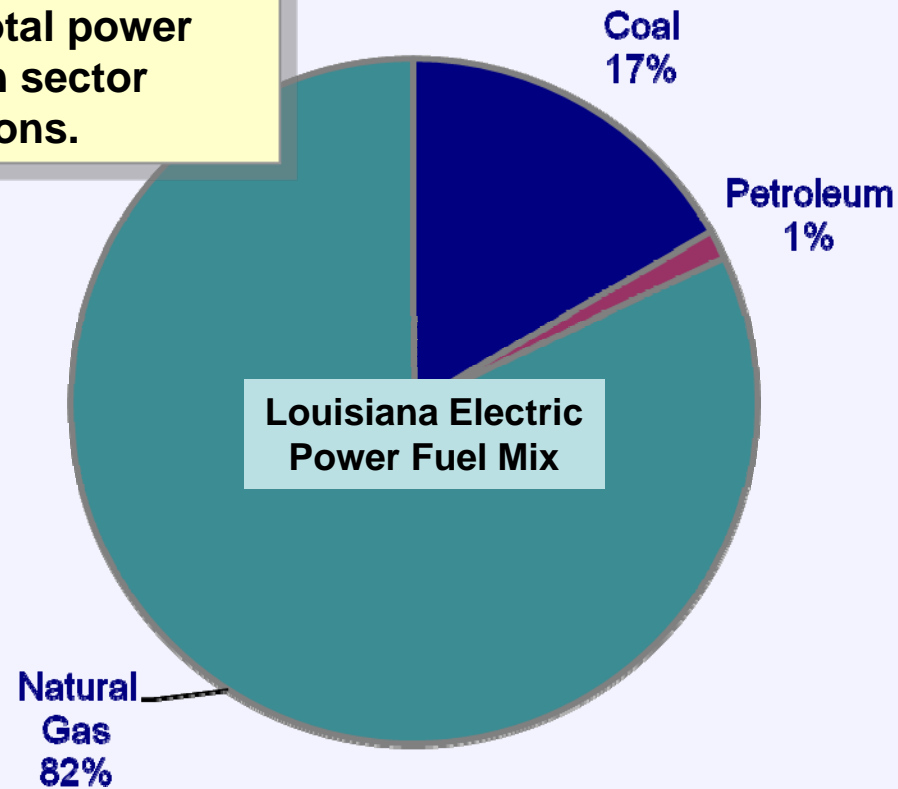
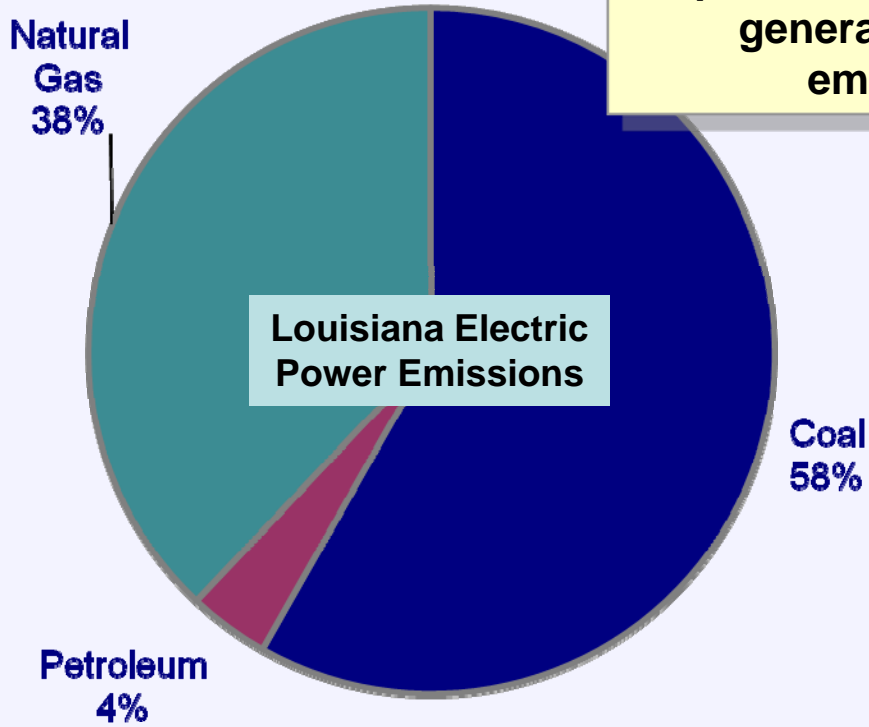
# Louisiana CO2 Emissions per Sector 2005

**Power generation comprises  
about 24 percent of overall  
state emissions.**

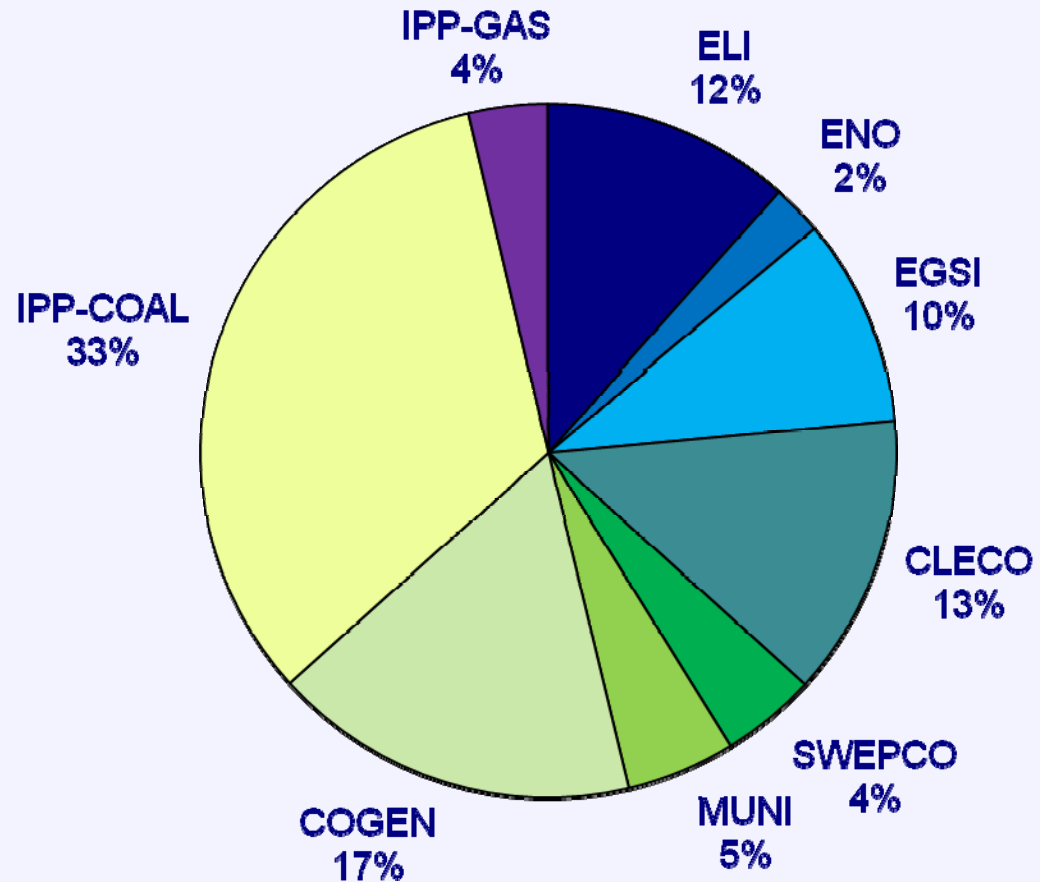


# Louisiana Electric Power CO2 Emissions and Fuel Mix

While coal only represents 17 percent of overall fuel mix, it accounts for 58 percent of total power generation sector emissions.

