

APPENDIX E: LIFE-CYCLE COST RESULTS AND DETERMINATION OF 30-YEAR AVERAGE COOLING DEGREE DAY AND HEATING DEGREE DAY DATA

E.1 LIFE-CYCLE COST RESULTS

This appendix provides the frequency and cumulative distribution charts of the life-cycle cost (LCC) results for all the efficiency improvement levels analyzed for central air conditioners and heat pumps. For details on the methodology used to calculate the LCC refer to Chapter 5.

The four sections that follow present the LCC results for each of the following four primary product classes: split system central air conditioners, split system heat pumps, single package central air conditioners, and single package heat pumps. The LCC results are based on the use of ARI manufacturer cost data. In each section, results are presented for efficiency levels of 11 through 13 SEER and 18 SEER (i.e., “max tech”). For each efficiency level, frequency and cumulative charts are provided showing the distribution of expected LCC differences from the baseline design.

E.1.1 Split System Air Conditioner Results

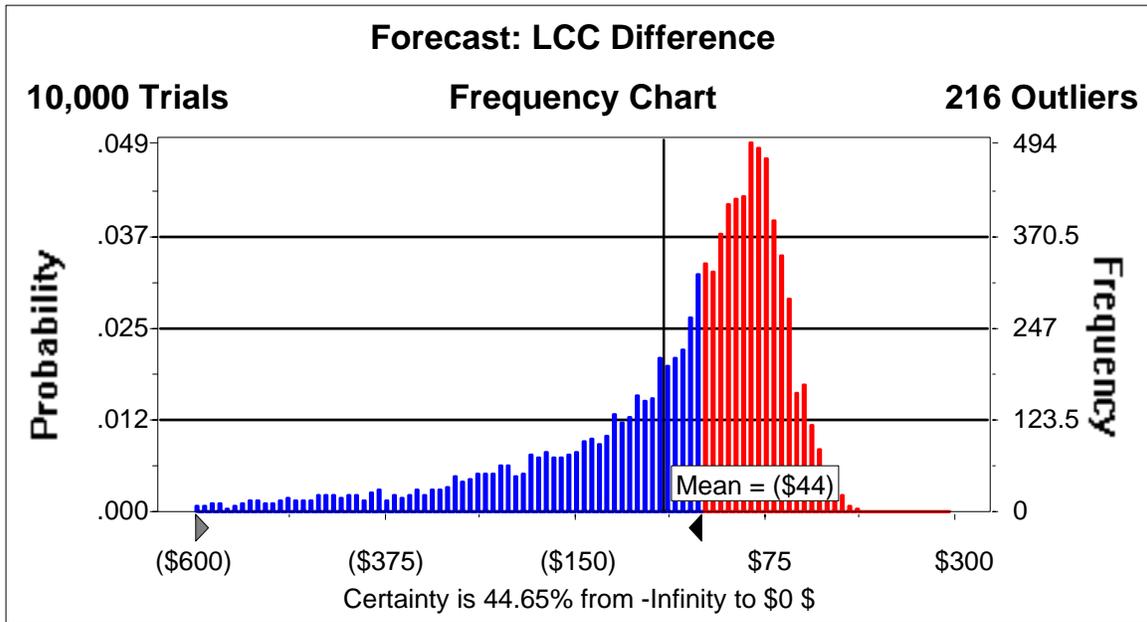


Figure E.1 Split A/C, 11 SEER: Frequency Chart of LCC Difference

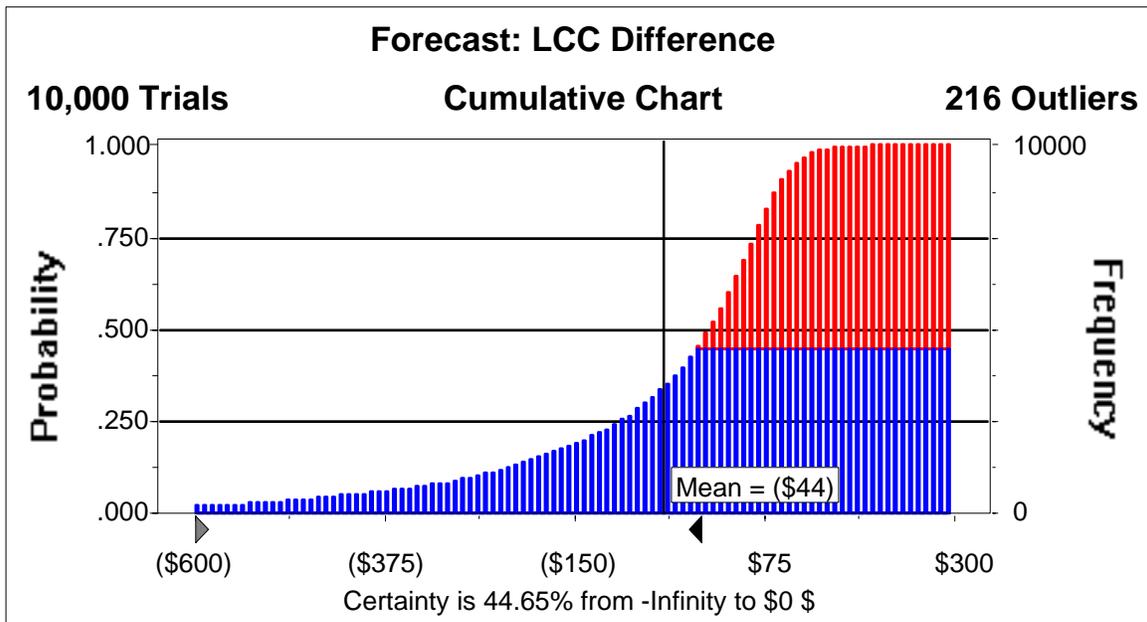


Figure E.2 Split A/C, 11 SEER: Cumulative Chart of LCC Difference

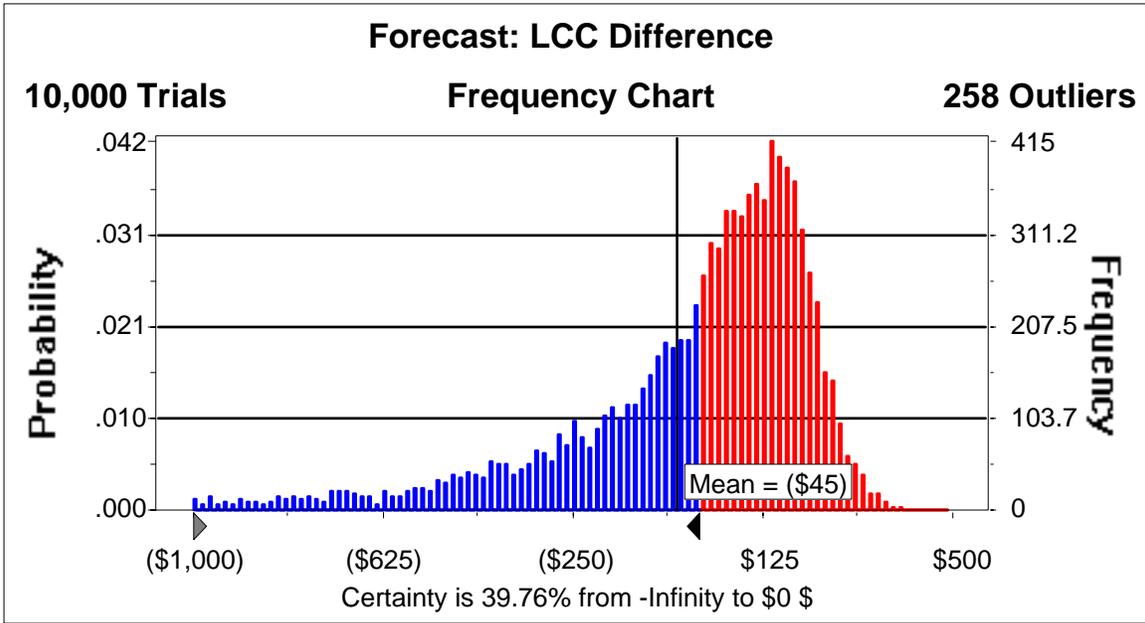


Figure E.3 Split A/C, 12 SEER: Frequency Chart of LCC Difference

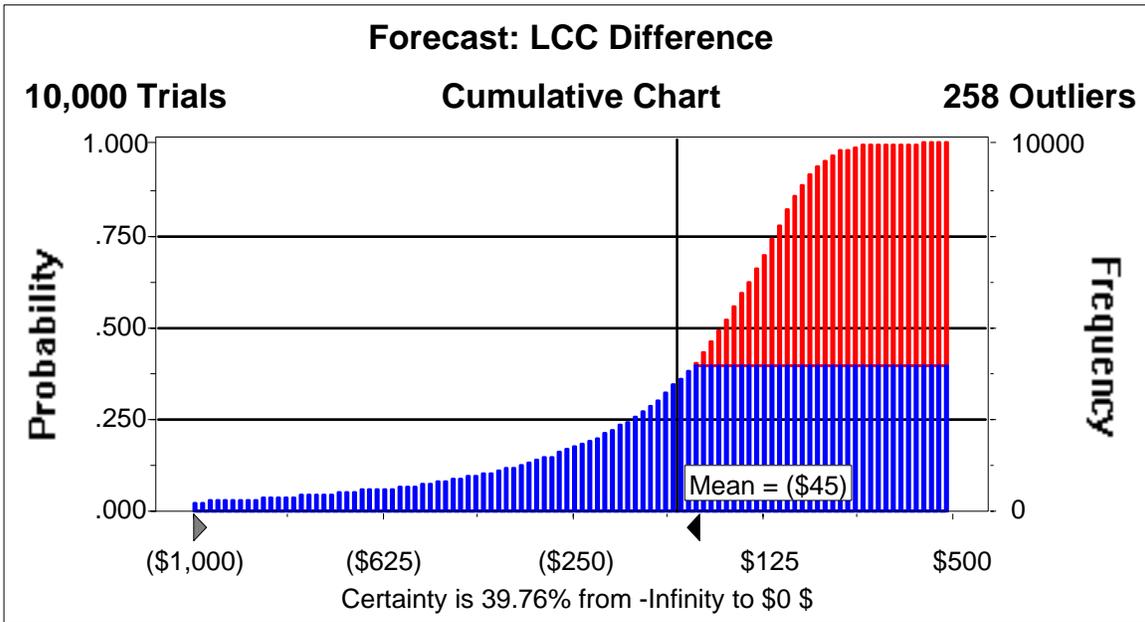


Figure E.4 Split A/C, 12 SEER: Cumulative Chart of LCC Difference

