

Nuclear



Regulatory Commission

Workshop March 2, 2011



DUFF & PHELPS
INVESTMENT MANAGEMENT CO.



HISTORICAL NDT FUND BALANCES, ANNUAL CONTRIBUTIONS AND DECOMMISSIONING COST ESTIMATES

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BACKGROUND ON DUFF & PHELPS



Origins:

Founded in 1932 focusing on
Utilities Investment Research

Investment Management:

Commenced 1979 (\$7.2 billion
12-31-10)

Investment Products:

Investment Grade Fixed Income
Domestic Large Cap Equities
Global Listed Infrastructure
Global Real Estate Securities

Nuclear Decommissioning Trust Funds:

Commenced 1990 (\$1.9 billion
12-31-10)

NUCLEAR DECOMMISSIONING FUNDING STUDY



- Five Year Period 2005 – 2009.
- Two Groups: (1) taxable investor-owned utilities; (2) non-taxable public power utilities.
- Sources of data: (1) SEC 10-K filings; (2) company annual reports; (3) biennial decommissioning financial assurance filings submitted to the NRC (last version was due on March 31, 2009).



NUCLEAR DECOMMISSIONING FUNDING STUDY (CONT'D)



- Includes 104 Operating & 5 Non-Operating Plants (Humboldt Bay #3, Millstone #1, TMI #2, Zion #1 and Zion #2).
- As of December 31, 2009:
 - (1) 28 Investor-Owned Utilities;
 - (2) 28 Public Power Utilities (excludes those with small shares).
- Ownership has declined from over 80 to less than 60 due to mergers /acquisitions and the purchase/sale of nuclear generation.



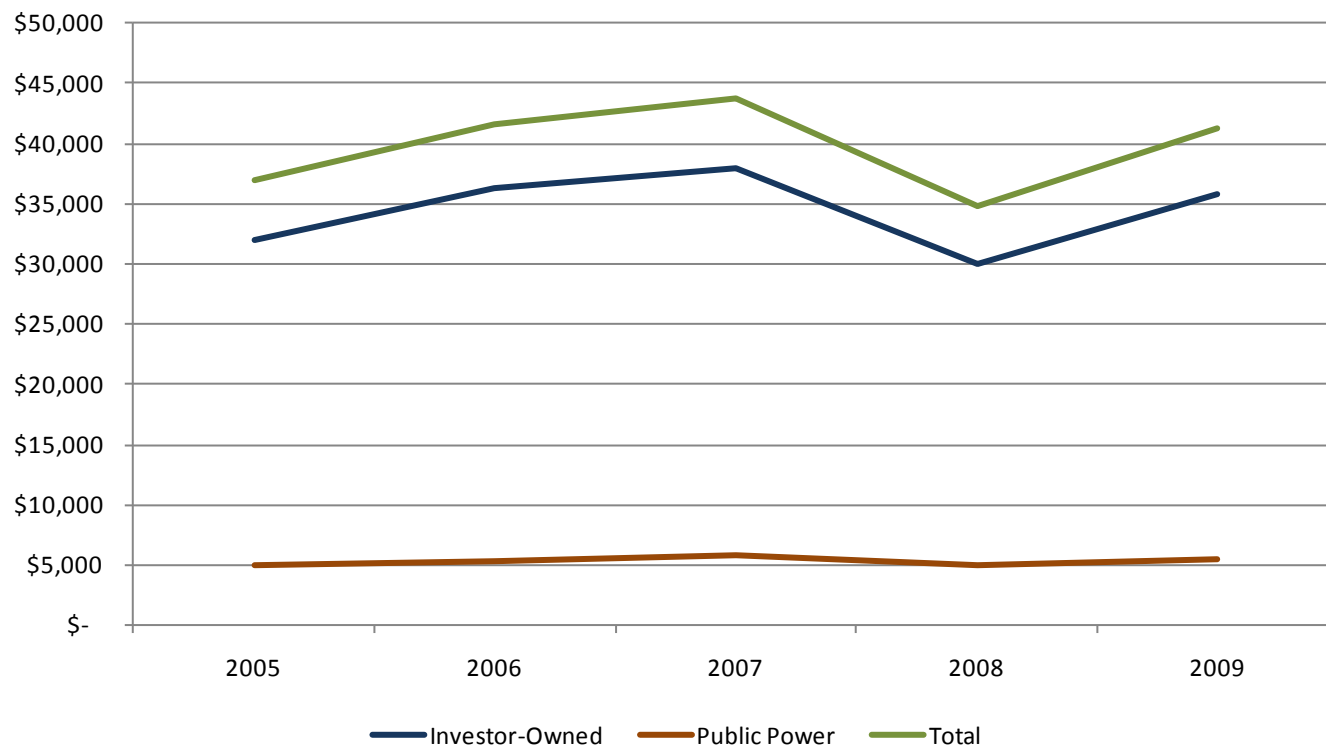
NUCLEAR DECOMMISSIONING FUNDING STUDY (CONT'D)



- Company Decommissioning Cost Estimates: (1) site-specific study or (2) NRC minimum cost formula.
- Pro-forma Decommissioning Cost Estimates: higher of (1) company cost estimate or (2) the average cost per KW reported for all investor-owned utilities (\$618/KW in 2009).
- Average years until license expiration: Shown in brackets [] under the column Lic. Exp. (License Expiration); represents the average years until license expiration for a given utility's portfolio of nuclear generating facilities weighted by each plant's generating capacity as a percent of the total megawatts of nuclear generating capacity owned by that particular utility taking into account license extensions granted by the NRC as of December 31, 2009.