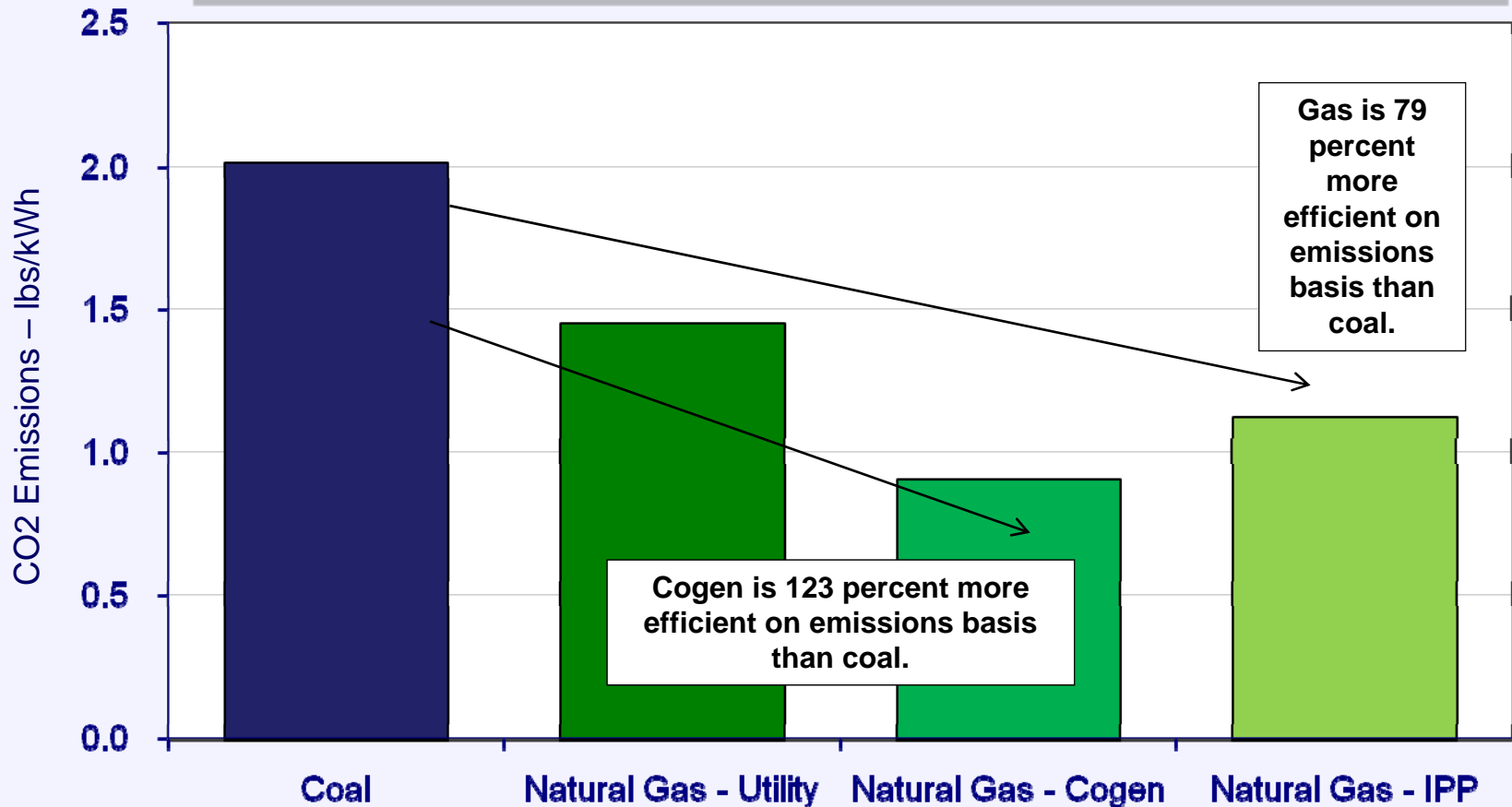


**The highest concentration of CO2 emissions are with IPP coal plant. Has significant implications for rural cooperative customers.**



# CO2 Emissions Rate by Fuel Type

**Coal plants have higher emissions rates than all types of gas plants. Cogeneration and newer gas plants have the lowest overall carbon emission rates.**





# Top Five CO2 Emitters by Fuel Type

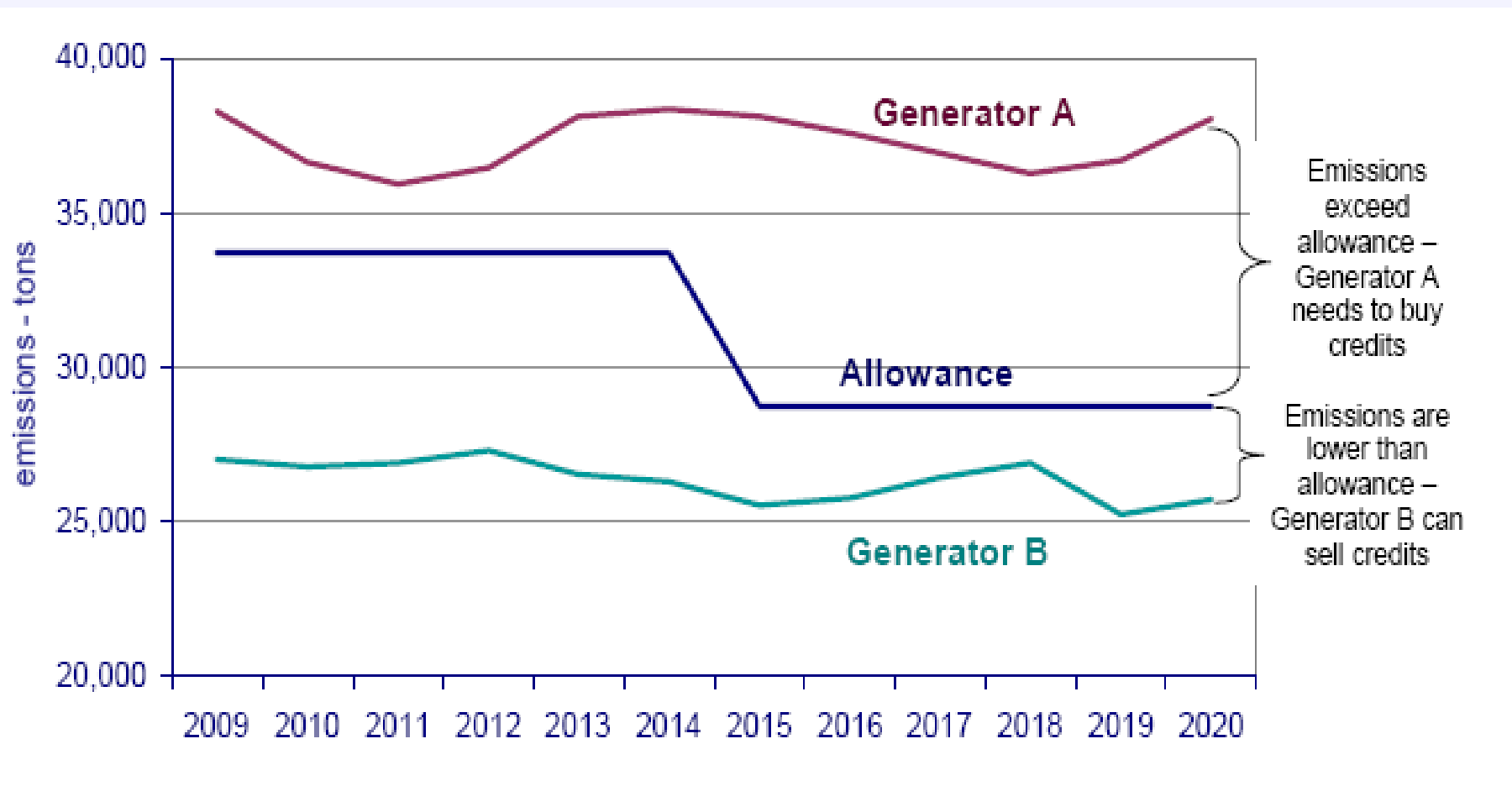
Company	Plant	2007 lbs/kWh
<b>Coal</b>		
EGSI	R S Nelson	2.27
CLECO/SWEPCO	Dolet Hills Power Station	2.20
IPP	Big Cajun 2 - 2B2	2.13
IPP	Big Cajun 2 - 2B3	2.07
IPP	Big Cajun 2 - 2B1	2.06
<b>Natural Gas</b>		
ELI	Ninemile Point	1.97
ELI	Waterford 1 & 2	1.96
LAFAYETTE/LEPA	Rodemacher Power Station	1.92
CLECO	Teche Power Station	1.88
SWEPCO	Arsenal Hill Power Plant	1.71



Center for Energy Studies

# Cap and Trade Mechanics

Generators with excess credits “trade” with those that are short on credits.

