ASHRAE Standard 140-2023

Informative Annex B16, Section B16.5.1

Example Results
for
Section 9 - HVAC Equipment Performance Tests CE100 through CE200

ASHRAE Standard 140-2023

Participating Organizations and Computer Programs for Quasi-analytical Solutions and Example Simulation Results Section 9 - HVAC Equipment Performance Tests CE100 through CE200

The quasi-analytical solutions and programs used to generate the example simulation results are described in Table B17-1. The first column of Table B17-1 ("Model"), indicates the proper program name and version number, or indicates a quasi-analytical solution.

The second column ("Authoring Organization") indicates the national research facility, university, or industry organization with expertise in building science that wrote the simulation software or did the quasi-analytical solutions.

The third column ("Implemented By") indicates the national research facility, university, or industry organization with expertise in building science that performed the simulations or did the quasi-analytical solutions.

The entries in the fourth column are the abbreviations for the simulations and quasi-analytical solutions generally used in the tables and charts which follow.

See Standard 140, Annex B17 for further details.

TABLE B17-1 Participating Organizations and Computer Programs

Model	Authoring Organization	Implemented By	Abbreviation
Quasi-Analytical solution with	Hochschule Technik & Architektur	Hochschule Technik & Architektur	
ideal controller model	Luzern, Switzerland (HTAL)	Luzern, Switzerland	HTAL1
Quasi-Analytical solution with	Hochschule Technik & Architektur	Hochschule Technik & Architektur	
realistic controller model	Luzern, Switzerland	Luzern, Switzerland	HTAL2
Quasi-Analytical Solution	Technische Universität Dresden,	Technische Universität Dresden,	
with ideal controller model	Germany (TUD)	Germany	TUD
CA-SIS V1	Electricité de France, France (EDF)	Electricité de France, France	CA-SIS
CLIM2000 2.1.6	Electricité de France, France	Electricité de France, France	CLM2000
			DOE21E/CIEMAT
DOE-2.1E-088	LANL/LBNL/ESTSC, a,b,c USA	CIEMAT, ^d Spain	DOE2.1-E/CIEMAT
		_	DOE21E/NREL
DOE-2.1E-133	LANL/LBNL/JJH, ^{a,b,e} USA	NREL/JNA, ^f USA	DOE2.1-E/NREL
	LBNL/UIUC/CERL/OSU/GARD		E+
ENERGYPLUS 1.0.0.023	Analytics/FSEC/DOE-OBT, a,g,h,i,j,k	GARD Analytics, USA	EnergyPlus
	University of Wisconsin, USA;		
TRNSYS 14.2-TUD with ideal	Technische Universität Dresden,	Technische Universität Dresden,	TRN-id
controller model	Ger.	Germany	TRNSYS-ideal
	University of Wisconsin, USA;		
TRNSYS 14.2-TUD with real	Technische Universität Dresden,	Technische Universität Dresden,	TRN-re
controller model	Ger.	Germany	TRNSYS-real

^aLANL: Los Alamos National Laboratory, United States

Energy Efficiency and Renewable Energy, United States

^bLBNL: Lawrence Berkeley National Laboratory, United States

^cESTSC: Energy Science and Technology Software Center (at Oak Ridge National Laboratory), United States

^dCIEMAT: Centro de Investigaciones Energeticas, Medioambientales y Tecnologicas, Spain

^eJJH: James J. Hirsch & Associates, United States

^fNREL/JNA: National Renewable Energy Laboratory/J. Neymark & Associates, United States

⁹UIUC: University of Illinois Urbana/Champaign, United States

^hCERL: U.S. Army Corps of Engineers, Construction Engineering Research Laboratories, United States

ⁱOSU: Oklahoma State University, United States

^jFSEC: University of Central Florida, Florida Solar Energy Center, United States

^kDOE-OBT: U.S. Department of Energy, Office of Building Technology, State and Community Programs,

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Table B16.5.1-1. Space Cooling Electricity Consumption

