appendix 4:

Method of Calculating Industrial Assessment Center Benefits

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Method of Calculating Results for Industrial Assessment Center Programs

The Industrial Assessment Center (IAC) program benefits are supported by 22 years of actual assessment and implementation data. Energy savings are calculated and summed from four sources associated with the IAC program: (1) IAC energy assessments, (2) assessments performed by IAC student alumni, (3) IAC website-related energy savings, and (4) replication assessments within firms served by the IAC.

Through the year 2002, tabulations are based on data collected by the IAC centers and studies done to estimate the non-assessment benefits. The first two lines show the number of assessments conducted in each year and the savings associated with each of these new assessments. The savings from each assessment are assumed to persist for seven years. Therefore, the energy saved in each year (shown in the third row) is the sum of energy savings from new assessment savings for this year plus the savings from measures implemented in the previous six years that continue to persist. Row four shows the accumulation of savings over time from energy assessments, derived from the annual savings of row three. Row five reports savings from alumni assessments, website savings, and replications calculated as follows.

Estimation of the contribution of assessments (or other, equivalent professional services) performed by IAC student alumni were based on a rate of graduation across the program of 4.67 students per school. The program started with 3 schools and grew to 30 schools (currently 26 schools), hence the range of between 14 and 140 fully-trained students graduating and joining the workforce each year. It was assumed 40% of the alumni have remained in the energy efficiency business and that each alumnus performs the equivalent of five assessments per year for 11 years after leaving the IAC program. The benefits of each energy assessment (or equivalent intervention) were assumed to persist for seven years, after which the aged energy assessment was "retired" for the purposes of this estimation.

The effect of the IAC website maintained at Rutgers University was estimated to begin in 1998. The number of unique visitors to the website was used to calculate the number of projects resulting from visitors to the site. It was assumed that about 5% of the visitors initiated some action due to IAC influeuence and that these actions or implementations saved an average 2,897 MBtu per assessment. As with the other assessments, energy savings are assumed to persist for seven years.

The savings from replications from all IAC Program activities is calculated as being 25% of the energy saved in the prior year from all program activities. This calculation is made to account for the ancillary effect of additional implementations that are initiated at a later time, due to the influence of the IAC program. These implementations may be accomplished at the same plant as the original implementations, or at other plants within the same company, or within other plants at other companies as plant managers/engineers/workers change jobs, but take the energy efficiency know-how with them.

The total cumulative IAC cost savings from all sources are reported in row 6. Energy cost savings, carbon reduction, and other benefits are related to energy savings by projected fuel prices and emission coefficients. The cumlative energy cost savings (row 7) and the cumlative carbon reduction (row 8) are shown for the IAC program through 2002.

Item	1977	1978	1979	1980	1981	1982	1983	1984
Number of Assessments	82	70	636	224	359	253	211	248
Annual Energy Saved Per New Assessment *(MBtu/Assessment-Year)*	3,212	3,212	3,212	3,212	3,212	1,782	2,047	3,504
Energy Saved From Assessments *(TBtu)*	0.263	0.488	2.53	3.25	4.40	4.85	5.29	5.89
Accumulated Energy Saved From Assessments *(TBtu)*	0.263	0.751	3.28	6.53	10.94	15.79	21.08	26.97
Other Energy Savings *(TBtu)*	0.0	0.065	0.215	0.930	1.42	2.01	2.54	3.70
Total Cumulative IAC Savings *(C)*	0.263	0.816	3.56	7.74	13.56	20.42	28.25	37.84
Energy Cost Savings *(B$)*	0.002	0.006	0.025	0.056	0.100	0.157	0.218	0.289
Carbon Reduction *(MMTCE)*	0.005	0.015	0.066	0.143	0.250	0.376	0.520	0.696

Item	1985	1986	1987	1988	1989	1990	1991	1992
Number of Assessments	368	298	324	388	340	360	455	531
Annual Energy Saved Per New Assessment *(MBtu/Assessment-Year)*	4,208	4,520	3,898	3,842	4,724	3,821	3,207	3,942
Energy Saved From Assessments *(TBtu)*	7.22	6.52	7.06	7.40	8.56	9.50	10.09	10.63
Accumulated Energy Saved From Assessments *(TBtu)*	34.19	40.71	47.77	55.17	63.73	73.23	83.32	93.95
Other Energy Savings *(TBtu)*	5.69	8.48	11.17	14.46	18.65	23.03	26.55	30.50
Total Cumulative IAC Savings *(TBtu)*	50.75	65.75	83.98	105.8	133.1	165.6	202.2	243.4
Energy Cost Savings *(B$)*	0.382	0.472	0.575	0.691	0.833	1.01	1.19	1.40
Carbon Reduction *(MMTCE)*	0.934	1.21	1.55	1.95	2.44	3.04	3.70	4.44

Item	1993	1994	1995	1996	1997	1998	1999	2000
Number of Assessments	585	776	879	867	720	723	734	700
Annual Energy Saved Per New Assessment *(MBtu/Assessment-Year)*	3,314	3,074	2,978	3,002	2,500	2,185	2,833	2,581
Energy Saved From Assessments *(TBtu)*	11.23	12.35	13.48	14.47	14.90	15.02	15.00	14.87
Accumulated Energy Saved From Assessments *(TBtu)*	105.2	117.5	131.0	145.5	160.4	175.4	190.4	205.3
Other Energy Savings *(TBtu)*	33.82	37.15	40.72	43.53	46.10	48.88	52.50	56.63
Total Cumulative IAC Savings *(TBtu)*	288.4	337.9	392.1	450.1	511.1	575.0	642.5	714.0
Energy Cost Savings *(B$)*	1.62	1.86	2.10	2.39	2.69	2.97	3.28	3.70
Carbon Reduction *(MMTCE)*	5.25	6.15	7.12	8.16	9.25	10.4	11.6	12.9

Item	2001	2002	2003	2004	2005	2006	2007	2008
Number of Assessments	639	650	–	–	–	–	–	–
Annual Energy Saved Per New Assessment *(MBtu/Assessment-Year)*	4,041	6,240	–	–	–	–	–	–
Energy Saved From Assessments *(TBtu)*	15.07	16.51	–	–	–	–	–	–
Accumulated Energy Saved From Assessments *(TBtu)*	220.3	236.8	–	–	–	–	–	–
Other Energy Savings *(TBtu)*	62.23	68.49	–	–	–	–	–	–
Total Cumulative IAC Savings *(TBtu)*	791.3	876.3	–	–	–	–	–	–
Energy Cost Savings *(B$)*	4.16	4.62	–	–	–	–	–	–
Carbon Reduction *(MMTCE)*	14.3	15.8	–	–	–	–	–	–