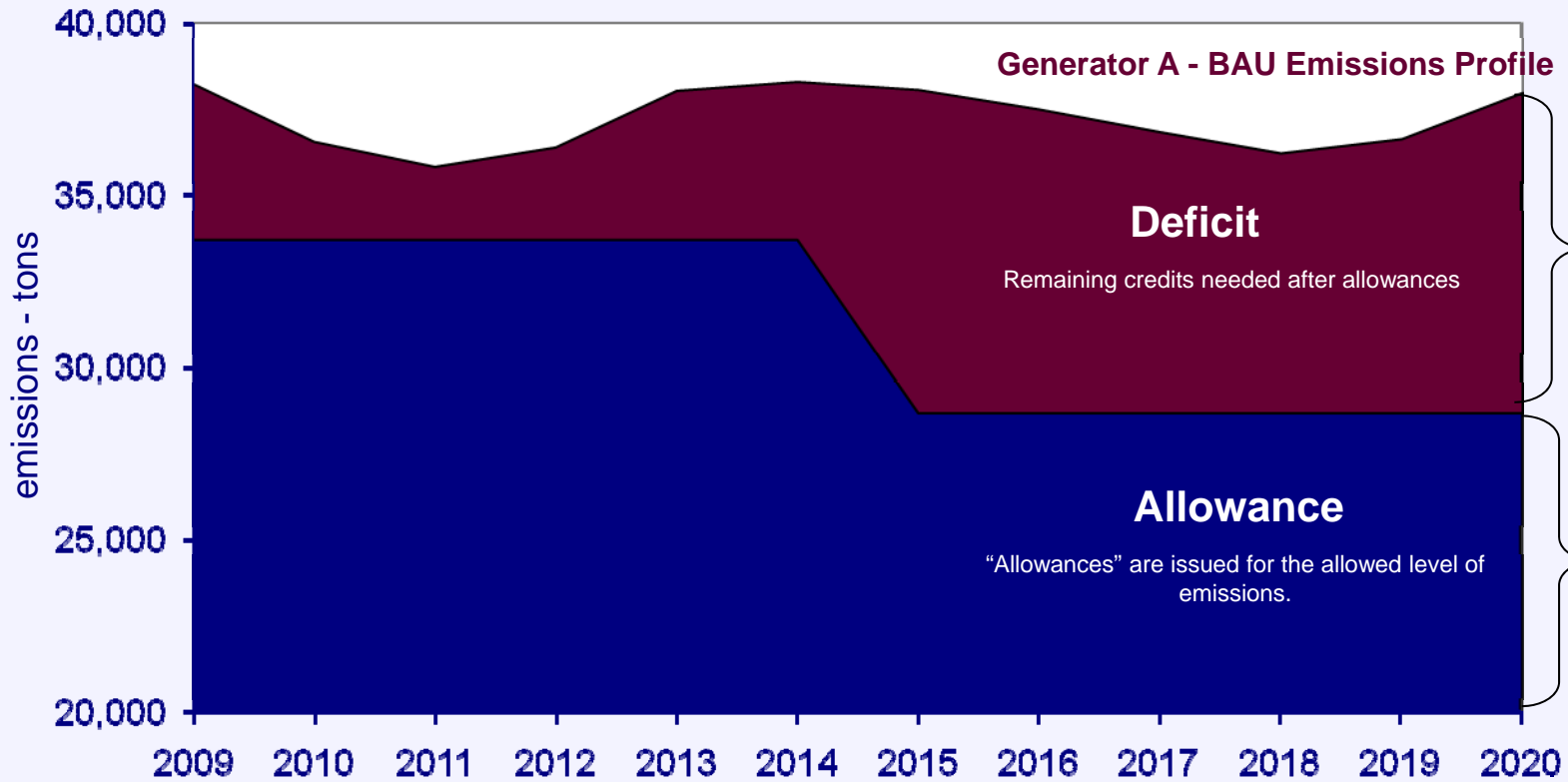


Allowances are offered to participants based upon two different methods:

<b>Allocated</b>	<b>Auction</b>
<p>Regulator makes an administrative determination of who gets allowances.</p>	<p>Market makes the decision about who gets the allowances.</p>
<p>Allocations made on a wide range of considerations and metrics including:</p> <ul style="list-style-type: none"><li>Metric (Heat Input, Output)</li><li>Baselines (Year, Updates)</li><li>Growth Pool</li><li>Set-Asides</li></ul>	<p>Periodic auction (think “eBay”) for the credits. Can be done in a variety of methods, but general approach is to allocate credits to those with the highest willingness to pay.</p> <p>There is an important issue associated with what to do with “auction proceeds.” Who gets those?</p>

# Auction Versus Allowance

**An auction system is more expensive because it requires a larger upfront purchase of credits.**



Total cost of emissions: \$570,000

At \$15/ton, remaining credits would cost \$140,000

At \$15/ton, allowances would cost about \$430,000 in 2020.

**Louisiana Emissions and Rate Impacts**

**Business As Usual Case**

**Allowance Based Regulatory Structure**

# Total CO2 Surplus/Deficit by Year and Utility BAU Case

	ELI	ENO	EGSI	Annual CO2 Surplus or Deficit by Utility					IPP-COAL	IPP-GAS	STATE TOTAL
				CLECO	SWEPCO	MUNI	COGEN	(tons)			
<b>Allocations based on:</b>											
<b>Emissions</b>											
2012	128,236	25,817	106,118	145,703	49,085	56,025	188,864	364,326	40,687	1,104,863	
2015	(297,546)	(59,903)	(246,226)	(338,074)	(113,893)	(129,996)	(438,222)	(845,346)	(94,406)	(2,563,612)	
2020	(1,007,183)	(202,769)	(833,468)	(1,144,370)	(385,522)	(440,031)	(1,483,365)	(2,861,466)	(319,563)	(8,677,736)	
2025	(1,741,865)	(350,678)	(1,441,435)	(1,979,123)	(666,739)	(761,009)	(2,565,396)	(4,948,743)	(552,665)	(15,007,654)	
2030	(2,476,548)	(498,586)	(2,049,403)	(2,813,876)	(947,956)	(1,081,987)	(3,647,426)	(7,036,020)	(785,768)	(21,337,571)	
2035	(3,161,139)	(636,410)	(2,615,918)	(3,591,714)	(1,209,998)	(1,381,081)	(4,655,682)	(8,980,982)	(1,002,978)	(27,235,903)	
2040	(3,845,730)	(774,234)	(3,182,433)	(4,369,552)	(1,472,041)	(1,680,174)	(5,663,938)	(10,925,945)	(1,220,187)	(33,134,235)	
2045	(4,530,320)	(912,058)	(3,748,949)	(5,147,390)	(1,734,084)	(1,979,267)	(6,672,194)	(12,870,908)	(1,437,397)	(39,032,566)	
2050	(5,214,911)	(1,049,882)	(4,315,464)	(5,925,228)	(1,996,127)	(2,278,360)	(7,680,450)	(14,815,871)	(1,654,606)	(44,930,898)	
<b>Generation</b>											
2012	349,898	218,524	(1,272,023)	(782,774)	(665,596)	(455,341)	5,906,763	(3,670,390)	1,475,800	1,104,863	
2015	(90,452)	120,139	(1,533,794)	(1,205,530)	(781,604)	(607,754)	4,903,888	(4,614,894)	1,246,389	(2,563,612)	
2020	(824,369)	(43,835)	(1,970,079)	(1,910,124)	(974,950)	(861,777)	3,232,428	(6,189,066)	864,036	(8,677,736)	
2025	(1,584,189)	(213,597)	(2,421,762)	(2,639,586)	(1,175,120)	(1,124,765)	1,501,976	(7,818,798)	468,188	(15,007,654)	
2030	(2,344,008)	(383,360)	(2,873,446)	(3,369,047)	(1,375,291)	(1,387,753)	(228,476)	(9,448,530)	72,341	(21,337,571)	
2035	(3,052,022)	(541,547)	(3,294,333)	(4,048,773)	(1,561,813)	(1,632,810)	(1,840,943)	(10,967,144)	(296,517)	(27,235,903)	
2040	(3,760,036)	(699,734)	(3,715,220)	(4,728,499)	(1,748,336)	(1,877,867)	(3,453,410)	(12,485,758)	(665,375)	(33,134,235)	
2045	(4,468,049)	(857,922)	(4,136,107)	(5,408,225)	(1,934,858)	(2,122,924)	(5,065,877)	(14,004,372)	(1,034,233)	(39,032,566)	
2050	(5,176,063)	(1,016,109)	(4,556,994)	(6,087,951)	(2,121,380)	(2,367,981)	(6,678,344)	(15,522,986)	(1,403,091)	(44,930,898)	
<b>Heat Input</b>											
2012	2,320,804	473,134	(696,645)	(980,177)	(505,992)	(407,904)	3,783,754	(3,643,333)	761,222	1,104,863	
2015	1,750,923	358,016	(996,231)	(1,389,960)	(632,489)	(563,435)	2,920,406	(4,589,615)	578,774	(2,563,612)	
2020	801,121	166,153	(1,495,541)	(2,072,931)	(843,318)	(822,654)	1,481,492	(6,166,752)	274,693	(8,677,736)	
2025	(182,204)	(32,483)	(2,012,473)	(2,780,007)	(1,061,588)	(1,091,021)	(8,206)	(7,799,552)	(40,120)	(15,007,654)	
2030	(1,165,528)	(231,118)	(2,529,406)	(3,487,083)	(1,279,858)	(1,359,389)	(1,497,905)	(9,432,352)	(354,933)	(21,337,571)	
2035	(2,081,808)	(416,210)	(3,011,093)	(4,145,949)	(1,483,245)	(1,609,458)	(2,886,033)	(10,953,825)	(648,281)	(27,235,903)	
2040	(2,998,087)	(601,302)	(3,492,780)	(4,804,815)	(1,686,633)	(1,859,528)	(4,274,161)	(12,475,298)	(941,630)	(33,134,235)	
2045	(3,914,367)	(786,394)	(3,974,467)	(5,463,681)	(1,890,021)	(2,109,598)	(5,662,289)	(13,996,771)	(1,234,978)	(39,032,566)	
2050	(4,830,647)	(971,486)	(4,456,154)	(6,122,547)	(2,093,408)	(2,359,667)	(7,050,418)	(15,518,244)	(1,528,327)	(44,930,898)	