_			ace Co											
Energy		ption, Tota		D05015		TDM	TDN		tics, All I			A a !		01-Jan-10
		CLM2000			E+	TRN-id	TRN-re			(Max-Min)		Analytical		Tested Prg
Case	EDF		CIEMAT	NREL	GARD	TUD	TUD			/Analytical*	TUD	HTAL1	HTAL2	Org
CE100	1531	1530	1521	1519	1520	1522	1512	1512	1531	1.2%	1531	1531	1531	
CE110	1077	1089	1061	1065	1069	1067	1062	1061	1089	2.6%	1076	1077	1077	
CE120	1012	1012	1011	1003	1006	1007	1002	1002	1012	1.0%	1013	1011	1011	
CE130	110	109	105	106	109	109	110	105	110	4.3%	111	110	110	
CE140	68	69	65	66	68	68	69	65	69	5.8%	69	69	68	
CE150	1208	1207	1202	1183	1197	1199	1192	1183	1208	2.1%	1206	1207	1207	
CE160	1140	1139	1138	1107	1132	1137	1133	1107	1140	2.9%	1140	1139	1139	
CE165	1502	1501	1499	1470	1491	1500	1490	1470	1502	2.1%	1498	1500	1500	
CE170	638	638	629	620	635	636	636	620	638	2.8%	641	638	638	
CE180	1083	1082	1077	1080	1082	1081	1080	1077	1083	0.5%	1083	1082	1082	
CE185	1544	1543	1541	1547	1540	1542	1538	1538	1547	0.6%	1545	1543	1543	
CE190	164	164	160	160	164	164	165	160	165	3.1%	165	164	164	
CE195	250	250	245	246	250	250	252	245	252	2.7%	252	250	250	
CE200	1477	1464	1468	1440	1465	1480	1480	1440	1480	2.7%	1476	1477	1477	
Energy	Consum	ption, Con	npressor	(kWh,e)				Statis	tics, All I	Results				01-Jan-10
3,		CLM2000			E+	TRN-id	TRN-re		,	(Max-Min)		Analytical		Tested Prg
Case	EDF		CIEMAT	NREL	GARD	TUD	TUD		Max	/Analytical*	TUD	HTAL1	HTAL2	Org
CE100	1319	1318	1307	1311	_, \D	1311	1303	1303	1319	1.2%	1319	1319	1319	0.9
CE110	889	899	866	883		879	876	866	899	3.7%	888	889	889	
CE120	840	840	850	838		836	832	832	850	2.2%	841	839	839	
CE130	95	94	93	93		94	95	93	95	2.1%	95	94	94	
CE140	57	57	55	56		56	57	55	57	3.9%	57	5 7	56	
CE140 CE150	1000	999	1007	982		992	987	982	1007	2.5%	999	999	999	
CE150	950	999	963	982 926		992 947	987 944	982	963	2.5% 3.9%		999 949	949	
CE160 CE165		1281	1291	926 1256		1280		1256	963 1291	3.9% 2.8%	950 1279	1280	1280	
II	1283						1272							
CE170	531	530	539	523		528	529	523	539	3.0%	533	530	530	
CE180	909	908	914	912		907	906	906	914	0.9%	908	908	908	
CE185	1340	1339	1343	1344		1337	1334	1334	1344	0.7%	1340	1339	1338	
CE190	138	138	139	138		138	138	138	139	1.4%	138	138	138	
CE195	217	217	219	217		216	218	216	219	1.1%	219	217	217	
CE200	1250	1239	1249	1218		1253	1253	1218	1253	2.8%	1249	1250	1250	
Energy		ption, Sup							tics, All I					01-Jan-10
		CLM2000		DOE21E	E+	TRN-id	TRN-re			(Max-Min)		Analytical		Tested Prg
Case	EDF													
		EDF	CIEMAT	NREL	GARD	TUD	TUD			/Analytical*	TUD	HTAL1	HTAL2	Org
CE100	144	144	145	141	144	144	142	141	145	2.9%	144	144	144	Org
CE110	144 128	144 129	145 133	141 122	144 128	144 128	142 127	141 122	145 133	2.9% 8.5%	144 128	144 128	144 128	Org
CE110 CE120	144 128 117	144 129 117	145 133 110	141 122 110	144 128 116	144 128 117	142 127 115	141 122 110	145 133 117	2.9% 8.5% 6.3%	144	144 128 117	144 128 117	Org
CE110	144 128 117 10	144 129 117 10	145 133 110 8	141 122 110 8	144 128 116 10	144 128 117 10	142 127 115 10	141 122	145 133	2.9% 8.5%	144 128	144 128 117 10	144 128	Org
CE110 CE120	144 128 117	144 129 117	145 133 110	141 122 110	144 128 116	144 128 117	142 127 115	141 122 110	145 133 117	2.9% 8.5% 6.3%	144 128 117	144 128 117	144 128 117	Org
CE110 CE120 CE130	144 128 117 10	144 129 117 10	145 133 110 8	141 122 110 8	144 128 116 10	144 128 117 10	142 127 115 10	141 122 110 8	145 133 117 10	2.9% 8.5% 6.3% 23.1%	144 128 117 10	144 128 117 10	144 128 117 10 8 141	Org
CE110 CE120 CE130 CE140	144 128 117 10 8	144 129 117 10 8	145 133 110 8 7	141 122 110 8 6	144 128 116 10 8	144 128 117 10 8	142 127 115 10 8	141 122 110 8 6	145 133 117 10 8	2.9% 8.5% 6.3% 23.1% 27.2%	144 128 117 10 8	144 128 117 10 8	144 128 117 10 8	Org
CE110 CE120 CE130 CE140 CE150	144 128 117 10 8 141	144 129 117 10 8 141	145 133 110 8 7 133	141 122 110 8 6 136	144 128 116 10 8 140	144 128 117 10 8 141	142 127 115 10 8 139	141 122 110 8 6 133	145 133 117 10 8 141	2.9% 8.5% 6.3% 23.1% 27.2% 5.7%	144 128 117 10 8 141	144 128 117 10 8 141	144 128 117 10 8 141	Org
CE110 CE120 CE130 CE140 CE150 CE160	144 128 117 10 8 141 129	144 129 117 10 8 141 129	145 133 110 8 7 133 119	141 122 110 8 6 136 121	144 128 116 10 8 140 128	144 128 117 10 8 141 129	142 127 115 10 8 139 128	141 122 110 8 6 133 119	145 133 117 10 8 141 129	2.9% 8.5% 6.3% 23.1% 27.2% 5.7% 7.8%	144 128 117 10 8 141 129 149	144 128 117 10 8 141 129	144 128 117 10 8 141 129	Org
CE110 CE120 CE130 CE140 CE150 CE160 CE165 CE170	144 128 117 10 8 141 129 149 73	144 129 117 10 8 141 129 150 73	145 133 110 8 7 133 119 142 61	141 122 110 8 6 136 121 145 63	144 128 116 10 8 140 128 149 73	144 128 117 10 8 141 129 149 73	142 127 115 10 8 139 128 148 73	141 122 110 8 6 133 119 142 61	145 133 117 10 8 141 129 150 73	2.9% 8.5% 6.3% 23.1% 27.2% 5.7% 7.8% 5.6% 16.1%	144 128 117 10 8 141 129 149 74	144 128 117 10 8 141 129 149 73	144 128 117 10 8 141 129 149	Org
CE110 CE120 CE130 CE140 CE150 CE160 CE165	144 128 117 10 8 141 129 149	144 129 117 10 8 141 129	145 133 110 8 7 133 119	141 122 110 8 6 136 121	144 128 116 10 8 140 128 149	144 128 117 10 8 141 129 149	142 127 115 10 8 139 128 148	141 122 110 8 6 133 119 142	145 133 117 10 8 141 129 150	2.9% 8.5% 6.3% 23.1% 27.2% 5.7% 7.8% 5.6%	144 128 117 10 8 141 129 149 74	144 128 117 10 8 141 129 149	144 128 117 10 8 141 129 149 73	Org
CE110 CE120 CE130 CE140 CE150 CE160 CE165 CE170 CE180 CE185	144 128 117 10 8 141 129 149 73 118	144 129 117 10 8 141 129 150 73 119	145 133 110 8 7 133 119 142 61 111	141 122 110 8 6 136 121 145 63 112 137	144 128 116 10 8 140 128 149 73 118 139	144 128 117 10 8 141 129 149 73 118	142 127 115 10 8 139 128 148 73 118	141 122 110 8 6 133 119 142 61 111	145 133 117 10 8 141 129 150 73 119	2.9% 8.5% 6.3% 23.1% 27.2% 5.7% 7.8% 5.6% 16.1% 6.9% 3.0%	144 128 117 10 8 141 129 149 74 119	144 128 117 10 8 141 129 149 73 119	144 128 117 10 8 141 129 149 73 119	Org
CE110 CE120 CE130 CE140 CE150 CE160 CE165 CE170 CE180 CE185 CE190	144 128 117 10 8 141 129 149 73 118 139	144 129 117 10 8 141 129 150 73 119 139	145 133 110 8 7 133 119 142 61 111 135	141 122 110 8 6 136 121 145 63 112 137	144 128 116 10 8 140 128 149 73 118 139	144 128 117 10 8 141 129 149 73 118 139	142 127 115 10 8 139 128 148 73 118 139	141 122 110 8 6 133 119 142 61 111 135	145 133 117 10 8 141 129 150 73 119 139	2.9% 8.5% 6.3% 23.1% 27.2% 5.7% 7.8% 5.6% 16.1% 6.9% 3.0% 22.9%	144 128 117 10 8 141 129 149 74 119 139	144 128 117 10 8 141 129 149 73 119 139	144 128 117 10 8 141 129 149 73 119 139	Org
CE110 CE120 CE130 CE140 CE150 CE160 CE165 CE170 CE180 CE185 CE190 CE195	144 128 117 10 8 141 129 149 73 118 139 18	144 129 117 10 8 141 129 150 73 119 139 18 23	145 133 110 8 7 133 119 142 61 111 135 14	141 122 110 8 6 136 121 145 63 112 137 14	144 128 116 10 8 140 128 149 73 118 139 18	144 128 117 10 8 141 129 149 73 118 139 18	142 127 115 10 8 139 128 148 73 118 139 18	141 122 110 8 6 133 119 142 61 111 135 14	145 133 117 10 8 141 129 150 73 119 139 18 23	2.9% 8.5% 6.3% 23.1% 27.2% 5.7% 7.8% 5.6% 16.1% 6.9% 3.0% 22.9% 23.3%	144 128 117 10 8 141 129 149 74 119 139 18 23	144 128 117 10 8 141 129 149 73 119 139 18 23	144 128 117 10 8 141 129 149 73 119 139 18 23	Org
CE110 CE120 CE130 CE140 CE150 CE165 CE170 CE180 CE185 CE190 CE195 CE200	144 128 117 10 8 141 129 73 118 139 18 23 154	144 129 117 10 8 141 129 150 73 119 139 18 23 153	145 133 110 8 7 133 119 142 61 111 135 14 18	141 122 110 8 6 136 121 145 63 112 137 14 18	144 128 116 10 8 140 128 149 73 118 139	144 128 117 10 8 141 129 149 73 118 139	142 127 115 10 8 139 128 148 73 118 139	141 122 110 8 6 133 119 142 61 111 135 14 18	145 133 117 10 8 141 129 150 73 119 139 18 23 155	2.9% 8.5% 6.3% 23.1% 27.2% 5.7% 7.8% 5.6% 16.1% 6.9% 3.0% 22.9% 23.3% 3.5%	144 128 117 10 8 141 129 149 74 119 139	144 128 117 10 8 141 129 149 73 119 139	144 128 117 10 8 141 129 149 73 119 139	
CE110 CE120 CE130 CE140 CE150 CE165 CE170 CE180 CE185 CE190 CE195 CE200	144 128 117 10 8 141 129 73 118 139 18 23 154 Consum	144 129 117 10 8 141 129 150 73 119 139 139 23 153	145 133 110 8 7 133 119 142 61 111 135 14 18 149	141 122 110 8 6 136 121 145 63 112 137 14 18 151	144 128 116 10 8 140 128 149 73 118 139 18 23 153	144 128 117 10 8 141 129 73 118 139 18 23 155	142 127 115 10 8 139 128 148 73 118 139 18 23	141 122 110 8 6 133 119 142 61 111 135 14 18 149	145 133 117 10 8 141 129 150 73 119 139 18 23	2.9% 8.5% 6.3% 23.1% 27.2% 5.7% 7.8% 5.6% 16.1% 6.9% 3.0% 22.9% 23.3% 3.5%	144 128 117 10 8 141 129 149 74 119 139 18 23 154	144 128 117 10 8 141 129 149 73 119 139 18 23 155	144 128 117 10 8 141 129 73 119 139 18 23 155	01-Jan-10
CE110 CE120 CE130 CE140 CE150 CE165 CE165 CE170 CE185 CE190 CE195 CE200 Energy	144 128 117 10 8 141 129 149 73 118 139 18 23 154 Consum	144 129 117 10 8 141 129 150 73 119 139 18 23 153 ption, Con	145 133 110 8 7 133 119 142 61 111 135 14 18 149 denser F a	141 122 110 8 6 136 121 145 63 112 137 14 18 151 an (kWh,e)	144 128 116 10 8 140 128 149 73 118 139 18 23 153	144 128 117 10 8 141 129 149 73 118 139 18 23 155	142 127 115 10 8 139 128 148 73 118 139 23 155	141 122 110 8 6 133 119 142 61 111 135 14 18 149 Statis	145 133 117 10 8 141 129 150 73 119 139 18 23 155 tics, All I	2.9% 8.5% 6.3% 23.1% 27.2% 5.7% 7.8% 5.6% 6.9% 3.0% 22.9% 23.3% 3.5% Results (Max-Min)	144 128 117 10 8 141 129 149 74 119 139 18 23 154	144 128 117 10 8 141 129 149 73 119 139 139 18 23 155	144 128 117 10 8 141 129 73 119 139 18 23 155	01-Jan-10 Tested Prg
CE110 CE120 CE130 CE140 CE150 CE160 CE165 CE170 CE180 CE185 CE195 CE200 Energy Case	144 128 117 10 8 141 129 149 73 118 139 18 23 154 Consum CA-SIS EDF	144 129 117 10 8 141 129 150 73 119 139 18 23 153 ption, Con CLM2000 EDF	145 133 110 8 7 133 119 142 61 111 135 14 18 149 denser F DOE21E CIEMAT	141 122 110 8 6 136 121 145 63 112 137 14 18 151 an (kWh,e)	144 128 116 10 8 140 128 149 73 118 139 18 23 153	144 128 117 10 8 141 129 149 73 118 139 18 23 155	142 127 115 10 8 139 128 148 73 118 139 18 23 155 TRN-re	141 122 110 8 6 133 119 142 61 111 135 14 18 149 Statis	145 133 117 10 8 141 129 150 73 119 139 139 23 155 tics, All I	2.9% 8.5% 6.3% 23.1% 27.2% 5.7% 7.8% 5.6% 16.1% 6.9% 3.0% 22.9% 23.3% 3.5% Results (Max-Min) /Analytical*	144 128 117 10 8 141 129 149 74 119 139 18 23 154	144 128 117 10 8 141 129 149 73 119 139 139 139 23 155 Analytical	144 128 117 10 8 141 129 149 73 119 139 18 23 155	01-Jan-10
CE110 CE120 CE130 CE140 CE150 CE160 CE165 CE170 CE180 CE185 CE195 CE200 Energy Case CE100	144 128 117 10 8 141 129 149 73 118 139 18 23 154 Consum CA-SIS EDF 68	144 129 117 10 8 141 129 150 73 119 139 18 23 153 ption, Con CLM2000 EDF	145 133 110 8 7 133 119 142 61 111 135 14 18 149 denser Fa DOE21E CIEMAT	141 122 110 8 6 136 121 145 63 112 137 14 18 151 an (kWh,e) DOE21E NREL	144 128 116 10 8 140 128 149 73 118 139 18 23 153	144 128 117 10 8 141 129 149 73 118 139 18 23 155 TRN-id TUD	142 127 115 10 8 139 128 148 73 118 139 18 23 155 TRN-re TUD	141 122 110 8 6 133 119 142 61 111 135 14 18 149 Statis Min 67	145 133 117 10 8 141 129 150 73 119 139 139 155 tics, All I	2.9% 8.5% 6.3% 23.1% 27.2% 5.7% 7.8% 5.6% 16.1% 6.9% 3.0% 22.9% 23.3% 3.55 Results (Max-Min) /Analytical* 2.0%	144 128 117 10 8 141 129 149 74 119 139 18 23 154	144 128 117 10 8 141 129 149 73 119 139 139 18 23 155 Analytical	144 128 117 10 8 141 129 149 73 119 139 18 23 155 HTAL2	01-Jan-10 Tested Prg
CE110 CE120 CE130 CE140 CE150 CE160 CE165 CE170 CE180 CE195 CE200 Energy Case CE100 CE110	144 128 117 10 8 141 129 149 73 118 139 18 23 154 Consum CA-SIS EDF 68 60	144 129 117 10 8 141 129 150 73 119 139 18 23 153 ption, Con CLM2000 EDF 68 61	145 133 110 8 7 133 119 142 61 111 135 14 18 149 denser Fa DOE21E CIEMAT 68 62	141 122 110 8 6 136 121 145 63 112 137 14 18 151 an (kWh,e) DOE21E NREL 67 60	144 128 116 10 8 140 128 149 73 118 139 18 23 153	144 128 117 10 8 141 129 149 73 118 139 18 23 155 TRN-id TUD 67 60	142 127 115 10 8 139 128 148 73 118 139 18 23 155 TRN-re TUD 67	141 122 110 8 6 133 119 142 61 111 135 14 18 149 Statis	145 133 117 10 8 141 129 150 73 119 139 139 23 155 tics, All I	2.9% 8.5% 6.3% 23.1% 27.2% 5.7% 7.8% 5.6% 16.1% 6.9% 22.9% 23.3% 3.5% Results (Max-Min) /Analytical* 2.0% 4.9%	144 128 117 10 8 141 129 149 74 119 139 18 23 154 TUD 68 60	144 128 117 10 8 141 129 149 73 119 139 18 23 155 Analytical HTAL1 68 60	144 128 117 10 8 141 129 149 73 119 139 18 23 155 HTAL2 68 60	01-Jan-10 Tested Prg
CE110 CE120 CE130 CE140 CE150 CE160 CE165 CE170 CE180 CE185 CE190 CE190 CE190 CE100 CE100 CE100 CE110 CE120	144 128 117 10 8 141 129 149 73 118 139 8 23 154 Consum CA-SIS EDF 68 60 55	144 129 117 10 8 141 129 150 73 119 139 18 23 153 ption, Con CLM2000 EDF 68 61 55	145 133 110 8 7 133 119 142 61 111 135 14 18 149 denser Fa DOE21E CIEMAT 68 62 51	141 122 110 8 6 136 121 145 63 112 137 14 18 151 an (kWh,e) DOE21E NREL 67 60 55	144 128 116 10 8 140 128 149 73 118 139 18 23 153	144 128 117 10 8 141 129 149 73 118 139 18 23 155 TRN-id TUD 67 60 55	142 127 115 10 8 139 128 148 73 118 139 18 23 155 TRN-re TUD 67 59 54	141 122 110 8 6 133 119 142 61 111 135 14 18 149 Statis Min 67 59 51	145 133 117 10 8 141 129 150 73 119 139 8 23 155 tics, All I	2.9% 8.5% 6.3% 23.1% 27.2% 5.7% 7.8% 5.6% 16.1% 6.9% 22.9% 23.3% 3.5% Results (Max-Min) /Analytical* 2.0% 4.9% 6.5%	144 128 117 10 8 141 129 149 74 119 139 18 23 154 TUD 68 60 55	144 128 117 10 8 141 129 149 73 119 139 18 23 155 Analytical HTAL1 68 60 55	144 128 117 10 8 141 129 149 73 119 139 18 23 155 HTAL2 68 60 55	01-Jan-10 Tested Prg
CE110 CE120 CE130 CE140 CE150 CE160 CE165 CE170 CE180 CE185 CE190 CE195 CE200 Energy Case CE100 CE110 CE120 CE130	144 128 117 10 8 141 129 149 73 118 139 8 23 154 Consum CA-SIS EDF 68 60 55 5	144 129 117 10 8 141 129 150 73 119 139 18 23 153 ption, Con CLM2000 EDF 68 61 55 5	145 133 110 8 7 133 119 142 61 111 135 14 18 149 denser Fa DOE21E CIEMAT 68 62 51 4	141 122 110 8 6 136 121 145 63 112 137 14 18 151 an (kWh,e) DOE21E NREL 67 60 55 5	144 128 116 10 8 140 128 149 73 118 139 18 23 153	144 128 117 10 8 141 129 149 73 118 139 8 23 155 TRN-id TUD 67 60 55 5	142 127 115 10 8 139 128 148 73 118 139 18 23 155 TRN-re TUD 67 59 54 5	141 122 110 8 6 133 119 142 61 111 135 14 18 149 Statis Min 67 59 51 4	145 133 117 10 8 141 129 150 73 119 139 8 23 155 tics, All I	2.9% 8.5% 6.3% 23.1% 27.2% 5.7% 7.8% 5.6% 16.1% 6.9% 22.9% 23.3% 3.5% Results (Max-Min) /Analytical* 2.0% 4.9% 6.5% 22.7%	144 128 117 10 8 141 129 149 74 119 139 18 23 154 TUD 68 60 55 5	144 128 117 10 8 141 129 149 73 119 139 18 23 155 Analytical HTAL1 68 60 55 5	144 128 117 10 8 141 129 149 73 119 139 18 23 155 HTAL2 68 60 55 5	01-Jan-10 Tested Prg