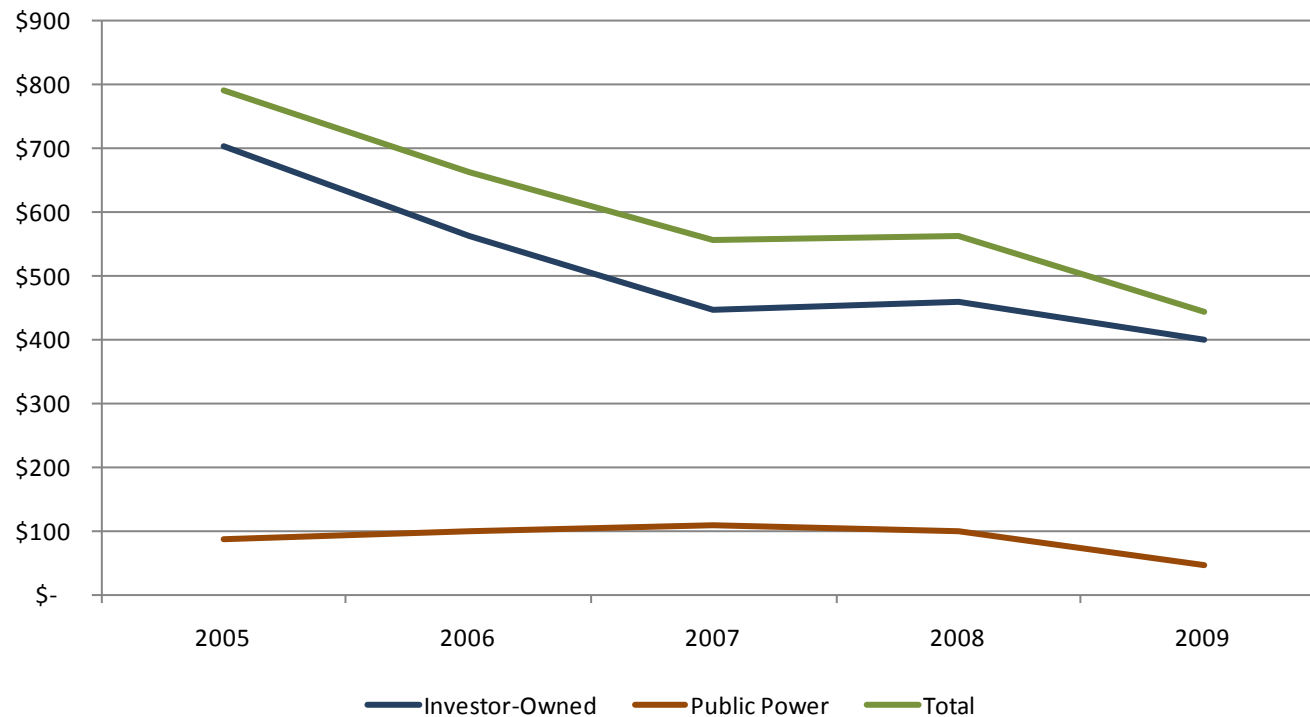


NDT FUND BALANCES (\$ MILLIONS)