# Total CO2 Cost by Year and Utility BAU Case

	Annual Abatement Costs (at \$10/ton)									
	ELI	ENO	EGSI	CLECO	SWPCO	MUNI	COGEN	IPP-COAL	IPP-GAS	STATE TOTAL
----- (million \$) -----										
<b>Allocations based on:</b>										
<b>Emissions</b>										
2012	(\$1.28)	(\$0.26)	(\$1.06)	(\$1.46)	(\$0.49)	(\$0.56)	(\$1.89)	(\$3.64)	(\$0.41)	(\$11.05)
2015	\$2.98	\$0.60	\$2.46	\$3.38	\$1.14	\$1.30	\$4.38	\$8.45	\$0.94	\$25.64
2020	\$10.07	\$2.03	\$8.33	\$11.44	\$3.86	\$4.40	\$14.83	\$28.61	\$3.20	\$86.78
2025	\$17.42	\$3.51	\$14.41	\$19.79	\$6.67	\$7.61	\$25.65	\$49.49	\$5.53	\$150.08
2030	\$24.77	\$4.99	\$20.49	\$28.14	\$9.48	\$10.82	\$36.47	\$70.36	\$7.86	\$213.38
2035	\$31.61	\$6.36	\$26.16	\$35.92	\$12.10	\$13.81	\$46.56	\$89.81	\$10.03	\$272.36
2040	\$38.46	\$7.74	\$31.82	\$43.70	\$14.72	\$16.80	\$56.64	\$109.26	\$12.20	\$331.34
2045	\$45.30	\$9.12	\$37.49	\$51.47	\$17.34	\$19.79	\$66.72	\$128.71	\$14.37	\$390.33
2050	\$52.15	\$10.50	\$43.15	\$59.25	\$19.96	\$22.78	\$76.80	\$148.16	\$16.55	\$449.31
<b>Generation</b>										
2012	(\$3.50)	(\$2.19)	\$12.72	\$7.83	\$6.66	\$4.55	(\$59.07)	\$36.70	(\$14.76)	(\$11.05)
2015	\$0.90	(\$1.20)	\$15.34	\$12.06	\$7.82	\$6.08	(\$49.04)	\$46.15	(\$12.46)	\$25.64
2020	\$8.24	\$0.44	\$19.70	\$19.10	\$9.75	\$8.62	(\$32.32)	\$61.89	(\$8.64)	\$86.78
2025	\$15.84	\$2.14	\$24.22	\$26.40	\$11.75	\$11.25	(\$15.02)	\$78.19	(\$4.68)	\$150.08
2030	\$23.44	\$3.83	\$28.73	\$33.69	\$13.75	\$13.88	\$2.28	\$94.49	(\$0.72)	\$213.38
2035	\$30.52	\$5.42	\$32.94	\$40.49	\$15.62	\$16.33	\$18.41	\$109.67	\$2.97	\$272.36
2040	\$37.60	\$7.00	\$37.15	\$47.28	\$17.48	\$18.78	\$34.53	\$124.86	\$6.65	\$331.34
2045	\$44.68	\$8.58	\$41.36	\$54.08	\$19.35	\$21.23	\$50.66	\$140.04	\$10.34	\$390.33
2050	\$51.76	\$10.16	\$45.57	\$60.88	\$21.21	\$23.68	\$66.78	\$155.23	\$14.03	\$449.31
<b>Heat Input</b>										
2012	(\$23.21)	(\$4.73)	\$6.97	\$9.80	\$5.06	\$4.08	(\$37.84)	\$36.43	(\$7.61)	(\$11.05)
2015	(\$17.51)	(\$3.58)	\$9.96	\$13.90	\$6.32	\$5.63	(\$29.20)	\$45.90	(\$5.79)	\$25.64
2020	(\$8.01)	(\$1.66)	\$14.96	\$20.73	\$8.43	\$8.23	(\$14.81)	\$61.67	(\$2.75)	\$86.78
2025	\$1.82	\$0.32	\$20.12	\$27.80	\$10.62	\$10.91	\$0.08	\$78.00	\$0.40	\$150.08
2030	\$11.66	\$2.31	\$25.29	\$34.87	\$12.80	\$13.59	\$14.98	\$94.32	\$3.55	\$213.38
2035	\$20.82	\$4.16	\$30.11	\$41.46	\$14.83	\$16.09	\$28.86	\$109.54	\$6.48	\$272.36
2040	\$29.98	\$6.01	\$34.93	\$48.05	\$16.87	\$18.60	\$42.74	\$124.75	\$9.42	\$331.34
2045	\$39.14	\$7.86	\$39.74	\$54.64	\$18.90	\$21.10	\$56.62	\$139.97	\$12.35	\$390.33
2050	\$48.31	\$9.71	\$44.56	\$61.23	\$20.93	\$23.60	\$70.50	\$155.18	\$15.28	\$449.31





# Residential Annual Bill Impact BAU Case

	Annual Average Ratepayer Impacts (Bill Impact)									
	ELI	ENO	EGSI	CLECO	SWEPCO	MUNI	COGEN	IPP-COAL	IPP-GAS	STATE AVG
----- (\$/bill) -----										
<b>Allocations based on:</b>										
<b>Emissions</b>										
2012	(\$0.71)	(\$0.56)	(\$0.87)	(\$2.53)	(\$1.36)	(\$1.85)	n.a.	(\$7.33)	n.a.	(\$2.17)
2015	\$1.65	\$1.30	\$2.03	\$5.88	\$3.15	\$4.28	n.a.	\$17.00	n.a.	\$5.04
2020	\$5.57	\$4.41	\$6.87	\$19.89	\$10.65	\$14.50	n.a.	\$57.56	n.a.	\$17.07
2025	\$9.64	\$7.63	\$11.88	\$34.40	\$18.42	\$25.08	n.a.	\$99.55	n.a.	\$29.51
2030	\$13.71	\$10.85	\$16.89	\$48.92	\$26.20	\$35.66	n.a.	\$141.53	n.a.	\$41.96
2035	\$17.49	\$13.84	\$21.56	\$62.44	\$33.44	\$45.51	n.a.	\$180.66	n.a.	\$53.56
2040	\$21.28	\$16.84	\$26.23	\$75.96	\$40.68	\$55.37	n.a.	\$219.78	n.a.	\$65.16
2045	\$25.07	\$19.84	\$30.90	\$89.48	\$47.92	\$65.22	n.a.	\$258.91	n.a.	\$76.76
2050	\$28.86	\$22.84	\$35.57	\$103.00	\$55.16	\$75.08	n.a.	\$298.03	n.a.	\$88.36
<b>Generation</b>										
2012	(\$1.94)	(\$4.75)	\$10.48	\$13.61	\$18.39	\$15.01	n.a.	\$73.83	n.a.	\$17.80
2015	\$0.50	(\$2.61)	\$12.64	\$20.96	\$21.60	\$20.03	n.a.	\$92.83	n.a.	\$23.71
2020	\$4.56	\$0.95	\$16.24	\$33.20	\$26.94	\$28.40	n.a.	\$124.50	n.a.	\$33.54
2025	\$8.77	\$4.65	\$19.96	\$45.89	\$32.47	\$37.07	n.a.	\$157.28	n.a.	\$43.73
2030	\$12.97	\$8.34	\$23.68	\$58.57	\$38.01	\$45.73	n.a.	\$190.06	n.a.	\$53.91
2035	\$16.89	\$11.78	\$27.15	\$70.38	\$43.16	\$53.81	n.a.	\$220.61	n.a.	\$63.40
2040	\$20.81	\$15.22	\$30.62	\$82.20	\$48.31	\$61.88	n.a.	\$251.16	n.a.	\$72.89
2045	\$24.73	\$18.66	\$34.09	\$94.01	\$53.47	\$69.96	n.a.	\$281.71	n.a.	\$82.38
2050	\$28.65	\$22.11	\$37.56	\$105.83	\$58.62	\$78.03	n.a.	\$312.25	n.a.	\$91.86
<b>Heat Impact</b>										
2012	(\$12.84)	(\$10.29)	\$5.74	\$17.04	\$13.98	\$13.44	n.a.	\$73.29	n.a.	\$14.34
2015	(\$9.69)	(\$7.79)	\$8.21	\$24.16	\$17.48	\$18.57	n.a.	\$92.32	n.a.	\$20.47
2020	(\$4.43)	(\$3.61)	\$12.33	\$36.04	\$23.30	\$27.11	n.a.	\$124.05	n.a.	\$30.68
2025	\$1.01	\$0.71	\$16.59	\$48.33	\$29.34	\$35.95	n.a.	\$156.89	n.a.	\$41.26
2030	\$6.45	\$5.03	\$20.85	\$60.62	\$35.37	\$44.80	n.a.	\$189.74	n.a.	\$51.84
2035	\$11.52	\$9.05	\$24.82	\$72.07	\$40.99	\$53.04	n.a.	\$220.34	n.a.	\$61.69
2040	\$16.59	\$13.08	\$28.79	\$83.53	\$46.61	\$61.28	n.a.	\$250.95	n.a.	\$71.55
2045	\$21.66	\$17.11	\$32.76	\$94.98	\$52.23	\$69.52	n.a.	\$281.55	n.a.	\$81.40
2050	\$26.73	\$21.13	\$36.73	\$106.43	\$57.85	\$77.76	n.a.	\$312.16	n.a.	\$91.26