CE110 CE120 CE130 CE140 CE150 CE160 CE165 CE170 CE180 CE185 CE199 CE195 CE200 Energy Case CE100 CE110 CE120 CE130 CE140	144 128 117 10 8 141 129 149 73 118 139 8 23 154 Consum CA-SIS EDF 68 60 55 5	144 129 117 10 8 141 129 150 73 119 139 18 23 153 ption, Con CLM2000 EDF 68 61 55 5	145 133 110 8 7 133 119 142 61 111 135 14 18 149 denser Fa DOE21E CIEMAT 68 62 51 4 3	141 122 110 8 6 136 121 145 63 112 137 14 18 151 an (kWh,e) DOE21E NREL 67 60 55 5	144 128 116 10 8 140 128 149 73 118 139 18 23 153	144 128 117 10 8 141 129 149 73 118 139 8 23 155 TRN-id TUD 67 60 55 4	142 127 115 10 8 139 128 148 73 118 139 18 23 155 TRN-re TUD 67 59 54 5	141 122 110 8 6 133 119 142 61 111 135 14 18 149 Statis Min 67 59 51 4 3	145 133 117 10 8 141 129 150 73 119 139 8 23 155 tics, All I	2.9% 8.5% 6.3% 23.1% 27.2% 5.7% 7.8% 5.6% 16.1% 6.9% 3.0% 22.9% 23.3% 3.5% Results (Max-Min) /Analytical* 2.0% 4.9% 6.5% 22.7% 19.3%	144 128 117 10 8 141 129 149 74 119 139 18 23 154 TUD 68 60 55 5	144 128 117 10 8 141 129 149 73 119 139 18 23 155 Analytical HTAL1 68 60 55 5	144 128 117 10 8 141 129 149 73 119 139 23 155 HTAL2 68 60 55 5 4	01-Jan-10 Tested Prg
CE110 CE120 CE130 CE140 CE150 CE160 CE165 CE170 CE180 CE185 CE190 CE195 CE200 Energy Case CE100 CE110 CE120 CE130	144 128 117 10 8 141 129 149 73 118 139 8 23 154 Consum CA-SIS EDF 68 60 55 5	144 129 117 10 8 141 129 150 73 119 139 18 23 153 ption, Con CLM2000 EDF 68 61 55 5	145 133 110 8 7 133 119 142 61 111 135 14 18 149 denser Fa DOE21E CIEMAT 68 62 51 4	141 122 110 8 6 136 121 145 63 112 137 14 18 151 an (kWh,e) DOE21E NREL 67 60 55 5	144 128 116 10 8 140 128 149 73 118 139 18 23 153	144 128 117 10 8 141 129 149 73 118 139 8 23 155 TRN-id TUD 67 60 55 5	142 127 115 10 8 139 128 148 73 118 139 18 23 155 TRN-re TUD 67 59 54 5	141 122 110 8 6 133 119 142 61 111 135 14 18 149 Statis Min 67 59 51 4	145 133 117 10 8 141 129 150 73 119 139 8 23 155 tics, All I	2.9% 8.5% 6.3% 23.1% 27.2% 5.7% 7.8% 5.6% 16.1% 6.9% 22.9% 23.3% 3.5% Results (Max-Min) /Analytical* 2.0% 6.5% 6.2.7% 19.3% 5.6%	144 128 117 10 8 141 129 149 74 119 139 18 23 154 TUD 68 60 55 5	144 128 117 10 8 141 129 149 73 119 139 18 23 155 Analytical HTAL1 68 60 55 5	144 128 117 10 8 141 129 149 139 18 23 155 HTAL2 68 60 55 5 4 66	01-Jan-10 Tested Prg
CE110 CE120 CE130 CE140 CE150 CE160 CE165 CE170 CE180 CE185 CE199 CE195 CE200 Energy Case CE100 CE110 CE120 CE130 CE140	144 128 117 10 8 141 129 149 73 118 139 8 23 154 Consum CA-SIS EDF 68 60 55 5	144 129 117 10 8 141 129 150 73 119 139 18 23 153 ption, Con CLM2000 EDF 68 61 55 5	145 133 110 8 7 133 119 142 61 111 135 14 18 149 denser Fa DOE21E CIEMAT 68 62 51 4 3	141 122 110 8 6 136 121 145 63 112 137 14 18 151 an (kWh,e) DOE21E NREL 67 60 55 5	144 128 116 10 8 140 128 149 73 118 139 18 23 153	144 128 117 10 8 141 129 149 73 118 139 8 23 155 TRN-id TUD 67 60 55 4	142 127 115 10 8 139 128 148 73 118 139 18 23 155 TRN-re TUD 67 59 54 5	141 122 110 8 6 133 119 142 61 111 135 14 18 149 Statis Min 67 59 51 4 3	145 133 117 10 8 141 129 150 73 119 139 8 23 155 tics, All I	2.9% 8.5% 6.3% 23.1% 27.2% 5.7% 7.8% 5.6% 16.1% 6.9% 3.0% 22.9% 23.3% 3.5% Results (Max-Min) /Analytical* 2.0% 4.9% 6.5% 22.7% 19.3%	144 128 117 10 8 141 129 149 74 119 139 18 23 154 TUD 68 60 55 5	144 128 117 10 8 141 129 149 73 119 139 18 23 155 Analytical HTAL1 68 60 55 5	144 128 117 10 8 141 129 149 73 119 139 23 155 HTAL2 68 60 55 5 4	01-Jan-10 Tested Prg
CE110 CE120 CE130 CE140 CE150 CE165 CE170 CE188 CE190 CE195 CE200 Energy Case CE100 CE120 CE130 CE140 CE150	144 128 117 10 8 141 129 149 73 118 139 8 23 154 Consum CA-SIS EDF 68 60 55 4 66	144 129 117 10 8 141 129 150 73 119 139 18 23 153 ption, Con CLM2000 EDF 68 61 55 5 4 66	145 133 110 8 7 133 119 142 61 111 135 14 18 149 denser Fa CIEMAT 68 62 51 4 3 62	141 122 110 8 6 136 121 145 63 112 137 14 18 151 an (kWh,e) DOE21E NREL 67 60 55 5 4 65	144 128 116 10 8 140 128 149 73 118 139 18 23 153	144 128 117 10 8 141 129 149 73 118 139 18 23 155 TRN-id TUD 67 60 55 4 66	142 127 115 10 8 139 128 148 73 118 23 155 TRN-re TUD 67 59 54 5 4 65	141 122 110 8 6 133 119 142 61 111 135 14 18 149 Statis Min 67 59 51 4 3 62	145 133 117 10 8 141 129 150 73 119 139 18 23 155 tics, All I	2.9% 8.5% 6.3% 23.1% 27.2% 5.7% 7.8% 5.6% 16.1% 6.9% 22.9% 23.3% 3.5% Results (Max-Min) /Analytical* 2.0% 6.5% 6.2.7% 19.3% 5.6%	144 128 117 10 8 141 129 149 74 119 139 18 23 154 TUD 68 60 55 5 4	144 128 117 10 8 141 129 149 73 119 139 18 23 155 Analytical HTAL1 68 60 55 5 4	144 128 117 10 8 141 129 149 139 18 23 155 HTAL2 68 60 55 5 4 66	01-Jan-10 Tested Prg
CE110 CE120 CE130 CE140 CE150 CE166 CE165 CE170 CE188 CE199 CE195 CE200 Energy Case CE100 CE110 CE120 CE130 CE140 CE150 CE160	144 128 117 10 8 141 129 149 73 118 139 18 23 154 Consum CA-SIS EDF 68 60 55 5 4 66 61	144 129 117 10 8 141 129 150 73 119 139 18 23 153 ption, Con CLM2000 EDF 68 61 55 4 66 61	145 133 110 8 7 133 119 142 61 111 135 14 18 149 denser Fa DOE21E CIEMAT 68 62 51 4 3 62 56	141 122 110 8 6 136 121 145 63 112 137 14 18 151 DOE21E NREL 67 60 55 4 65 60	144 128 116 10 8 140 128 149 73 118 139 18 23 153	144 128 117 10 8 141 129 73 118 139 18 23 155 TRN-id TUD 67 60 55 5 4 66 61	142 127 115 10 8 139 128 148 73 118 23 155 TRN-re TUD 67 59 54 65 60	141 122 110 8 6 133 119 142 61 111 135 14 18 149 Statis Min 67 59 51 4 3 62 56	145 133 117 10 8 141 129 150 73 119 139 18 23 155 tics, All I Max 68 62 55 4 66 61	2.9% 8.5% 6.3% 23.1% 27.2% 5.7% 7.8% 5.6% 16.1% 6.9% 22.9% 23.3% 3.5% Results (Max-Min) /Analytical* 2.0% 6.5% 6.5% 22.7% 19.3% 5.6% 8.4%	144 128 117 10 8 141 129 149 74 119 139 18 23 154 TUD 68 60 55 5 4 66 61	144 128 117 10 8 141 129 149 73 119 139 18 23 155 Analytical HTAL1 68 60 55 5 4 66 61	144 128 117 10 8 141 129 149 139 18 23 155 HTAL2 68 60 55 5 4 66 61	01-Jan-10 Tested Prg
CE110 CE120 CE130 CE140 CE150 CE166 CE165 CE170 CE185 CE190 CE195 CE200 Energy Case CE100 CE110 CE120 CE130 CE140 CE150 CE150 CE150 CE160 CE165	144 128 117 10 8 141 129 149 73 118 139 18 23 154 Consum CA-SIS EDF 68 60 55 5 4 66 61 70	144 129 117 10 8 141 129 150 73 119 139 18 23 153 ption, Con CLM2000 EDF 68 61 55 5 4 66 61 70	145 133 110 8 7 133 119 142 61 111 135 14 18 149 denser Fa DOE21E CIEMAT 68 62 51 4 3 62 56 67	141 122 110 8 6 136 121 145 63 112 137 14 18 151 DOE21E NREL 67 60 55 5 4 65 60 69	144 128 116 10 8 140 128 149 73 118 139 18 23 153	144 128 117 10 8 141 129 73 118 139 18 23 155 TRN-id TUD 67 60 55 5 5 4 66 61 70	142 127 115 10 8 139 128 148 73 118 23 155 TRN-re TUD 67 59 54 65 60 69	141 122 110 8 6 133 119 142 61 111 135 14 18 149 Statis Min 67 59 51 4 3 62 56 67	145 133 117 10 8 141 129 150 73 119 139 18 23 155 tics, All I Max 68 62 55 4 66 61 70	2.9% 8.5% 6.3% 23.1% 27.2% 5.7% 7.8% 5.6% 16.1% 6.9% 22.9% 23.3% 3.5% Results (Max-Min) /Analytical* 2.0% 4.9% 6.5% 22.7% 19.3% 5.6% 8.4% 5.1%	144 128 117 10 8 141 129 149 74 119 139 18 23 154 TUD 68 60 55 5 4 66 61 70	144 128 117 10 8 141 129 149 73 119 139 18 23 155 Analytical HTAL1 68 60 55 5 4 66 61 70	144 128 117 10 8 141 129 149 139 18 23 155 HTAL2 68 60 55 5 5 4 66 61 70	01-Jan-10 Tested Prg
CE110 CE120 CE130 CE140 CE150 CE165 CE170 CE185 CE190 CE195 CE200 Energy Case CE100 CE110 CE120 CE130 CE140 CE150 CE150 CE150 CE165 CE170 CE1680 CE165 CE170 CE180	144 128 117 10 8 141 129 149 73 118 139 18 23 154 Consum CA-SIS EDF 68 60 55 5 4 66 61 70 34 56	144 129 117 10 8 141 129 150 73 119 139 18 23 153 ption, Con CLM2000 EDF 68 61 55 5 4 66 61 70 34 56	145 133 110 8 7 133 119 142 61 111 135 14 18 149 denser Fa DOE21E CIEMAT 68 62 51 4 3 62 56 67 29 52	141 122 110 8 6 136 121 145 63 112 137 14 18 151 an (kWh,e) DOE21E NREL 67 60 55 5 4 65 60 69 34	144 128 116 10 8 140 128 149 73 118 139 18 23 153	144 128 117 10 8 141 129 149 73 118 139 18 23 155 TRN-id TUD 67 60 55 5 4 66 61 70 34 56	142 127 115 10 8 139 128 148 73 118 23 155 TRN-re TUD 67 59 54 5 4 65 60 69 34 55	141 122 110 8 6 133 119 142 61 111 135 14 18 149 Statis Min 67 59 51 4 3 62 56 67 29 52	145 133 117 10 8 141 129 150 73 119 139 18 23 155 tics, All I 68 62 55 4 66 61 70 34 56	2.9% 8.5% 6.3% 23.1% 27.2% 5.7% 7.8% 5.6% 6.1% 6.9% 22.9% 23.3% 3.5% Results (Max-Min) /Analytical* 2.0% 4.9% 6.5% 6.5% 6.5% 5.6% 8.4% 5.1% 16.1% 7.1%	144 128 117 10 8 141 129 149 74 119 139 18 23 154 TUD 68 60 55 5 4 66 61 70 35 56	144 128 117 10 8 141 129 149 73 119 139 18 23 155 Analytical HTAL1 68 60 55 5 4 66 61 70 34	144 128 117 10 8 141 129 73 119 139 18 23 155 HTAL2 68 60 55 5 4 66 61 70 34 56	01-Jan-10 Tested Prg
CE110 CE120 CE130 CE140 CE150 CE165 CE170 CE188 CE190 CE195 CE200 Energy Case CE100 CE110 CE120 CE130 CE140 CE156 CE170 CE180	144 128 117 10 8 141 129 149 73 118 139 18 23 154 Consum CA-SIS EDF 68 60 55 5 4 66 61 70 34 56 65	144 129 117 10 8 141 129 150 73 119 139 139 55 EDF 68 61 55 4 66 61 70 34 56 65	145 133 110 8 7 133 119 142 61 111 135 14 18 149 denser Fa DOE21E CIEMAT 68 62 51 4 3 62 51 4 3 62 56 67 29 52 63	141 122 110 8 6 136 121 145 63 112 137 14 18 151 an (kWh,e) DOE21E NREL 67 60 55 5 4 65 60 69 34 56 66	144 128 116 10 8 140 128 149 73 118 139 18 23 153	144 128 117 10 8 141 129 149 73 118 139 18 23 155 TRN-id TUD 67 60 55 5 4 66 61 70 34 56 65	142 127 115 10 8 139 128 148 73 118 23 155 TRN-re TUD 67 59 54 55 60 69 34 55 65	141 122 110 8 6 133 119 142 61 111 135 14 18 149 Statis Min 67 59 51 4 3 62 56 67 29 52 63	145 133 117 10 8 141 129 150 73 119 139 18 23 155 tics, All I Max 68 62 55 4 66 61 70 34 56 66	2.9% 8.5% 6.3% 23.1% 27.2% 5.7% 7.8% 5.6% 6.9% 3.0% 22.9% 23.3% 3.5% Results (Max-Min) /Analytical* 2.0% 4.9% 6.5% 22.7% 19.3% 5.6% 5.1% 16.1% 7.1% 3.9%	144 128 117 10 8 141 129 149 74 119 139 139 154 TUD 68 60 55 5 4 66 61 70 35 56 65	144 128 117 10 8 141 129 149 73 119 139 18 23 155 Analytical HTAL1 68 60 55 5 4 66 61 70 34 56 65	144 128 117 10 8 141 129 73 119 139 18 23 155 HTAL2 68 60 55 5 4 66 61 70 34 56 65	01-Jan-10 Tested Prg
CE110 CE120 CE130 CE140 CE150 CE160 CE165 CE170 CE180 CE195 CE200 Energy Case CE100 CE110 CE120 CE130 CE140 CE156 CE170 CE180 CE165 CE170 CE180	144 128 117 10 8 141 129 149 73 118 139 18 23 154 Consum CA-SIS EDF 68 60 55 5 4 66 61 70 34 56 65 8	144 129 117 10 8 141 129 150 73 119 139 139 153 Ption, Con CLM2000 EDF 68 61 55 4 66 61 70 34 56 65 9	145 133 110 8 7 133 119 142 61 111 135 14 18 149 denser Fa DOE21E CIEMAT 68 62 51 4 3 62 56 67 29 52 63 7	141 122 110 8 6 136 121 145 63 112 137 14 18 151 an (kWh,e) DOE21E NREL 67 60 55 5 4 65 60 69 34 56 66 8	144 128 116 10 8 140 128 149 73 118 139 18 23 153	144 128 117 10 8 141 129 149 73 118 139 18 23 155 TRN-id TUD 67 60 55 5 4 66 61 70 34 56 65 8	142 127 115 10 8 139 128 148 73 118 23 155 TRN-re TUD 67 59 54 55 60 69 34 55 65 9	141 122 110 8 6 133 119 142 61 111 135 14 18 149 Statis Min 67 59 51 4 3 62 56 67 29 52 63 7	145 133 117 10 8 141 129 150 73 119 139 18 23 155 tics, All I Max 68 62 55 5 4 66 61 70 34 56 66 9	2.9% 8.5% 6.3% 23.1% 27.2% 5.7% 7.8% 5.6% 6.1% 6.9% 22.9% 23.3% 3.5% Results (Max-Min) /Analytical* 2.0% 4.9% 6.5% 22.7% 19.3% 5.6% 5.1% 16.1% 7.1% 3.9% 27.7%	144 128 117 10 8 141 129 149 74 119 139 139 154 TUD 68 60 55 5 4 66 61 70 35 56 65 9	144 128 117 10 8 141 129 149 73 119 139 18 23 155 Analytical HTAL1 68 60 55 4 66 61 70 34 56 65 9	144 128 117 10 8 141 129 73 119 139 18 23 155 HTAL2 68 60 55 5 4 66 61 70 34 56 65 9	01-Jan-10 Tested Prg
CE110 CE120 CE130 CE140 CE150 CE160 CE165 CE170 CE180 CE195 CE200 Energy Case CE100 CE110 CE120 CE130 CE140 CE156 CE170 CE165 CE170 CE180 CE165 CE170 CE180 CE165 CE170 CE180 CE185 CE190 CE195	144 128 117 10 8 141 129 149 73 118 139 18 23 154 Consum CA-SIS EDF 68 60 55 5 4 66 61 70 34 56 65 8 11	144 129 117 10 8 141 129 150 73 119 139 18 23 153 Ption, Con CLM2000 EDF 68 61 55 5 4 66 61 70 34 56 65 9 11	145 133 110 8 7 133 119 142 61 111 135 14 18 149 denser Fa DOE21E CIEMAT 68 62 51 4 3 62 56 67 29 52 63 7 8	141 122 110 8 6 136 121 145 63 112 137 14 18 151 an (kWh,e) DOE21E NREL 67 60 55 5 4 65 60 69 34 56 66 8 11	144 128 116 10 8 140 128 149 73 118 139 18 23 153	144 128 117 10 8 141 129 149 73 118 139 18 23 155 TRN-id TUD 67 60 55 5 4 66 61 70 34 56 65 8 11	142 127 115 10 8 139 128 148 73 118 23 155 TRN-re TUD 67 59 54 65 60 69 34 55 65 9 11	141 122 110 8 6 133 119 142 61 111 135 14 18 149 Statis Min 67 59 51 4 3 62 56 67 29 52 63 7 8	145 133 117 10 8 141 129 150 73 119 139 139 155 tics, All I	2.9% 8.5% 6.3% 23.1% 27.2% 5.7% 7.8% 5.6% 16.1% 6.9% 3.0% 22.9% 23.3% 3.5% Results (Max-Min) /Analytical* 2.0% 4.9% 6.5% 22.7% 19.3% 5.6% 8.4% 5.1% 16.1% 7.1% 3.9% 27.7% 25.2%	144 128 117 10 8 141 129 149 74 119 139 18 23 154 TUD 68 60 55 5 4 66 61 70 35 56 65 9 11	144 128 117 10 8 141 129 149 73 119 139 135 Analytical HTAL1 68 60 55 4 66 61 70 34 56 65 9 11	144 128 117 10 8 141 129 139 139 155 HTAL2 68 60 55 5 4 66 61 70 34 56 65 9 11	01-Jan-10 Tested Prg
CE110 CE120 CE130 CE140 CE150 CE160 CE165 CE170 CE185 CE195 CE200 Energy Case CE100 CE140 CE150 CE140 CE150 CE160 CE160 CE160 CE160 CE160 CE160 CE160 CE170 CE185 CE190 CE195 CE200	144 128 117 10 8 141 129 149 73 118 23 154 Consum CA-SIS EDF 68 60 55 5 4 66 61 70 34 56 65 8 11 73	144 129 117 10 8 141 129 150 73 119 139 139 153 Ption, Con CLM2000 EDF 68 61 55 4 66 61 70 34 56 65 9	145 133 110 8 7 133 119 142 61 111 135 14 18 149 denser Fa DOE21E CIEMAT 68 62 51 4 3 62 56 67 29 52 63 7 8 70	141 122 110 8 6 136 121 145 63 112 137 14 18 151 an (kWh,e) DOE21E NREL 67 60 555 5 4 65 60 69 34 566 66 8 11 71	144 128 116 10 8 140 128 149 73 118 23 153 E+ GARD	144 128 117 10 8 141 129 149 73 118 139 18 23 155 TRN-id TUD 67 60 55 5 4 66 61 70 34 56 65 8	142 127 115 10 8 139 128 148 73 118 23 155 TRN-re TUD 67 59 54 55 60 69 34 55 65 9	141 122 110 8 6 133 119 142 61 111 135 14 18 149 Statis Min 67 59 51 4 3 62 56 67 29 52 63 7	145 133 117 10 8 141 129 150 73 119 139 18 23 155 tics, All I Max 68 62 55 5 4 66 61 70 34 56 66 9	2.9% 8.5% 6.3% 23.1% 27.2% 5.7% 7.8% 5.6% 6.1% 6.9% 22.9% 23.3% 3.5% Results (Max-Min) /Analytical* 2.0% 4.9% 6.5% 22.7% 19.3% 5.6% 5.1% 16.1% 7.1% 3.9% 27.7%	144 128 117 10 8 141 129 149 74 119 139 139 154 TUD 68 60 55 5 4 66 61 70 35 56 65 9	144 128 117 10 8 141 129 149 73 119 139 18 23 155 Analytical HTAL1 68 60 55 4 66 61 70 34 56 65 9	144 128 117 10 8 141 129 73 119 139 18 23 155 HTAL2 68 60 55 5 4 66 61 70 34 56 65 9	01-Jan-10 Tested Prg