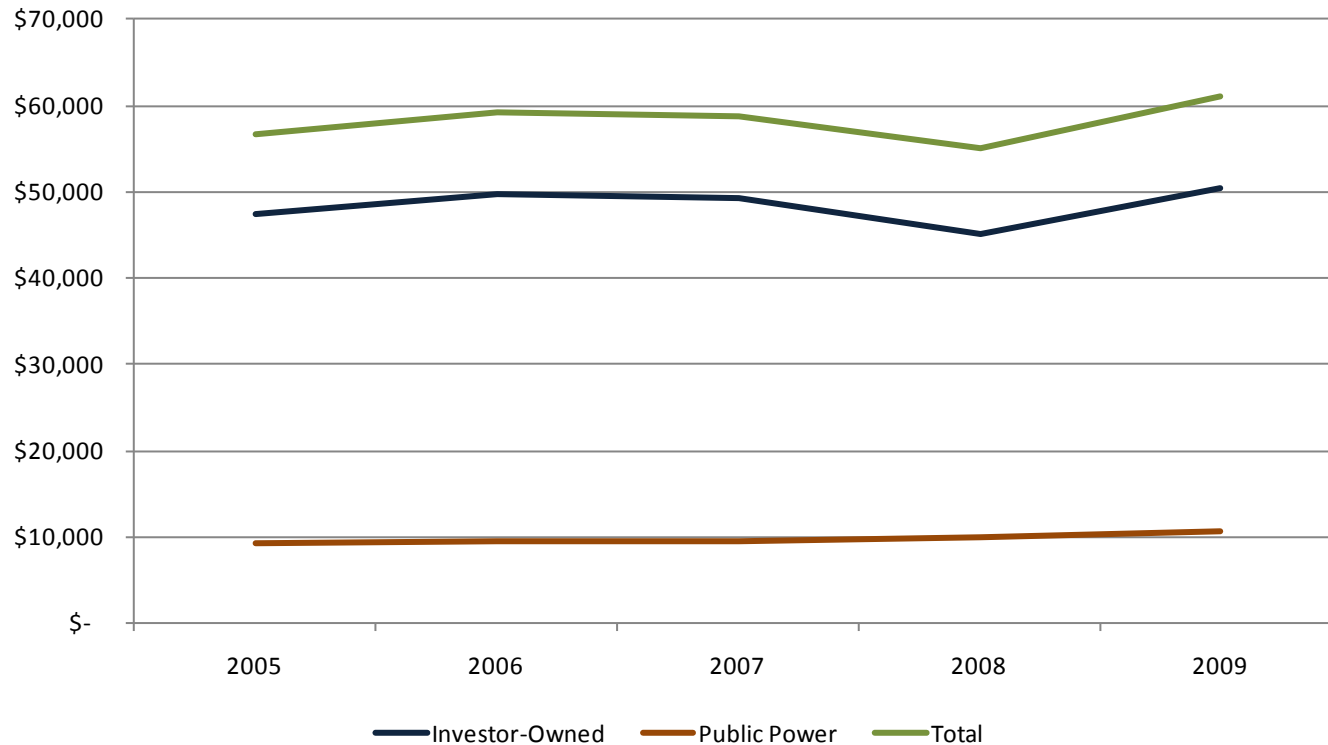
	2005		2006		2007		2008		2009
Investor-Owned	\$	32,061	\$	36,289	\$	38,012	\$	29,960	\$ 35,868
Public Power	\$	4,904	\$	5,270	\$	5,778	\$	4,926	\$ 5,462
Total	\$	36,965	\$	41,559	\$	43,790	\$	34,886	\$ 41,331

ANNUAL CONTRIBUTIONS TO NDT FUNDS (\$ MILLIONS)



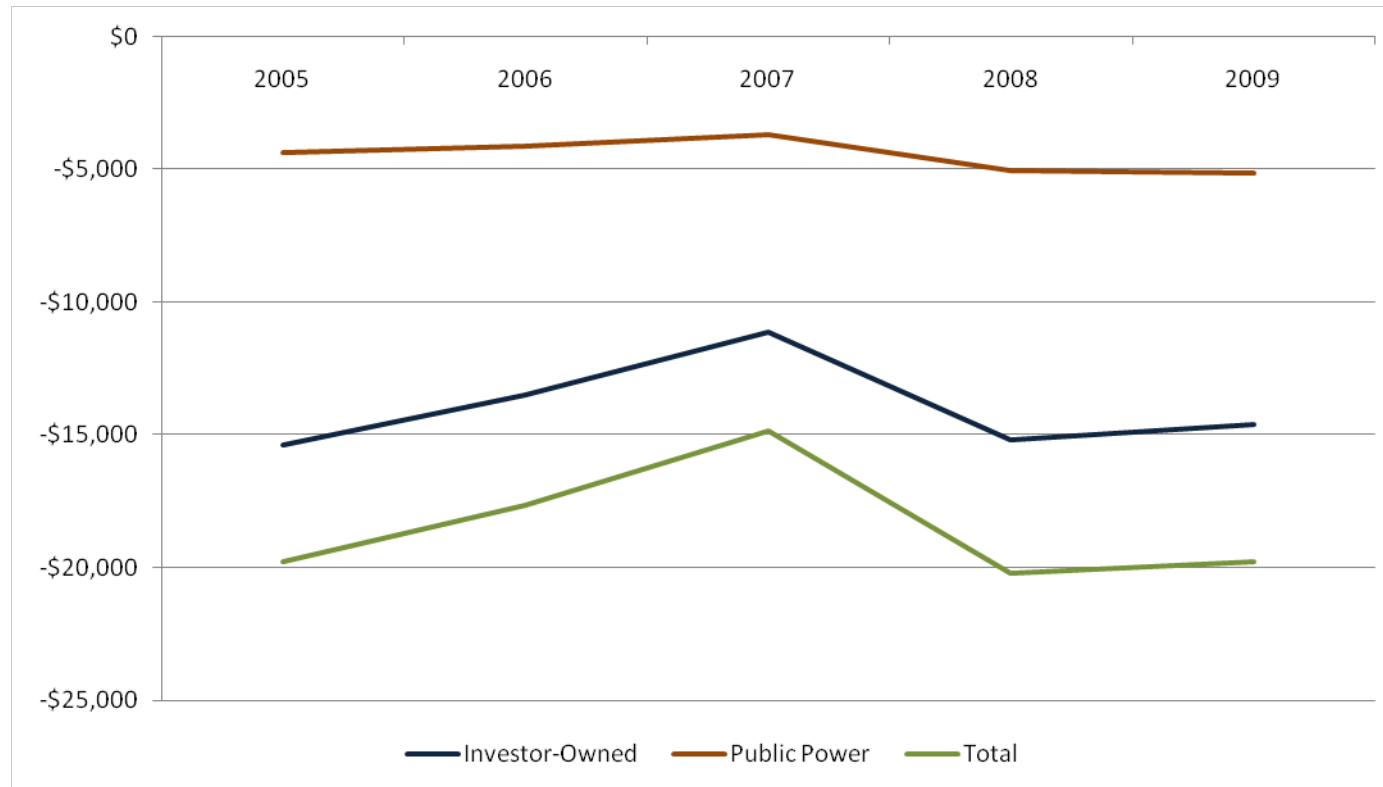
	2005		2006		2007		2008		2009
Investor-Owned	\$	703	\$	564	\$	449	\$	461	\$ 399
Public Power	\$	87	\$	100	\$	109	\$	101	\$ 46
Total	\$	790	\$	664	\$	558	\$	562	\$ 445