Preliminary and Not for Citation



## **Louisiana Emissions and Rate Impacts**

### **Growth Case**

### **Allowance Based Regulatory Structure**



# Total CO2 Surplus/Deficit by Year and Utility Growth Case

	ELI	ENO	EGSI	Annual CO2 Surplus or Deficit by Utility						STATE TOTAL
				CLECO	SWEPCO	MUNI	COGEN	IPP-COAL	IPP-GAS	
----- (tons) -----										
<b>Allocations based on:</b>										
<b>Emissions</b>										
2012	(500,441)	(102,878)	(535,624)	(580,615)	(195,601)	(184,388)	(734,628)	(1,393,920)	(160,005)	(4,388,099)
2015	(892,090)	(185,188)	(964,167)	(1,045,157)	(354,882)	(331,913)	(1,422,166)	(2,397,477)	(281,320)	(7,874,361)
2020	(2,234,168)	(364,525)	(1,873,688)	(2,028,156)	(1,117,499)	(651,937)	(2,615,415)	(4,358,474)	(537,728)	(15,781,589)
2025	(2,827,940)	(871,174)	(2,606,150)	(2,831,478)	(1,462,209)	(867,874)	(3,342,109)	(5,387,710)	(707,380)	(20,904,024)
2030	(3,895,585)	(1,162,784)	(3,131,540)	(3,777,193)	(1,778,270)	(1,036,213)	(4,035,466)	(6,279,190)	(876,104)	(25,972,345)
2035	(4,675,083)	(1,406,812)	(3,504,733)	(4,277,071)	(2,019,842)	(1,146,626)	(4,880,040)	(6,880,813)	(997,824)	(29,788,844)
2040	(5,427,784)	(1,685,363)	(3,872,278)	(4,806,203)	(2,856,581)	(1,253,471)	(5,364,271)	(7,466,141)	(1,127,964)	(33,860,056)
2045	(5,857,677)	(1,860,762)	(3,991,927)	(5,026,263)	(3,017,210)	(1,299,380)	(5,608,672)	(7,696,836)	(1,214,330)	(35,573,057)
2050	(6,046,280)	(1,907,695)	(4,052,490)	(5,102,519)	(3,144,094)	(1,326,228)	(5,781,919)	(7,813,607)	(1,290,491)	(36,465,323)
<b>Generation</b>										
2012	(459,358)	60,528	(1,641,034)	(1,640,928)	(948,000)	(184,852)	4,808,720	(5,574,791)	1,191,616	(4,388,099)
2015	(792,918)	(1,949)	(1,998,100)	(2,025,746)	(1,082,195)	(301,596)	3,478,064	(6,244,602)	1,094,681	(7,874,361)
2020	(1,786,806)	(203,081)	(2,931,123)	(3,048,165)	(1,517,606)	(652,226)	1,637,823	(8,010,683)	730,277	(15,781,589)
2025	(2,138,278)	(496,748)	(3,455,737)	(3,815,193)	(1,916,467)	(910,021)	393,227	(9,048,570)	483,763	(20,904,024)
2030	(2,998,915)	(735,788)	(3,981,973)	(4,585,422)	(2,234,518)	(1,111,980)	(690,511)	(9,891,500)	258,261	(25,972,345)
2035	(3,844,831)	(983,959)	(4,345,439)	(5,070,172)	(2,463,071)	(1,236,320)	(1,529,870)	(10,416,414)	101,232	(29,788,844)
2040	(4,677,588)	(1,260,514)	(4,692,624)	(5,566,148)	(3,132,675)	(1,351,148)	(2,225,797)	(10,898,921)	(54,642)	(33,860,056)
2045	(5,157,575)	(1,421,127)	(4,807,991)	(5,769,344)	(3,279,872)	(1,398,610)	(2,534,337)	(11,082,973)	(121,228)	(35,573,057)
2050	(5,392,438)	(1,471,978)	(4,867,050)	(5,846,790)	(3,390,934)	(1,426,225)	(2,731,095)	(11,177,194)	(161,618)	(36,465,323)
<b>Heat Input</b>										
2012	1,731,178	362,195	(1,371,311)	(1,652,381)	(734,669)	(481,421)	2,305,747	(5,126,315)	578,878	(4,388,099)
2015	1,350,429	286,840	(1,783,914)	(2,100,675)	(889,685)	(623,518)	1,361,135	(5,933,352)	458,377	(7,874,361)
2020	(348,903)	111,770	(2,615,356)	(2,999,215)	(1,655,947)	(925,548)	(56,031)	(7,477,398)	185,039	(15,781,589)
2025	(1,436,772)	(415,799)	(3,433,875)	(3,844,314)	(1,950,972)	(1,133,629)	(709,334)	(8,051,254)	71,926	(20,904,024)
2030	(2,543,994)	(1,081,841)	(3,869,117)	(4,777,408)	(2,204,473)	(1,272,655)	(1,464,326)	(8,684,625)	(73,905)	(25,972,345)
2035	(3,288,284)	(1,323,864)	(4,210,237)	(5,230,644)	(2,425,749)	(1,366,298)	(2,552,518)	(9,188,490)	(202,760)	(29,788,844)
2040	(4,038,293)	(1,608,130)	(4,562,473)	(5,732,881)	(3,225,061)	(1,464,207)	(3,178,191)	(9,704,990)	(345,830)	(33,860,056)
2045	(4,421,675)	(1,787,961)	(4,684,755)	(5,951,906)	(3,387,823)	(1,507,520)	(3,490,653)	(9,921,258)	(419,506)	(35,573,057)
2050	(4,583,087)	(1,840,816)	(4,749,552)	(6,032,873)	(3,516,844)	(1,532,479)	(3,702,715)	(10,035,858)	(471,097)	(36,465,323)