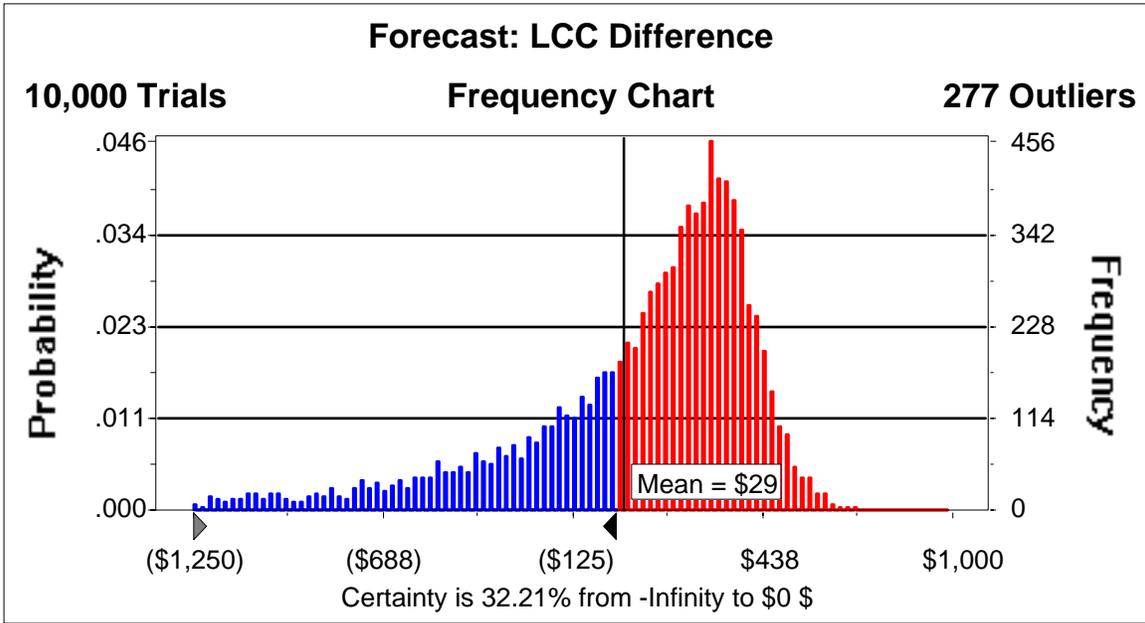


Figure E.5 Split A/C, 13 SEER: Frequency Chart of LCC Difference

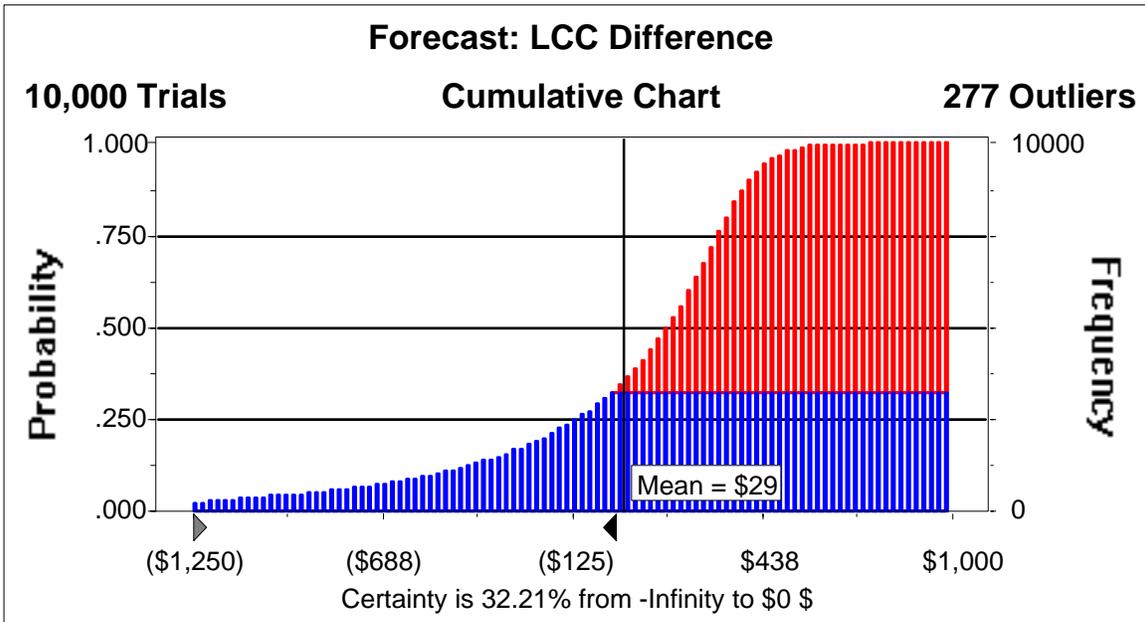


Figure E.6 Split A/C, 13 SEER: Cumulative Chart of LCC Difference

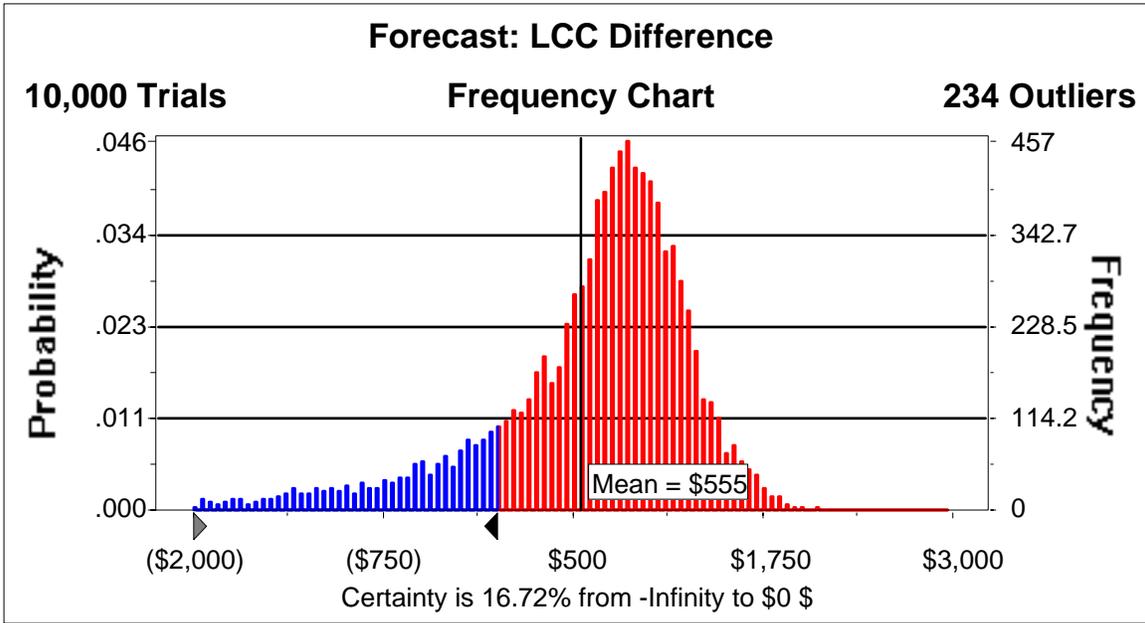


Figure E.7 Split A/C, 18 SEER: Frequency Chart of LCC Difference

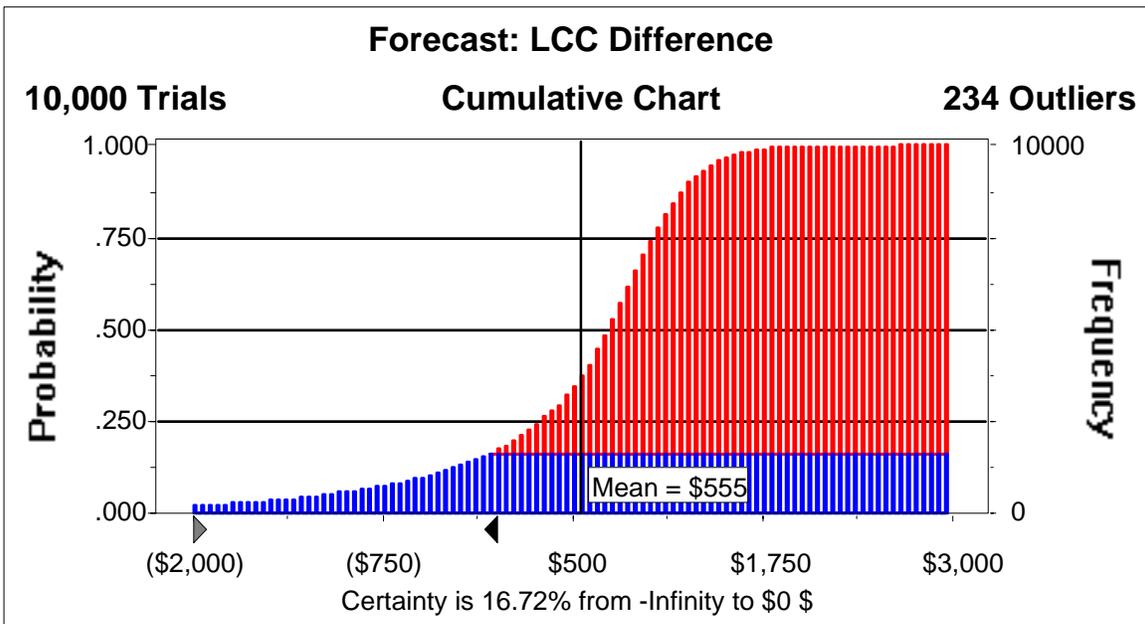


Figure E.8 Split A/C, 18 SEER: Cumulative Chart of LCC Difference

E.1.2 Split System Heat Pump Results

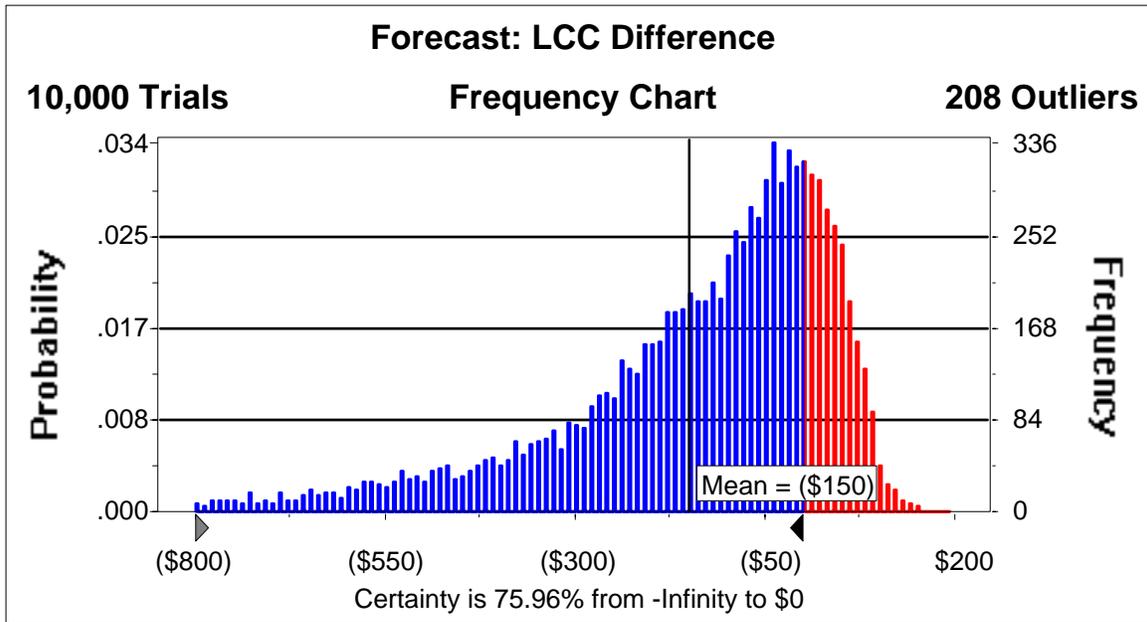


Figure E.9 Split Heat Pump, 11 SEER: Frequency Chart of LCC Difference

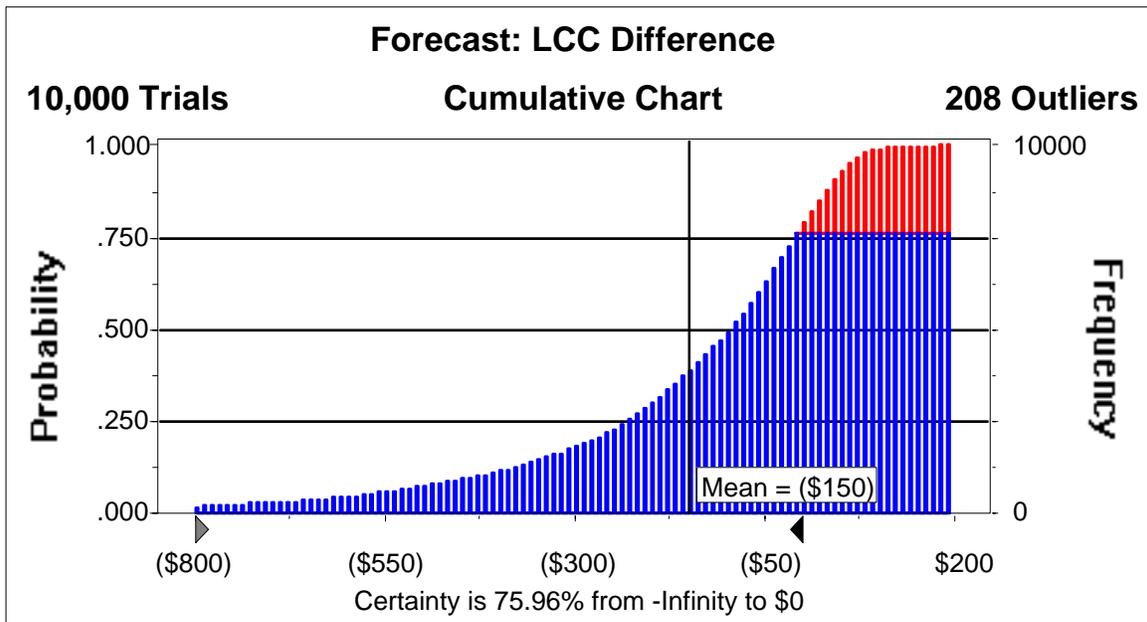


Figure E.10 Split Heat Pump, 11 SEER: Cumulative Chart of LCC Difference