COST ESTIMATES OF DECOMMISSIONING IN CURRENT DOLLARS (\$ MILLIONS)



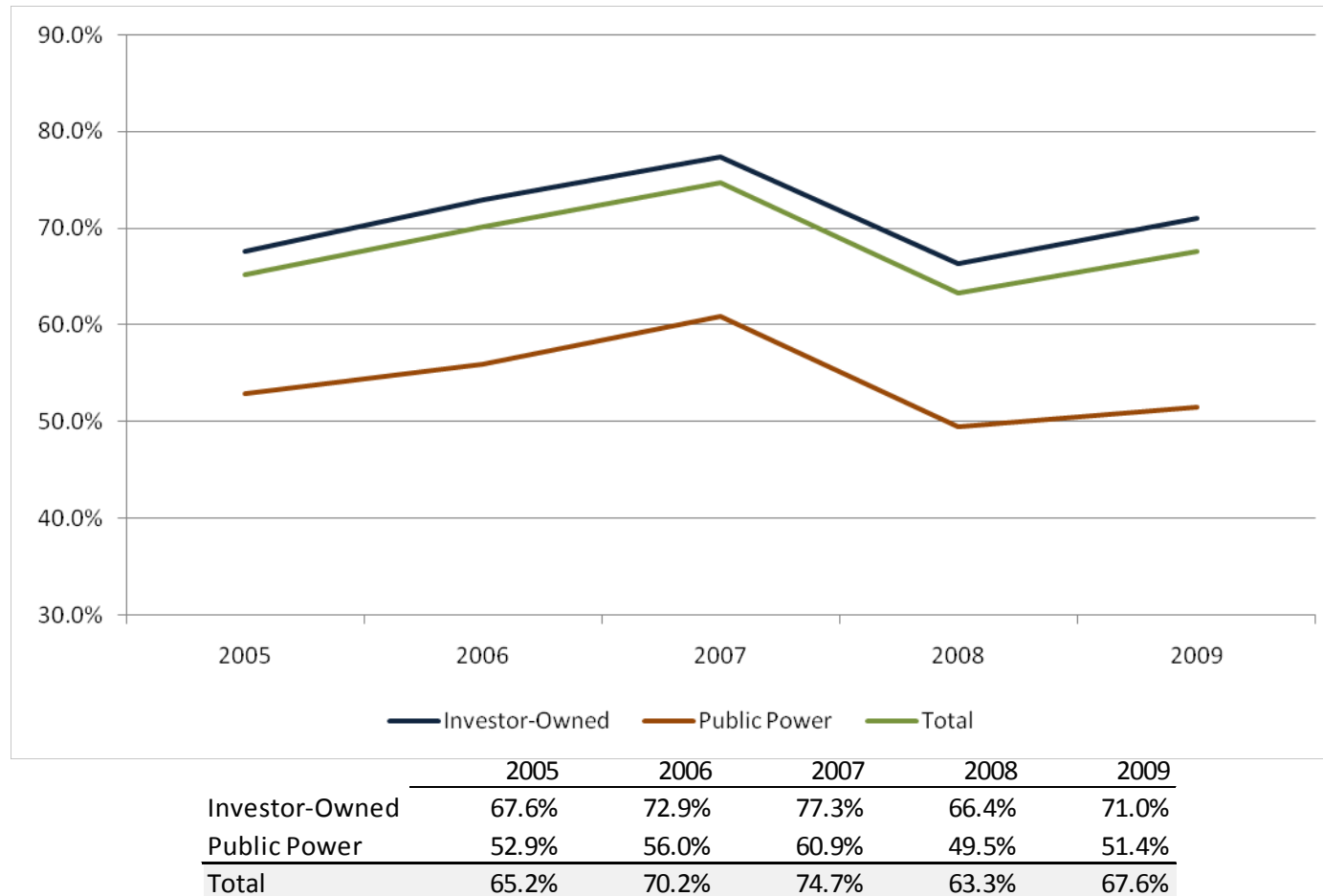
	2005		2006		2007		2008		2009
Investor-Owned	\$	47,453	\$	49,785	\$	49,170	\$	45,142	\$ 50,493
Public Power	\$	9,278	\$	9,419	\$	9,484	\$	9,959	\$ 10,620
Total	\$	56,731	\$	59,204	\$	58,654	\$	55,101	\$ 61,113

DECOMMISSIONING FUNDING STATUS -- ASSETS LESS COSTS (\$ MILLIONS)