Preliminary and Not for Citation

# Total CO2 Cost by Year and Utility Growth Case

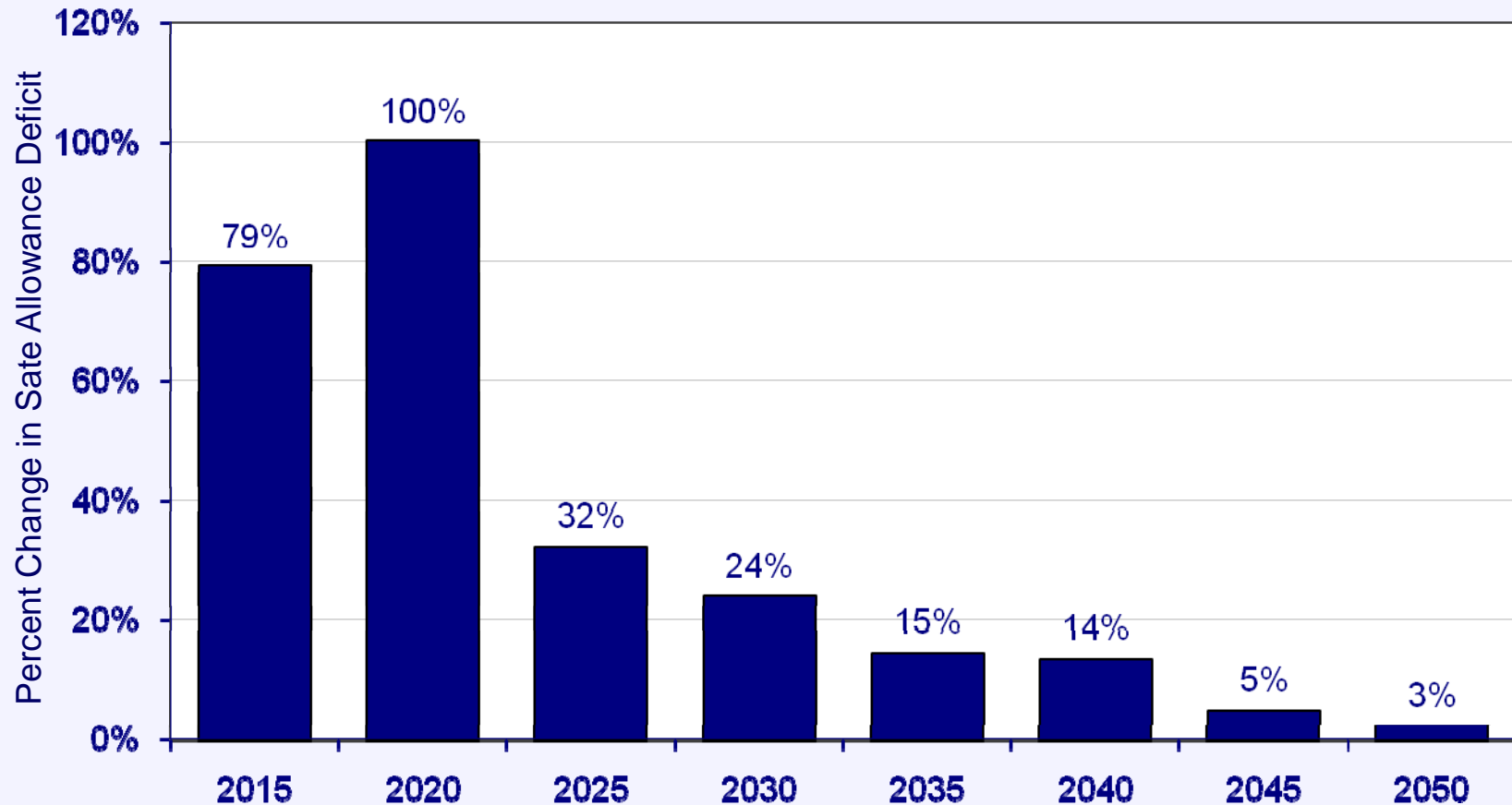
	ELI	ENO	EGSI	Annual Abatement Costs			COGEN	IPP-COAL	IPP-GAS	STATE TOTAL
				CLECO	SWEPCO	MUNI				
----- (million \$) -----										
<b>Allocations based on:</b>										
<b>Emissions</b>										
2012	\$7.51	\$1.54	\$8.03	\$8.71	\$2.93	\$2.77	\$11.02	\$20.91	\$2.40	\$65.82
2015	\$14.20	\$2.95	\$15.35	\$16.64	\$5.65	\$5.28	\$22.64	\$38.16	\$4.48	\$125.35
2020	\$39.27	\$6.41	\$32.93	\$35.64	\$19.64	\$11.46	\$45.97	\$76.60	\$9.45	\$277.36
2025	\$54.87	\$16.90	\$50.57	\$54.94	\$28.37	\$16.84	\$64.85	\$104.54	\$13.73	\$405.62
2030	\$83.46	\$24.91	\$67.09	\$80.92	\$38.10	\$22.20	\$86.45	\$134.52	\$18.77	\$556.42
2035	\$110.58	\$33.28	\$82.90	\$101.17	\$47.78	\$27.12	\$115.43	\$162.76	\$23.60	\$704.61
2040	\$141.75	\$44.01	\$101.13	\$125.52	\$74.60	\$32.73	\$140.09	\$194.98	\$29.46	\$884.27
2045	\$168.90	\$53.65	\$115.10	\$144.92	\$87.00	\$37.47	\$161.72	\$221.93	\$35.01	\$1,025.69
2050	\$192.48	\$60.73	\$129.01	\$162.44	\$100.09	\$42.22	\$184.06	\$248.74	\$41.08	\$1,160.85
<b>Generation</b>										
2012	\$6.89	(\$0.91)	\$24.62	\$24.61	\$14.22	\$2.77	(\$72.13)	\$83.62	(\$17.87)	\$65.82
2015	\$12.62	\$0.03	\$31.81	\$32.25	\$17.23	\$4.80	(\$55.36)	\$99.40	(\$17.43)	\$125.35
2020	\$31.40	\$3.57	\$51.51	\$53.57	\$26.67	\$11.46	(\$28.78)	\$140.79	(\$12.83)	\$277.36
2025	\$41.49	\$9.64	\$67.06	\$74.03	\$37.19	\$17.66	(\$7.63)	\$175.58	(\$9.39)	\$405.62
2030	\$64.25	\$15.76	\$85.31	\$98.24	\$47.87	\$23.82	\$14.79	\$211.91	(\$5.53)	\$556.42
2035	\$90.94	\$23.27	\$102.78	\$119.93	\$58.26	\$29.24	\$36.19	\$246.38	(\$2.39)	\$704.61
2040	\$122.16	\$32.92	\$122.55	\$145.36	\$81.81	\$35.29	\$58.13	\$284.63	\$1.43	\$884.27
2045	\$148.71	\$40.98	\$138.63	\$166.35	\$94.57	\$40.33	\$73.07	\$319.56	\$3.50	\$1,025.69
2050	\$171.67	\$46.86	\$154.94	\$186.13	\$107.95	\$45.40	\$86.94	\$355.82	\$5.15	\$1,160.85
<b>Heat Input</b>										
2012	(\$25.97)	(\$5.43)	\$20.57	\$24.79	\$11.02	\$7.22	(\$34.59)	\$76.89	(\$8.68)	\$65.82
2015	(\$21.50)	(\$4.57)	\$28.40	\$33.44	\$14.16	\$9.93	(\$21.67)	\$94.45	(\$7.30)	\$125.35
2020	\$6.13	(\$1.96)	\$45.96	\$52.71	\$29.10	\$16.27	\$0.98	\$131.41	(\$3.25)	\$277.36
2025	\$27.88	\$8.07	\$66.63	\$74.60	\$37.86	\$22.00	\$13.76	\$156.23	(\$1.40)	\$405.62
2030	\$54.50	\$23.18	\$82.89	\$102.35	\$47.23	\$27.26	\$31.37	\$186.06	\$1.58	\$556.42
2035	\$77.78	\$31.31	\$99.59	\$123.72	\$57.38	\$32.32	\$60.38	\$217.34	\$4.80	\$704.61
2040	\$105.46	\$42.00	\$119.15	\$149.72	\$84.22	\$38.24	\$83.00	\$253.45	\$9.03	\$884.27
2045	\$127.49	\$51.55	\$135.08	\$171.61	\$97.68	\$43.47	\$100.65	\$286.06	\$12.10	\$1,025.69
2050	\$145.90	\$58.60	\$151.20	\$192.05	\$111.96	\$48.79	\$117.87	\$319.49	\$15.00	\$1,160.85