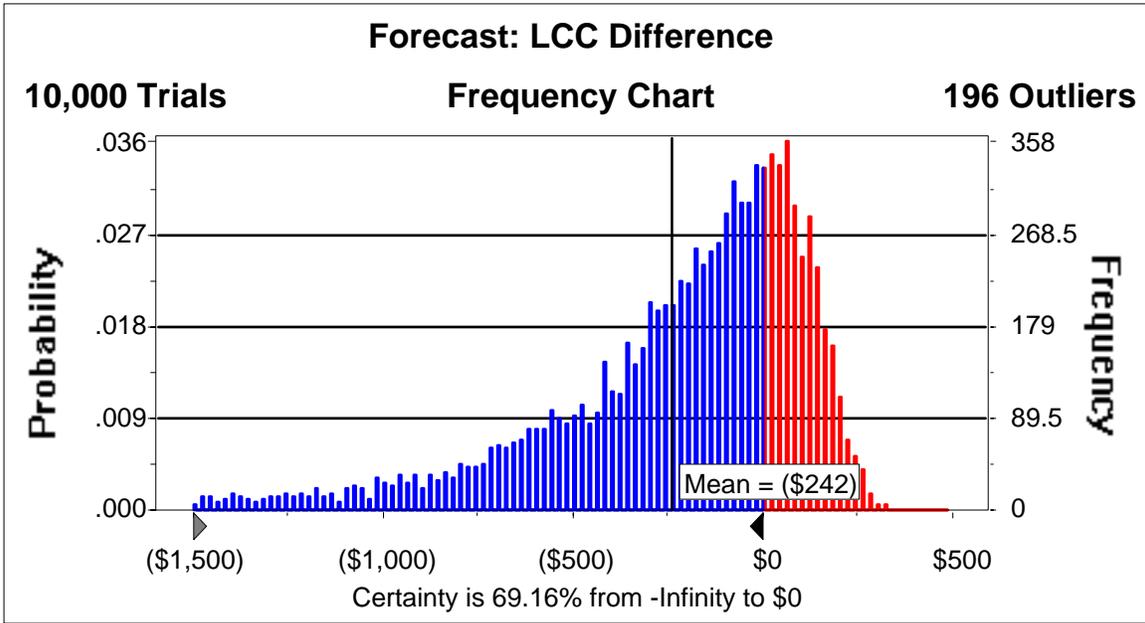


Figure E.11 Split Heat Pump, 12 SEER: Frequency Chart of LCC Difference

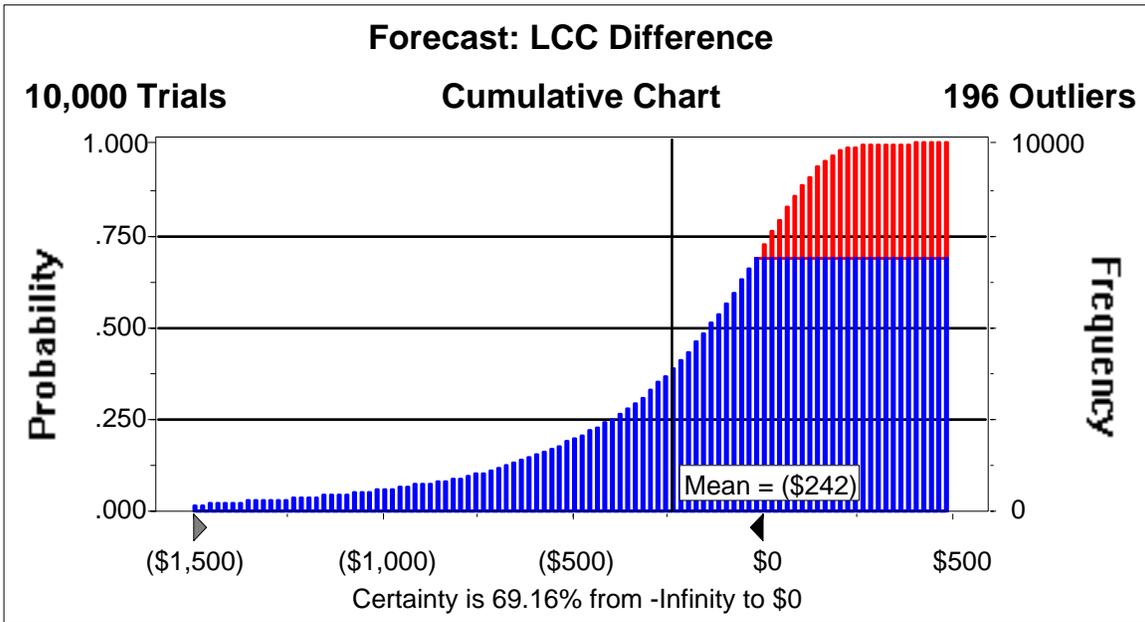


Figure E.12 Split Heat Pump, 12 SEER: Cumulative Chart of LCC Difference

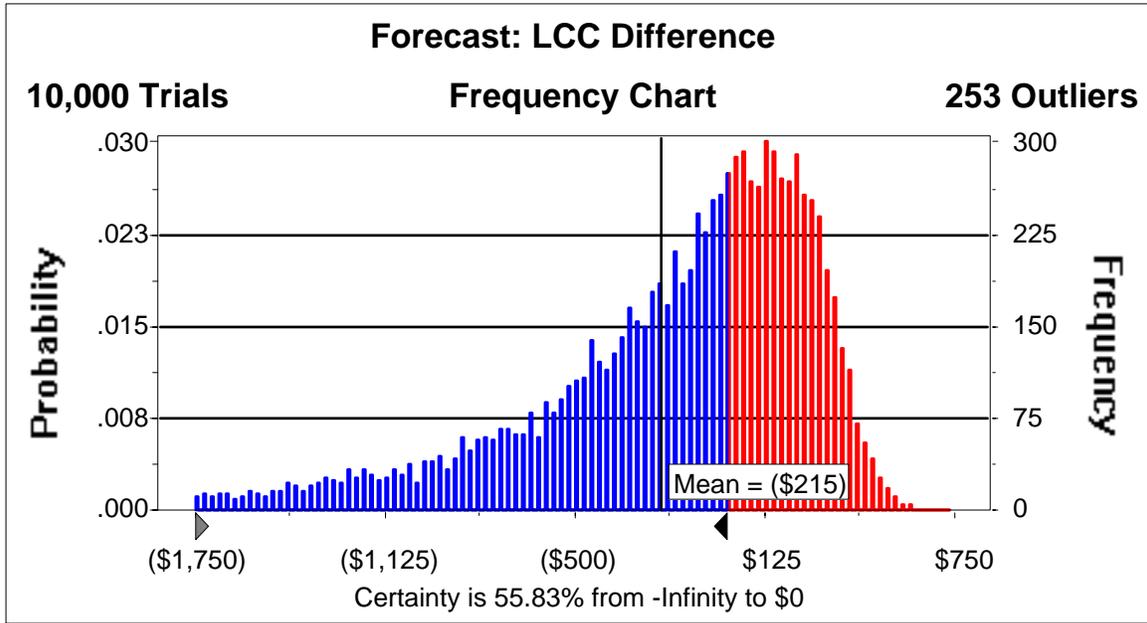


Figure E.13 Split Heat Pump, 13 SEER: Frequency Chart of LCC Difference

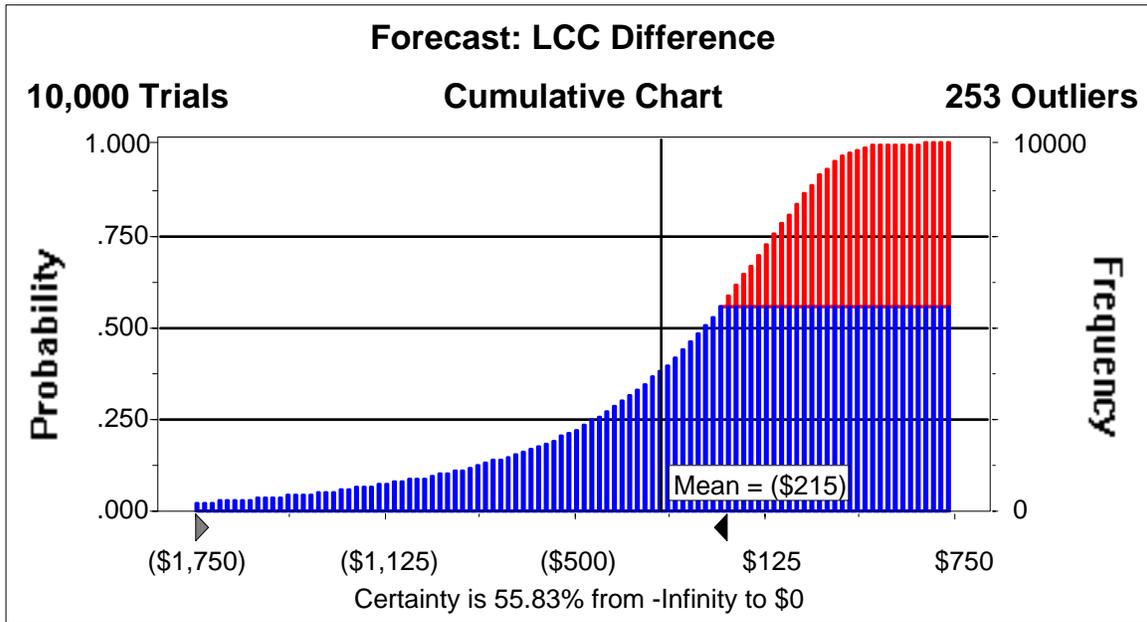


Figure E.14 Split Heat Pump, 13 SEER: Cumulative Chart of LCC Difference

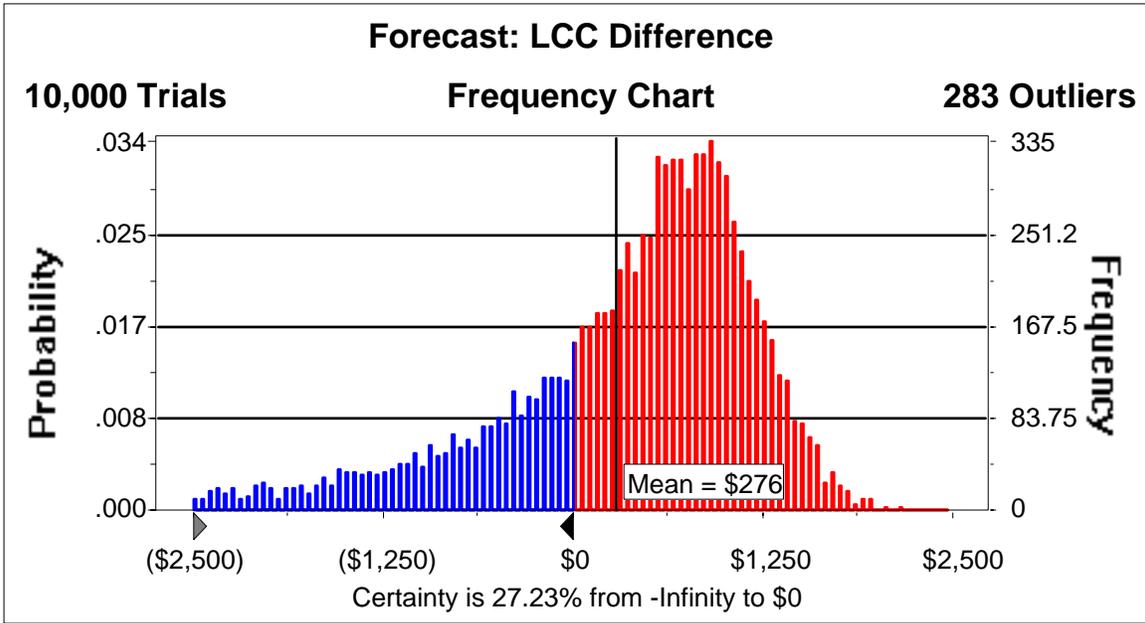


Figure E.15 Split Heat Pump, 18 SEER: Frequency Chart of LCC Difference

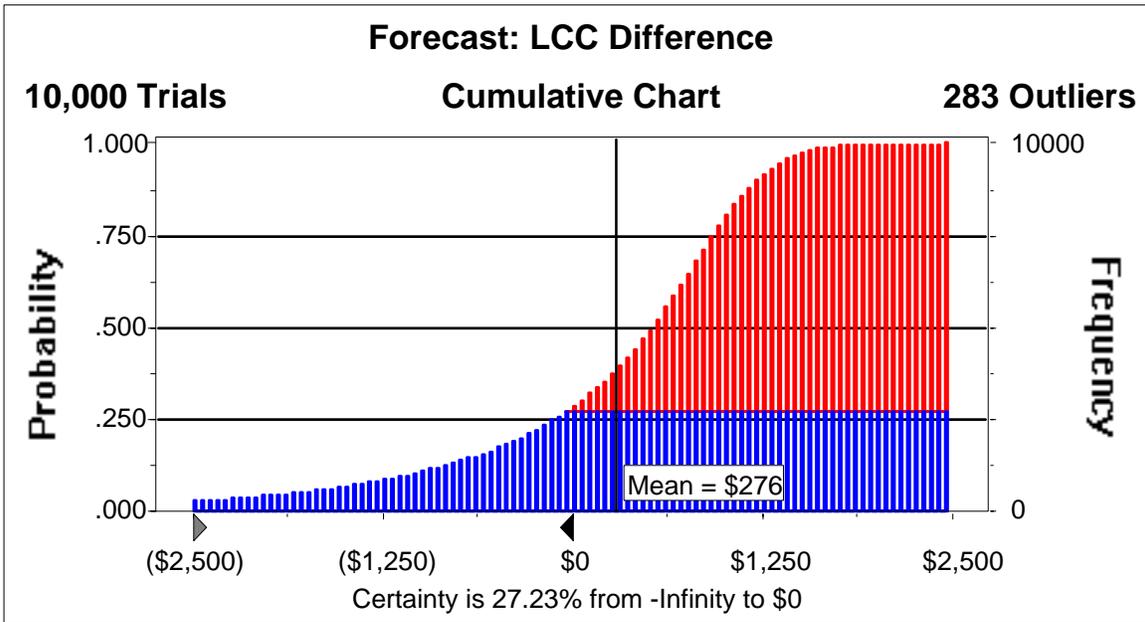


Figure E.16 Split Heat Pump, 18 SEER: Cumulative Chart of LCC Difference

E.1.3 Single Package Air Conditioner Results