	2005	2006	2007	2008	2009
Investor-Owned	\$ (15,392)	\$ (13,496)	\$ (11,158)	\$ (15,182)	\$ (14,625)
Public Power	\$ (4,374)	\$ (4,149)	\$ (3,706)	\$ (5,033)	\$ (5,158)
Total	\$ (19,766)	\$ (17,645)	\$ (14,864)	\$ (20,215)	\$ (19,783)

DECOMMISSIONING FUNDING STATUS (NDT ASSETS AS PERCENT OF LIABILITY)



SUMMARY OF DATA FIVE YEARS ENDING DECEMBER 31, 2009



- Fluctuation in NDT assets: decrease of \$8.9 billion (20.3%) in 2008 and increase of \$6.4 billion (18.5%) in 2009 reflects conservative management of funds - -- similar to returns of 60% S&P 500 & 40% Barclays Capital Aggregate Indices.
- Contributions each of last five years (\$445 million - \$790 million) lower than the \$1.5 billion rate of the 1990's.
- NDT Assets and Decommissioning Cost Estimates Increased by Same Amount (\$4.4 billion) between 2005 and 2009.



SUMMARY OF DATA FIVE YEARS ENDING DECEMBER 31, 2009 (CONT'D)



■ Funding Status (Assets less Current Cost of Decommissioning):

(1) Ranged from Negative \$14.9 billion to Negative \$20.2 billion;

(2) Negative \$19.8 billion as of 12-31-09 same amount as of 12-31-05.

■ Investor-Owned Utilities Consistently Higher Funding Ratios (66% to 77%) than Public Power Utilities (50% to 61%).



ESTIMATED DECOMMISSIONING FUNDING STATUS AS OF 12-31-10



- In 2010, assets increased about 12% (\$5 billion) to about \$46 billion - - - - - similar to returns of 60% S&P 500 & 40% Barclays Capital Aggregate Indices.
- In 2010, decommissioning liability (cost in current dollars) increased about 7% (\$5 billion) to about \$65 billion - - - see NRC Minimum Cost Study on pages 19-21.
- Decommissioning Funding Status (NDT assets less decommissioning liability) improved to negative \$19 billion from negative \$20 billion as of 12-31-09.
- Actual Decommissioning Funding Status Unclear Because:
 - (1) uncertain availability of low level waste disposal sites for most plants;
 - (2) timing of decommissioning expenditures - - - 61 operating license extensions granted, 21 under review and 16 expected to be filed;
 - (3) impact of inclusion of spent fuel storage costs.

INVESTOR OWNED UTILITIES



Company	Lic. Exp. [Avg. Yrs]	MW Nuclear Capacity	Decommissioning Cost Estimate (\$MM)			12/31/2009 Fund Balance (\$MM)	Annual Contribution (\$MM)
			Co. Est.	Amt/KW	Co. or \$618/KW		
1 Ameren	2024 [15]	1,190	\$694	\$583	\$735	\$293	\$7
2 American Electric Power	2034-2037 [27]	2,069	\$808	\$390	\$1,279	\$1,100	\$11
3 Central Vermont Public Service	2045 [36]	20	\$7	\$370	\$12	\$5	\$0
4 Constellation Energy	2029-2046 [27]	3,789	\$2,092	\$552	\$2,342	\$1,245	\$19
5 Detroit Edison ⁽¹⁾	2025 [15]	1,125	\$1,300	\$1,156	\$1,300	\$814	\$34
6 Dominion Resources ⁽²⁾	2013-2045 [23]	5,690	\$4,478	\$787	\$4,478	\$2,625	\$5
7 Duke Energy	2033-2043 [28]	5,173	\$3,000	\$580	\$3,197	\$1,765	\$48
8 El Paso Electric	2024-2027 [16]	623	\$342	\$548	\$385	\$135	\$8
9 Entergy ⁽³⁾	2012-2038 [15]	8,234	\$4,018	\$488	\$5,089	\$3,211	\$23
10 Exelon ⁽⁴⁾	2016-2039 [18]	16,711	\$7,355	\$440	\$10,327	\$6,669	\$29
11 First Energy ⁽⁵⁾	2014-2036 [15]	4,647	\$2,600	\$560	\$2,872	\$1,859	\$6
12 FPL Group ⁽⁶⁾	2014-2043 [22]	5,470	\$4,000	\$731	\$4,000	\$3,267	\$0
13 Great Plains Energy	2045 [35]	545	\$279	\$512	\$337	\$113	\$4
14 MidAmerican Energy	2032 [23]	434	\$271	\$625	\$271	\$264	\$2
15 NRG Energy - NRG South Texas LP	2027-2028 [18]	1,126	\$651	\$578	\$696	\$367	\$71
16 Pacific G&E ⁽⁷⁾	2024-2025 [15]	2,303	\$2,260	\$981	\$2,260	\$1,899	\$14
17 Pinnacle West	2024-2027 [16]	1,127	\$455	\$404	\$696	\$415	\$9
18 PPL Corp.	2042-2044 [33]	2,093	\$1,030	\$492	\$1,293	\$548	\$0
19 Progress Energy ⁽⁸⁾	2016-2046 [23]	3,806	\$3,740	\$983	\$3,740	\$1,367	\$25
20 PS Enterprise Group	2016-2034 [16]	3,612	\$2,100	\$581	\$2,232	\$1,199	\$0
21 PS New Mexico	2024-2027 [16]	402	\$209	\$521	\$248	\$137	\$3
22 San Diego G&E ⁽⁹⁾	2022 [13]	430	\$394	\$916	\$394	\$588	\$9
23 Scana Corp.	2042 [32]	644	\$451	\$700	\$451	\$69	\$3
24 Southern Cal Edison ⁽⁹⁾	2022-2027 [14]	2,237	\$1,827	\$817	\$1,827	\$2,864	\$46
25 Southern Company ⁽¹⁰⁾	2034-2049 [30]	3,644	\$2,332	\$640	\$2,332	\$1,081	\$3
26 Energy Future Holdings	2030-2033 [22]	2,367	\$1,213	\$512	\$1,463	\$475	\$15
27 Westar Energy	2045 [35]	545	\$279	\$512	\$337	\$112	\$3
28 Xcel Energy ⁽¹¹⁾	2013-2030 [10]	1,668	\$2,308	\$1,384	\$2,308	\$1,382	\$3
IOU Total		81,724	\$50,493	\$618	\$56,902	\$35,868	\$399