Table B16.5.1-2. COP: Mean, and (Max-Min)/Mean

Mean C	OP			, ,	max m			Statis	tics, All l	Results				01-Jan-10
		CLM2000	DOE21E	DOE21E	E+	TRN-id	TRN-re		,	(Max-Min)		Analytical		Tested Prg
Case	EDF	EDF	CIEMAT	NREL	GARD	TUD	TUD	Min	Max	/Analytical*	TUD	HTAL1	HTAL2	
CE100	2.39	2.39	2.43	2.41	2.40	2.40	2.42	2.39	2.43	1.7%	2.39	2.39	2.39	
CE110	3.38	3.34	3.46	3.41	3.40	3.41	3.43	3.34	3.46	3.5%	3.38	3.38	3.38	
CE120	3.59	3.59	3.61	3.62	3.61	3.61	3.63	3.59	3.63	1.1%	3.59	3.59	3.59	
CE130	1.91	1.91	1.98	1.95	1.90	1.92	1.92	1.90	1.98	3.8%	1.89	1.91	1.91	
CE140	2.77	2.73	2.92	2.85	2.77	2.80	2.80	2.73	2.92	6.6%	2.75	2.77	2.77	
CE150	3.62	3.63	3.67	3.70	3.65	3.65	3.67	3.62	3.70	2.2%	3.63	3.63	3.63	
CE160	3.84	3.84	3.87	3.95	3.86	3.85	3.86	3.84	3.95	2.9%	3.83	3.84	3.84	
CE165	2.92	2.92	2.95	2.99	2.94	2.93	2.94	2.92	2.99	2.2%	2.93	2.93	2.93	
CE170	3.38	3.39	3.44	3.48	3.40	3.39	3.40	3.38	3.48	2.9%	3.37	3.39	3.39	
CE180	4.04	4.04	4.08	4.03	4.04	4.05	4.06	4.03	4.08	1.4%	4.04	4.04	4.04	
CE185	2.85	2.85	2.87	2.82	2.85	2.85	2.86	2.82	2.87	1.8%	2.85	2.85	2.85	
CE190	3.41	3.41	3.49	3.46	3.39	3.41	3.40	3.39	3.49	2.7%	3.39	3.41	3.41	
CE195	2.31	2.31	2.36	2.34	2.30	2.32	2.31	2.30	2.36	2.5%	2.29	2.31	2.31	
CE200	3.62	3.61	3.67	3.71	3.65	3.61	3.61	3.61	3.71	2.7%	3.62	3.62	3.62	
(Max - I	Min)/Mea							Statis	tics, All l					01-Jan-10
		CLM2000	DOE21E		E+	TRN-id	TRN-re			(Max-Min)		Analytical		Tested Prg
Case	EDF	EDF	CIEMAT	NREL	GARD	TUD	TUD	Min		/Analytical*	TUD	HTAL1	HTAL2	Org
CE100	0.000	0.001	0.002	0.001	0.003	0.000	0.000	0.000	0.003		0.000		0.000	
CE110	0.000	0.010	0.002	0.001	0.003	0.000	0.011	0.000	0.011		0.000		0.000	
CE120	0.000	0.004	0.001	0.001	0.003	0.000	0.012	0.000	0.012		0.000		0.000	
CE130	0.000	0.038	0.013	0.009	0.004	0.000	0.172	0.000	0.172		0.000		0.000	
CE140	0.000	0.056	0.011	0.019	0.004	0.000	0.204	0.000	0.204		0.000		0.000	
CE150	0.003	0.003	0.001	0.005	0.011	0.000	0.009	0.000	0.011		0.000		0.001	
CE160	0.003	0.005	0.001	0.003	0.011	0.000	0.010	0.000	0.011		0.000		0.000	
CE165	0.010	0.003	0.001	0.003	0.012	0.000	0.008	0.000	0.012		0.000		0.000	
CE170	0.000	0.006	0.002	0.004	0.015	0.000	0.043	0.000	0.043		0.000		0.000	
CE180	0.005	0.002	0.002	0.010	0.029	0.000	0.012	0.000	0.029		0.000		0.000	
CE185	0.007	0.004	0.002	0.010	0.034	0.000	0.009	0.000	0.034		0.000		0.000	
CE190	0.000	0.023	0.007	0.019	0.040	0.000	0.101	0.000	0.101		0.000		0.000	
CE195	0.000	0.017	0.008	0.017	0.043	0.000	0.086	0.000	0.086		0.000		0.000	
CE200	0.006	0.000	0.000	0.005	0.012	0.000	0.000	0.000	0.012		0.000		0.000	

^{*} ABS[(Max-Min) / (Mean of Analytical Solutions)]

Table B16.5.1-3. Coil Loads: Total, Sensible, and Latent

<u> </u>	T (1 (1) A (1	41 15						01.4	4° A II I	D 14 .				04 1 40
Coll Load,	Total (kWh	CLM2000	DOE21E	DOE21E	E+	TRN-id	TRN-re	Statis	stics, All I	Results (Max-Min)		Analytical		01-Jan-10 Tested Prg
Case	EDF	EDF	CIEMAT	NREL	GARD	TUD	TUD	Min	May	/Analytical*	TUD	HTAL1	HTAL2	Org
CE100	3800	3800	3841	3794	3798	3800	3798	3794	3841	1.3%	3800	3800	3800	Oig
CE110	3765	3766	3804	3756	3763	3765	3763	3756	3804	1.3%	3765	3765	3765	
CE120	3749	3749	3763	3739	3747	3748	3747	3739	3763	0.6%	3749	3749	3749	
CE130	219	219	216	215	217	219	220	215	220	2.1%	219	219	219	
CE140	198	198	196	195	196	198	199	195	199	2.0%	198	198	197	
CE150	4517	4517	4543	4528	4509	4517	4515	4509	4543	0.8%	4518	4517	4518	
CE160	4501	4500	4516	4508	4491	4500	4499	4491	4516	0.6%	4501	4500	4500	
CE165	4538	4538	4567	4549	4529	4537	4535	4529	4567	0.0%	4537	4537	4538	
CE170	2233	2232	2226	2237	2225	2232	2232	2225	2237	0.5%	2232	2232	2233	
CE180	4495	4495	4510	4535	4481	4495	4494	4481	4535	1.2%	4495	4495	4494	
CE185	4507	4535	4565	4583	4523	4535	4534	4507	4583	1.7%	4535	4535	4534	
CE190	578	577	573	579	574	577	578	573	579	1.0%	578	577	578	
CE190 CE195	602	601	573 595	602	574 598	601	601	573 595	602	1.0%	601	601	601	
CE 195 CE 200	5498	5436	5534	5522	5484	5498	5498	5436	5534	1.1%	5498	5498	5498	
	Sensible (3022	J 1 07	0400	J -1 30		stics, All I		U-100	J-30	J -1 30	01-Jan-10
Con Loau,	•	CLM2000	DOE21E	DOE21E	E+	TRN-id	TRN-re	Otalia	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	(Max-Min)		Analytical		Tested Prg
Case	EDF	EDF	CIEMAT	NREL	GARD	TUD	TUD	Min	Max	/Analytical*	TUD	HTAL1	HTAL2	Org
CE100	3800	3800	3841	3794	3798	3800	3798	3794	3841	1.3%	3800	3800	3800	Sig
CE110	3765	3766	3804	3756	3763	3765	3763	3756	3804	1.3%	3765	3765	3765	
CE120	3749	3749	3763	3739	3747	3748	3747	3739	3763	0.6%	3749	3749	3749	
CE130	219	219	216	215	217	219	220	215	220	2.1%	219	219	219	
CE140	198	198	196	195	196	198	199	195	199	2.0%	198	198	197	
CE150	3778	3778	3804	3786	3776	3778	3776	3776	3804	0.7%	3778	3778	3779	
CE160	3761	3761	3777	3769	3759	3761	3760	3759	3777	0.5%	3761	3761	3761	
CE165	3798	3798	3828	3809	3795	3798	3796	3795	3828	0.9%	3798	3798	3799	
CE170	1493	1493	1487	1498	1491	1492	1492	1487	1498	0.7%	1493	1493	1493	
CE180	1537	1538	1553	1607	1537	1538	1537	1537	1607	4.5%	1538	1538	1538	
CE185	1548	1578	1608	1653	1577	1578	1577	1548	1653	6.6%	1578	1578	1578	
CE190	208	208	203	212	206	208	208	203	212	4.4%	208	208	208	
CE195	232	232	226	235	230	231	232	226	235	4.1%	232	232	232	
CE200	4276	4215	4313	4303	4274	4277	4277	4215	4313	2.3%	4277	4277	4277	
	Latent (kW			1000	121 7	1411	12.7		stics, All I		12.7	12.7	12.7	01-Jan-10
Jon Loud,		CLM2000	DOE21E	DOE21E	E+	TRN-id	TRN-re	Oldic	, , 1111	(Max-Min)		Analytical		Tested Prg
Case	EDF	EDF	CIEMAT	NREL	GARD	TUD	TUD	Min	Max	/Analytical*	TUD	HTAL1	HTAL2	Org
CE100	0	0	0	0	0	0	0	0	0	,	0	0	0	9
CE110	0	0	0	0	0	0	0	0	0		0	0	0	
CE120	0	0	0	0	0	0	0	0	0		0	0	0	
CE130	0	0	0	0	0	0	0	0	0		0	0	0	
CE140	0	0	0	0	0	0	0	0	0		0	0	0	
CE150	739	739	739	742	733	739	739	733	742	1.2%	739	739	739	
CE160	740	739	739	739	732	739	739	732	740	1.1%	739	739	739	
CE165	740	739	739	740	733	739	739	733	740	1.0%	739	739	739	
CE170	740	739	739	739	734	739	739	734	740	0.9%	739	739	739	
CE180	2958	2957	2957	2928	2944	2957	2957	2928	2958	1.0%	2957	2957	2956	
CE185	2959	2957	2957	2930	2946	2957	2957	2930	2959	1.0%	2958	2957	2956	
CE190	370	370	370	366	368	370	370	366	370	1.0%	370	370	370	
CE195	370	370	370	367	368	370	370	367	370	0.9%	370	370	370	
CE200	1222	1221	1221	1219	1210	1221	1221	1210	1222	1.0%	1221	1221	1221	
		ean of Ana								1.070	1			<u> </u>

^{*} ABS[(Max-Min) / (Mean of Analytical Solutions)]

Table B16.5.1-4. Sensible Coil Load minus Zone Load (Fan Heat)

Sensible Co	oil - Zone	Load, (Fan	Heat) (kW	h,thermal)				Statis	tics, All I	Results				01-Jan-10
	CA-SIS	CLM2000	DOE21E	DOE21E	E+	TRN-id	TRN-re			(Max-Min)		Analytical		Tested Prg
Case	EDF	EDF	CIEMAT	NREL	GARD	TUD	TUD	Min	Max	/Analytical*	TUD	HTAL1	HTAL2	Org
CE100	144	144	187	139	144	144	142	139	187	33.6%	144	144	144	
CE110	128	129	168	119	128	128	127	119	168	38.2%	128	128	128	
CE120	117	117	133	108	116	117	115	108	133	21.8%	117	117	117	
CE130	10	10	8	8	10	10	10	8	10	27.0%	10	10	10	
CE140	8	8	7	6	8	8	8	6	8	25.6%	8	8	8	
CE150	141	141	168	149	140	141	139	139	168	20.2%	141	141	142	
CE160	129	129	147	137	129	129	128	128	147	14.3%	129	129	129	
CE165	149	149	181	161	149	149	148	148	181	22.4%	149	149	150	
CE170	73	73	69	79	73	73	73	69	79	14.2%	74	73	74	
CE180	117	118	135	188	119	118	118	117	188	60.1%	118	119	118	
CE185	109	139	171	215	140	139	139	109	215	76.5%	139	139	139	
CE190	18	18	15	24	18	18	18	15	24	51.0%	18	18	18	
CE195	23	23	18	28	23	23	23	18	28	40.8%	23	23	23	
CE200	154	153	193	181	154	155	155	153	193	25.7%	154	155	155	

^{*} ABS[(Max-Min) / (Mean of Analytical Solutions)]

Table B16.5.1-5. Zone Loads: Total, Sensible, and Latent

Zone Load,	Total (kW	h thermal)		<u> </u>				Statis	stics, All F	Results				01-Jan-10
Zone Loau,	•	CLM2000	DOE21E	DOE21E	E+	TRN-id	TRN-re	Otalis	oucs, Air i	(Max-Min)		Analytical		Tested Prg
Case	EDF	EDF	CIEMAT	NREL	GARD	TUD	TUD	Min	Max	/Analytical*	TUD	HTAL1	HTAL2	Org
CE100	3656	3656	3654	3655	3654	3656	3656	3654	3656	0.1%	3656	3656	3656	0.9
CE110	3637	3637	3636	3637	3636	3637	3637	3636	3637	0.0%	3637	3637	3637	
CE120	3632	3632	3630	3632	3631	3632	3631	3630	3632	0.0%	3632	3632	3632	
CE130	209	209	207	208	207	209	209	207	209	1.3%	209	209	209	
CE140	190	190	189	188	188	190	190	188	190	1.1%	190	190	190	
CE150	4376	4376	4375	4376	4375	4376	4376	4375	4376	0.0%	4376	4376	4376	
CE160	4371	4371	4370	4371	4370	4371	4371	4370	4371	0.0%	4371	4371	4371	
CE165	4388	4388	4386	4387	4386	4388	4387	4386	4388	0.0%	4388	4388	4388	
CE170	2159	2159	2157	2158	2157	2159	2159	2157	2159	0.1%	2159	2159	2159	
CE180	4376	4376	4375	4376	4375	4376	4376	4375	4376	0.0%	4376	4376	4376	
CE185	4396	4396	4394	4395	4393	4395	4395	4393	4396	0.1%	4396	4396	4396	
CE190	557	559	558	558	558	559	559	557	559	0.4%	559	559	559	
CE195	576	579	577	577	576	578	579	576	579	0.4 %	579	579	579	
CE200	5343	5283	5342	5343	5342	5343	5343	5283	5343	1.1%	5343	5343	5343	
Zone Load,				00-0	0072	00-0	00-0		stics, All F		00-0	00-0	00-0	01-Jan-10
Lono Loud,		CLM2000		DOE21E	E+	TRN-id	TRN-re	Otatio	7 ti 00, 7 ti 1	(Max-Min)		Analytical		Tested Prg
Case	EDF	EDF	CIEMAT	NREL	GARD	TUD	TUD	Min	Max	/Analytical*	TUD	HTAL1	HTAL2	Org
CE100	3656	3656	3654	3655	3654	3656	3656	3654	3656	0.1%	3656	3656	3656	0.9
CE110	3637	3637	3636	3637	3636	3637	3637	3636	3637	0.0%	3637	3637	3637	
CE120	3632	3632	3630	3632	3631	3632	3631	3630	3632	0.0%	3632	3632	3632	
CE130	209	209	207	208	207	209	209	207	209	1.3%	209	209	209	
CE140	190	190	189	188	188	190	190	188	190	1.1%	190	190	190	
CE150	3637	3637	3636	3637	3636	3637	3636	3636	3637	0.0%	3637	3637	3637	
CE160	3632	3632	3630	3632	3631	3632	3631	3630	3632	0.0%	3632	3632	3632	
CE165	3649	3649	3647	3648	3647	3649	3648	3647	3649	0.1%	3649	3649	3649	
CE170	1420	1420	1418	1419	1418	1419	1419	1418	1420	0.1%	1420	1420	1420	
CE180	1420	1420	1418	1419	1418	1419	1419	1418	1420	0.1%	1420	1420	1420	
CE185	1439	1439	1437	1437	1437	1438	1438	1437	1439	0.2%	1439	1439	1439	
CE190	190	190	188	188	188	190	190	188	190	1.0%	190	190	190	
CE195	209	209	207	208	207	209	209	207	209	1.1%	209	209	209	
CE200	4122	4062	4121	4122	4121	4122	4122	4062	4122	1.5%	4122	4122	4122	
Zone Load,									stics, All I					01-Jan-10
	•	CLM2000	DOE21E	DOE21E	E+	TRN-id	TRN-re		,	(Max-Min)		Analytical		Tested Prg
Case	EDF	EDF	CIEMAT	NREL	GARD	TUD	TUD	Min	Max	/Ànalytical*	TUD	HTAL1	HTAL2	Org
CE100	0	0	0	0	0	0	0	0	0		0	0	0	J
CE110	0	0	0	0	0	0	0	0	0		0	0	0	
CE120	0	0	0	0	0	0	0	0	0		0	0	0	
CE130	0	0	0	0	0	0	0	0	0		0	0	0	
CE140	0	0	0	0	0	0	0	0	0		0	0	0	
CE150	739	739	739	739	739	739	739	739	739	0.1%	739	739	739	
CE160	739	739	739	739	739	739	739	739	739	0.1%	739	739	739	
CE165	739	739	739	739	739	739	739	739	739	0.1%	739	739	739	
CE170	739	739	739	739	739	739	739	739	739	0.1%	739	739	739	
CE180	2957	2957	2957	2958	2957	2957	2957	2957	2958	0.0%	2957	2957	2957	
CE185	2957	2957	2957	2958	2957	2957	2957	2957	2958	0.0%	2957	2957	2957	
CE190	367	370	370	370	370	370	370	367	370	0.8%	370	370	370	
CE195	367	370	370	370	370	370	370	367	370	0.8%	370	370	370	
CE200	1221	1221	1221	1221	1221	1221	1221	1221	1221	0.0%	1221	1221	1221	
CE190 CE195 CE200	367 367 1221	370 370	370 370 1221	370 370 1221	370 370	370 370	370 370	367 367	370 370	0.8% 0.8%	370 370	370 370	370 370	

^{*} ABS[(Max-Min) / (Mean of Analytical Solutions)]

Table B16.5.1-6. Latent Coil Load minus Zone Load (Should be 0)

Latent Coil	- Zone Lo	ad, (Should	d be 0) (kW	h,thermal)				Statist	tics, All F	Results		·		01-Jan-10
	CA-SIS	CLM2000	DOE21E	DOE21E	E+	TRN-id	TRN-re			(Max-Min)		Analytical	HTAL2	Tested Prg
Case	EDF	EDF	CIEMAT	NREL	GARD	TUD	TUD	Min	Max	/Analytical*	TUD	HTAL1	HTAL2	Org
CE100	0	0	0	0	0	0	0	0	0		0	0	0	
CE110	0	0	0	0	0	0	0	0	0		0	0	0	
CE120	0	0	0	0	0	0	0	0	0		0	0	0	
CE130	0	0	0	0	0	0	0	0	0		0	0	0	
CE140	0	0	0	0	0	0	0	0	0		0	0	0	
CE150	0	0	0	2	-7	0	0	-7	2		0	0	0	
CE160	1	0	0	0	-7	0	0	-7	1		0	0	0	
CE165	1	0	0	1	-6	0	0	-6	1		0	0	0	
CE170	1	0	0	-1	-6	0	0	-6	1		0	0	0	
CE180	1	0	0	-30	-13	0	0	-30	1		1	0	-1	
CE185	2	0	0	-28	-11	0	0	-28	2		1	0	-1	
CE190	3	0	0	-3	-2	0	0	-3	3		0	0	0	
CE195	3	0	0	-3	-1	0	0	-3	3		0	0	0	
CE200	1	0	0	-2	-11	0	0	-11	1		0	0	0	

^{*} ABS[(Max-Min) / (Mean of Analytical Solutions)]

Note: The statistics in the tables below are based on the Standard 140 informative example results.

These statistics do not have any substantial importance and are not to be interpreted as acceptance criteria.