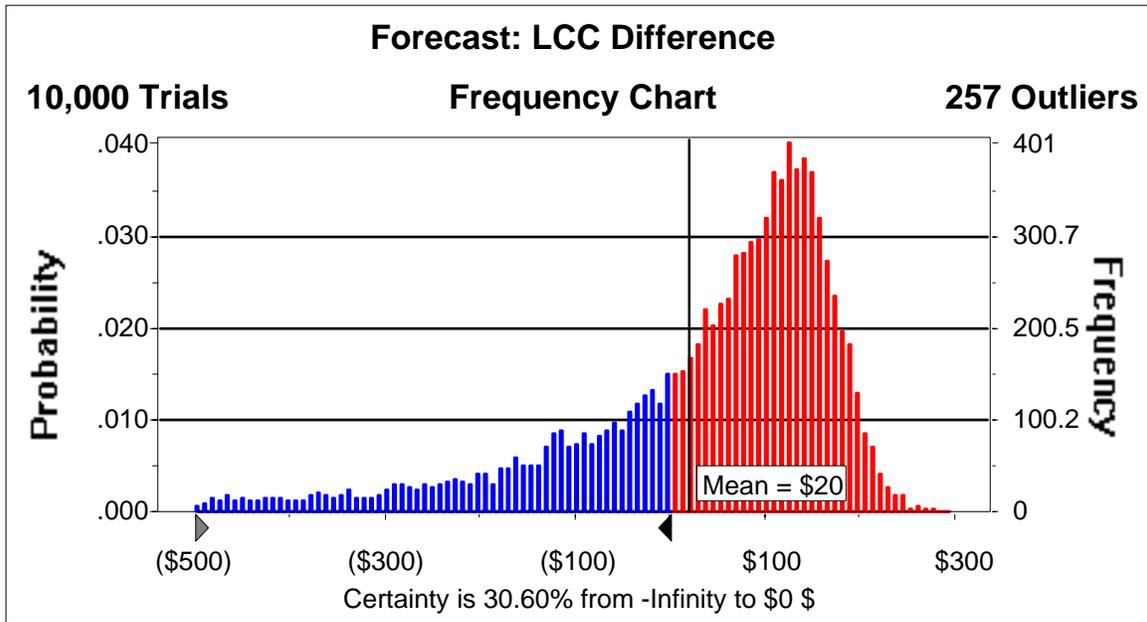


Figure E.17 Single Package A/C, 11 SEER: Frequency Chart of LCC Difference

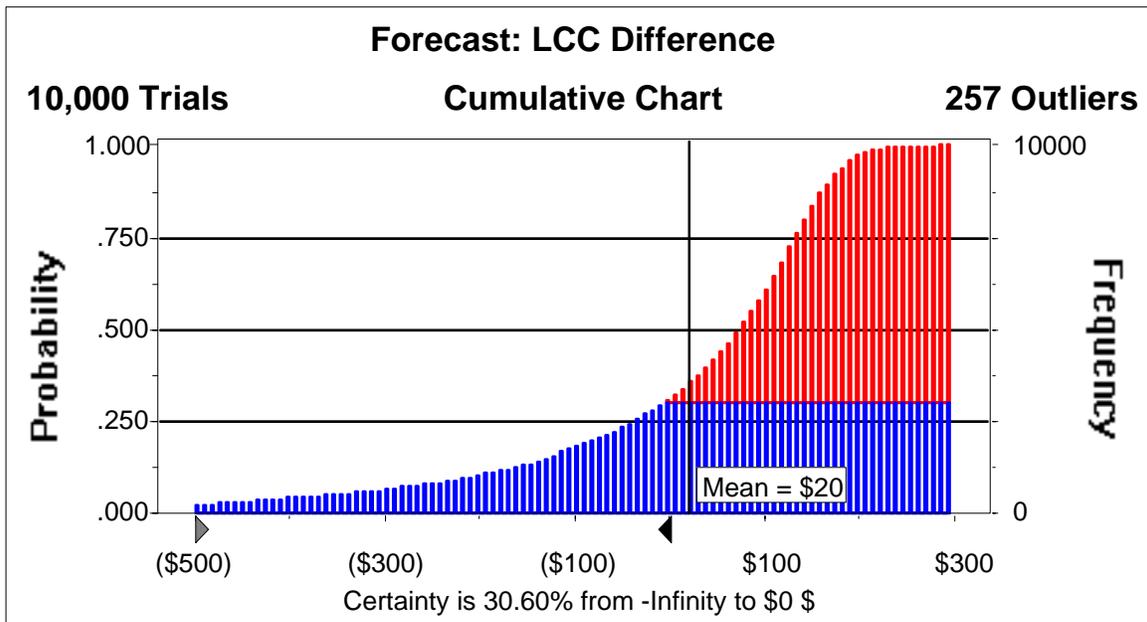


Figure E.18 Single Package A/C, 11 SEER: Cumulative Chart of LCC Difference

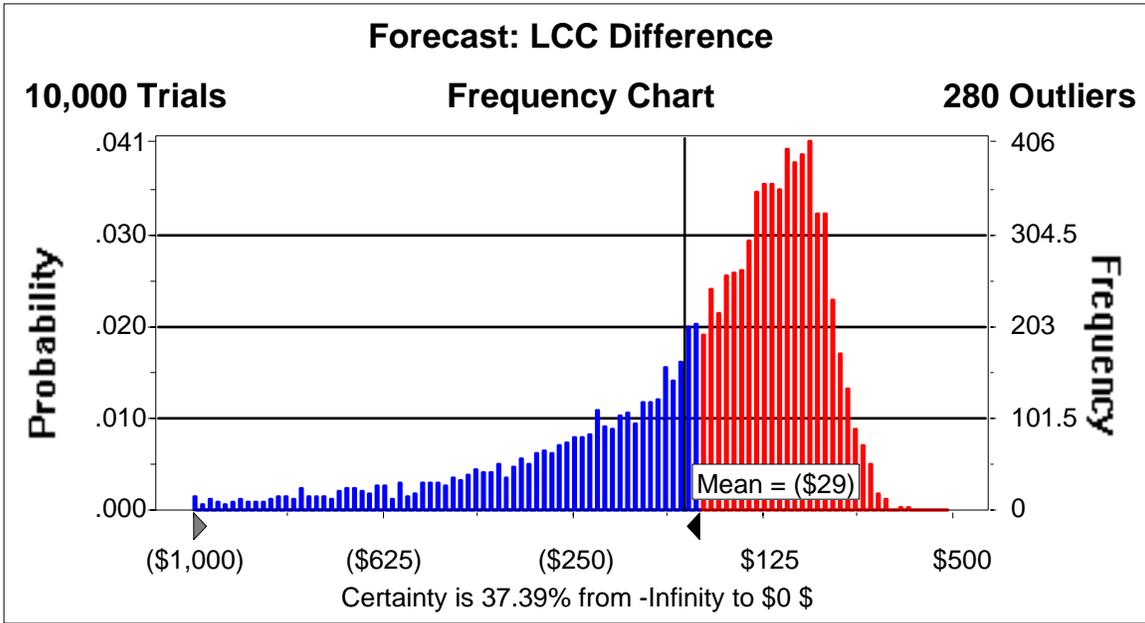


Figure E.19 Single Package A/C, 12 SEER: Frequency Chart of LCC Difference

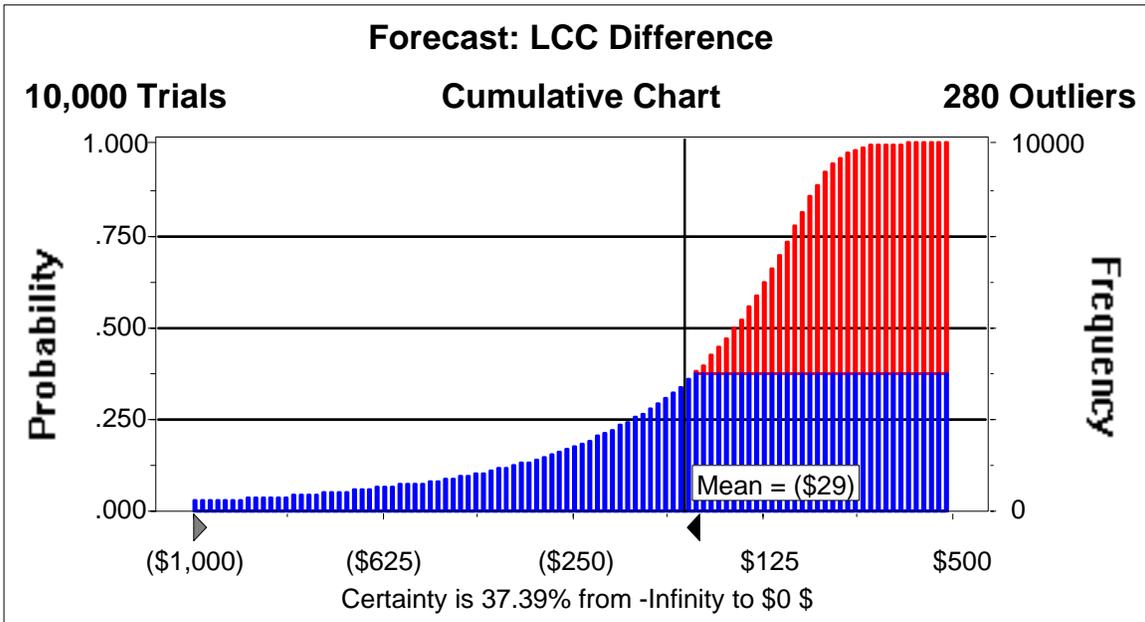


Figure E.20 Single Package A/C, 12 SEER: Cumulative Chart of LCC Difference

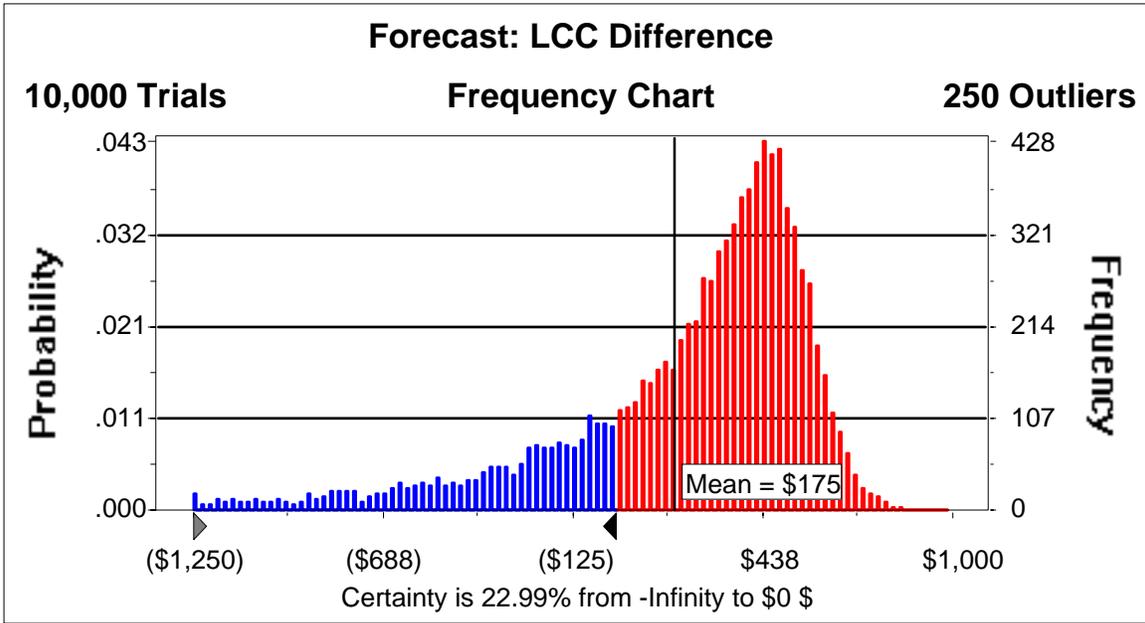


Figure E.21 Single Package A/C, 13 SEER: Frequency Chart of LCC Difference

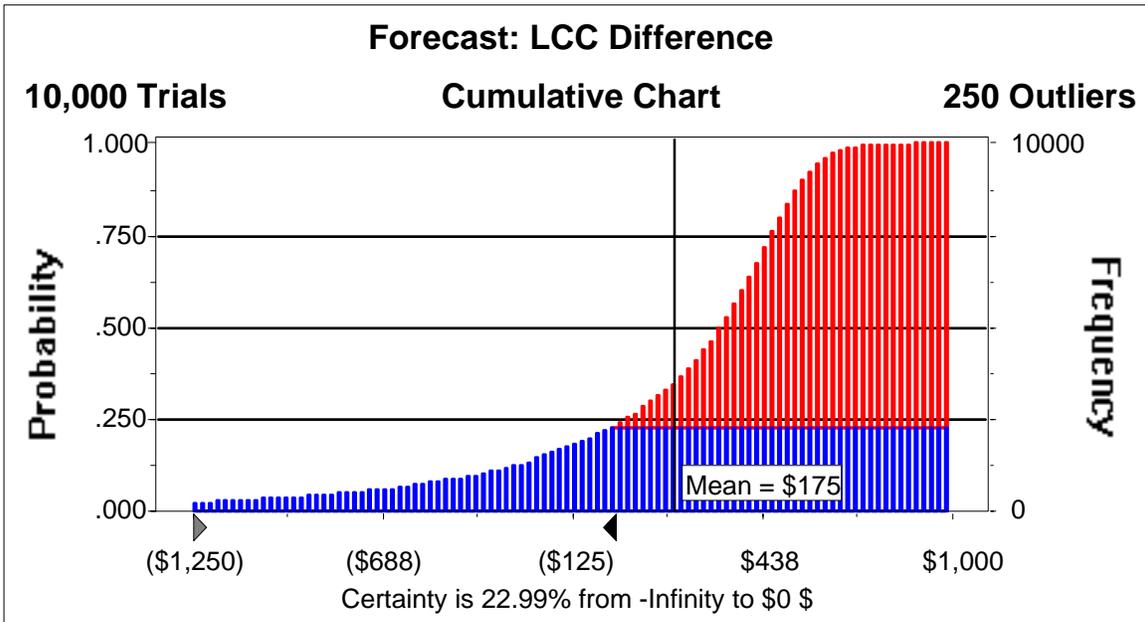


Figure E.22 Single Package A/C, 13 SEER: Cumulative Chart of LCC Difference

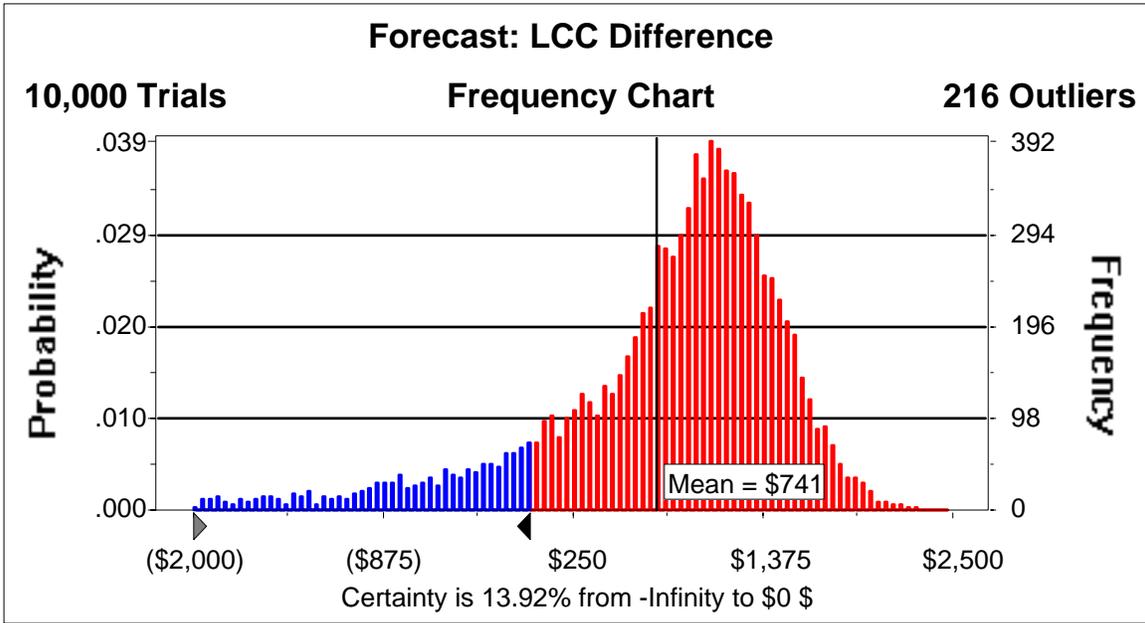