INVESTOR-OWNED UTILITIES - - - FOOTNOTES



- (1) Excludes Fermi Unit 1, whose decommissioning is to be completed in 2010.
- (2) Includes Millstone #1, Which has been shut down permanently.
- (3) Excludes Indian Point 3 and Fitzpatrick (trust funds retained by New York Power Authority).
- (4) Includes 2,080 MW Zion plants which have been shut down permanently. Zion is excluded from average years to license expiration.
- (5) Includes Non-Operating Three Mile Island #2 .
- (6) FPL in the process of upgrading baseload capacity at its existing St. Lucie & Turkey Point nuclear units by 400 MW. These upgrades are projected to be in service in 2012. The 5,470 MW excludes this 400 MW.
- (7) Includes 63 mw of Humboldt Bay Unit 3 which has been shut down permanently and is scheduled for decommissioning 2009-2015.
- (8) Excludes 6.6% interest (57 mW) in Crystal River #3 representing minority ownership by 8 municipalities (Orlando Utilities Commission's 1.6% represented within Public Utilities).
- (9) Excludes SONGS #1 which is currently being decommissioned. (approximately \$92mm for San Diego G&E and \$276mm for Southern California Edison).
- (10) Fund balance includes \$25 million of internal reserve.
- (11) Fund balance includes \$133 million of internal reserve.