Table B16.5.1-7. Sensitivities for Space Cooling Electricity Consumption

	•	ocholliv	11.00 10	. Opacc	000111	ig Liet	tiloity	Consu	iiiptioii	l				1
Delta Qtot (kW	h,e)							Stati	stics, All	Results				01-Jan-10
	CA-SIS	CLM2000	DOE21E	DOE21E	E+	TRN-id	TRN-re			(Max-Min)		Analytical		Tested Prg
Case	EDF		CIEMAT	NREL	GARD	TUD	TUD	Min	Max	/Analytical*	TUD	HTAL1	HTAL2	Org
CE110-CE100	-454	-441	-460	-454	-451	-455	-450	-460	-441	4.1%	-454	-454	-453	Oig
CE120-CE110	-65	-77	-50	-62	-63	-60	-60	-77	-50		-64	-66	-66	
CE120-CE100	-519	-518	-510	-516	-514	-515	-510	-519	-510	41.2% 1.8%	-518	-520	-520	
CE130-CE100	-1421	-1421	-1415	-1413	-1411	-1414	-1402	-1421	-1402	1.3%	-1420	-1421	-1421	
CE140-CE130	-42	-40	-40	-40	-41	-41	-41	-42	-40	4.8%	-42	-41	-41	
CE140-CE110	-1009	-1020	-996	-999	-1001	-999	-993	-1020	-993	2.6%	-1007	-1009	-1009	
CE150-CE110	131	118	141	118	128	132	130	118	141	17.9%	130	129	129	
CE160-CE150	-68	-68	-65	-76	-65	-62	-59	-76	-59	25.8%	-66	-67	-68	
CE165-CE160	362	362	362	363	359	363	357	357	363	1.7%	357	360	361	
CE170-CE150	-570	-569	-573	-563	-562	-563	-556	-573	-556	3.1%	-565	-569	-569	
CE180-CE150	-125	-125	-125	-103	-115	-118	-112	-125	-103	18.0%	-124	-124	-125	
CE180-CE170	445	444	448	460	447	445	444	444	460	3.6%	442	445	444	
CE185-CE180	461	461	464	467	458	460	458	458	467	1.9%	462	461	461	
CE190-CE180	-919	-918	-917	-920	-918	-917	-915	-920	-915	0.6%	-917	-918	-918	
CE190-CE140	96	95	95	94	96	96	96	94	96	2.6%	96	96	96	
CE195-CE190	86	86	85	86	86	86	86	85	86	2.0%	87	86	86	
CE195-CE185	-1294	-1293	-1296	-1301	-1290	-1292	-1287	-1301	-1287	1.1%	-1292	-1293	-1293	
CE195-CE130	140	141	140	140	142	141	141	140	142	1.5%	142	141	141	
CE200-CE100	-54	-66	-53	-79	-55	-42	-32	-79	-32	87.3%	-55	-53	-54	
Del Qcomp (kV					*				stics, All					01-Jan-10
		CLM2000	DOE21E	DOE21E	E+	TRN-id	TRN-re		, ,	(Max-Min)		Analytical		Tested Prg
C								B 41	B 4	,	TUE		LITALO	
Case	EDF		CIEMAT	NREL	GARD	TUD	TUD	Min	Max	/Analytical*	TUD	HTAL1	HTAL2	Org
CE110-CE100	-430	-419	-442	-428		-432	-427	-442	-419	5.3%	-431	-430	-430	
CE120-CE110	-49	-59	-16	-45		-43	-44	-59	-16	87.9%	-47	- 50	-50	
CE120-CE100	-479	-478	-457	-473		-475	-471	-479	-457	4.5%	-478	-480	-480	
CE130-CE100	-1224	-1224	-1214	-1218		-1218	-1208	-1224	-1208	1.3%	-1224	-1225	-1225	
CE140-CE130	-38	-37	-38	-37		-38	-38	-38	-37	3.7%	-38	-38	-38	
CE140-CE110	-832 111	-842 100	-811 141	-827		-823	-819	-842	-811 141	3.7%	-831	-833 110	-833	
CE150-CE110	111	100	141	99 56		113	111	99 56	141	38.3%	111	110	110	
CE160-CE150	-50	-50	-44 320	-56		-45	-42	-56	-42	27.5%	-49	-50	-50	
CE165-CE160 CE170-CE150	333 -469	332	329	330		333 -464	328	328	333	1.6%	328 -466	331	331	
		-469	-468	-459 70			-458 80	-469	-458 70	2.3%	-466	-469	-469	
CE180-CE150	-91 378	-91 378	-93 375	-70 380		-85 370	-80 378	-93 375	-70 380	25.0%	-91 375	-91 378	-92 378	
CE180-CE170	378	378	375	389 432		379 430	378	375	389 432	3.6%	375	378 431	378 431	
CE185-CE180 CE190-CE180	431 -771	431 -770	428 -775	432 -774		-770	428 -768	428 -775	-768	0.9%	432 -770	-770	-770	
CE190-CE180 CE190-CE140	81	-770 81	-775 85	-774 82		-770 82	-700 82	81	-700 85	0.9%	82	-770 81	81	
CE190-CE140 CE195-CE190	79	79	79	79		79	80	79	80	4.5%	80	79	79	
CE195-CE196	-1123	-1122	-1124	-1127		-1120	-1116	-1127	-1116	0.8%	-1121	-1122	-1121	
CE195-CE183	122	123	126	124		123	123	122	126	1.0%	123	122	123	
CE200-CE100	-69	-79								3.0%				
CLZ00-CL 100														
		-13	-58	-93		-58	-50	-93 Ctati	-50	62.3%	-70	-69	-69	01 len 10
Del Q IDfan (kV	Wh,e)								stics, All	Results	-70		-69	01-Jan-10
	Wh,e) CA-SIS	CLM2000	DOE21E	DOE21E	E+	TRN-id	TRN-re	Stati	stics, All	Results (Max-Min)		Analytical		Tested Prg
	Wh,e)	CLM2000			E+ GARD					Results	TUD		-69 HTAL2	
Del Q IDfan (kV	Wh,e) CA-SIS	CLM2000	DOE21E	DOE21E		TRN-id	TRN-re	Stati	stics, All	Results (Max-Min)		Analytical		Tested Prg
Del Q IDfan (kV Case CE110-CE100 CE120-CE110	Wh,e) CA-SIS EDF -16 -11	CLM2000 EDF -15 -12	DOE21E CIEMAT	DOE21E NREL	GARD -16 -11	TRN-id TUD -16 -11	TRN-re TUD	Stati Min	stics, All	Results (Max-Min) /Analytical*	TUD	Analytical HTAL1 -16 -11	HTAL2 -16 -11	Tested Prg
Case CE110-CE100 CE120-CE110 CE120-CE100	Wh,e) CA-SIS EDF -16 -11 -27	CLM2000 EDF -15 -12 -27	DOE21E CIEMAT -12 -23 -36	DOE21E NREL -19 -12 -31	-16 -11 -27	TRN-id TUD -16 -11 -27	TRN-re TUD -16 -11 -27	Stati Min -19 -23 -36	Max -12 -11 -27	Results (Max-Min) /Analytical* 41.9% 111.4% 32.2%	TUD -16 -11 -27	Analytical HTAL1 -16 -11 -27	HTAL2 -16 -11 -27	Tested Prg
Case CE110-CE100 CE120-CE110 CE120-CE100 CE130-CE100	Wh,e) CA-SIS EDF -16 -11 -27 -134	CLM2000 EDF -15 -12 -27 -134	DOE21E CIEMAT -12 -23 -36 -137	DOE21E NREL -19 -12 -31 -133	-16 -11 -27 -133	TRN-id TUD -16 -11 -27 -133	TRN-re TUD -16 -11 -27 -132	Stati Min -19 -23 -36 -137	Max -12 -11 -27 -132	Results (Max-Min) /Analytical* 41.9% 111.4%	TUD -16 -11 -27 -134	Analytical HTAL1 -16 -11 -27 -134	HTAL2 -16 -11 -27 -134	Tested Prg
Case CE110-CE100 CE120-CE110 CE120-CE100 CE130-CE100 CE140-CE130	Wh,e) CA-SIS EDF -16 -11 -27 -134 -2	CLM2000 EDF -15 -12 -27 -134 -2	DOE21E CIEMAT -12 -23 -36 -137 -1	DOE21E NREL -19 -12 -31 -133 -2	-16 -11 -27 -133 -2	TRN-id TUD -16 -11 -27 -133 -2	TRN-re TUD -16 -11 -27 -132 -2	Stati Min -19 -23 -36 -137 -2	Max -12 -11 -27 -132 -1	Results (Max-Min) /Analytical* 41.9% 111.4% 32.2%	TUD -16 -11 -27 -134 -2	Analytical HTAL1 -16 -11 -27 -134 -2	HTAL2 -16 -11 -27 -134 -2	Tested Prg
Case CE110-CE100 CE120-CE110 CE120-CE100 CE130-CE100 CE130-CE100 CE140-CE130 CE140-CE130	Wh,e) CA-SIS EDF -16 -11 -27 -134 -2 -120	CLM2000 EDF -15 -12 -27 -134 -2 -121	DOE21E CIEMAT -12 -23 -36 -137	DOE21E NREL -19 -12 -31 -133 -2 -116	-16 -11 -27 -133 -2 -119	TRN-id TUD -16 -11 -27 -133 -2 -120	TRN-re TUD -16 -11 -27 -132	Stati Min -19 -23 -36 -137	Max -12 -11 -27 -132	Results (Max-Min) /Analytical* 41.9% 111.4% 32.2% 3.7%	TUD -16 -11 -27 -134 -2 -120	Analytical HTAL1 -16 -11 -27 -134 -2 -120	HTAL2 -16 -11 -27 -134 -2 -120	Tested Prg
Case CE110-CE100 CE120-CE110 CE120-CE100 CE130-CE100 CE130-CE100 CE140-CE130 CE140-CE110 CE150-CE110	Wh,e) CA-SIS EDF -16 -11 -27 -134 -2 -120 13	CLM2000 EDF -15 -12 -27 -134 -2 -121 12	DOE21E CIEMAT -12 -23 -36 -137 -1 -126 0	DOE21E NREL -19 -12 -31 -133 -2 -116 14	GARD -16 -11 -27 -133 -2 -119 13	TRN-id TUD -16 -11 -27 -133 -2 -120 13	TRN-re TUD -16 -11 -27 -132 -2 -118 13	Min -19 -23 -36 -137 -2 -126 0	Max -12 -11 -27 -132 -1 -116 14	Results (Max-Min) /Analytical* 41.9% 111.4% 32.2% 3.7% 36.7%	TUD -16 -11 -27 -134 -2 -120 13	Analytical HTAL1 -16 -11 -27 -134 -2 -120 13	HTAL2 -16 -11 -27 -134 -2 -120 13	Tested Prg
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Case CE10-CE100 CE120-CE110 CE120-CE110 CE120-CE110 CE120-CE100 CE130-CE100 CE140-CE110 CE160-CE150 CE165-CE160 CE170-CE150 CE180-CE150 CE180-CE150 CE180-CE150 CE180-CE150 CE180-CE170 CE190-CE180 CE190-CE180 CE190-CE100 CE100-CE100	Wh,e) CA-SIS EDF -16 -17 -134 -12 -120 -68 -23 -100 -100 -5 -116 -13 -100 CA-SIS EDF -8 -5 -13 -63 -1 -56 -6 -5 -9 -32 -10 -22 -9	CLM2000 EDF -15 -12 -27 -134 -2 -121 -12 -12 -12 -13 -68 -22 -101 -10 -5 -116 -13 -9 CLM2000 EDF -7 -6 -13 -63 -1 -57 -5 -5 -5 -5 -9 -32 -10 -22 -9	DOE21E CIEMAT -12 -23 -36 -137 -1 -126 0 -14 -23 -72 -22 -29 -24 -97 -7 -4 -117 -9 -1 DOE21E CIEMAT -61 -17 -64 -59 0 0 -7 -7 -11 -34 -10 -34 -10 -33 -72 -34 -34 -10 -35 -36 -36 -36 -36 -36 -36 -36 -36 -36 -36	DOE21E NREL -19 -131 -133 -2 -116 -14 -15 -24 -73 -24 -73 -24 -98 -119 -10	GARD -16 -11 -27 -133 -2 -119 13 -12 20 -67 -22 45 21 -100 5 -116 12 10 E+	TRN-id TUD -16 -11 -27 -133 -12 -120 -68 -22 -120 -68 -22 -110 -5 -117 -12 -11 TRN-id TUD -7 -5 -13 -66 -6 -6 -6 -10 -32 -11 -10 -32 -11 -10 -37 -56 -6 -6 -6 -7 -5 -13 -56 -6 -6 -7 -7 -5 -13 -56 -6 -6 -6 -7 -7 -5 -13 -56 -6 -6 -6 -7 -7 -5 -13 -56 -6 -6 -6 -7 -7 -5 -13 -56 -6 -6 -6 -7 -7 -5 -13 -56 -6 -6 -6 -6 -7 -7 -5 -13 -56 -6 -6 -6 -7 -7 -5 -13 -56 -6 -6 -6 -6 -7 -7 -7 -5 -13 -56 -6 -6 -6 -6 -7 -7 -7 -5 -13 -56 -6 -6 -6 -7 -7 -7 -5 -13 -56 -6 -6 -6 -7 -7 -7 -5 -13 -56 -6 -6 -6 -6 -7 -7 -7 -7 -7 -7 -7 -7 -7 -7 -7 -7 -7	TRN-re TUD -16 -11 -27 -132 -132 -118 -13 -11 -20 -66 -21 -100 -10 -5 -116 -12 -12 -100 -7 -5 -13 -62 -11 -56 -6 -59 -31 -10 -10 -10 -10	Stati Min -19 -23 -36 -137 -2 -126 0 -15 -20 -73 -24 45 20 -101 7 4 -119 9 4 Stati Min -8 -11 -17 -64 -11 -59 0 -7 9 -34 -11 21	stics, All Max -12 -11 -27 -132 -16 -14 -116 -24 -66 -21 -25 -97 -10 5 -116 -31 -2 -62 -1 -56 -6 -51 -31 -9 -9 -33 -9 -31 -9 -33 -9 -33 -9 -33 -9 -31	Results (Max-Min) /Analytical* 41.9% 111.4% 32.2% 3.7% 36.7% 36.7% 21.6% 9.7% 12.1% 9.9% 24.1% 4.3% 28.2% 30.8% 2.6% 29.1% 78.4% Results (Max-Min) /Analytical* 29.9% 37.5% 6.3% 100.7% 27.1% 3.7% 27.1% 3.7.% 3.7	TUD -16 -11 -27 -134 -22 -120 -13 -13 -12 -101 -10 -7 -13 -63 -11 -56 -6 -6 -9 -32 -111 -10	Analytical HTAL1 -16 -11 -27 -134 -2 -120 -13 -12 -20 -68 -23 -45 -21 -101 -10 -5 -117 -11 Analytical HTAL1 -7 -5 -13 -66 -6 -9 -32 -11 -10 -10 -17 -56 -17 -56 -17 -56 -17 -56 -17 -56 -17 -17 -57 -17 -7 -7 -7 -7 -7 -7 -7 -7 -7 -7 -7 -7 -7	HTAL2 -16 -11 -27 -134 -2 -120 -68 -23 -12 -101 -5 -117 -12 -11 HTAL2 -7 -13 -66 -6 -9 -32 -11 -10 -56 -17 -56 -17 -56 -17 -56 -6 -6 -7 -7 -7 -7 -7 -7 -7 -7 -7 -7 -7 -7 -7	Tested Prg Org 01-Jan-10 Tested Prg
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Case CE110-CE100 CE120-CE110 CE120-CE110 CE120-CE110 CE120-CE110 CE140-CE130 CE140-CE130 CE140-CE150 CE160-CE150 CE160-CE150 CE180-CE150 CE180-CE170 CE180-CE170 CE195-CE180 CE195-CE180 CE190-CE140 CE195-CE100 CE120-CE100 CE120-CE100 CE120-CE100 CE120-CE110 CE140-CE110 CE140-CE150 CE180-CE150 CE180-CE150 CE180-CE170 CE180-CE170 CE180-CE170 CE180-CE170 CE180-CE170 CE180-CE170 CE180-CE170 CE180-CE170 CE180-CE170 CE180-CE150 CE180-CE150 CE180-CE150 CE180-CE150 CE180-CE150 CE180-CE170 CE185-CE180 CE190-CE180	Wh,e) CA-SIS EDF -16 -10 -13 -12 -120 -13 -12 -100 -68 -23 -25 -116 -100 -5 -116 -100 -5 -116 -100 -68 -23 -100 -68 -23 -10 -100 -68 -23 -100 -100 -100 -100 -100 -100 -100 -10	CLM2000 EDF -15 -12 -27 -134 -2 -121 -12 -12 -12 -14 -68 -22 -101 -5 -116 -13 -9 CLM2000 EDF -7 -6 -13 -63 -1 -57 -5 -9 -32 -10 -10 -57 -5 -9 -32 -10 -55 -5 -5 -5 -5 -5 -5 -5 -5 -5 -5 -5 -5	DOE21E CIEMAT -12 -23 -36 -137 -1 -126 0 -14 -23 -72 -22 -29 -24 -97 -7 -4 -117 -9 -1 DOE21E CIEMAT -61 -17 -64 -59 0 0 -7 -7 -11 -34 -10 -34 -10 -33 -72 -34 -34 -10 -35 -36 -36 -36 -36 -36 -36 -36 -36 -36 -36	DOE21E NREL -19 -12 -31 -133 -22 -116 -14 -15 -24 -73 -24 -73 -24 -9 -98 -119 -10 -10 -10 -10 -10 -10 -10 -10 -10 -10	GARD -16 -11 -27 -133 -2 -119 13 -12 20 -67 -22 45 21 -100 5 -116 12 10 E+	TRN-id TUD -16 -11 -27 -133 -12 -120 -68 -22 -120 -68 -22 -110 -5 -117 -12 -11 TRN-id TUD -7 -5 -13 -66 -6 -6 -6 -10 -32 -11 -10 -32 -11 -10 -37 -56 -6 -6 -6 -7 -5 -13 -56 -6 -6 -7 -7 -5 -13 -56 -6 -6 -6 -7 -7 -5 -13 -56 -6 -6 -6 -7 -7 -5 -13 -56 -6 -6 -6 -7 -7 -5 -13 -56 -6 -6 -6 -7 -7 -5 -13 -56 -6 -6 -6 -6 -7 -7 -5 -13 -56 -6 -6 -6 -7 -7 -5 -13 -56 -6 -6 -6 -6 -7 -7 -7 -5 -13 -56 -6 -6 -6 -6 -7 -7 -7 -5 -13 -56 -6 -6 -6 -7 -7 -7 -5 -13 -56 -6 -6 -6 -7 -7 -7 -5 -13 -56 -6 -6 -6 -6 -7 -7 -7 -7 -7 -7 -7 -7 -7 -7 -7 -7 -7	TRN-re TUD -11 -27 -132 -118 -13 -11 -20 -66 -21 -100 -5 -116 -10 -7 -5 -13 -62 -1 -56 -6 -5 -9 -31 -10 -7 -5 -13 -56 -55 -56 -56	Stati Min -19 -23 -36 -137 -2 -126 0 -15 -20 -73 -24 -45 -20 -101 7 4 -119 9 4 Stati Min -8 -11 -17 -64 -19 -59 0 -7 9 -34 -11 -17 -64 -11 -59 0 -7 9 -34 -11 -17 -64 -11 -59 0 -7 -7 9 -34 -11 -17 -64 -11 -59 0 -7 -7 -9 -34 -11 -17 -64 -11 -59 0 -7 -9 -34 -34 -31 -31 -31 -31 -31 -31 -31 -31 -31 -31	stics, All Max -12 -11 -27 -132 -1 -116 -14 -11 24 -66 -21 49 25 -97 10 5 -116 13 12 -12 -62 -1 -56 6 6 -5 -5 -11 -31 -9 23 11 -45 5	Results (Max-Min) /Analytical* 41.9% 41.14% 32.2% 3.7% 36.7% 36.7% 106.4% 32.6% 21.6% 21.6% 29.1% 78.28% 30.8% 30.8% 30.8% 30.8% 30.8% 31.6% 29.1% 78.4% Results (Max-Min) /Analytical* 29.9% 114.1% 37.1% 37.5% 6.3% 100.7% 27.1% 17.3% 8.2% 100.7% 27.1% 17.3% 8.2% 34.5% 34.5%	TUD -16 -11 -27 -134 -2 -120 -133 -122 -20 -68 -22 -21 -101 -101 -7 -5 -13 -63 -1 -56 -6 -9 -32 -11 -10 -47 -5 -13	Analytical HTAL1 -16 -11 -27 -134 -2 -120 -13 -12 -20 -68 -23 -45 -21 -101 -10 -5 -117 -11 Analytical HTAL1 -7 -5 -13 -66 -6 -9 -32 -11 -10 -10 -17 -56 -17 -56 -17 -56 -17 -56 -17 -56 -17 -17 -57 -17 -7 -7 -7 -7 -7 -7 -7 -7 -7 -7 -7 -7 -7	HTAL2 -16 -11 -27 -134 -2 -120 -68 -23 -12 -101 -5 -117 -12 -11 HTAL2 -7 -13 -66 -6 -9 -32 -11 -10 -56 -17 -56 -17 -56 -17 -56 -6 -6 -7 -7 -7 -7 -7 -7 -7 -7 -7 -7 -7 -7 -7	Tested Prg Org 01-Jan-10 Tested Prg
Case	Wh,e) CA-SIS EDF -16 -11 -27 -134 -120 -18 -120 -68 -23 -45 -21 -100 -10 -5 -116 -33 -12 -100 -68 -23 -116 -5 -116 -5 -116 -5 -116 -9 -8 -5 -13 -63 -10 -20 -8 -9 -32 -10 -9 -48 -43	CLM2000 EDF -15 -12 -27 -134 -2 -121 -12 -12 -12 -13 -68 -22 -101 -10 -10 -10 -10 -10 -10 -10 -10 -1	DOE21E CIEMAT -12 -23 -36 -137 -1 -126 0 -14 -23 -72 -22 -24 -97 7 4 -117 9 4 -117 -64 -11 -17 -64 -11 -59 0 0 -7 -7 -7 -64 -11 -45 -33 -72 -7 -7 -7 -7 -7 -7 -7 -7 -7 -7 -7 -7 -7	DOE21E NREL -19 -131 -133 -24 -116 -14 -15 -24 -73 -24 -98 -119 -10 -10 -10 -10 -10 -10 -10 -10 -10 -10	GARD -16 -11 -27 -133 -2 -119 13 -12 20 -67 -22 45 21 -100 5 -116 12 10 E+	TRN-id TUD -16 -11 -27 -133 -12 -120 -68 -22 -120 -68 -22 -117 -100 -5 -117 -11 TRN-id TUD -7 -13 -63 -61 -60 -6 -6 -6 -6 -6 -6 -7 -10 -32 -11 -10 -47 -5 -12 -10 -47 -5 -12 -10 -47 -5 -12 -10 -47 -5 -12 -10 -47 -5 -12 -10 -47 -5 -12 -10 -47 -5 -12 -10 -47 -5 -12 -10 -47 -5 -12 -10 -47 -5 -12 -10 -47 -5 -5 -10 -47 -5 -5 -10 -47 -5 -5 -10 -47 -5 -5 -6 -6 -6 -6 -6 -6 -6 -6 -6 -6 -6 -6 -6	TRN-re TUD -16 -11 -27 -132 -132 -118 -13 -11 -20 -66 -21 -100 -10 -5 -116 -12 -12 -100 -7 -7 -13 -62 -11 -56 -6 -55 -13 -62 -10 -10 -47 -5 -5 -2 -10 -47 -5 -5 -5 -6 -5 -5 -5 -6 -5 -5 -5 -6 -5 -5 -5 -6 -5 -5 -5 -6 -5 -5 -5 -6 -5 -5 -5 -6 -5 -5 -5 -6 -5 -5 -5 -6 -5 -5 -5 -6 -5 -5 -5 -6 -5 -5 -6 -5 -5 -5 -6 -5 -5 -5 -6 -5 -5 -5 -6 -5 -5 -5 -6 -5 -5 -5 -6 -5 -5 -5 -6 -5 -5 -5 -6 -5 -5 -7 -7 -7 -7 -7 -7 -7 -7 -7 -7 -7 -7 -7	Stati Min -19 -23 -36 -137 -2 -126 0 -15 -20 -73 -24 -45 -20 -101 7 4 -119 9 4 -119 -8 -8 -11 -17 -64 -11 -59 0 -7 9 -34 -11 21 9 -48 3 2	stics, All Max -12 -11 -17 -132 -1-16 -14 -11 -14 -66 -21 -25 -97 -10 -5 -116 -12 -56 -6 -5 -12 -62 -1 -56 -6 -5 -11 -31 -9 23 -11 -45 -5 -3 3	Results (Max-Min) /Analytical* 41.9% 111.4% 32.2% 3.7% 36.7% 8.3% 106.4% 32.6% 9.7% 12.1.6% 9.9% 24.1% 4.3% 28.2% 30.8% 2.6% 29.1% 78.4% Results (Max-Min) /Analytical* 29.9% 114.1% 3.7.% 37.5% 100.7% 27.1% 17.3% 100.7% 27.1% 17.3% 100.7% 27.1% 14.3% 9.6% 24.6% 5.5% 34.5% 62.1%	TUD -16 -11 -27 -134 -22 -120 -13 -12 -101 -101 -7 -117 -12 -10 -7 -13 -63 -11 -56 -6 -6 -9 -32 -11 -10 -47 -5 -12 -10 -47 -5 -12 -10 -47 -7 -7 -7 -7 -7 -7 -7 -7 -7 -7 -7 -7 -7	Analytical HTAL1 -16 -11 -27 -134 -2 -120 -88 -23 -12 -101 -10 -5 -117 -12 -11 Analytical HTAL1 -7 -5 -13 -63 -1 -56 -6 -6 -9 -32 -11 -10 -47 -5 -2 -1 -10 -47 -5 -2 -16 -47 -5 -2 -17 -17 -17 -18 -18 -18 -18 -18 -18 -18 -18 -18 -18	HTAL2 -16 -11 -27 -134 -2 -120 -13 -12 -20 -68 -23 -117 -101 -10 -5 -117 -12 -11 HTAL2 -7 -5 -13 -63 -1 -16 -6 -6 -6 -9 -32 -11 -10 -47 -5 -5 -12 -10 -47 -5 -5 -12 -10 -47 -5 -5 -12 -10 -47 -5 -5 -12 -10 -47 -5 -5 -12 -10 -47 -5 -5 -12 -10 -47 -5 -5 -10 -47 -5 -5 -10 -47 -5 -5 -10 -47 -5 -5 -10 -47 -5 -5 -10 -47 -5 -5 -10 -47 -5 -5 -10 -47 -5 -5 -10 -47 -5 -5 -10 -47 -5 -5 -10 -47 -5 -5 -10 -47 -5 -5 -10 -47 -5 -5 -10 -47 -5 -5 -10 -47 -5 -5 -10 -47 -5 -5 -10 -47 -5 -5 -10 -47 -5 -5 -10 -47 -5 -5 -5 -10 -47 -5 -5 -5 -10 -47 -5 -5 -5 -5 -5 -6 -6 -6 -6 -6 -6 -6 -6 -6 -6 -6 -6 -6	Tested Prg Org 01-Jan-10 Tested Prg
Del Q IDfan (KV Case CE110-CE100 CE120-CE110 CE120-CE110 CE120-CE110 CE140-CE130 CE140-CE130 CE140-CE110 CE160-CE150 CE160-CE150 CE180-CE150 CE180-CE170 CE180-CE170 CE185-CE180 CE190-CE140 CE195-CE180 CE190-CE140 CE195-CE130 CE200-CE100 Del Q ODfan (k) Case CE110-CE100 CE120-CE110 CE120-CE110 CE120-CE110 CE120-CE110 CE130-CE100 CE140-CE150 CE180-CE150 CE180-CE150 CE180-CE150 CE180-CE150 CE180-CE150 CE180-CE170 CE185-CE180 CE190-CE180 CE190-CE180 CE190-CE180 CE190-CE180 CE190-CE180 CE190-CE180 CE190-CE180 CE195-CE180 CE195-CE180 CE195-CE180 CE195-CE180 CE195-CE190 CE195-CE195	Wh,e) CA-SIS EDF -16 -17 -134 -12 -120 -68 -23 -100 -105 -116 -13 -100 CA-SIS EDF -8 -5 -13 -63 -1 -56 -6 -5 -9 -32 -10 -22 -9 -48 4 4 3 -54	CLM2000 EDF -15 -12 -27 -134 -2 -121 -12 -112 -12 -12 -13 -68 -22 -46 -20 -101 -10 -5 -116 -13 -9 CLM2000 EDF -7 -6 -13 -63 -1 -57 -5 -5 -5 -9 -32 -10 -22 -47 -5 -5 -5 -5 -5 -5 -5 -5 -5 -5 -5 -5 -5	DOE21E CIEMAT -12 -23 -36 -137 -126 0 -14 -23 -72 -22 -24 -97 7 4 -117 9 4 DOE21E CIEMAT -6 -11 -59 0 0 -7 11 -34 -10 23 11 -45 3 2 -55	DOE21E NREL -19 -131 -133 -2116 -14 -15 -24 -73 -24 -73 -24 -98 -8 -119 -10 -10 -10 -10 -10 -10 -10 -10 -10 -10	GARD -16 -11 -27 -133 -2 -119 13 -12 20 -67 -22 45 21 -100 5 -116 12 10 E+	TRN-id TUD -16 -11 -27 -133 -12 -120 -68 -22 -120 -68 -22 -117 -12 -117 -12 -117 -7 -5 -13 -63 -1 -10 -63 -1 -10 -32 -11 -11 -11 -11 -11 -11 -11 -11 -11 -1	TRN-re TUD -16 -11 -27 -132 -118 -13 -11 -20 -66 -21 -100 -10 -5 -116 -12 -12 -10 -7 -5 -13 -62 -1 -10 -10 -10 -10 -10 -10 -10 -10 -10	Stati Min -19 -23 -36 -137 -2 -126 0 -15 -20 -73 -24 45 -20 -101 7 4 -119 9 4 Stati Min -8 -11 -17 -64 -1 -59 0 -7 9 -34 -11 21 9 -48 3 2 -55	stics, All Max -12 -11 -17 -132 -11 -116 -14 -11 -24 -66 -21 -25 -97 -10 -5 -116 -13 -12 -62 -1 -56 -5 -11 -56 -5 -11 -51 -51 -51 -51 -51 -51 -51 -51	Results (Max-Min) /Analytical* 41.9% 111.4% 32.2% 3.7% 36.7% 36.7% 21.6% 9.7% 12.1% 4.3% 28.2% 30.8% 24.1% 4.3% 28.2% 30.8% 21.1% 4.3% 28.2% 30.8% 29.1% 30.8% 29.1% 31.4% 30.8% 29.1% 4.3% 62.1% 64.4% 55.5% 34.5% 34.5% 34.5% 34.5%	TUD -16 -11 -27 -134 -12 -120 -68 -22 -101 -101 -7 -15 -117 -12 -10 -7 -5 -13 -63 -1 -63 -1 -10 -7 -5 -13 -63 -11 -566 -6 -9 -9 -32 -111 -10 -47 -5 -55	Analytical HTAL1 -16 -11 -27 -134 -2 -120 -68 -23 -21 -101 -10 -5 -117 -12 -11 -7 -5 -13 -63 -1 -10 -69 -32 -11 -10 -47 -5 -2 -55	HTAL2 -16 -11 -27 -134 -2 -120 -13 -12 -20 -68 -23 -45 -5 -117 -12 -11 -56 -6 -6 -6 -9 -32 -11 -10 -47 -5 -5 -17 -55	Tested Prg Org Org 01-Jan-10 Tested Prg