Figure E.23 Single Package A/C, 18 SEER: Frequency Chart of LCC Difference

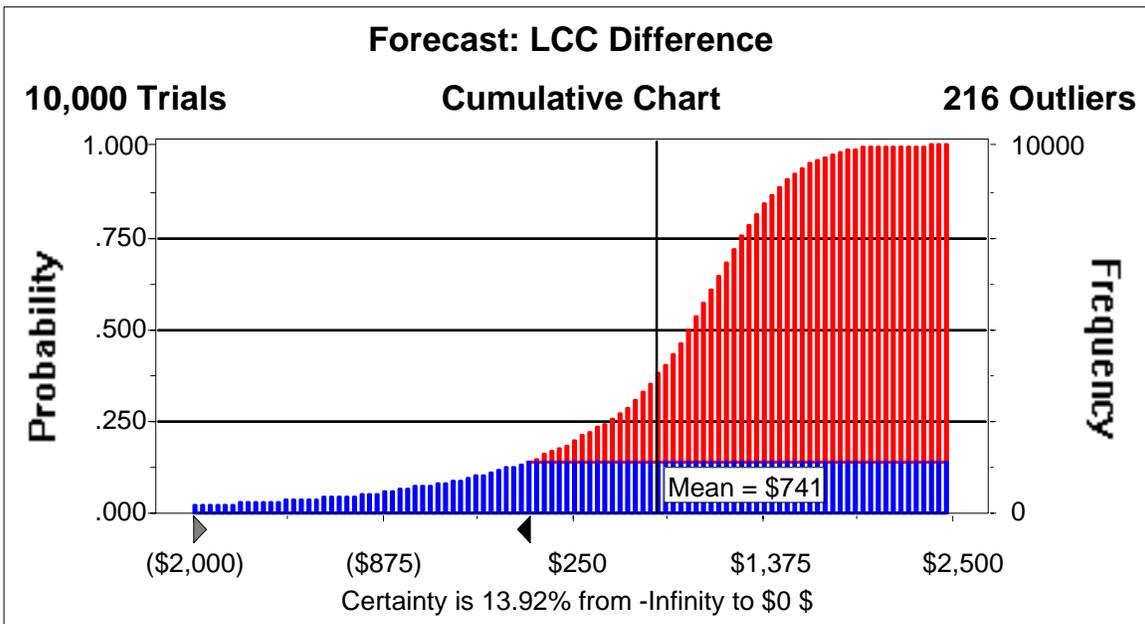


Figure E.24 Single Package A/C, 18 SEER: Cumulative Chart of LCC Difference

E.1.4 Single Package Heat Pump Results

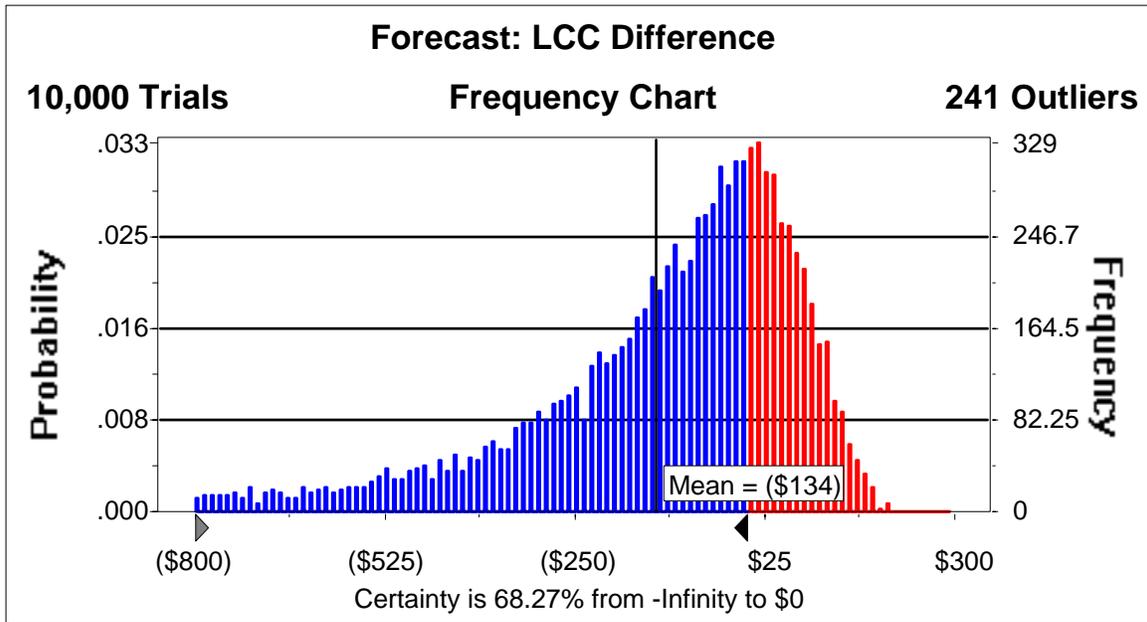


Figure E.25 Single Package Heat Pump, 11 SEER : Frequency Chart of LCC Difference

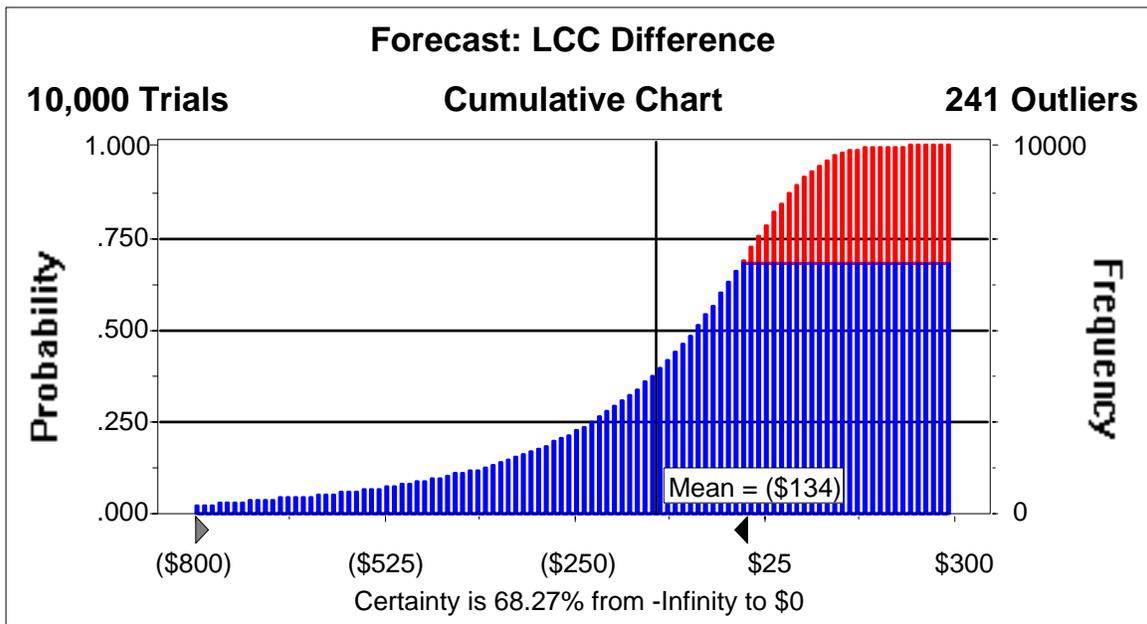


Figure E.26 Single Package Heat Pump, 11 SEER: Cumulative Chart of LCC Difference

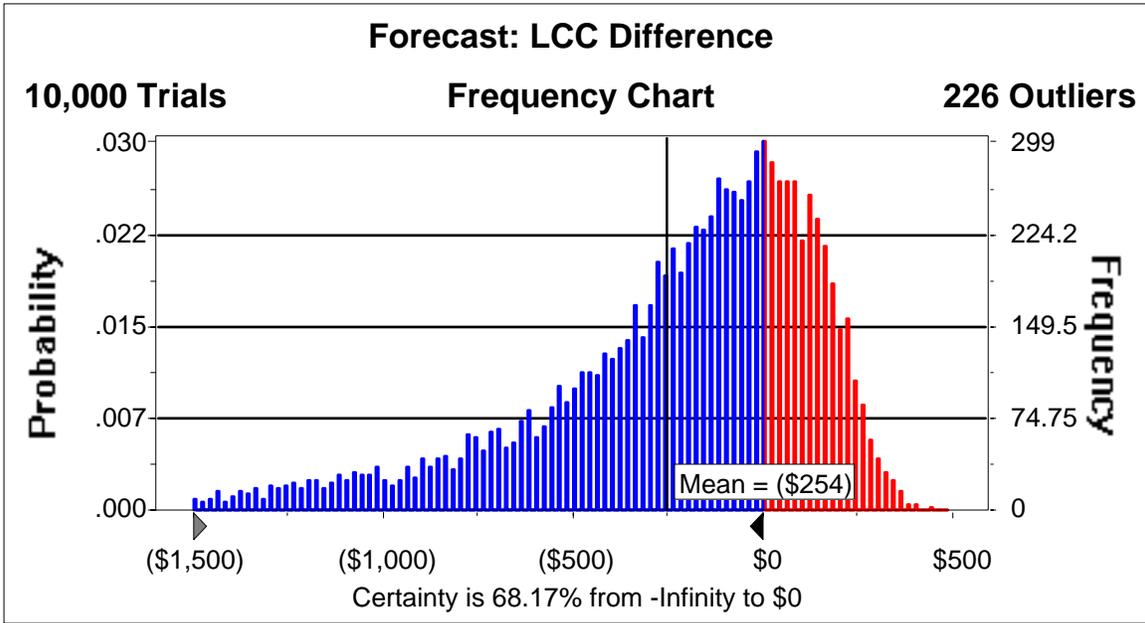


Figure E.27 Single Package Heat Pump, 12 SEER: Frequency Chart of LCC Difference

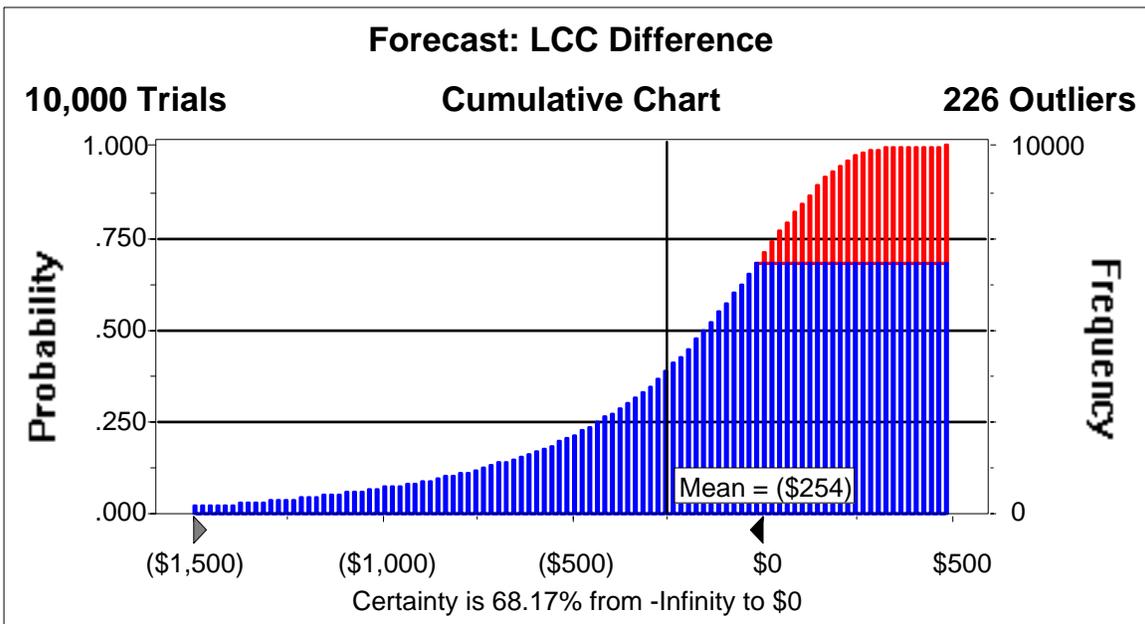


Figure E.28 Single Package Heat Pump, 12 SEER: Cumulative Chart of LCC Difference