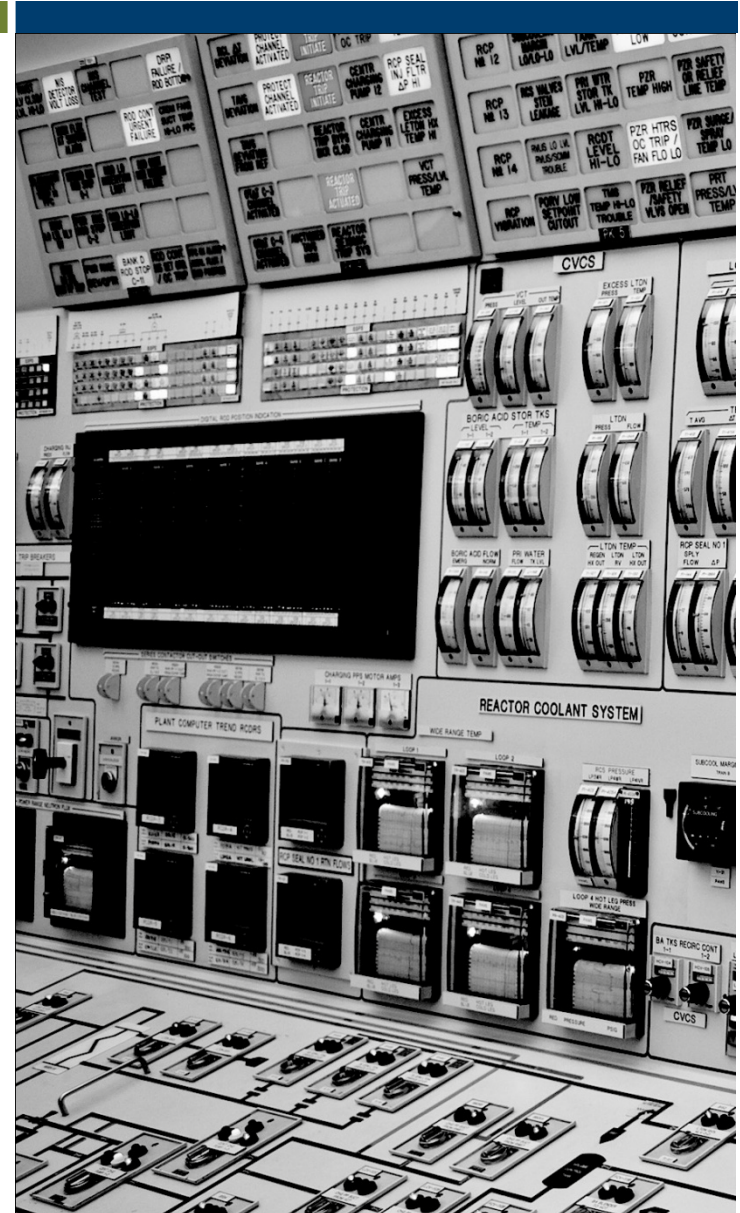
PUBLIC POWER UTILITIES



Company	Lic. Exp. [Avg. Yrs]		MW Nuclear Capacity	Decommissioning Cost Estimate (\$MM)			12/31/2009 Fund Balance (\$MM)	Annual Contribution (\$MM)
				Co. Est.	Amt/KW	Co. or \$618/KW		
1 Allegheny Electric Co-op	2022-2024	[14]	229	\$137	\$598	\$142	\$64	\$2
2 Central Iowa Power Cooperative ⁽¹⁾	2014	[5]	116	\$97	\$834	\$97	\$65	\$1
3 City of Austin	2027-2028	[18]	410	\$221	\$539	\$253	\$156	\$5
4 City of San Antonio	2027-2028	[18]	1,024	\$386	\$377	\$633	\$355	\$5
5 Corn Belt Power Co-op ⁽²⁾	2014	[5]	58	\$82	\$1,405	\$82	\$27	\$2
6 Energy Northwest ⁽³⁾	2023	[14]	1,131	\$877	\$775	\$877	\$135	\$1
7 Florida Municipal Power Agency ⁽⁴⁾	2043	[33]	74	\$331	\$4,473	\$331	\$49	\$3
10 KEPCO	2045	[36]	70	\$36	\$509	\$43	\$11	\$1
8 Long Island Power Authority	2046	[37]	205	\$103	\$502	\$127	\$75	\$1
9 Los Angeles Dept. Water & Power ⁽³⁾	2024-2027	[16]	221	\$123	\$557	\$137	\$114	\$0
11 Massachusetts Muni Power	2026-2045	[22]	199	\$105	\$527	\$123	\$58	\$2
12 Municipal Electric Authority-GA	2034-2049	[34]	819	\$506	\$618	\$506	\$288	\$1
13 Nebraska Public Power District ⁽⁵⁾	2014	[5]	770	\$527	\$685	\$527	\$457	\$0
14 N. Carolina Eastern Muni Power Agency	2034-2046	[29]	490	\$265	\$541	\$303	\$188	\$1
15 N. Carolina Electric Corp. ⁽⁶⁾	2043	[35]	694	\$246	\$355	\$429	\$120	\$4
16 North Carolina Muni Power	2043	[34]	847	\$300	\$354	\$523	\$230	\$1
17 New York Power Authority ⁽⁷⁾	2015-2034	[15]	1,877	\$945	\$504	\$1,160	\$942	\$0
18 Oglethorpe Power	2034-2049	[33]	1,199	\$751	\$626	\$751	\$240	\$0
19 Old Dominion Electric Co-op	2038-2040	[30]	210	\$85	\$404	\$130	\$85	\$0
20 Omaha Public Power District	2033	[24]	482	\$670	\$1,389	\$670	\$306	\$0
21 Orlando Utilities Commission	2036-2043	[32]	64	\$29	\$452	\$40	\$47	\$0
22 Piedmont Muni Power Agency	2043	[34]	282	\$154	\$545	\$174	\$55	\$2
23 Riverside Public Utilities ⁽³⁾	2022	[13]	38	\$65	\$1,711	\$65	\$59	\$2
24 Salt River Project	2024-2027	[16]	677	\$359	\$530	\$418	\$152	\$8
25 Southern California Public Power ⁽³⁾	2024-2027	[16]	229	\$121	\$530	\$142	\$157	\$7
26 South Carolina Public Power	2042	[33]	322	\$179	\$556	\$199	\$155	\$0
27 South Mississippi Electric	2022	[13]	127	\$56	\$437	\$78	\$34	\$0
28 Tennessee Valley Authority	2020-2036	[21]	6,671	\$2,865	\$430	\$4,123	\$838	\$0
Public Power Total			19,535	\$10,620	\$544	\$13,081	\$5,462	\$46

PUBLIC POWER UTILITIES - - - FOOTNOTES

- (1) Fund balance includes \$26.6 mm Internal Reserve
- (2) Fund balance includes \$10.2 mm Internal Reserve
- (3) Fund Balance at 6/30/09
- (4) Fund Balance at 9/30/09
- (5) Fund balance includes \$1.9 mm Internal Reserve
- (6) Data as of 12/31/08
- (7) Sold its interest in Indian Point 3 & James A. Fitzpatrick on 11/12/00 to Entergy but has retained the plant's NDT Fund until license expiration.