^{*} ABS[(Max-Min) / (Mean of Analytical Solutions)]

Table B16.5.1-8. Sensitivities for COP and Coil Loads

					ina Co		-							
Delta COP (kW					_			Stati	stics, All					01-Jan-10
		CLM2000	DOE21E	DOE21E	E+	TRN-id	TRN-re			(Max-Min)		Analytical		Tested Prg
Case	EDF	EDF	CIEMAT	NREL	GARD	TUD	TUD	Min	Max	/Analytical*	TUD	HTAL1	HTAL2	Org
CE110-CE100	0.99	0.95	1.03	1.01	1.00	1.01	1.01	0.95	1.03	7.6%	0.99	0.99	0.99	
CE120-CE110	0.21	0.25	0.16	0.21	0.21	0.20	0.20	0.16	0.25	44.5%	0.21	0.21	0.21	
CE120-CE100	1.20	1.20	1.18	1.22	1.20	1.20	1.21	1.18	1.22	2.8%	1.20	1.20	1.20	
CE130-CE100 CE140-CE130	-0.48 0.86	-0.48 0.83	-0.46 0.94	-0.45 0.90	-0.50 0.87	-0.48 0.88	-0.50 0.88	-0.50 0.83	-0.45 0.94	10.0% 13.4%	-0.50 0.86	-0.48 0.86	-0.48 0.86	
CE140-CE110	-0.61	-0.61	-0.54	-0.56	-0.63	-0.61	-0.63	-0.63	-0.54	13.4%	-0.63	-0.61	-0.61	
CE150-CE110	0.24	0.29	0.21	0.29	0.25	0.24	0.25	0.21	0.29	31.9%	0.25	0.25	0.25	
CE160-CE150	0.22	0.21	0.20	0.25	0.21	0.20	0.19	0.19	0.25	30.4%	0.21	0.21	0.21	
CE165-CE160	-0.92	-0.92	-0.91	-0.96	-0.92	-0.92	-0.92	-0.96	-0.91	5.5%	-0.90	-0.91	-0.91	
CE170-CE150	-0.24	-0.24	-0.23	-0.22	-0.26	-0.26	-0.27	-0.27	-0.22	19.1%	-0.26	-0.24	-0.24	
CE180-CE150	0.42	0.41	0.42	0.33	0.39	0.40	0.38	0.33	0.42	22.8%	0.42	0.41	0.41	
CE180-CE170 CE185-CE180	0.66 -1.19	0.65 -1.19	0.64 -1.21	0.55 -1.20	0.65 -1.19	0.65 -1.20	0.65 -1.20	0.55 -1.21	0.66 -1.19	16.9%	0.68 -1.20	0.65 -1.19	0.65 -1.19	
CE190-CE180	-0.63	-0.63	-0.60	-0.57	-0.65	-0.64	-0.65	-0.65	-0.57	1.7% 12.7%	-0.66	-0.63	-0.63	
CE190-CE140	0.64	0.68	0.57	0.60	0.62	0.61	0.61	0.57	0.68	16.4%	0.64	0.64	0.64	
CE195-CE190	-1.10	-1.10	-1.13	-1.12	-1.09	-1.09	-1.10	-1.13	-1.09	3.3%	-1.09	-1.10	-1.10	
CE195-CE185	-0.54	-0.54	-0.51	-0.49	-0.55	-0.54	-0.55	-0.55	-0.49	12.1%	-0.55	-0.54	-0.54	
CE195-CE130	0.40	0.40	0.38	0.38	0.40	0.40	0.39	0.38	0.40	4.2%	0.40	0.40	0.40	
CE200-CE100	1.23	1.22	1.24	1.30	1.24	1.21	1.19	1.19	1.30	8.9%	1.23	1.23	1.23	
Del Q coil,t (kV								Stati	stics, All	Results				01-Jan-10
		CLM2000			E+	TRN-id	TRN-re			(Max-Min)		Analytical		Tested Prg
Case	EDF		CIEMAT	NREL	GARD	TUD	TUD	Min	Max	/Analytical*	TUD	HTAL1	HTAL2	Org
CE110-CE100	-35	-34	-38	-38	-35	-35	-35	-38	-34	12.5%	-35	-35	-35	
CE120-CE110	-16	-17	-40 70	-16	-16	-16	-16	-40 70	-16	146.5%	-16	-16	-17	
CE120-CE100	-51	-51	-78	-55	-51	-51	-51	-78 2626	-51	52.7%	-51	-52	-52	
CE130-CE100 CE140-CE130	-3581 -21	-3581 -21	-3626 -20	-3579 -21	-3581 -21	-3581 -21	-3578 -21	-3626 -21	-3578 -20	1.3%	-3581 -21	-3581 -21	-3581 -22	
CE140-CE130 CE140-CE110	-3567	-3568	-3608	-21 -3561	-21 -3567	-21 -3567	-3565	-3608	-3561	4.9% 1.3%	-3567	-3567	-3568	
CE150-CE110	752	751	739	772	746	752	752	739	772	4.4%	752	752	753	
CE160-CE150	-16	-17	-26	-19	-18	-17	-16	-26	-16	59.5%	-17	-17	-18	
CE165-CE160	37	38	51	40	38	37	36	36	51	40.0%	36	37	38	
CE170-CE150	-2284	-2285	-2317	-2291	-2284	-2285	-2283	-2317	-2283	1.5%	-2285	-2286	-2286	
CE180-CE150	-22	-22	-33	7	-28	-22	-21	-33	7	172.5%	-22	-23	-25	
CE180-CE170 CE185-CE180	2262 12	2263 40	2284 55	2298 48	2256 41	2263 40	2262 40	2256 12	2298 55	1.8%	2263 40	2263 40	2261 40	
CE190-CE180	-3917	-3918	-3937	-3956	-3907	-3917	-3916	-3956	-3907	107.3% 1.3%	-3918	-3918	-3916	
CE190-CE140	380	379	377	384	378	380	379	377	384	1.8%	380	379	380	
CE195-CE190	24	24	23	23	23	24	24	23	24	5.8%	24	24	24	
CE195-CE185	-3905	-3934	-3970	-3981	-3925	-3934	-3933	-3981	-3905	1.9%	-3934	-3934	-3933	
CE195-CE130	383	382	379	207	004	200	200	270	207		202	000	200	n l
				387	381	382	382	379	387	1.9%	382	382	382	
CE200-CE100	1698	1636	1693	1728	381 1687	382 1698	1700	1636	1728	5.4%	1697	382 1697	382 1697	
	1698 Wh,t)	1636	1693	1728	1687	1698	1700	1636		5.4% Results		1697		01-Jan-10
CE200-CE100	1698 Wh,t) CA-SIS	1636 CLM2000	1693 DOE21E	1728 DOE21E	1687 E+	1698 TRN-id	1700 TRN-re	1636	1728	5.4% Results (Max-Min)	1697	1697 Analytical	1697	Tested Prg
CE200-CE100 Del Q coil,s (k) Case	1698 Wh,t) CA-SIS EDF	1636 CLM2000 EDF	DOE21E CIEMAT	1728 DOE21E NREL	1687 E+ GARD	1698 TRN-id TUD	1700 TRN-re TUD	1636 Stati	1728 stics, All Max	5.4% Results	1697 TUD	1697 Analytical HTAL1	1697 HTAL2	
CE200-CE100 Del Q coil,s (k) Case CE110-CE100	1698 Wh,t) CA-SIS EDF -35	1636 CLM2000 EDF -34	DOE21E CIEMAT -38	1728 DOE21E NREL -38	1687 E+ GARD -35	TRN-id TUD -35	TRN-re TUD -35	1636 Statis Min -38	1728 stics, All Max -34	5.4% Results (Max-Min) /Analytical* 12.5%	1697 TUD -35	Analytical HTAL1 -35	1697 HTAL2 -35	Tested Prg
CE200-CE100 Del Q coil,s (k) Case CE110-CE100 CE120-CE110	1698 Wh,t) CA-SIS EDF -35 -16	1636 CLM2000 EDF -34 -17	1693 DOE21E CIEMAT -38 -40	1728 DOE21E NREL -38 -16	1687 E+ GARD -35 -16	1698 TRN-id TUD -35 -16	1700 TRN-re TUD -35 -16	1636 Statis Min -38 -40	1728 stics, All Max -34 -16	5,4% Results (Max-Min) /Analytical* 12.5% 146.5%	TUD -35 -16	Analytical HTAL1 -35 -16	1697 HTAL2 -35 -17	Tested Prg
CE200-CE100 Del Q coil,s (kV Case CE110-CE100 CE120-CE110 CE120-CE100	1698 Wh,t) CA-SIS EDF -35 -16 -51	1636 CLM2000 EDF -34 -17 -51	1693 DOE21E CIEMAT -38 -40 -78	1728 DOE21E NREL -38 -16 -55	E+ GARD -35 -16 -51	1698 TRN-id TUD -35 -16 -51	1700 TRN-re TUD -35 -16 -51	1636 Statis Min -38 -40 -78	1728 stics, All Max -34 -16 -51	5.4% Results (Max-Min) /Analytical* 12.5% 146.5% 52.8%	1697 TUD -35 -16 -51	Analytical HTAL1 -35 -16 -52	1697 HTAL2 -35 -17 -52	Tested Prg
CE200-CE100 Del Q coil,s (kV Case CE110-CE100 CE120-CE100 CE120-CE100 CE130-CE100	1698 Wh,t) CA-SIS EDF -35 -16 -51 -3581	1636 CLM2000 EDF -34 -17 -51 -3581	1693 DOE21E CIEMAT -38 -40 -78 -3626	1728 DOE21E NREL -38 -16 -55 -3579	E+ GARD -35 -16 -51 -3581	TRN-id TUD -35 -16 -51 -3581	1700 TRN-re TUD -35 -16 -51 -3578	Min -38 -40 -78 -3626	1728 stics, All Max -34 -16 -51 -3578	5.4% Results (Max-Min) /Analytical* 12.5% 146.5% 52.8% 1.3%	TUD -35 -16 -51 -3581	1697 Analytical HTAL1 -35 -16 -52 -3581	HTAL2 -35 -17 -52 -3581	Tested Prg
CE200-CE100 Del Q coil,s (kV Case CE110-CE100 CE120-CE110 CE120-CE100	1698 Wh,t) CA-SIS EDF -35 -16 -51	1636 CLM2000 EDF -34 -17 -51	1693 DOE21E CIEMAT -38 -40 -78	1728 DOE21E NREL -38 -16 -55	E+ GARD -35 -16 -51	1698 TRN-id TUD -35 -16 -51	1700 TRN-re TUD -35 -16 -51	1636 Statis Min -38 -40 -78	1728 stics, All Max -34 -16 -51	5.4% Results (Max-Min) /Analytical* 12.5% 146.5% 52.8% 1.3% 4.9%	1697 TUD -35 -16 -51	Analytical HTAL1 -35 -16 -52	1697 HTAL2 -35 -17 -52	Tested Prg
CE200-CE100 Del Q coil,s (kV Case CE110-CE100 CE120-CE110 CE120-CE100 CE130-CE100 CE140-CE130 CE140-CE110 CE150-CE110	1698 Wh,t) CA-SIS EDF -35 -16 -51 -3581 -21 -3567 13	1636 CLM2000 EDF -34 -17 -51 -3581 -21 -3568 12	1693 DOE21E CIEMAT -38 -40 -78 -3626 -20 -3608 0	1728 DOE21E NREL -38 -16 -55 -3579 -21 -3561 30	E+ GARD -35 -16 -51 -3581 -21 -3567 13	TRN-id TUD -35 -16 -51 -3581 -21 -3567 13	TRN-re TUD -35 -16 -51 -3578 -21 -3565 13	Min -38 -40 -78 -3626 -21 -3608 0	Max -34 -16 -51 -3578 -20 -3561 30	5.4% Results (Max-Min) /Analytical* 12.5% 146.5% 52.8% 1.3%	TUD -35 -16 -51 -3581 -21 -3567 13	Analytical HTAL1 -35 -16 -52 -3581 -21 -3567 13	HTAL2 -35 -17 -52 -3581 -22 -3568 14	Tested Prg
CE200-CE100 Del Q coil,s (kV Case CE110-CE100 CE120-CE110 CE120-CE100 CE130-CE100 CE140-CE130 CE140-CE110 CE150-CE110 CE150-CE110 CE160-CE150	1698 Wh,t) CA-SIS EDF -35 -16 -51 -3581 -21 -3567 13 -17	1636 CLM2000 EDF -34 -17 -51 -3581 -21 -3568 12 -17	1693 DOE21E CIEMAT -38 -40 -78 -3626 -20 -3608 0 -26	1728 DOE21E NREL -38 -16 -55 -3579 -21 -3561 30 -17	E+ GARD -35 -16 -51 -3581 -21 -3567 13 -17	TRN-id TUD -35 -16 -51 -3581 -21 -3567 13 -17	1700 TRN-re TUD -35 -16 -51 -3578 -21 -3565 13 -16	Min -38 -40 -78 -3626 -21 -3608 0 -26	Max -34 -16 -51 -3578 -20 -3561 30 -16	5.4% Results (Max-Min) /Analytical* 12.5% 146.5% 52.8% 1.3% 4.9% 1.3% 228.7% 58.9%	TUD -35 -16 -51 -3581 -21 -3567 13 -17	Analytical HTAL1 -35 -16 -52 -3581 -21 -3567 13 -17	HTAL2 -35 -17 -52 -3581 -22 -3568 14 -18	Tested Prg
CE200-CE100 Del Q coil,s (k) Case CE110-CE100 CE120-CE110 CE130-CE100 CE140-CE130 CE140-CE110 CE150-CE110 CE160-CE150 CE166-CE150 CE165-CE160	1698 Wh,t) CA-SIS EDF -35 -16 -51 -3581 -21 -3567 13 -17	1636 CLM2000 EDF -34 -17 -51 -3581 -21 -3568 12 -17 37	1693 DOE21E CIEMAT -38 -40 -78 -3626 -20 -3608 0 -26 51	1728 DOE21E NREL -38 -16 -55 -3579 -21 -3561 30 -17 40	E+ GARD -35 -16 -51 -3581 -21 -3567 13 -17 36	TRN-id TUD -35 -16 -51 -3581 -21 -3567 13 -17 37	1700 TRN-re TUD -35 -16 -51 -3578 -21 -3565 13 -16 36	Min -38 -40 -78 -3626 -21 -3608 0 -26 36	Max -34 -16 -51 -3578 -20 -3561 30 -16 51	5.4% Results (Max-Min) /Analytical* 12.5% 146.5% 52.8% 1.3% 4.9% 1.3% 228.7% 58.9% 40.1%	TUD -35 -16 -51 -3581 -21 -3567 13 -17 36	Analytical HTAL1 -35 -16 -52 -3581 -21 -3567 13 -17 37	HTAL2 -35 -17 -52 -3581 -22 -3568 14 -18 38	Tested Prg
CE200-CE100 Del Q coil,s (kV Case CE110-CE100 CE120-CE110 CE120-CE100 CE130-CE100 CE140-CE130 CE140-CE110 CE160-CE150 CE165-CE160 CE170-CE150 CE170-CE150	1698 Wh,t) CA-SIS EDF -35 -16 -51 -3581 -21 -3567 13 -17 37 -2285	1636 CLM2000 EDF -34 -17 -51 -3581 -21 -3568 12 -17 37 -2285	1693 DOE21E CIEMAT -38 -40 -78 -3626 -20 -3608 0 -26 51 -2317	1728 DOE21E NREL -38 -16 -55 -3579 -21 -3561 30 -17 40 -2288	E+ GARD -35 -16 -51 -3581 -21 -3567 13 -17 36 -2285	TRN-id TUD -35 -16 -51 -3581 -21 -3567 13 -17 37 -2285	1700 TRN-re TUD -35 -16 -51 -3578 -21 -3565 13 -16 -36 -2283	Min -38 -40 -78 -3626 -21 -3608 0 -26 36 -2317	1728 stics, All Max -34 -16 -51 -3578 -20 -3561 30 -16 51 -2283	5.4% Results (Max-Min) /Analytical* 12.5% 146.5% 52.8% 1.3% 4.9% 4.9% 228.7% 58.9% 40.1%	TUD -35 -16 -51 -3581 -21 -3567 13 -17 36 -2285	Analytical HTAL1 -35 -16 -52 -3581 -21 -3567 13 -17 37 -2286	HTAL2 -35 -17 -52 -3581 -22 -3568 14 -18 38 -2286	Tested Prg
CE200-CE100 Del Q coil,s (kV Case CE110-CE100 CE120-CE110 CE130-CE100 CE140-CE130 CE140-CE110 CE150-CE110 CE160-CE150 CE165-CE160 CE170-CE150 CE180-CE150 CE180-CE150	1698 Wh,t) CA-SIS EDF -35 -16 -51 -3581 -21 -3567 13 -17 37 -2285 -2241	1636 CLM2000 EDF -34 -17 -51 -3581 -21 -3568 12 -17 37 -2285 -2240	1693 DOE21E CIEMAT -38 -40 -78 -3626 -20 -3608 0 -26 51 -2317 -2250	1728 DOE21E NREL -38 -16 -55 -3579 -21 -3561 30 -17 40 -2288 -2179	E+ GARD -35 -16 -51 -3581 -21 -3567 13 -17 36 -2285 -2239	TRN-id TUD -35 -16 -51 -3581 -21 -3567 13 -17 37 -2285 -2240	1700 TRN-re TUD -35 -16 -51 -3578 -21 -3565 13 -16 -36 -36 -2283 -2239	Min -38 -40 -78 -3626 -21 -3608 0 -26 36 -2317 -2250	1728 stics, All Max -34 -16 -3578 -20 -3561 30 -16 51 -2283 -2179	5.4% Results (Max-Min) /Analytical* 12.5% 146.5% 52.8% 1.3% 4.9% 228.7% 58.9% 40.1% 1.5% 3.2%	TUD -35 -16 -3581 -21 -3567 13 -17 366 -2285 -2241	Analytical HTAL1 -35 -16 -52 -3581 -21 -3567 13 -17 37 -2286 -2240	HTAL2 -35 -17 -3581 -22 -3568 -14 -18 -38 -2286 -2241	Tested Prg
CE200-CE100 Del Q coil,s (k) Case CE110-CE100 CE120-CE110 CE130-CE100 CE140-CE130 CE140-CE110 CE160-CE150 CE160-CE150 CE160-CE150 CE160-CE150 CE180-CE150 CE180-CE150	1698 Wh,t) CA-SIS EDF -35 -16 -51 -3581 -21 -3587 -37 -37 -2285 -2241	1636 CLM2000 EDF -34 -17 -51 -3581 -21 -3568 12 -17 -37 -2285 -2240 45	1693 DOE21E CIEMAT -38 -40 -78 -3626 -20 -3608 0 -26 51 -2317 -2250 66	1728 DOE21E NREL -38 -16 -55 -3579 -21 -3561 30 -17 40 -2288 -2179 109	E+ GARD -35 -16 -51 -3581 -21 -3581 -21 -3567 13 -17 36 -2285 -2239 46	1698 TRN-id TUD -35 -16 -51 -3581 -21 -3581 -217 -37 -2285 -2240 45	1700 TRN-re TUD -35 -16 -51 -3578 -21 -3565 13 -16 36 -2233 -2239 45	1636 Statis Min -38 -40 -78 -3626 -21 -3608 0 -26 -336 -2317 -2250 44	1728 stics, All Max -34 -16 -51 -3578 -20 -3561 30 -16 51 -2283 -2179 109	5.4% Results (Max-Min) /Analytical* 12.5% 146.5% 52.8% 1.3% 4.9% 1.3% 228.7% 58.9% 40.1% 1.5% 3.2% 144.8%	TUD -35 -16 -51 -3581 -21 -3581 -21 -3587 13 -17 36 -2285 -2241 45	1697 Analytical HTAL1 -35 -16 -52 -3581 -21 -3567 13 -17 37 -2286 -2240 45	HTAL2 -35 -17 -52 -3581 -22 -3588 14 -18 38 -2286 -2241 45	Tested Prg
CE200-CE100 Del Q coil,s (kV Case CE110-CE100 CE120-CE110 CE120-CE100 CE140-CE130 CE140-CE130 CE140-CE110 CE150-CE110 CE160-CE150 CE165-CE160 CE170-CE150 CE180-CE150	1698 Wh,t) CA-SIS EDF -35 -16 -51 -3581 -21 -3567 13 -17 37 -2285 -2241	1636 CLM2000 EDF -34 -17 -51 -3581 -21 -3568 12 -17 37 -2285 -2240	1693 DOE21E CIEMAT -38 -40 -78 -3626 -20 -3608 0 -26 51 -2317 -2250	1728 DOE21E NREL -38 -16 -55 -3579 -21 -3561 30 -17 40 -2288 -2179	E+ GARD -35 -16 -51 -3581 -21 -3567 13 -17 36 -2285 -2239	TRN-id TUD -35 -16 -51 -3581 -21 -3567 13 -17 37 -2285 -2240	1700 TRN-re TUD -35 -16 -51 -3578 -21 -3565 13 -16 -36 -36 -2283 -2239	Min -38 -40 -78 -3626 -21 -3608 0 -26 36 -2317 -2250	1728 stics, All Max -34 -16 -3578 -20 -3561 30 -16 51 -2283 -2179	5.4% Results (Max-Min) /Analytical* 12.5% 146.5% 52.8% 1.3% 4.9% 1.3% 228.7% 58.9% 40.1% 1.5% 3.2% 144.8% 110.0%	TUD -35 -16 -3581 -21 -3567 13 -17 366 -2285 -2241	Analytical HTAL1 -35 -16 -52 -3581 -21 -3567 13 -17 37 -2286 -2240	HTAL2 -35 -17 -3581 -22 -3568 -14 -18 -38 -2286 -2241	Tested Prg
CE200-CE100 Del Q coil,s (kV Case CE110-CE100 CE120-CE110 CE130-CE100 CE140-CE130 CE140-CE110 CE160-CE150 CE165-CE160 CE170-CE150 CE180-CE150 CE180-CE150 CE180-CE150	1698 Wh,t) CA-SIS EDF -35 -16 -51 -3581 -21 -3567 -13 -17 -37 -2285 -2241 -44 -11 -1329 -10	1636 CLM2000 EDF -34 -17 -51 -3581 -21 -3568 12 -17 37 -2285 -2240 45 40 -1330 10	1693 DOE21E CIEMAT -38 -40 -78 -3626 -20 -3608 0 -26 -51 -2317 -2250 66 55 -1350 7	1728 DOE21E NREL -38 -16 -55 -3579 -21 -3561 30 -17 40 -2288 -2179 109 46 -1394 18	E+ GARD -35 -16 -51 -3567 -3567 -37 -36 -225 -2239 -46 39 -1331 10	TRN-id TUD -35 -16 -51 -3567 -37 -225 -2240 -45 -40 -1330 -130	1700 TRN-re TUD -35 -16 -51 -3578 -21 -3565 13 -16 -36 -2283 -2239 45 40 -1329 9	1636 Statis Min -38 -40 -78 -3608 0 -21 -3608 0 -26 -36 -2317 -2250 44 11 -1394 7	1728 stics, All Max -34 -16 -51 -3578 -20 -3561 30 -16 51 -2283 -2179 109 55	5.4% Results (Max-Min) /Analytical* 12.5% 146.5% 52.8% 1.3% 4.9% 1.3% 228.7% 58.9% 40.1% 1.5% 3.2% 144.8%	1697 TUD -35 -16 -51 -3567 13 -17 36 -2285 -2241 45 40	1697 Analytical HTAL1 -35 -16 -52 -3581 -21 -3567 -37 -2286 -2240 -45 -40 -1330 -10	1697 HTAL2 -35 -17 -52 -3581 -22 -3568 14 -18 38 -2281 45 40 -1330 11	Tested Prg
CE200-CE100 Del Q coil,s (kV Case CE110-CE100 CE120-CE110 CE130-CE100 CE140-CE130 CE140-CE110 CE160-CE150 CE160-CE150 CE160-CE150 CE180-CE150 CE180-CE150 CE180-CE150 CE180-CE150 CE180-CE150 CE180-CE150 CE180-CE150 CE180-CE170 CE185-CE180 CE190-CE140 CE190-CE140 CE190-CE140	1698 Wh,t) CA-SIS EDF -3567 -16 -51 -3567 13 -17 -37 -2285 -2241 41 -1329 10 24	1636 CLM2000 EDF -34 -17 -51 -3581 -21 -3568 12 -17 37 -2285 -2240 45 40 -1330 10 24	1693 DOE21E CIEMAT -38 -40 -78 -3608 0 -26 -51 -2317 -2250 -66 55 -1350 7 23	1728 DOE21E NREL -38 -16 -55 -3579 -21 -3561 30 -17 40 -2288 -2179 109 46 -1394 188 23	E+ GARD -35 -16 -51 -3567 -3567 -3567 -36 -2285 -2285 -2285 -2331 100 23	1698 TRN-id TUD -35 -16 -51 -3587 -3567 -337 -2285 -2240 -45 40 -1330 10 24	1700 TRN-re TUD -35 -16 -51 -35765 13 -16 -36 -2283 -2283 -239 45 40 -1329 9 9 24	1636 Statis Min -38 -40 -78 -3608 0 -26 -360 -2317 -2250 44 11 -1394 7 23	1728 stics, All Max -34 -16 -51 -3578 -20 -3561 30 -16 51 -2283 -2179 155 -1329 188 24	5.4% Results (Max-Min) /Analytical* 12.5% 146.5% 52.8% 1.3% 4.9% 1.3% 288.7% 58.9% 40.1% 1.5% 3.2% 144.8% 110.0% 4.9% 100.3% 5.7%	1697 TUD -35 -16 -51 -3567 13 -17 36 -2285 -2241 45 40 -1330 10 24	1697 Analytical HTAL1 -35 -16 -52 -3567 -13 -17 -2286 -2240 -1330 10 24	HTAL2 -35 -17 -52 -3568 -14 -18 -2286 -2245 -40 -1330 -11 -24	Tested Prg
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CE200-CE100 Del Q coil,s (k) Case CE110-CE100 CE120-CE110 CE120-CE110 CE120-CE100 CE140-CE130 CE140-CE150 CE160-CE150 CE165-CE160 CE170-CE150 CE180-CE150 CE180-CE150 CE190-CE180 CE190-CE150 CE165-CE160 CE170-CE150 CE180-CE150 CE180-CE150 CE165-CE160 CE170-CE150 CE180-CE150 CE180-CE170 CE185-CE180	1698 Wh,t) CA-SIS -16 -51 -3567 -3567 -37 -2285 -2241 -311 -444 -1316 -314 -476 Wh,t) CA-SIS -207 -2085 -2241 -1329 -100 -00 -00 -00 -00 -00 -00 -00 -00 -0	1636 CLM2000 EDF -34 -17 -51 -3581 -21 -3568 12 -17 -37 -2285 -2240 -1330 24 -1346 13 415 CLM2000 EDF 0 0 0 0 739 0 0 2218 2218	DOE21E CIEMAT -38 -40 -78 -3608 0 -26 -51 -2317 -2250 -666 -55 -1350 7 23 -1382 10 472 DOE21E CIEMAT 0 0 0 0 7399 0 0 2218 2218 2218	1728 DOE21E NREL -38 -16 -55 -3579 -21 -3561 30 -17 -40 -2288 -2179 -46 -1394 18 23 -1418 20 509 DOE21E NREL 0 0 0 742 -2 1 -3 2186 2189 2	E+ GARD -35 -16 -51 -3581 -21 -3567 -33 -17 -36 -2285 -2289 -46 -39 -1331 -10 -23 -1347 -13 -477	TRN-id TUD -35 -16 -51 -3567 -37 -2285 -224 -40 -1330 -17 TRN-id 10 -24 -1346	TRN-re TUD -3565 -16 -51 -3565 -36 -2283 -21 -3565 -16 -36 -2283 -2283 -2283 -2289 -1345 -40 -1329 -1345 -12 -170 0 0 0 0 0 0 739 0 0 0 2218 2218 2218	1636 Statis Min -38 -40 -78 -3608 0 -21 -3608 0 -26 -36 -2317 -2250 44 11 -1394 7 23 -1418 10 0 0 0 0 733 -2 0 -33 2186 2189 0	1728 stics, All -34 -16 -51 -3578 -20 -3561 30 -16 -51 -2283 -2179 109 -55 -1329 18 24 -1316 20 -309 stics, All Max 0 0 0 742 1 1 2219 2218 2	5.4% Results (Max-Min) /Analytical* 12.5% 146.5% 52.8% 1.3% 4.9% 1.3% 228.7% 58.9% 40.1% 1.5% 3.2% 64.110.0% 4.9% 7.6% 7.6% 81.6% 19.7% Results (Max-Min) /Analytical* 1.2% 1.5% 1.3% 1.5% 1.3%	TUD -35 -16 -51 -3567 -13 -17 -36 -2285 -2241 -45 -40 -1330 -1346 -124 -1346 -124 -76 TUD 0 0 0 0 0 0 739 0 0 0 2218 2218 2218	1697 Analytical HTAL1 -35 -16 -52 -3587 -337 -2286 -2240 45 40 -1330 10 24 -1347 124 -7347 124 -7347 120 0 0 0 739 0 0 0 739 0 0 0 2218 2218	HTAL2 -355 -17 -52 -3568 -14 -18 -38 -2286 -2241 -45 -40 -1330 -1346 -124 -1346 -124 -1346 -124 -7346 -7346 -7346 -7346 -7346 -7346 -7346 -7346 -7346 -7346 -7346 -7346 -7346 -7346 -7347	Tested Prg Org Org 01-Jan-10 Tested Prg
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CE200-CE100 Del Q coil,s (k) Case CE110-CE100 CE120-CE110 CE120-CE110 CE130-CE100 CE140-CE130 CE160-CE150 CE160-CE150 CE180-CE150 CE180-CE150 CE190-CE180 CE190-CE180 CE190-CE180 CE190-CE180 CE190-CE100 Del Qcoil,lat (k) Case CE110-CE100 CE120-CE110 CE120-CE110 CE120-CE110 CE120-CE110 CE120-CE110 CE120-CE110 CE120-CE100 CE140-CE150 CE140-CE150 CE140-CE150 CE165-CE160 CE170-CE150 CE165-CE150 CE160-CE150 CE160-CE150 CE160-CE150 CE180-CE150 CE180-CE170 CE180-CE170 CE180-CE170 CE180-CE170 CE180-CE170	1698 Wh,t) CA-SIS -16 -51 -3567 -3567 -37 -2285 -2241 -311 -444 -1316 -314 -476 Wh,t) CA-SIS -207 -2085 -2241 -1329 -100 -00 -00 -00 -00 -00 -00 -00 -00 -0	1636 CLM2000 EDF -34 -17 -51 -3581 -21 -3568 12 -17 -37 -2285 -2240 -1330 24 -1346 13 415 CLM2000 EDF 0 0 0 0 739 0 0 2218 2218	1693 DOE21E CIEMAT -388 -40 -78 -3608 0 -26 51 -2317 -2250 65 55 -1350 7 23 -1382 10 472 DOE21E CIEMAT 0 0 0 739 0 0 2218 2218 2218 0 -2587	1728 DOE21E NREL -38 -16 -55 -3579 -21 -3561 30 -17 -40 -2288 -2179 109 46 -1394 188 20 -1418 20 -1	E+ GARD -35 -16 -51 -3581 -21 -3567 13 -17 -36 -2285 -2239 49 -1331 10 0 23 -1347 13 477 E+ GARD 0 0 0 733 -1 1 1 2211 2210 2 -2576	TRN-id TUD -35 -16 -51 -3567 -13 -17 -2285 -2240 -40 -1330 -10 -24 -1346 -12 -477 TRN-id TUD 0 0 0 0 739 0 0 739 0 0 -2218 2218 2218 0 -2587	TRN-re TUD -35 -16 -51 -3578 -21 -3565 13 -16 -2283 -239 -24 -1329 9 24 -1345 12 479 TRN-re TUD 0 0 0 739 0 0 739 0 0 2218 2218 2218 0 -2587	1636 Statis Min -38 -40 -78 -3608 0 -21 -3608 0 -26 -36 -2317 -2250 44 11 -1394 7 23 -1418 10 0 0 0 0 733 -2 0 -33 2186 2189 0	1728 stics, All -34 -16 -51 -51 -3578 -20 -3561 30 -16 51 -2283 -2179 109 -55 -1329 188 24 -1316 20 -3565, All Max 0 0 0 742 1 1 2219 2218 22-2562	5.4% Results (Max-Min) /Analytical* 12.5% 146.5% 52.8% 1.3% 4.9% 1.3% 228.7% 58.9% 40.1% 1.5% 3.2% 64.110.0% 4.9% 7.6% 7.6% 81.6% 19.7% Results (Max-Min) /Analytical* 1.2% 1.5% 1.3% 1.5% 1.3%	TUD -35 -16 -51 -3567 -13 -17 -36 -2285 -2241 -45 -40 -1330 -1346 -124 -1346 -124 -76 TUD 0 0 0 0 0 0 739 0 0 0 2218 2218 2218	1697 Analytical HTAL1 -35 -16 -52 -3587 -13 -17 -2286 -2240 -40 -1330 -10 -24 -1347 -12 -476 Analytical HTAL1 0 0 0 0 739 0 0 739 0 0 2218 2218 2218 0 -2587	HTAL2 -355 -17 -52 -3568 -14 -18 -38 -2286 -2241 -45 -40 -1330 -1346 -124 -1346 -124 -1346 -124 -7346 -7346 -7346 -7346 -7346 -7346 -7346 -7346 -7346 -7346 -7346 -7346 -7346 -7346 -7347	Tested Prg Org Org 01-Jan-10 Tested Prg
CE200-CE100 Del Q coil,s (k) Case CE110-CE100 CE120-CE110 CE120-CE110 CE120-CE100 CE140-CE130 CE140-CE150 CE160-CE150 CE160-CE150 CE180-CE150 CE180-CE150 CE190-CE140 CE190-CE140 CE190-CE140 CE190-CE140 CE190-CE140 CE190-CE140 CE190-CE150 CE200-CE100 Del Qcoil,lat (k) Case CE110-CE100 CE120-CE110 CE120-CE110 CE120-CE100 CE140-CE150 CE180-CE150 CE180-CE150 CE180-CE150 CE180-CE150 CE180-CE150 CE180-CE150 CE165-CE160 CE170-CE150 CE180-CE150 CE180-CE150 CE180-CE170 CE185-CE180 CE190-CE180 CE190-CE180 CE190-CE180 CE190-CE180 CE190-CE180 CE190-CE180 CE190-CE180 CE195-CE180 CE190-CE180 CE195-CE180	1698 Wh,t) CA-SIS EDF -356 -16 -51 -3581 -21 -3567 -37 -2285 -2241 -11 -1329 -10 -24 -1316 -37 -24 -1316 -38 -24 -1316 -39 -24 -1316 -17 -7 -2285 -2241 -1316 -17 -17 -17 -18 -18 -18 -18 -18 -18 -18 -18 -18 -18	1636 CLM2000 EDF -34 -17 -51 -3588 12 -17 -37 -2285 -2240 -1330 10 24 -1346 13 415 CLM2000 EDF 0 0 0 0 739 0 0 739 0 0 2218 2218 2218 2218 2218 2218 2218	DOE21E CIEMAT -38 -40 -78 -3608 0 -26 -51 -2317 -22317 -2250 -3608 55 -1350 7 23 -1382 10 472 DOE21E CIEMAT 0 0 0 0 739 0 0 2218 2218 2218 2218 0 -2587	1728 DOE21E NREL -38 -16 -55 -3579 -21 -3561 30 -17 -40 -2288 -2179 -46 -1394 -18 -23 -1418 -20 -20 -20 -20 -21 -3561 -17 -40 -2288 -2179 -40 -2288 -2179 -40 -2288 -2179 -40 -2288 -2179 -21 -3 -3 -1418 -3 -3 -1418 -3 -3 -1418 -3 -3 -1418 -3 -3 -1418 -3 -3 -3 -3 -3 -3 -3 -3 -3 -3 -3 -3 -3	E+ GARD -35 -16 -51 -3567 -336 -21 -3567 -336 -2285 -2289 -46 -39 -1331 -10 -23 -1347 -13 -477	TRN-id TUD -35 -16 -51 -3567 -13 -7 -2285 -2240 -40 -1330 -17 -17 -18 -19 -19 -19 -19 -19 -19 -19 -19 -19 -19	TRN-re TUD -3565 -16 -51 -3565 -13 -16 -36 -2283 -239 -45 -40 -1329 -24 -1345 -12 -479 TRN-re TUD 0 0 0 0 739 0 0 0 739 0 0 2218 2218 2218 0 -2587 370 0 0 -2587	1636 Statis Min -38 -40 -78 -3608 0 -21 -3608 0 -2317 -2250 44 11 -1394 7 23 -1418 10 0 415 Statis Min 0 0 0 733 -22 0 -3 2186 2189 0 -2588 366 0 -2589	1728 stics, All -34 -16 -51 -3578 -20 -3561 30 -16 51 -2283 -2179 -55 -1329 18 24 -1316 20 -3561 20 -10 -10 -10 -10 -10 -10 -10 -10 -10 -1	5.4% Results (Max-Min) /Analytical* 12.5% 146.5% 52.8% 1.3% 4.9% 1.3% 228.7% 58.9% 40.1% 1.5% 3.2% 110.0% 4.9% 100.3% 110.0% 4.9% 100.3% 110.0% 144.8% 110.0% 144.8% 110.0% 145.7% 7.6% 81.6% 19.7% Results (Max-Min) /Analytical* 1.2% 1.2% 1.3% 1.3% 1.0% 1.3% 1.0% 1.0% 1.0% 1.0% 1.0% 1.0% 1.0% 1.0	TUD -35 -16 -51 -3567 13 -17 -3567 13 -17 -36 -2285 -2241 -45 -40 -1330 10 0 24 -1346 12 -476 TUD 0 0 0 0 0 0 739 0 0 0 739 0 0 2218 2218 2218 2218 2218 0 -2588 370 0 -2588	1697 Analytical HTAL1 -35 -16 -52 -3587 -37 -2286 -2240 -40 -1330 -17 -1347 -124 -1347 -124 -1347 -124 -1347 -124 -1347 -124 -1347 -124 -1347 -124 -1347 -124 -1347 -124 -1347 -124 -1347 -125 -1347 -124 -1347 -124 -1347 -124 -1347 -124 -1347 -125 -1347	HTAL2 -35 -17 -52 -3568 -14 -18 -38 -2286 -2241 -40 -1330 -1346 -124 -1346 -124 -1346 -124 -76 HTAL2 0 0 0 0 739 0 0 0 739 0 0 -217 2217 2217 0 -2586 370 0 -2587	Tested Prg Org Org 01-Jan-10 Tested Prg
CE200-CE100 Del Q coil,s (kV Case CE110-CE100 CE120-CE110 CE120-CE110 CE120-CE100 CE140-CE130 CE140-CE150 CE160-CE150 CE160-CE150 CE180-CE150 CE180-CE150 CE190-CE180 CE190-CE180 CE190-CE180 CE190-CE180 CE190-CE180 CE190-CE180 CE190-CE180 CE195-CE195 CE185-CE180 CE195-CE195 CE185-CE180 CE195-CE195 CE195-CE180 CE10-CE100 CE120-CE110 CE120-CE100 CE140-CE150 CE140-CE150 CE140-CE150 CE140-CE150 CE160-CE150 CE160-CE150 CE160-CE150 CE160-CE150 CE160-CE150 CE180-CE150	1698 Wh,t) CA-SIS EDF 0 35 -16 -51 -3567 13 -17 -37 -2285 -2241 11 -1329 10 24 -1316 13 476 Wh,t) CA-SIS EDF 0 0 0 7399 1 1 2219 2218 1 -2588 370 0	1636 CLM2000 EDF -34 -17 -51 -3581 -21 -3568 12 -17 -37 -2285 -2240 45 40 -1330 24 -1346 -1346 CLM2000 EDF 0 0 0 0 739 0 0 739 0 0 2218 2218 2218 2218 0 -2587 370 0	DOE21E CIEMAT -388 -40 -78 -3608 0 -26 -51 -2317 -2250 -66 -55 -1350 0 472 DOE21E CIEMAT 0 0 0 739 0 0 739 0 0 2218 2218 2218 2218 2218 7 7 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1728 DOE21E NREL -38 -16 -55 -3579 -21 -3561 30 -17 40 -2288 -2179 46 -1394 23 -1418 23 -1418 23 -1418 0 00 0 0 742 -2 1 -3 2186 2189 2 -2562 366 0	E++ GARD -35 -16 -51 -3581 -21 -3567 -33 -17 -36 -2285 -2289 -46 -39 -1331 -10 -23 -1347 -13 -477	TRN-id TUD -35 -16 -51 -3567 -37 -2285 -2240 -45 -40 -1330 -1346 -1346 -142 -1346 -10 0 0 0 0 739 0 0 0 739 0 0 0 2218 2218 2218 0 -2587 370 0	TRN-re TUD -3565 -16 -511 -3578 -21 -3565 -36 -2283 -2283 -2283 -2283 -2283 -2283 -2283 -2283 -2283 -24 -1345 -16 0 0 0 0 0 0 739 0 0 0 739 0 0 0 2218 2218 2218 0 -2587 370 0	1636 Statis Min -38 -40 -78 -3608 0 -21 -3608 0 -2317 -225 44 11 -1394 11 -1394 1415 Statis Min 0 0 0 733 -2 -3 2186 2189 0 -2588 366 0	1728 stics, All Max -34 -16 -51 -3578 -20 -3561 30 -16 -51 -2283 -2179 109 -55 -1329 24 -1316 20 -509 stics, All Max 0 0 0 742 1 1 1 2219 2218 22-2562 370 0	5.4% Results (Max-Min) /Analytical* 12.5% 146.5% 52.8% 1.3% 4.9% 1.3% 4.9% 1.0% 58.9% 40.1% 1.5% 58.9% 40.1% 1.5% 6100.3% 61.6% 110.0% 81.6% 11.6% 11.6% 11.2% 1.2% 1.5% 1.3% 1.5% 1.3% 1.0%	TUD -35 -16 -51 -3567 13 -17 -36 -2285 -2241 -45 -40 -1330 10 24 -1346 12 -476 TUD 0 0 0 0 739 0 0 0 739 0 0 2218 2218 2218 2218 370 0	1697 Analytical HTAL1 -35 -16 -52 -3581 -21 -3567 13 -17 -2286 -2240 45 40 -1330 24 -1347 12 476 Analytical HTAL1 0 0 0 0 739 0 0 0 739 0 0 2218 2218 2218 0 -2587 370 0	HTAL2 -355 -17 -52 -3568 -14 -18 -38 -2286 -2241 -45 -40 -1330 -1346 -124 -1346 -146 -146 -146 -146 -146 -146 -146 -1	Tested Prg Org Org 01-Jan-10 Tested Prg

^{*} ABS[(Max-Min) / (Mean of Analytical Solutions)]