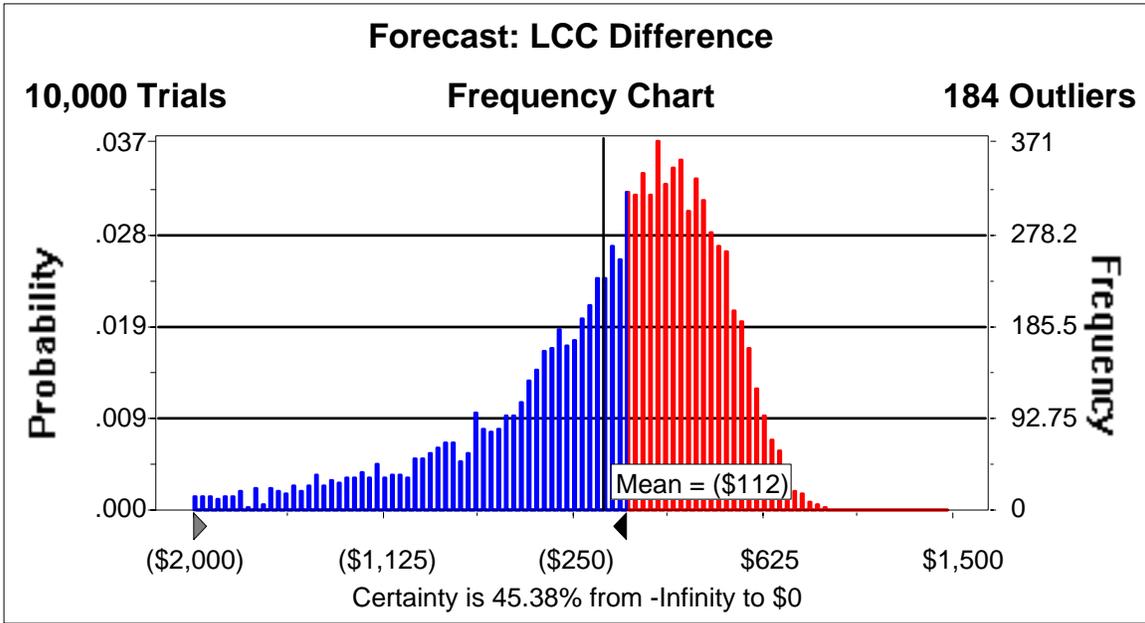


Figure E.29 Single Package Heat Pump, 13 SEER: Frequency Chart of LCC Difference

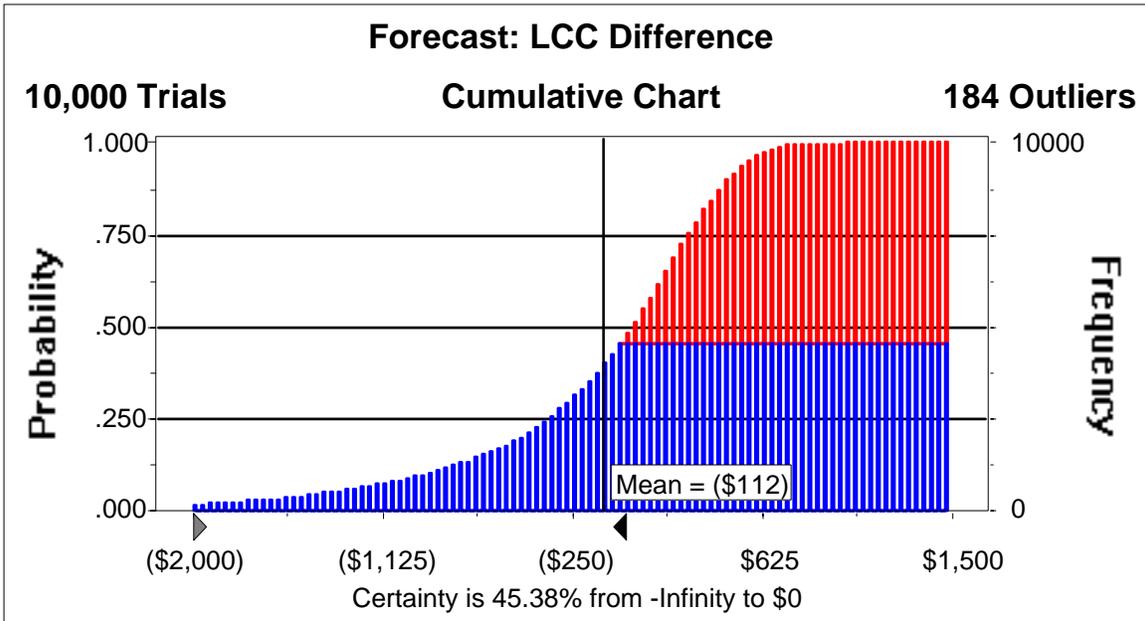


Figure E.30 Single Package Heat Pump, 13 SEER: Cumulative Chart of LCC Difference

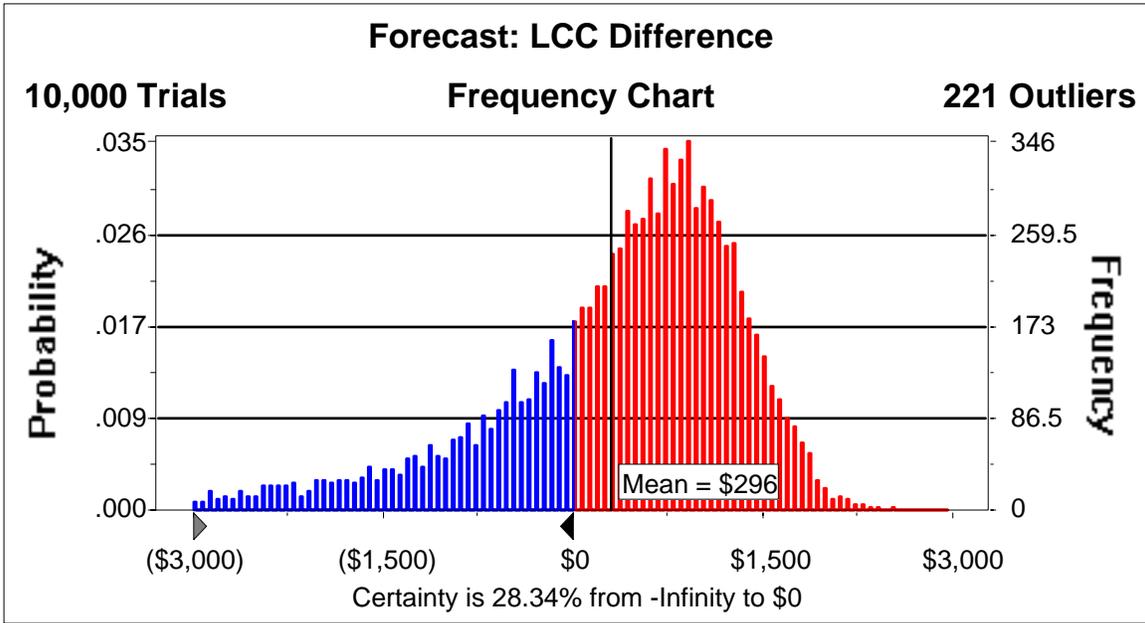


Figure E.31 Single Package Heat Pump, 18 SEER: Frequency Chart of LCC Difference

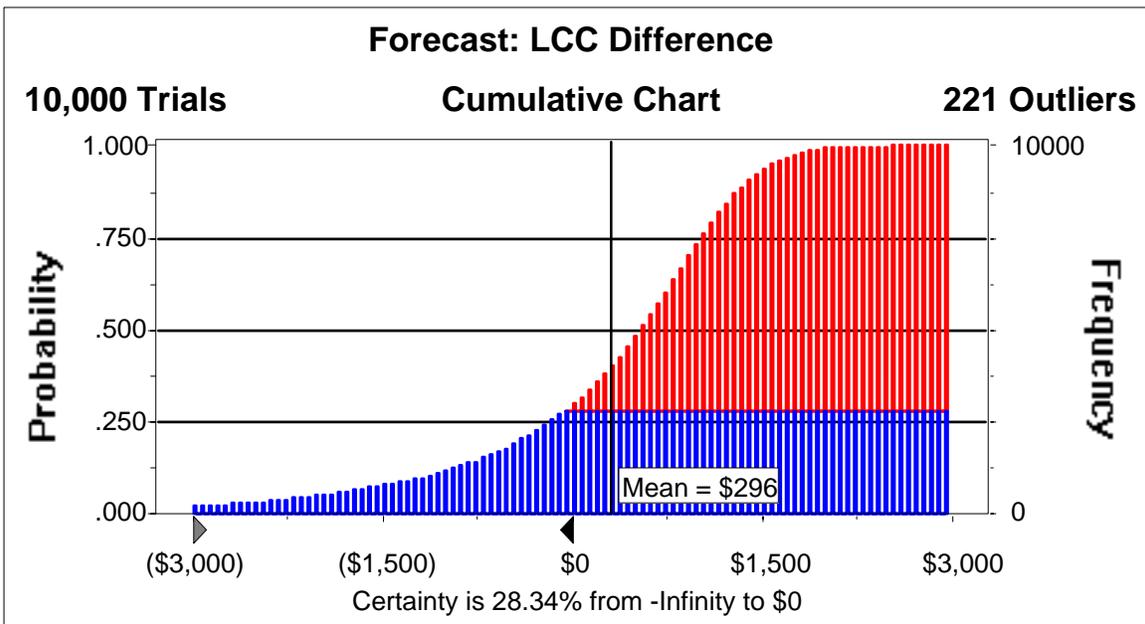


Figure E.32 Single Package Heat Pump, 18 SEER: Cumulative Chart of LCC Difference

E.2 DETERMINATION OF 30-YEAR AVERAGE COOLING DEGREE DAY AND HEATING DEGREE DAY DATA

The determination of 30-year average (1961 to 1990) cooling degree day (CDD) and heating degree day (HDD) data for the nine Census Divisions and four large states (i.e., New York, Florida, Texas, and California) is based on weighting representative weather station CDDs and HDDs by a combination of 1) population data and 2) the estimated central air conditioner and heat pump shipments to the weather station region.

For each of the nine Census Divisions and four large states, Tables E.1 through E.13 show how the 30-year average CDDs and HDDs were determined. Starting with representative weather station cities, the population of each weather station is determined. Then, knowing the shipments per state, the shipments per weather station are determined based on weather station population. With the CDD and HDD known per weather station, a shipment weighted calculation is performed to determine the *weighted-average* CDD and HDD.

Shipments per state are based on data provided by the Air-Conditioning and Refrigeration Institute for the years 1992 through 1994. Weather station population, CDD, and HDD data are based on data from the National Oceanic & Atmospheric Administration.