# Residential Annual Bill Impact Growth Case

	ELI	ENO	EGSI	Annual Average Ratepayer Impacts (Bill Impact)						STATE AVG
				CLECO	SWEPCO	MUNI	COGEN	IPP-COAL	IPP-GAS	
	----- (\$/bill) -----									
<b>Allocations based on:</b>										
<b>Emissions</b>										
2012	\$3.66	\$2.65	\$5.98	\$13.44	\$7.22	\$8.11	n.a.	\$36.38	n.a.	\$11.06
2015	\$6.53	\$4.78	\$10.77	\$24.20	\$13.10	\$14.60	n.a.	\$62.57	n.a.	\$19.51
2020	\$16.34	\$9.40	\$20.93	\$46.96	\$41.25	\$28.68	n.a.	\$113.75	n.a.	\$39.62
2025	\$20.69	\$22.47	\$29.11	\$65.56	\$53.97	\$38.18	n.a.	\$140.62	n.a.	\$52.94
2030	\$28.50	\$29.99	\$34.98	\$87.46	\$65.64	\$45.58	n.a.	\$163.88	n.a.	\$65.15
2035	\$34.20	\$36.29	\$39.14	\$99.03	\$74.56	\$50.44	n.a.	\$179.58	n.a.	\$73.32
2040	\$39.71	\$43.47	\$43.25	\$111.28	\$105.44	\$55.14	n.a.	\$194.86	n.a.	\$84.74
2045	\$42.85	\$48.00	\$44.59	\$116.38	\$111.37	\$57.16	n.a.	\$200.88	n.a.	\$88.75
2050	\$44.23	\$49.21	\$45.26	\$118.14	\$116.05	\$58.34	n.a.	\$203.93	n.a.	\$90.74
<b>Generation</b>										
2012	\$3.36	(\$1.56)	\$18.33	\$37.99	\$34.99	\$8.13	n.a.	\$145.50	n.a.	\$35.25
2015	\$5.80	\$0.05	\$22.32	\$46.90	\$39.95	\$13.27	n.a.	\$162.98	n.a.	\$41.61
2020	\$13.07	\$5.24	\$32.74	\$70.58	\$56.02	\$28.69	n.a.	\$209.07	n.a.	\$59.34
2025	\$15.64	\$12.81	\$38.60	\$88.34	\$70.74	\$40.03	n.a.	\$236.16	n.a.	\$71.76
2030	\$21.94	\$18.98	\$44.47	\$106.17	\$82.48	\$48.92	n.a.	\$258.16	n.a.	\$83.02
2035	\$28.13	\$25.38	\$48.53	\$117.39	\$90.92	\$54.39	n.a.	\$271.86	n.a.	\$90.94
2040	\$34.22	\$32.52	\$52.41	\$128.88	\$115.63	\$59.44	n.a.	\$284.45	n.a.	\$101.08
2045	\$37.73	\$36.66	\$53.70	\$133.58	\$121.07	\$61.52	n.a.	\$289.26	n.a.	\$104.79
2050	\$39.45	\$37.97	\$54.36	\$135.37	\$125.17	\$62.74	n.a.	\$291.72	n.a.	\$106.68
<b>Heat Impact</b>										
2012	(\$12.66)	(\$9.34)	\$15.32	\$38.26	\$27.12	\$21.18	n.a.	\$133.79	n.a.	\$30.52
2015	(\$9.88)	(\$7.40)	\$19.92	\$48.64	\$32.84	\$27.43	n.a.	\$154.86	n.a.	\$38.06
2020	\$2.55	(\$2.88)	\$29.21	\$69.44	\$61.12	\$40.71	n.a.	\$195.15	n.a.	\$56.47
2025	\$10.51	\$10.73	\$38.35	\$89.01	\$72.01	\$49.87	n.a.	\$210.13	n.a.	\$68.66
2030	\$18.61	\$27.91	\$43.21	\$110.61	\$81.37	\$55.98	n.a.	\$226.66	n.a.	\$80.62
2035	\$24.06	\$34.15	\$47.02	\$121.11	\$89.54	\$60.10	n.a.	\$239.81	n.a.	\$87.97
2040	\$29.54	\$41.48	\$50.96	\$132.74	\$119.04	\$64.41	n.a.	\$253.29	n.a.	\$98.78
2045	\$32.35	\$46.12	\$52.32	\$137.81	\$125.05	\$66.32	n.a.	\$258.94	n.a.	\$102.70
2050	\$33.53	\$47.48	\$53.05	\$139.68	\$129.81	\$67.41	n.a.	\$261.93	n.a.	\$104.70

The addition of newer gas-fired generation over time significantly reduces the annual change in the deficit over time.





## **Louisiana Emissions and Rate Impacts**

**Business as Usual Case**

**Auction Based Regulatory Structure**

# Total CO2 Cost by Year and Utility BAU Case

		Annual Abatement Costs											STATE TOTAL						
		ELI	ENO	EGSI	CLECO	SWEPCO	MUNI	COGEN	IPP-COAL	IPP-GAS									
		(million \$)																	
<b>Allocations based on:</b>																			
<b>Emissions</b>																			
2012	\$	95.3	\$	19.2	\$	78.8	\$	108.2	\$	36.5	\$	41.6	\$	140.3	\$	270.6	\$	30.2	\$820.70
2015	\$	101.1	\$	20.4	\$	83.7	\$	114.9	\$	38.7	\$	44.2	\$	148.9	\$	287.2	\$	32.1	\$870.94
2020	\$	111.6	\$	22.5	\$	92.4	\$	126.8	\$	42.7	\$	48.8	\$	164.4	\$	317.1	\$	35.4	\$961.58
2025	\$	123.2	\$	24.8	\$	102.0	\$	140.0	\$	47.2	\$	53.8	\$	181.5	\$	350.1	\$	39.1	\$1,061.67
2030	\$	136.0	\$	27.4	\$	112.6	\$	154.6	\$	52.1	\$	59.4	\$	200.4	\$	386.5	\$	43.2	\$1,172.17
2035	\$	150.2	\$	30.2	\$	124.3	\$	170.7	\$	57.5	\$	65.6	\$	221.2	\$	426.7	\$	47.7	\$1,294.17
2040	\$	165.8	\$	33.4	\$	137.2	\$	188.4	\$	63.5	\$	72.5	\$	244.2	\$	471.2	\$	52.6	\$1,428.86
2045	\$	183.1	\$	36.9	\$	151.5	\$	208.0	\$	70.1	\$	80.0	\$	269.7	\$	520.2	\$	58.1	\$1,577.58
2050	\$	202.2	\$	40.7	\$	167.3	\$	229.7	\$	77.4	\$	88.3	\$	297.7	\$	574.3	\$	64.1	\$1,741.78
<b>Generation</b>																			
2012	\$	95.3	\$	19.2	\$	78.8	\$	108.2	\$	36.5	\$	41.6	\$	140.3	\$	270.6	\$	30.2	\$820.70
2015	\$	101.1	\$	20.4	\$	83.7	\$	114.9	\$	38.7	\$	44.2	\$	148.9	\$	287.2	\$	32.1	\$870.94
2020	\$	111.6	\$	22.5	\$	92.4	\$	126.8	\$	42.7	\$	48.8	\$	164.4	\$	317.1	\$	35.4	\$961.58
2025	\$	123.2	\$	24.8	\$	102.0	\$	140.0	\$	47.2	\$	53.8	\$	181.5	\$	350.1	\$	39.1	\$1,061.67
2030	\$	136.0	\$	27.4	\$	112.6	\$	154.6	\$	52.1	\$	59.4	\$	200.4	\$	386.5	\$	43.2	\$1,172.17
2035	\$	150.2	\$	30.2	\$	124.3	\$	170.7	\$	57.5	\$	65.6	\$	221.2	\$	426.7	\$	47.7	\$1,294.17
2040	\$	165.8	\$	33.4	\$	137.2	\$	188.4	\$	63.5	\$	72.5	\$	244.2	\$	471.2	\$	52.6	\$1,428.86
2045	\$	183.1	\$	36.9	\$	151.5	\$	208.0	\$	70.1	\$	80.0	\$	269.7	\$	520.2	\$	58.1	\$1,577.58
2050	\$	202.2	\$	40.7	\$	167.3	\$	229.7	\$	77.4	\$	88.3	\$	297.7	\$	574.3	\$	64.1	\$1,741.78
<b>Heat Input</b>																			
2012	\$	95.3	\$	19.2	\$	78.8	\$	108.2	\$	36.5	\$	41.6	\$	140.3	\$	270.6	\$	30.2	\$820.70
2015	\$	101.1	\$	20.4	\$	83.7	\$	114.9	\$	38.7	\$	44.2	\$	148.9	\$	287.2	\$	32.1	\$870.94
2020	\$	111.6	\$	22.5	\$	92.4	\$	126.8	\$	42.7	\$	48.8	\$	164.4	\$	317.1	\$	35.4	\$961.58
2025	\$	123.2	\$	24.8	\$	102.0	\$	140.0	\$	47.2	\$	53.8	\$	181.5	\$	350.1	\$	39.1	\$1,061.67
2030	\$	136.0	\$	27.4	\$	112.6	\$	154.6	\$	52.1	\$	59.4	\$	200.4	\$	386.5	\$	43.2	\$1,172.17
2035	\$	150.2	\$	30.2	\$	124.3	\$	170.7	\$	57.5	\$	65.6	\$	221.2	\$	426.7	\$	47.7	\$1,294.17
2040	\$	165.8	\$	33.4	\$	137.2	\$	188.4	\$	63.5	\$	72.5	\$	244.2	\$	471.2	\$	52.6	\$1,428.86
2045	\$	183.1	\$	36.9	\$	151.5	\$	208.0	\$	70.1	\$	80.0	\$	269.7	\$	520.2	\$	58.1	\$1,577.58
2050	\$	202.2	\$	40.7	\$	167.3	\$	229.7	\$	77.4	\$	88.3	\$	297.7	\$	574.3	\$	64.1	\$1,741.78