Table B16.5.1-9. Indoor Drybulb Temperature: Mean and (Max-Min)/Mean

Mean IDB	(°C)						_	Static	tics, All Re	aculte			Ī	01-Jan-10
linouri ibb		CLM2000	DOE21E	DOE21E	E+	TRN-id	TRN-re	Otatio	1103, 7111 111	(Max-Min)		Analytical		Tested Prg
Case	EDF	EDF	CIEMAT	NREL	GARD	TUD	TUD	Min	Max	/Analytical*	TUD	HTAL1	HTAL2	Org
CE100	22.2	22.2	22.3	22.3	22.2	22.2	22.6	22.2	22.6	2.0%	22.2	22.2	22.2	Oig
CE110	22.2	22.2	22.3	22.3	22.2	22.2	22.5	22.2	22.5	1.5%	22.2	22.2	22.2	
CE120	26.7	26.7	26.8	26.7	26.7	26.7	27.1	26.7	27.1	1.4%	26.7	26.7	26.7	
CE130	22.2	22.2	22.1	22.1	22.2	22.2	21.6	21.6	22.2	2.5%	22.2	22.2	22.2	
CE140	22.2	22.2	22.1	22.1	22.2	22.2	21.5	21.5	22.2	3.1%	22.2	22.2	22.2	
CE150	22.2	22.2	22.3	22.3	22.2	22.2	22.7	22.2	22.7	2.1%	22.2	22.2	22.2	
CE160	26.7	26.7	26.8	26.7	26.7	26.7	27.0	26.7	27.0	1.1%	26.7	26.7	26.7	
CE165	23.3	23.3	23.4	23.4	23.3	23.3	23.8	23.3	23.8	2.1%	23.3	23.3	23.3	
CE170	22.2	22.2	22.2	22.2	22.2	22.2	22.1	22.1	22.2	0.5%	22.2	22.2	22.2	
CE180	22.2	22.2	22.3	22.3	22.2	22.2	22.3	22.2	22.3	0.6%	22.2	22.2	22.2	
CE185	22.2	22.2	22.3	22.3	22.2	22.2	22.4	22.2	22.4	0.8%	22.2	22.2	22.2	
CE190	22.2	22.2	22.1	22.1	22.2	22.2	21.9	21.9	22.2	1.1%	22.2	22.2	22.2	
CE195	22.2	22.2	22.1	22.1	22.2	22.2	22.0	22.0	22.2	0.9%	22.2	22.2	22.2	
CE200	26.7	26.7	26.8	26.8	26.7	26.7	26.7	26.7	26.8	0.4%	26.7	26.7	26.7	
(Max - Min	n)/Mean IDB	(°C)						Statis	tics, All Re	esults				01-Jan-10
		CLM2000	DOE21E	DOE21E	E+	TRN-id	TRN-re			(Max-Min)		Analytical		Tested Prg
Case	EDF	EDF	CIEMAT	NREL	GARD	TUD	TUD	Min		/Analytical*	TUD	HTAL1	HTAL2	Org
CE100	0.000	0.000	0.000	0.000	0.000	0.000	0.049	0.000	0.049		0.000		0.002	
CE110	0.000	0.000	0.000	0.000	0.000	0.000	0.048	0.000	0.048		0.000		0.002	
CE120	0.000	0.000	0.000	0.000	0.000	0.000	0.077	0.000	0.077		0.000		0.002	
CE130	0.000	0.000	0.000	0.000	0.000	0.000	0.056	0.000	0.056		0.000		0.001	
CE140	0.000	0.000	0.000	0.000	0.000	0.000	0.069	0.000	0.069		0.000		0.002	
CE150	0.000	0.000	0.000	0.000	0.000	0.000	0.054	0.000	0.054		0.000		0.002	
CE160	0.000	0.000	0.000	0.000	0.000	0.000	0.045	0.000	0.045		0.000		0.002	
CE165	0.000	0.000	0.000	0.000	0.000	0.000	0.051	0.000	0.051		0.000		0.002	
CE170	0.000	0.000	0.000	0.000	0.000	0.000	0.050	0.000	0.050		0.000		0.001	
CE180	0.000	0.000	0.000	0.000	0.000	0.000	0.035	0.000	0.035		0.000		0.001	
CE185	0.000	0.000	0.000	0.000	0.000	0.000	0.021	0.000	0.021		0.000		0.001	
CE190	0.000	0.000	0.000	0.000	0.000	0.000	0.028	0.000	0.028		0.000		0.001	
CE195 CE200	0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.023 0.000	0.000 0.000	0.023 0.000		0.000 0.000		0.001 0.000	

^{*} ABS[(Max-Min) / (Mean of Analytical Solutions)]

Table B16.5.1-10. Humidity Ratio: Mean and (Max-Min)/Mean

Mean Humidity Ratio								Statistics, All Results					01-Jan-10	
	CA-SIS	CLM2000	DOE21E	DOE21E	E+	TRN-id	TRN-re			(Max-Min)		Analytical		Tested Prg
Case	EDF	EDF	CIEMAT	NREL	GARD	TUD	TUD	Min	Max	/Analytical*	TUD	HTAL1	HTAL2	Org
CE100	0.0075	0.0069	0.0076	0.0074	0.0075	0.0075	0.0075	0.0069	0.0076	9.4%	0.0074	0.0073	0.0073	
CE110	0.0066	0.0069	0.0070	0.0064	0.0066	0.0066	0.0066	0.0064	0.0070	9.8%	0.0065	0.0064	0.0064	
CE120	0.0080	0.0070	0.0078	0.0078	0.0080	0.0080	0.0080	0.0070	0.0080	13.2%	0.0079	0.0079	0.0079	
CE130	0.0075	0.0069	0.0076	0.0073	0.0075	0.0075	0.0075	0.0069	0.0076	9.4%	0.0074	0.0073	0.0073	
CE140	0.0065	0.0069	0.0071	0.0064	0.0066	0.0066	0.0066	0.0064	0.0071	10.2%	0.0065	0.0064	0.0064	
CE150	0.0083	0.0085	0.0082	0.0083	0.0084	0.0083	0.0085	0.0082	0.0085	4.0%	0.0082	0.0082	0.0082	
CE160	0.0102	0.0101	0.0097	0.0099	0.0103	0.0101	0.0102	0.0097	0.0103	5.8%	0.0100	0.0099	0.0099	
CE165	0.0093	0.0099	0.0090	0.0092	0.0094	0.0093	0.0095	0.0090	0.0099	9.2%	0.0093	0.0092	0.0092	
CE170	0.0106	0.0107	0.0105	0.0105	0.0106	0.0105	0.0105	0.0105	0.0107	2.2%	0.0104	0.0105	0.0105	
CE180	0.0164	0.0164	0.0166	0.0164	0.0162	0.0163	0.0164	0.0162	0.0166	2.6%	0.0162	0.0162	0.0162	
CE185	0.0162	0.0171	0.0164	0.0162	0.0161	0.0162	0.0163	0.0161	0.0171	6.4%	0.0161	0.0161	0.0161	
CE190	0.0160	0.0161	0.0163	0.0159	0.0159	0.0159	0.0157	0.0157	0.0163	3.5%	0.0158	0.0159	0.0159	
CE195	0.0156	0.0164	0.0158	0.0155	0.0154	0.0155	0.0153	0.0153	0.0164	7.0%	0.0154	0.0154	0.0154	
CE200	0.0114	0.0115	0.0109	0.0111	0.0115	0.0113	0.0113	0.0109	0.0115	5.1%	0.0111	0.0111	0.0111	
(Max - Min)/Mean Humidity Ratio									stics, All Re	esults				01-Jan-10
		CLM2000	DOE21E	DOE21E	E+	TRN-id	TRN-re			(Max-Min)		Analytical		Tested Prg
Case	EDF	EDF	CIEMAT	NREL	GARD	TUD	TUD		Max	/Analytical*	TUD	HTAL1	HTAL2	Org
CE100	0.000	0.022	0.000	0.000	0.001	0.000	0.000	0.0000	0.0217		0.000		0.000	
CE110	0.000	0.022	0.014	0.000	0.000	0.000	0.000	0.0000	0.0217		0.000		0.000	
CE120	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.0000	0.0005		0.000		0.000	
CE130	0.000	0.010	0.000	0.000	0.001	0.000	0.000	0.0000	0.0101		0.000		0.000	
CE140	0.000	0.012	0.014	0.000	0.001	0.000	0.000	0.0000	0.0142		0.000		0.000	
CE150	0.012	0.000	0.000	0.000	0.013	0.000	0.013	0.0000	0.0132		0.000		0.000	
CE160	0.020	0.000	0.010	0.010	0.013	0.000	0.011	0.0000	0.0196		0.000		0.000	
CE165	0.011	0.001	0.011	0.000	0.013	0.000	0.013	0.0000	0.0131		0.000		0.000	
CE170	0.000	0.000	0.010	0.000	0.011	0.000	0.024	0.0000	0.0238		0.000		0.001	
CE180	0.018	0.000	0.012	0.012	0.010	0.000	0.040	0.0000	0.0402		0.000		0.001	
CE185	0.012	0.006	0.018	0.012	0.011	0.000	0.025	0.0000	0.0246		0.000		0.001	
CE190	0.000	0.000	0.018	0.019	0.014	0.000	0.031	0.0000	0.0312		0.000		0.001	
CE195	0.000	0.006	0.019	0.019	0.014	0.000	0.024	0.0000	0.0241		0.000		0.001	
CE200	0.018	0.000	0.009	0.009	0.013	0.000	0.000	0.0000	0.0175		0.000		0.000	

^{*} ABS[(Max-Min) / (Mean of Analytical Solutions)]

Figure B16.5.1-1.
HVAC BESTEST: Mean COP

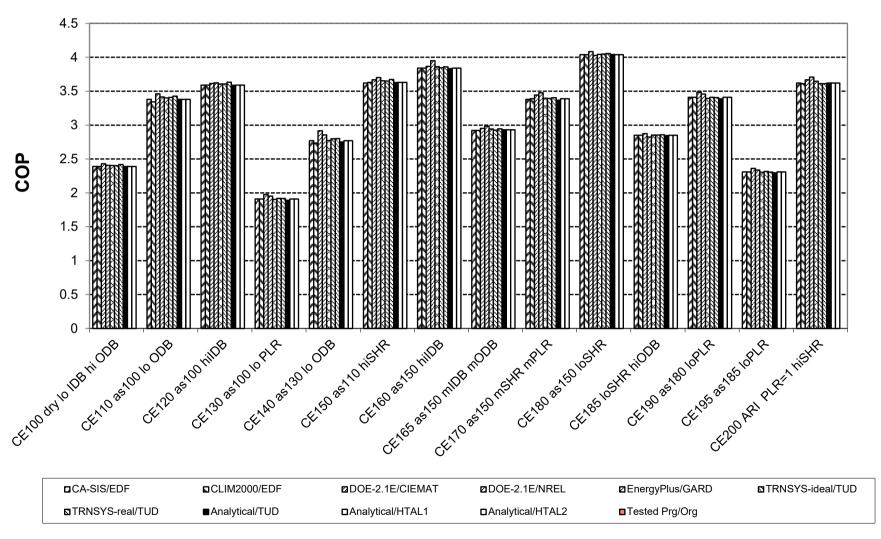


Figure B16.5.1-2.

HVAC BESTEST: (Maximum - Minimum)/Mean COP

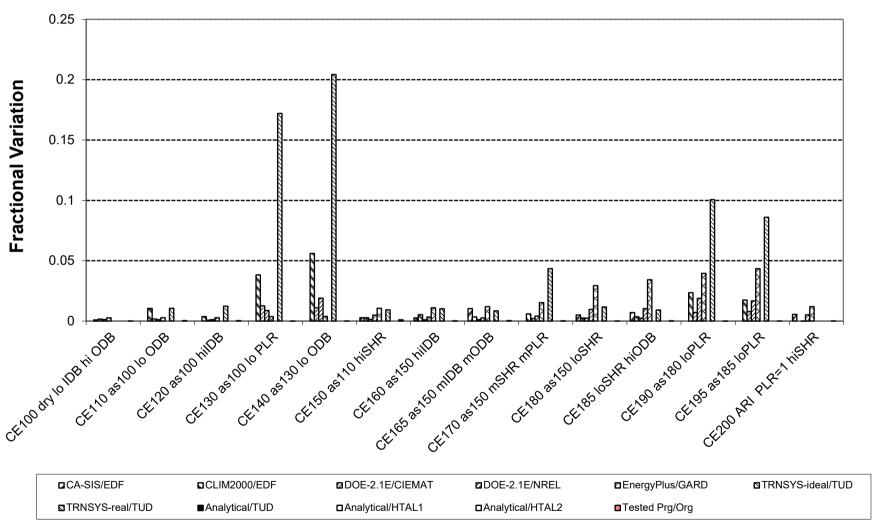


Figure B16.5.1-3.

HVAC BESTEST: Mean COP Sensitivities

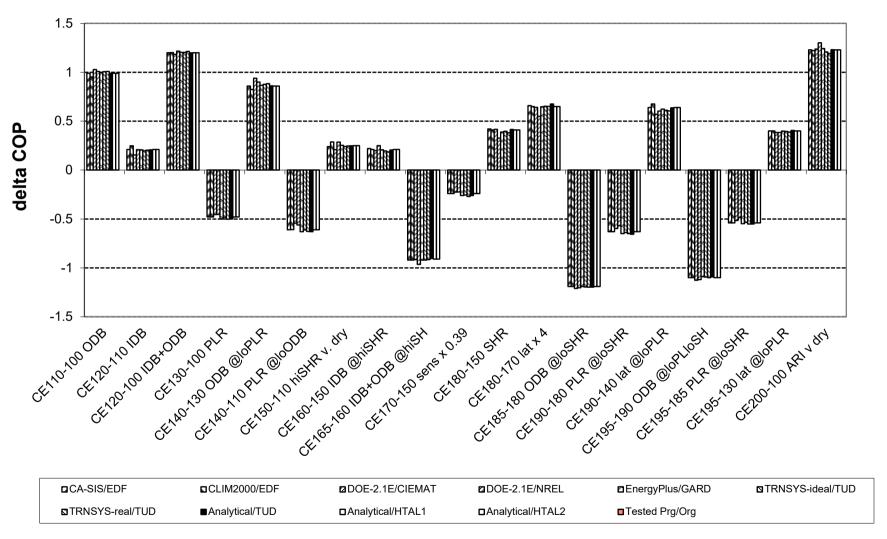


Figure B16.5.1-4.

HVAC BESTEST: Total Space Cooling Electricity Consumption

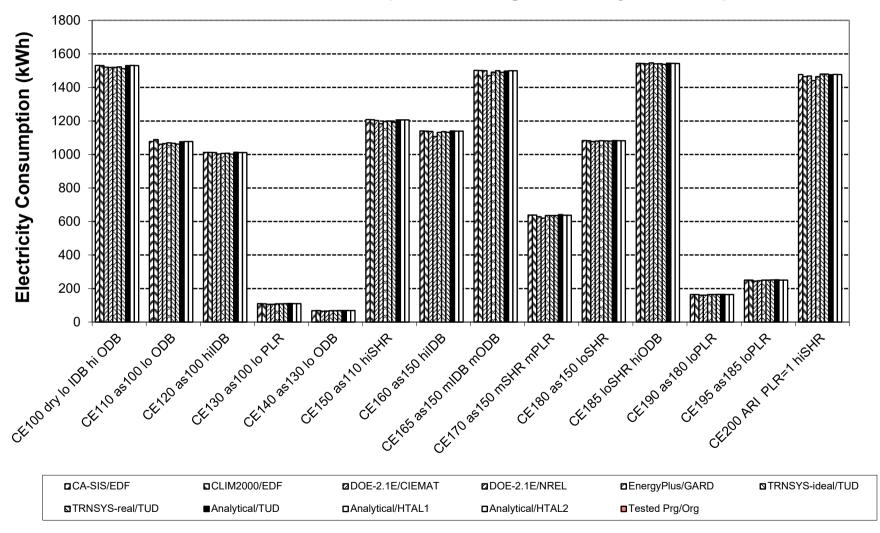


Figure B16.5.1-5.

HVAC BESTEST: Total Space Cooling Electricity Sensitivities

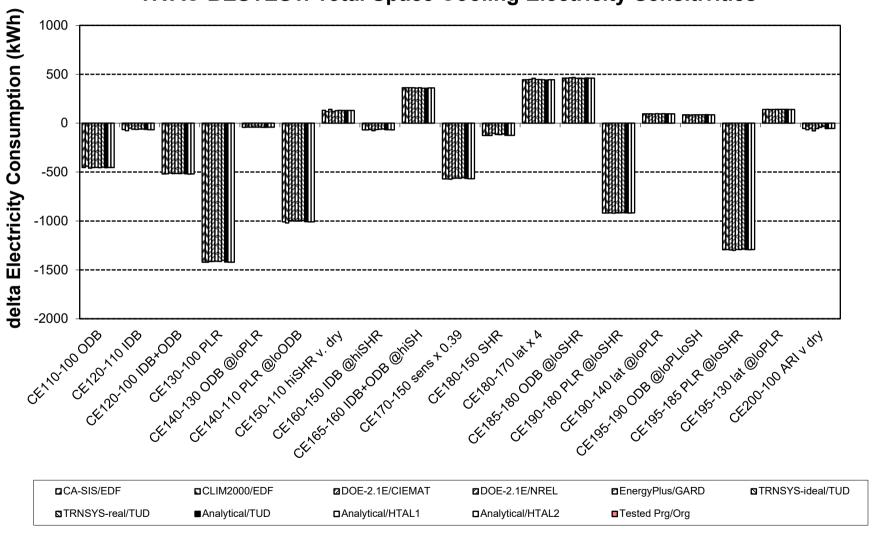


Figure B16.5.1-6.

HVAC BESTEST: Compressor Electricity Consumption

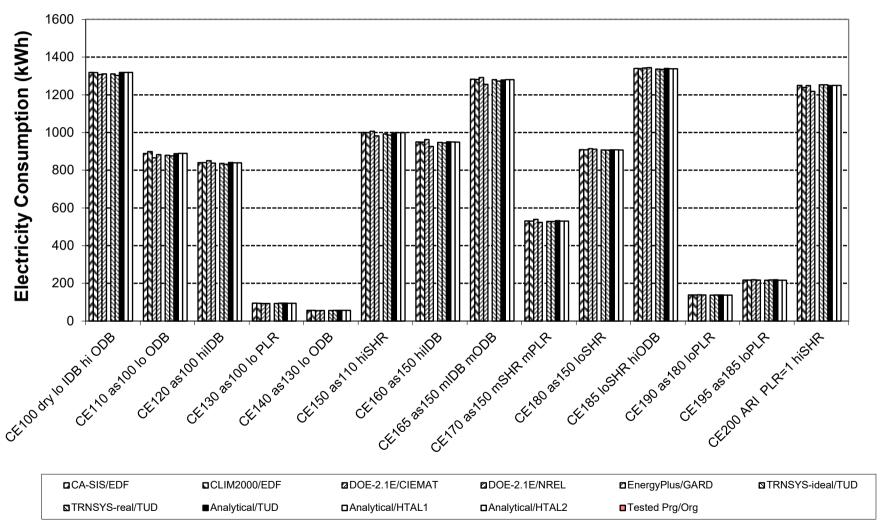


Figure B16.5.1-7.

HVAC BESTEST: Total Compressor Electricity Sensitivities

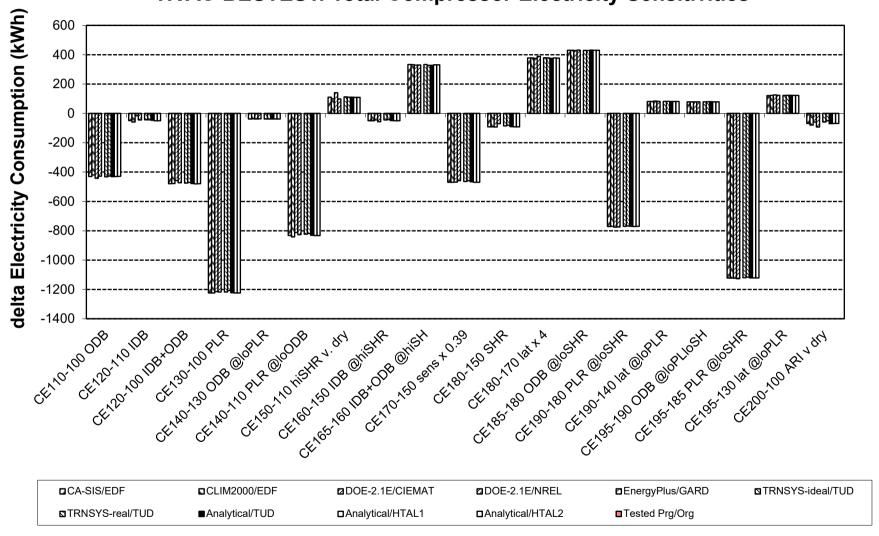


Figure B16.5.1-8.

HVAC BESTEST: Total Indoor (Supply) Fan Electricity Consumption

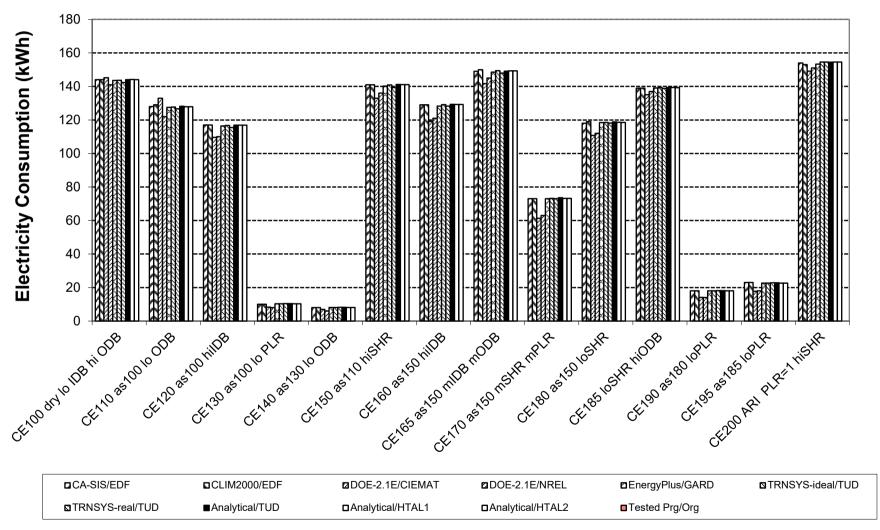


Figure B16.5.1-9.

HVAC BESTEST: Indoor (Supply) Fan Electricity Sensitivities

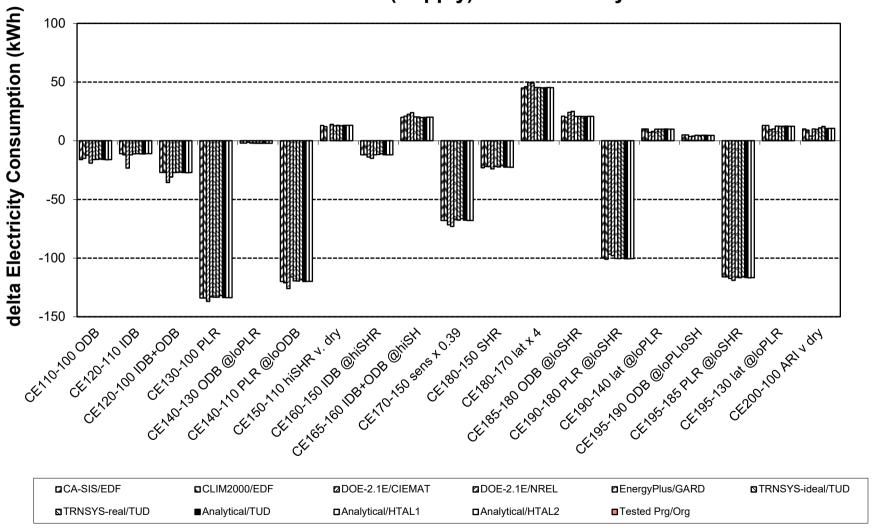


Figure B16.5.1-10.

HVAC BESTEST: Outdoor (Condenser) Fan Electricity Consumption

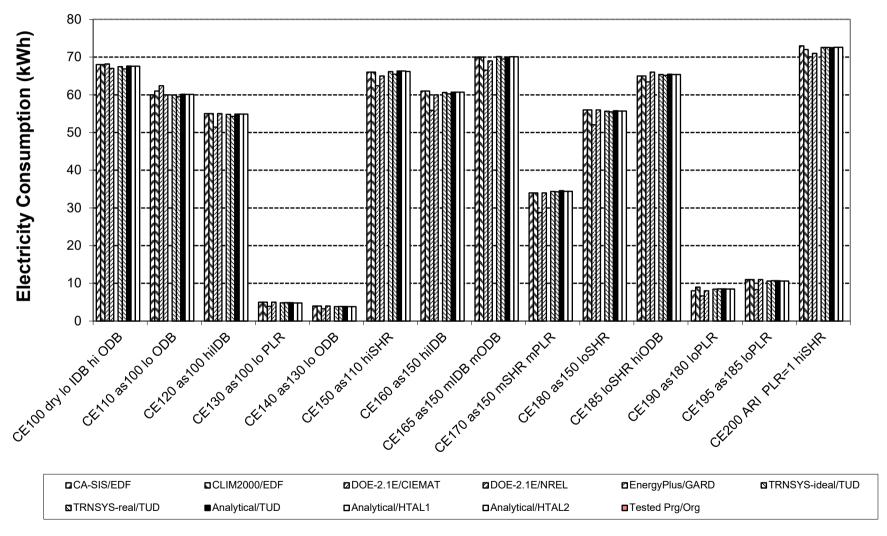


Figure B16.5.1-11.