NUCLEAR DECOMMISSIONING MINIMUM COST ESTIMATES BASED ON LABOR AND ENERGY ESCALATION FACTORS AS OF DECEMBER 2010 AND BURIAL COST FACTORS PER NUREG 1307, REVISION 14 ISSUED NOVEMBER 2010



Labor Region	Reactor	Compact	Burial Contract	Cost (\$MM)	Compound Growth (%)	% Change '09-'10 (%)
Northeast	PWR	Atlantic	Direct	828.5	9.0	7.1
Northeast	PWR	Atlantic	Waste Vendor	481.8	6.6	15.1
Northeast	PWR	Non-Atlantic	Direct	828.5	9.0	7.1
Northeast	PWR	Non-Atlantic	Waste Vendor	481.8	6.6	15.1
Northeast	BWR	Atlantic	Direct	979.1	8.6	7.1
Northeast	BWR	Atlantic	Waste Vendor	628.1	6.6	8.7
Northeast	BWR	Non-Atlantic	Direct	979.1	8.6	7.1
Northeast	BWR	Non-Atlantic	Waste Vendor	628.1	6.6	8.7
South	PWR	Atlantic	Direct	813.5	8.9	7.2
South	PWR	Atlantic	Waste Vendor	466.8	6.4	15.5
South	PWR	Non-Atlantic	Direct	813.5	8.9	7.2
South	PWR	Non-Atlantic	Waste Vendor	466.8	6.4	15.5
South	BWR	Atlantic	Direct	959.8	8.5	7.2
South	BWR	Atlantic	Waste Vendor	608.8	6.5	8.8
South	BWR	Non-Atlantic	Direct	959.8	8.5	7.2
South	BWR	Non-Atlantic	Waste Vendor	608.8	6.5	8.8

¹ Based on escalation formula of 0.65L (labor) + 0.13E (energy) + 0.22B (burial) and 1986 Base Cost of \$105 million for PWR Reactor and \$135 million for BWR Reactor.

² Compound Growth = Annualized % change over 24 years from 1986 Base Cost.

NUCLEAR DECOMMISSIONING MINIMUM COST ESTIMATES BASED ON LABOR AND ENERGY ESCALATION FACTORS AS OF DECEMBER 2010 AND BURIAL COST FACTORS PER NUREG 1307, REVISION 14, ISSUED NOVEMBER 2010



Labor Region	Reactor	Compact	Burial Contract	Cost (\$MM)	Compound Growth (%)	% Change '09-'10 (%)
Midwest	PWR	Non-Atlantic	Direct	819.7	8.9	7.3
Midwest	PWR	Non-Atlantic	Waste Vendor	472.9	6.5	15.6
Midwest	BWR	Non-Atlantic	Direct	967.7	8.6	7.3
Midwest	BWR	Non-Atlantic	Waste Vendor	616.7	6.5	9.0
West	PWR	Non-Atlantic	Direct	819.7	8.9	7.1
West	PWR	Non-Atlantic	Waste Vendor	472.9	6.5	15.2
West	PWR	Northwest	Direct	374.8	5.4	0.3
West	PWR	Northwest	Waste Vendor	341.4	5.0	13.3
West	BWR	Non-Atlantic	Direct	967.7	8.6	7.1
West	BWR	Non-Atlantic	Waste Vendor	616.7	6.5	8.7
West	BWR	Northwest	Direct	464.7	5.3	-49.7
West	BWR	Northwest	Waste Vendor	406.4	4.7	-52.5

¹ Based on escalation formula of 0.65L (labor) + 0.13E (energy) + 0.22B (burial) and 1986 Base Cost of \$105 million for PWR Reactor and \$135 million for BWR Reactor.

² Compound Growth = Annualized % change over 24 years from 1986 Base Cost.

NUCLEAR DECOMMISSIONING MINIMUM COST ESTIMATE ESCALATION FACTORS AS OF DECEMBER 2010 FOR LABOR AND ENERGY AND BURIAL COST FACTORS PER NUREG 1307, REVISION



14,

Burial Factors as of December 2010

		<u>PWR¹</u>	<u>BWR²</u>
Washington Burial Site ³	Direct	8.034	7.423
	Waste Vendor	6.588	5.458
Barnwell, SC Burial Site	Atlantic Compact ⁴ Direct	27.292	24.356
	Atlantic Compact ⁴ Waste Vendor	12.280	12.540
	Non-Atlantic ⁵ Compact Direct	27.292	24.356
	Non-Atlantic ⁵ Compact Vendor	12.280	12.540

Labor Factors as of December 2010

Northeast	2.45
South	2.23
Midwest	2.32
West	2.32

Energy Factors as of December 2010

PWR ¹	2.263
BWR ²	2.319

¹ Pressurized Water Reactor

² Boiling Water Reactor

³ Applicable to Northwest and Rocky Mountain Compacts

⁴ Atlantic Compact Consists of Connecticut, New Jersey and South Carolina for burial at Barnwell, SC.

⁵ NRC is assuming Atlantic Compact Factors will apply to Non-Atlantic Compact even though Barnwell burial site stopped accepting waste from outside the Atlantic Compact as of July 1, 2008

DISCLOSURES



- This material was compiled for educational purposes only by Duff & Phelps Investment Management Co. from public sources. Information contained herein, including material supplied by others, is believed to be accurate, but cannot be guaranteed.
- Sources for the data in the Nuclear Decommissioning Funding Study are contained on page 4. The NRC Minimum Cost Estimate Tables were compiled based on data from the NRC and the Bureau of Labor Statistics.