	Annual Average Ratepayer Impacts (Bill Impact)									
	ELI	ENO	EGSI	CLECO	SWEPSCO	MUNI	COGEN	IPP-COAL	IPP-GAS	STATE AVG
	----- (\$/bill) -----									
<b>Allocations based on:</b>										
<b>Emissions</b>										
2012	\$52.72	\$41.72	\$64.97	\$188.14	\$100.76	\$137.14	n.a.	\$544.38	n.a.	\$161.40
2015	\$55.94	\$44.27	\$68.95	\$199.66	\$106.92	\$145.53	n.a.	\$577.70	n.a.	\$171.28
2020	\$61.77	\$48.88	\$76.12	\$220.44	\$118.05	\$160.68	n.a.	\$637.82	n.a.	\$189.11
2025	\$68.20	\$53.97	\$84.04	\$243.38	\$130.34	\$177.41	n.a.	\$704.21	n.a.	\$208.79
2030	\$75.29	\$59.59	\$92.79	\$268.71	\$143.91	\$195.87	n.a.	\$777.50	n.a.	\$230.52
2035	\$83.13	\$65.79	\$102.45	\$296.68	\$158.88	\$216.26	n.a.	\$858.43	n.a.	\$254.52
2040	\$91.78	\$72.63	\$113.11	\$327.56	\$175.42	\$238.76	n.a.	\$947.77	n.a.	\$281.01
2045	\$101.34	\$80.19	\$124.89	\$361.65	\$193.68	\$263.62	n.a.	\$1,046.42	n.a.	\$310.25
2050	\$111.88	\$88.54	\$137.88	\$399.29	\$213.84	\$291.05	n.a.	\$1,155.33	n.a.	\$342.55
<b>Generation</b>										
2012	\$52.72	\$41.72	\$64.97	\$188.14	\$100.76	\$137.14	n.a.	\$544.38	n.a.	\$161.40
2015	\$55.94	\$44.27	\$68.95	\$199.66	\$106.92	\$145.53	n.a.	\$577.70	n.a.	\$171.28
2020	\$61.77	\$48.88	\$76.12	\$220.44	\$118.05	\$160.68	n.a.	\$637.82	n.a.	\$189.11
2025	\$68.20	\$53.97	\$84.04	\$243.38	\$130.34	\$177.41	n.a.	\$704.21	n.a.	\$208.79
2030	\$75.29	\$59.59	\$92.79	\$268.71	\$143.91	\$195.87	n.a.	\$777.50	n.a.	\$230.52
2035	\$83.13	\$65.79	\$102.45	\$296.68	\$158.88	\$216.26	n.a.	\$858.43	n.a.	\$254.52
2040	\$91.78	\$72.63	\$113.11	\$327.56	\$175.42	\$238.76	n.a.	\$947.77	n.a.	\$281.01
2045	\$101.34	\$80.19	\$124.89	\$361.65	\$193.68	\$263.62	n.a.	\$1,046.42	n.a.	\$310.25
2050	\$111.88	\$88.54	\$137.88	\$399.29	\$213.84	\$291.05	n.a.	\$1,155.33	n.a.	\$342.55
<b>Heat Impact</b>										
2012	\$52.72	\$41.72	\$64.97	\$188.14	\$100.76	\$137.14	n.a.	\$544.38	n.a.	\$161.40
2015	\$55.94	\$44.27	\$68.95	\$199.66	\$106.92	\$145.53	n.a.	\$577.70	n.a.	\$171.28
2020	\$61.77	\$48.88	\$76.12	\$220.44	\$118.05	\$160.68	n.a.	\$637.82	n.a.	\$189.11
2025	\$68.20	\$53.97	\$84.04	\$243.38	\$130.34	\$177.41	n.a.	\$704.21	n.a.	\$208.79
2030	\$75.29	\$59.59	\$92.79	\$268.71	\$143.91	\$195.87	n.a.	\$777.50	n.a.	\$230.52
2035	\$83.13	\$65.79	\$102.45	\$296.68	\$158.88	\$216.26	n.a.	\$858.43	n.a.	\$254.52
2040	\$91.78	\$72.63	\$113.11	\$327.56	\$175.42	\$238.76	n.a.	\$947.77	n.a.	\$281.01
2045	\$101.34	\$80.19	\$124.89	\$361.65	\$193.68	\$263.62	n.a.	\$1,046.42	n.a.	\$310.25
2050	\$111.88	\$88.54	\$137.88	\$399.29	\$213.84	\$291.05	n.a.	\$1,155.33	n.a.	\$342.55



## **Louisiana Emissions and Rate Impacts**

### **Growth Case**

### **Auction Based Regulatory Structure**

# Total CO2 Cost by Year and Utility Growth Case

	Annual Abatement Costs									STATE TOTAL
	ELI	ENO	EGSI	CLECO	SWEPCO	MUNI	COGEN	IPP-COAL	IPP-GAS	
----- (million \$) -----										
<b>Allocations based on:</b>										
<b>Emissions</b>										
2012	\$103.00	\$21.20	\$110.20	\$119.50	\$40.30	\$37.90	\$151.20	\$286.90	\$32.90	\$903.10
2015	\$114.90	\$23.80	\$124.10	\$134.60	\$45.70	\$42.70	\$183.10	\$308.70	\$36.20	\$1,013.80
2020	\$178.10	\$29.10	\$149.40	\$161.70	\$89.10	\$52.00	\$208.50	\$347.50	\$42.90	\$1,258.30
2025	\$201.40	\$62.00	\$185.60	\$201.70	\$104.10	\$61.80	\$238.00	\$383.70	\$50.40	\$1,488.70
2030	\$262.80	\$78.40	\$211.30	\$254.80	\$120.00	\$69.90	\$272.30	\$423.60	\$59.10	\$1,752.20
2035	\$317.80	\$95.60	\$238.20	\$290.70	\$137.30	\$77.90	\$331.70	\$467.70	\$67.80	\$2,024.70
2040	\$375.40	\$116.60	\$267.80	\$332.40	\$197.60	\$86.70	\$371.00	\$516.40	\$78.00	\$2,341.90
2045	\$433.90	\$137.80	\$295.70	\$372.30	\$223.50	\$96.30	\$415.50	\$570.20	\$90.00	\$2,635.20
2050	\$487.10	\$153.70	\$326.50	\$411.10	\$253.30	\$106.80	\$465.80	\$629.50	\$104.00	\$2,937.80

	Annual Average Ratepayer Impacts (Bill Impact)									
	ELI	ENO	EGSI	CLECO	SWEPCO	MUNI	COGEN	IPP-COAL	IPP-GAS	STATE AVG
	----- (\$/bill) -----									
<b>Allocations based on:</b>										
<b>Emissions</b>										
2012	\$56.99	\$46.12	\$90.82	\$207.73	\$111.34	\$124.90		\$577.16		\$177.61
2015	\$63.58	\$51.78	\$102.28	\$233.98	\$126.26	\$140.72		\$621.02		\$199.38
2020	\$98.55	\$63.31	\$123.13	\$281.08	\$246.16	\$171.37		\$699.07		\$247.47
2025	\$111.44	\$134.88	\$152.96	\$350.62	\$287.61	\$203.67		\$771.90		\$292.78
2030	\$145.41	\$170.55	\$174.14	\$442.92	\$331.53	\$230.36		\$852.16		\$344.60
2035	\$175.84	\$207.97	\$196.31	\$505.33	\$379.33	\$256.73		\$940.88		\$398.19
2040	\$207.71	\$253.66	\$220.71	\$577.81	\$545.93	\$285.73		\$1,038.85		\$460.57
2045	\$240.08	\$299.77	\$243.70	\$647.17	\$617.48	\$317.36		\$1,147.08		\$518.26
2050	\$269.52	\$334.36	\$269.08	\$714.62	\$699.81	\$351.97		\$1,266.38		\$577.77



Center for Energy Studies

## Conclusions

- **Under the BAU case, with allocated credits Louisiana ratepayers could see total carbon regulation costs from a credit of \$11 in 2012 to \$449 million in 2050.**
- **Under the growth case, with allocated credits Louisiana ratepayers could see total carbon regulation costs from \$65 in 2012 to \$1.16 billion in 2050.**
- **Under the BAU case, with auctioned credits Louisiana ratepayers could see total carbon regulation costs from \$820 in 2012 to \$1.7 billion in 2050.**
- **Under the growth case, with auctioned credits Louisiana ratepayers could see total carbon regulation costs from \$900 in 2012 to \$2.9 billion in 2050.**



Center for Energy Studies

## Questions, Comments, & Discussion

[dismukes@lsu.edu](mailto:dismukes@lsu.edu)

[www.enrg.lsu.edu](http://www.enrg.lsu.edu)