HVAC BESTEST: Outdoor (Condenser) Fan Electricity Sensitivities

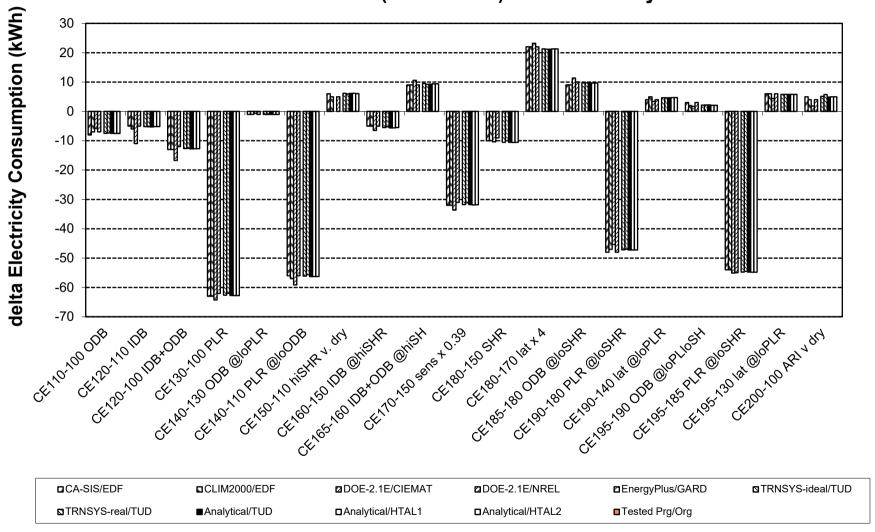


Figure B16.5.1-12.
HVAC BESTEST: Total Coil Load

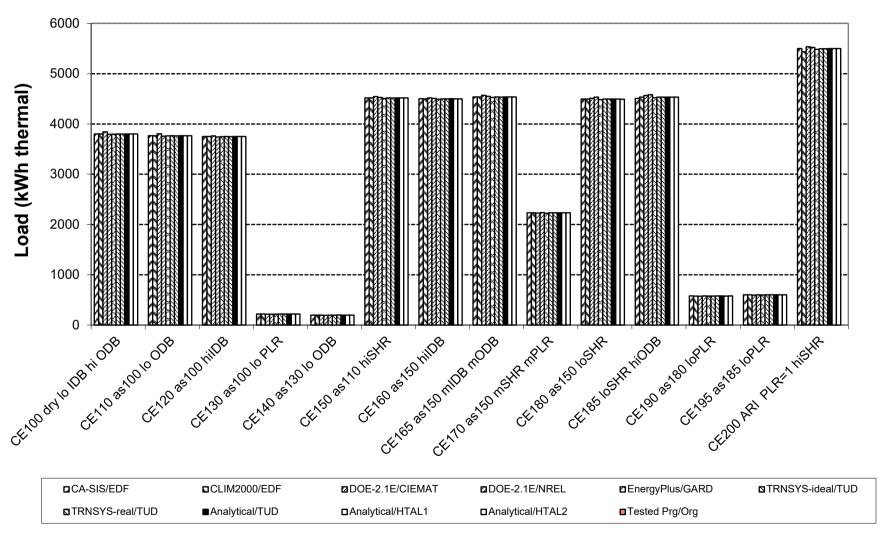


Figure B16.5.1-13.

HVAC BESTEST: Total Coil Load Sensitivities

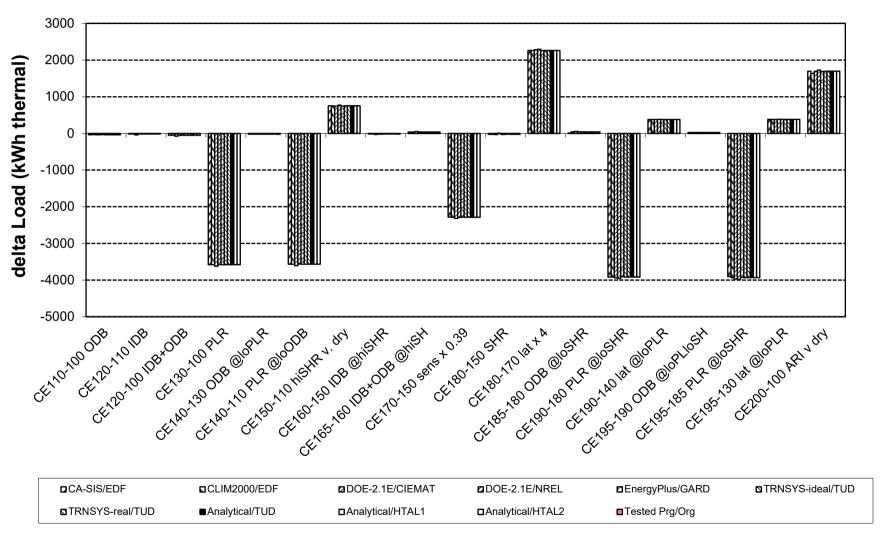


Figure B16.5.1-14.

HVAC BESTEST: Sensible Coil Load

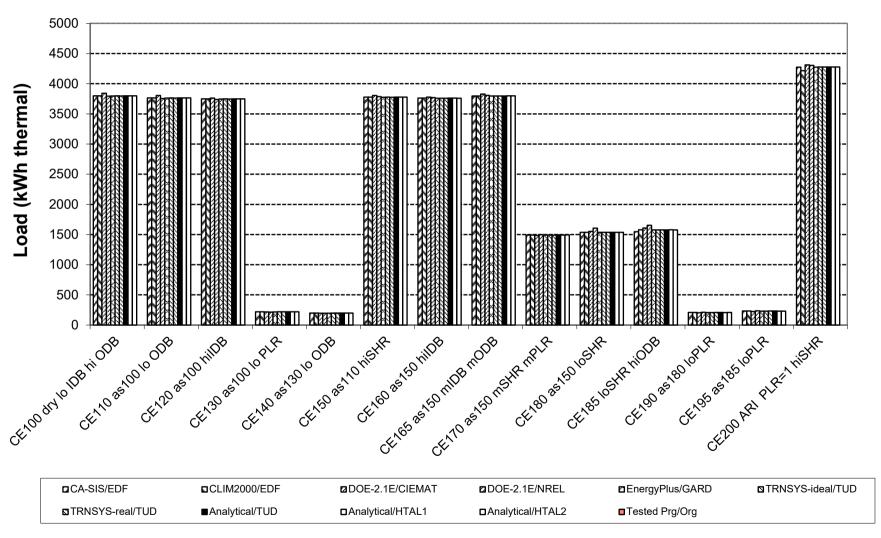


Figure B16.5.1-15.

HVAC BESTEST: Sensible Coil Load Sensitivities

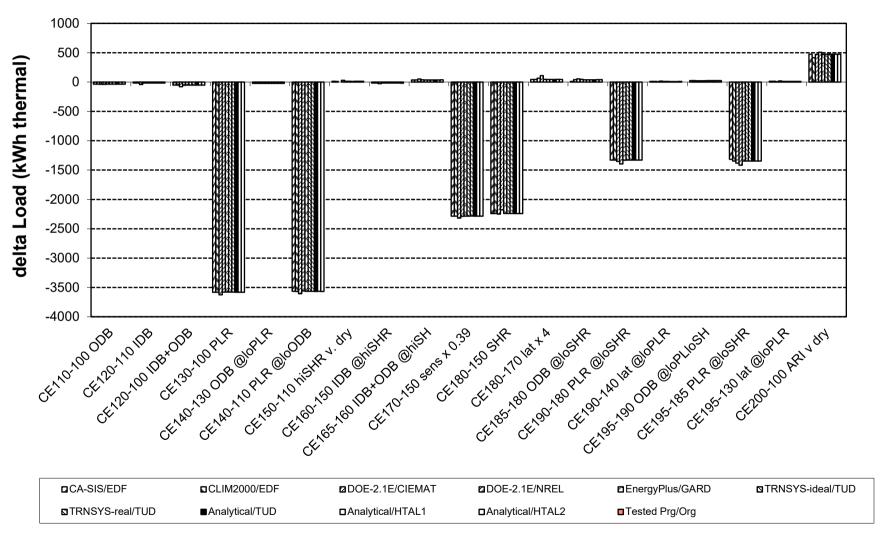


Figure B16.5.1-16.
HVAC BESTEST: Latent Coil Load

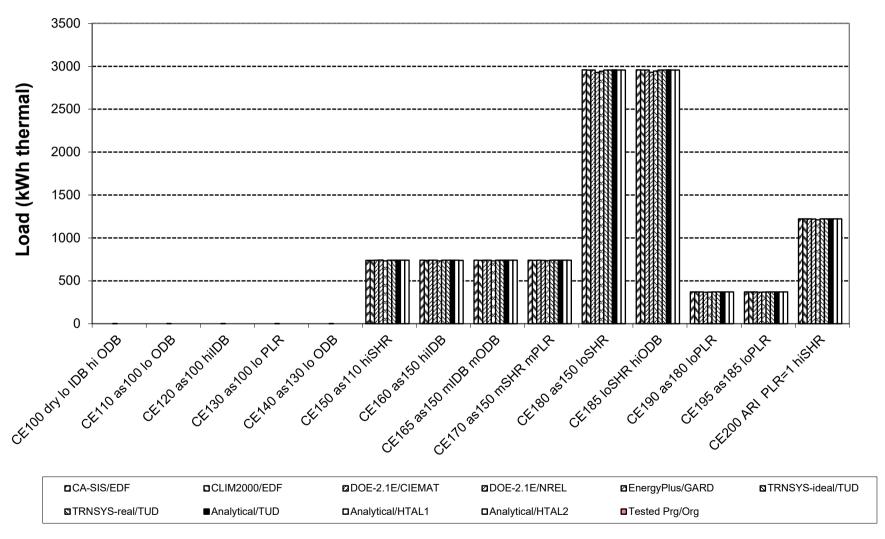


Figure B16.5.1-17.

HVAC BESTEST: Latent Coil Load Sensitivities

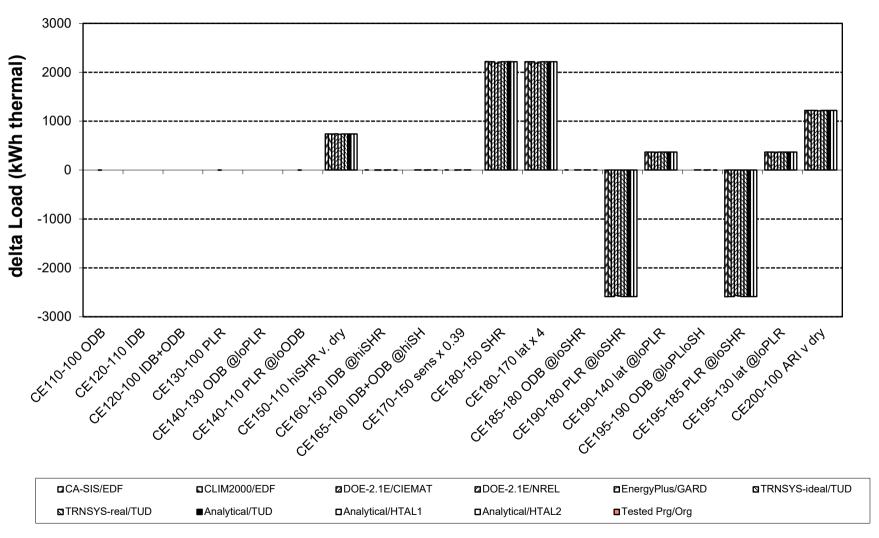


Figure B16.5.1-18.

HVAC BESTEST: Mean Indoor Drybulb Temperature

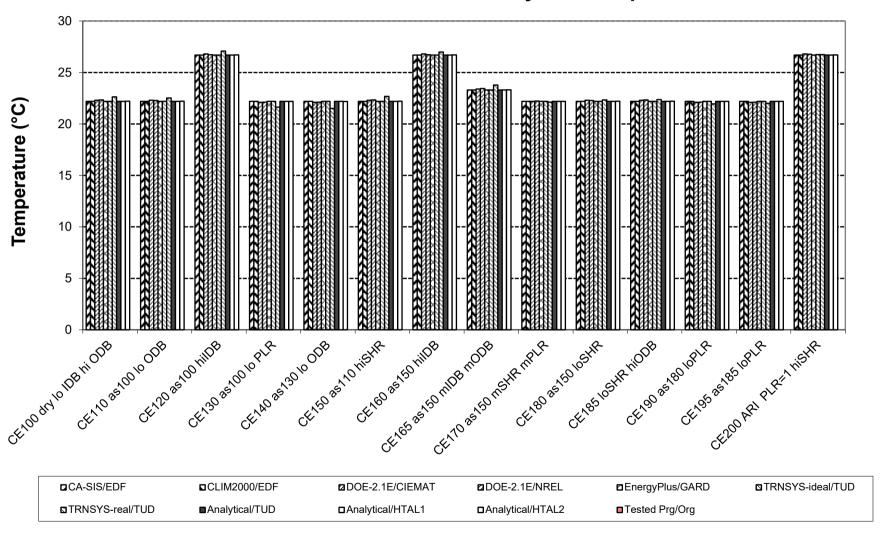


Figure B16.5.1-19.

HVAC BESTEST: (Maximum - Minimum)/Mean Indoor Drybulb

Temperature

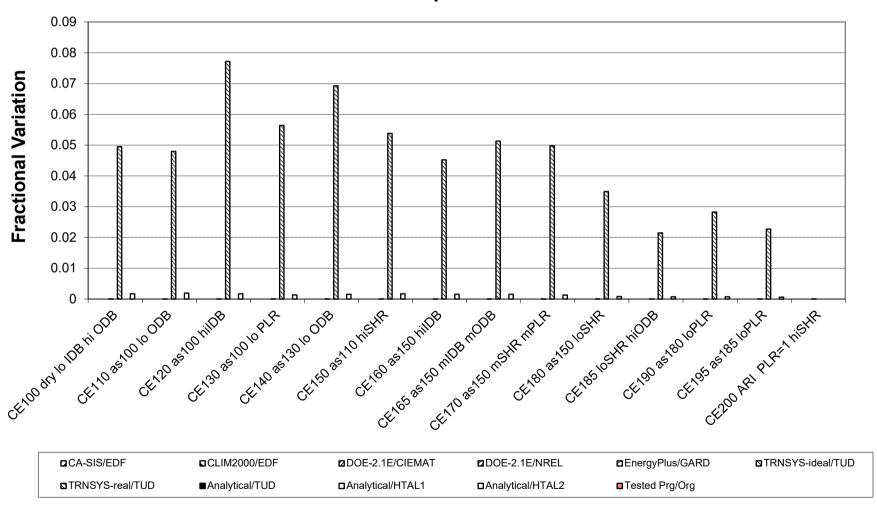


Figure B16.5.1-20.

HVAC BESTEST: Mean Indoor Humidity Ratio

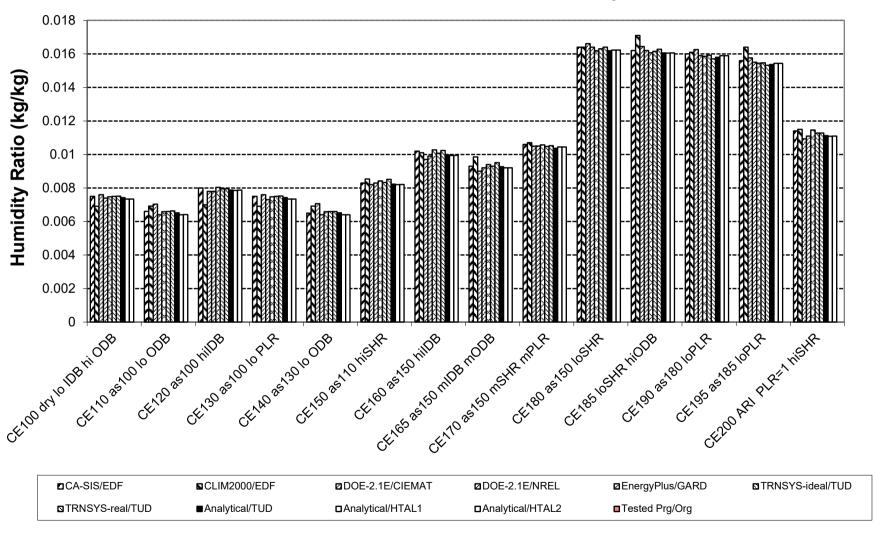


Figure B16.5.1-21.

HVAC BESTEST: (Maximum - Minimum)/Mean Indoor Humidity Ratio

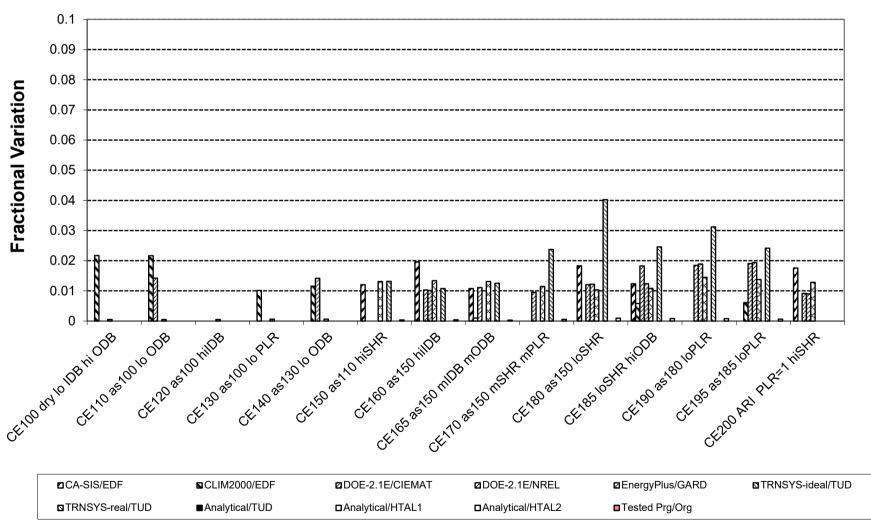


Figure B16.5.1-22.
HVAC BESTEST: Total Zone Load

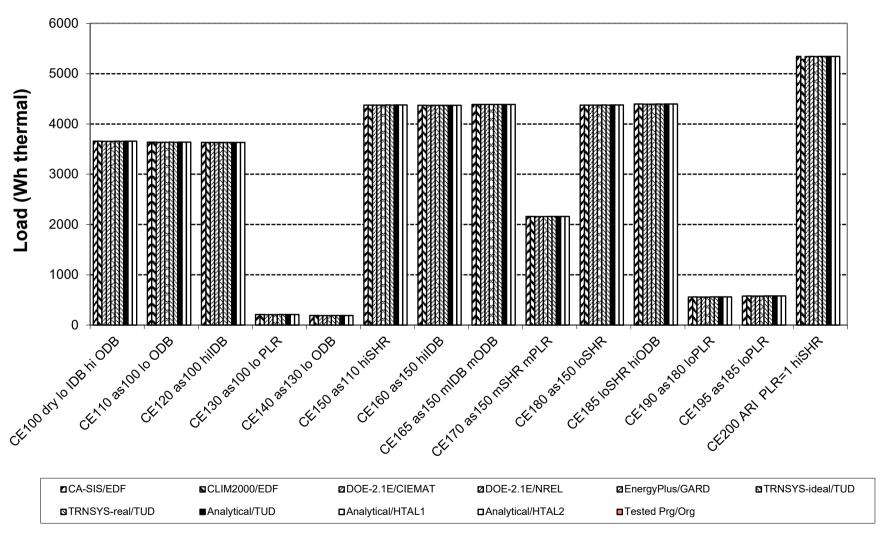


Figure B16.5.1-23.
HVAC BESTEST: Sensible Zone Load

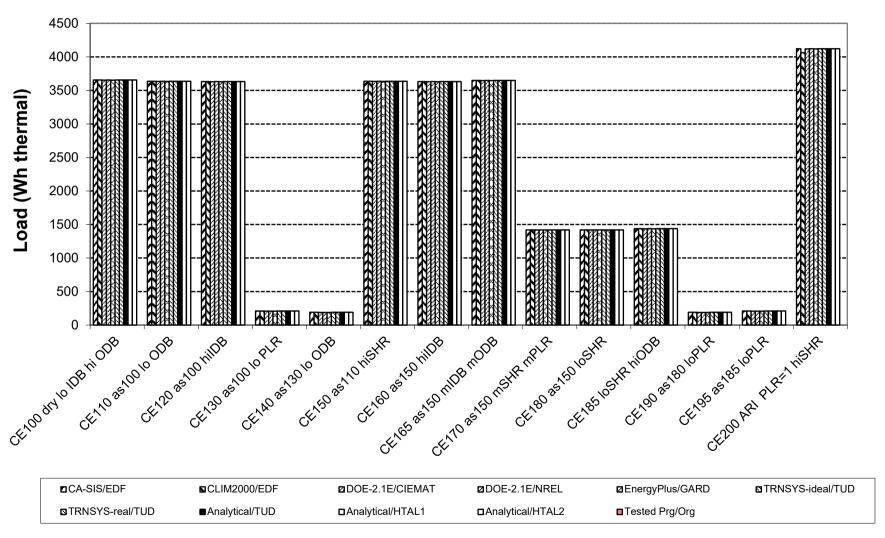


Figure B16.5.1-24.
HVAC BESTEST: Latent Zone Load

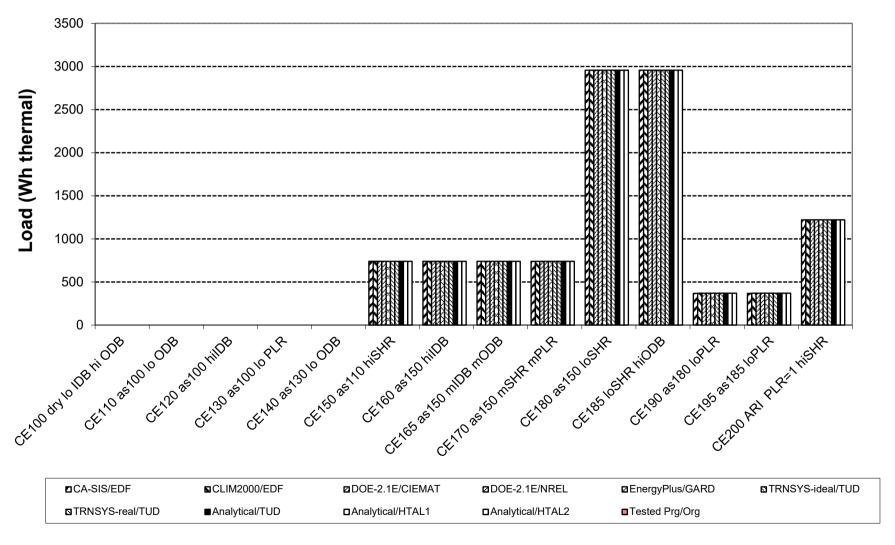


Figure B16.5.1-25.

HVAC BESTEST: Sensible Coil Load - Zone Load (Fan Heat)

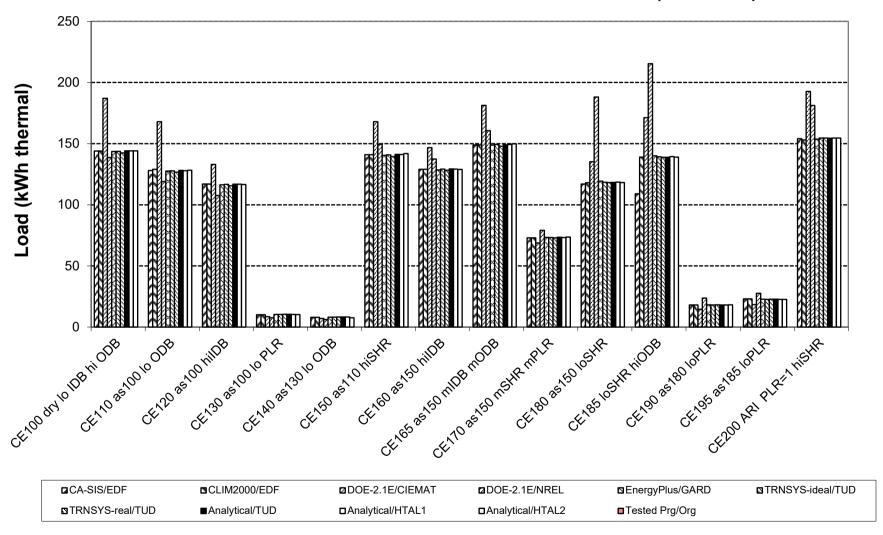


Figure B16.5.1-26.

HVAC BESTEST: Latent Coil Load - Latent Zone Load (Should = 0)