Table E.1 Census Division 1 (New England): Calculation of 30-year Average CDD and HDD

Weather Station	State	Weather Station Population	Total State Weather Station Population	Shipments per State	Shipments per Weather Station	CDD	HDD
BRIDGEPORT, CT	CT	141,686			8,266	724	5537
HARTFORD, CT	CT	139,739	281,425	16,418	8,152	677	6151
BLUE HILL, MA	MA				0	434	6398
BOSTON, MA	MA	574,283			14,768	678	5641
WORCESTER, MA	MA	169,759	744,042	19,134	4,365	333	6979
CARIBOU, ME	ME				0	131	9651
PORTLAND, ME	ME	64,157	64,157	177	177	268	7378
CONCORD, NH	NH	36,006			7,965	328	7554
MT. WASHINGTON, NH	NH		36,006	7,965	0	0	14015
PROVIDENCE, RI	RI	160,728	160,728	3,707	3,707	606	5884
BURLINGTON, VT	VT	39,127	39,127	198	198	388	7771
Total Shipments				47,598			
Sum-Product CDD (CDD · Shipments)						27,952,977	
Weighted CDD						587	
Sum-Product CDD (CDD · Shipments)							29,450,811
Weighted HDD							6187

Table E.2 Census Division 2 (Mid Atlantic minus New York): Calculation of 30-year Average CDD and HDD

Weather Station	State	Weather Station Population	Total State Weather Station Population	Shipments per State	Shipments per Weather Station	CDD	HDD
ATLANTIC CITY AP, NJ	NJ	37,986			7,769	826	5169
ATLANTIC CITY C.O.,NJ	NJ				0	824	4728
NEWARK, NJ	NJ	275,221	313,207	64,059	56,290	1201	4888
ALLENTOWN, PA	PA	105,301			5,730	773	5785
AVOCA, PA	PA	1,585,577			1,088	539	6291
PHILADELPHIA, PA	PA	369,879			86,287	1101	6279
PITTSBURGH, PA	PA	20,000			20,129	654	5347
WILLIAMSPORT, PA	PA	31,933	2,273,784	123,740	1,738	622	4954
ERIE, PA.	PA	108,718			5,916	550	5968
MIDDLETOWN/HARRISBURG INTL	PA	52,376			2,850	962	6087
				Total Shipments	187,798		
						Sum-Product CDD (CDD · Shipments)	194,280,970
						Weighted CDD	1035
						Sum-Product CDD (CDD · Shipments)	106,599,547
						Weighted HDD	5676

Table E.3 Census Division 3 (East North Central): Calculation of 30-year Average CDD and HDD

Weather Station	State	Weather Station Population	Total State Weather Station Population	Shipments per State	Shipments per Weather Station	CDD	HDD
CHICAGO, IL	IL	2,783,726			128,956	752	6536
MOLINE, IL	IL	43,080			1,996	911	6474
PEORIA, IL	IL	134,886			6,249	982	6148
ROCKFORD, IL	IL	142,815			6,616	702	6969
SPRINGFIELD, IL	IL	105,412	3,209,919	148,699	4,883	1141	5688
EVANSVILLE, IN	IN	126,272			10,683	1376	4708
FORT WAYNE, IN	IN	195,680			16,555	824	6273
INDIANAPOLIS, IN	IN	731,278			61,869	1014	5615
SOUTH BEND, IN	IN	105,511	1,158,741	98,033	8,927	728	6331
ALPENA, MI	MI	11,354			750	231	8284
DETROIT, MI	MI	1,027,974			67,899	626	6569
FLINT, MI	MI	140,925			9,308	483	6979
GRAND RAPIDS, MI	MI	199,933			13,206	534	6973
HOUGHTON LAKE, MI	MI				0	256	8218
LANSING, MI	MI	127,321			8,410	490	7101
MARQUETTE, MI	MI	21,977			1,452	155	9567
MUSKEGON, MI	MI	52,985			3,500	431	6924
SAULT STE. MARIE, MI	MI		1,582,469	104,525	0	131	9316
AKRON, OH	OH	223,019			14,340	625	6160
CLEVELAND, OH	OH	592,764			38,115	621	6201
COLUMBUS, OH	OH	632,945			40,699	797	5708
DAYTON, OH	OH	182,011			11,704	886	5708
GREATER CINCINNATI AP	OH	50,627			23,413	996	5248
MANSFIELD, OH	OH	332,943			3,255	666	6258
TOLEDO, OH	OH	95,732			21,409	610	6579
YOUNGSTOWN, OH	OH	364,114	2,474,155	159,091	6,156	497	6544
GREEN BAY, WI	WI	96,466			6,324	381	8089
LA CROSSE, WI	WI	49,075			3,217	692	7491
MADISON, WI	WI	190,766			12,506	485	7673
MILWAUKEE, WI	WI	628,088	964,395	63,222	41,175	479	7324
Total Shipments				573,570			
Sum-Product CDD (CDD · Shipments)						420,268,536	
Weighted CDD						733	
Sum-Product CDD (CDD · Shipments)							3,654,208,541
Weighted HDD							6371

Table E.4 Census Division 4 (West North Central): Calculation of 30-year Average CDD and HDD

Weather Station	State	Weather Station Population	Total State Weather Station Population	Shipments per State	Shipments per Weather Station	CDD	HDD
DES MOINES, IA	IA	193,189			16,028	1036	6497
DUBUQUE, IA	IA	57,538			4,774	593	7327
SIOUX CITY, IA	IA	80,505			6,679	907	6893
WATERLOO, IA	IA	66,467	397,699	32,996	5,515	702	7406
CONCORDIA, KS	KS				0	1317	5574
DODGE CITY, KS	KS	21,129			1,952	1465	5001
GOODLAND, KS	KS				0	859	5974
TOPEKA, KS	KS	119,883			11,074	1304	5265
WICHITA, KS	KS	304,017	445,029	41,109	28,083	1628	4791
DULUTH, MN	MN	85,493			5,482	180	9818
INTERNATIONAL FALLS, MN	MN				0	249	10487
MINNEAPOLIS-ST.PAUL, MN	MN	640,618			41,077	682	7981
ROCHESTER, MN	MN	70,729			4,535	472	8250
SAINT CLOUD, MN	MN		796,840	51,095	0	415	8928
COLUMBIA, MO	MO	69,133			9,071	1189	5212
KANSAS CITY, MO	MO	434,829			57,052	1288	5393
SPRINGFIELD, MO	MO	396,685			18,434	1320	4638
ST. LOUIS, MO	MO	140,494	1,041,141	136,604	52,047	1534	4758
BISMARCK, ND	ND	49,272			1,226	488	8968
FARGO, ND	ND	86,371			2,150	537	9254
WILLISTON, ND	ND	13,136	148,779	3,703	327	548	9090
GRAND ISLAND, NE	NE	39,487			2,215	997	6421
LINCOLN, NE	NE	191,972			10,770	1134	6278
NORFOLK, NE	NE	21,476			1,205	877	6873
NORTH PLATTE, NE	NE				0	713	6859
OMAHA (NORTH), NE	NE				19,325	1037	6413
OMAHA EPPLEY AP, NE	NE	344,463			0	1072	6300
SCOTTSBLUFF, NE	NE	13,711			769	713	6729
VALENTINE, NE	NE		611,109	34,285	0	752	7282
ABERDEEN, SD	SD	24,995			932	633	8446
HURON, SD	SD	12,448			464	743	7923
RAPID CITY, SD	SD	54,523			2,034	611	7301
SIOUX FALLS, SD	SD	100,836	192,802	7,193	3,762	744	7809
				Total Shipments	306,984		
						Sum-Product CDD (CDD · Shipments)	354,944,657
						Weighted CDD	1156
						Sum-Product CDD (CDD · Shipments)	1,844,653,833
						Weighted HDD	6009

Table E.5 Census Division 5 (South Atlantic minus Florida): Calculation of 30-year Average CDD and HDD

Weather Station	State	Weather Station Population	Total State Weather Station Population	Shipments per State	Shipments per Weather Station	CDD	HDD
WASHINGTON DULLES AP, D.C.	D.C.				0	973	5006
WASHINGTON NAT'L AP, D.C.	D.C.	606,900	606,900	10,678	10,678	1549	4047
WILMINGTON, DE	DE	71,529	71,529	7,642	7,642	1046	4937
ATHENS, GA	GA	86,522			19,781	1709	2893
ATLANTA, GA	GA	393,929			90,060	1667	2991
AUGUSTA,GA	GA	186,616			42,664	1948	2565
COLUMBUS, GA	GA	178,683			40,850	2284	2261
MACON, GA	GA	107,365			24,546	2125	2334
SAVANNAH, GA	GA	137,812	1,090,927	249,407	31,507	2365	1847
BALTIMORE, MD	MD	736,014	736,014	137,478	137,478	1137	4707
ASHEVILLE, NC	NC	63,379			10,079	787	4308
CAPE HATTERAS, NC	NC				0	1638	2698
CHARLOTTE, NC	NC	419,558			66,722	1582	3341
GREENSBORO-WNSTN-SALM-HGHPT,NC	NC	347,417			55,249	1253	3865
RALEIGH, NC	NC	218,859			34,805	1417	3457
WILMINGTON, NC	NC	55,530	1,104,743	175,685	8,831	1926	2470
CHARLESTON AP,SC	SC	88,256			23,792	2266	2013
CHARLESTON C.O.,SC	SC	70,304			18,952	2313	1866
COLUMBIA, SC	SC	110,734			29,851	1966	2649
GREENVILLE-SPARTANBURG AP, SC	SC	101,735	371,029	100,020	27,425	1473	3272
LYNCHBURG, VA	VA	66,049			12,934	1048	4340
NORFOLK, VA	VA	261,250			51,161	1422	3495
RICHMOND, VA	VA	202,798			39,714	1348	3963
ROANOKE, VA	VA	96,509			18,899	1052	4360
WALLOPS ISLAND, VA	VA	30,000	656,606	128,584	5,875	1096	4261
BECKLEY, WV	WV	18,274			2,747	463	5558
CHARLESTON, WV	WV	57,287			8,611	1031	4646
ELKINS, WV	WV	15,000			2,255	346	6120
HUNTINGTON, WV	WV	54,844	145,405	21,857	8,244	1005	4665
Total Shipments				831,352			
Sum-Product CDD (CDD · Shipments)						1,299,115,703	
Weighted CDD						1563	
Sum-Product CDD (CDD · Shipments)							2,853,297,411
Weighted HDD							3432

Table E.6 Census Division 6 (East South Central): Calculation of 30-year Average CDD and HDD

Weather Station	State	Weather Station Population	Total State Weather Station Population	Shipments per State	Shipments per Weather Station	CDD	HDD
BIRMINGHAM AP,AL	AL	265,347			35,331	1797	2918
HUNTSVILLE, AL	AL	159,880			21,288	1651	3323
MOBILE, AL	AL	199,973			26,627	2627	1702
MONTGOMERY, AL	AL	190,350	815,550	108,591	25,345	2212	2224
JACKSON, KY	KY				0	1033	4393
LEXINGTON, KY	KY	225,366			26,807	1140	4783
LOUISVILLE, KY	KY	269,555			32,063	1288	4514
PADUCAH KY	KY	27,256	522,177	62,112	3,242	1475	4279
JACKSON, MS	MS	202,062			29,612	2215	2467
MERIDIAN, MS	MS	41,036			6,014	2138	2444
TUPELO, MS	MS	30,685	273,783	40,122	4,497	1908	3079
BRISTOL-JHNSN CTY-KNGSPRT,TN	TN	114,232			11,211	972	4406
CHATTANOOGA, TN	TN	152,393			14,956	1544	3587
KNOXVILLE, TN	TN	169,761			16,661	1266	3937
MEMPHIS, TN	TN	618,652			60,717	2118	3082
NASHVILLE, TN	TN	488,366			47,930	1616	3729
OAK RIDGE, TN	TN	27,310	1,570,714	154,156	2,680	1156	4183
Total Shipments				364,982			
Sum-Product CDD (CDD · Shipments)						652,550,522	
Weighted CDD						1788	
Sum-Product CDD (CDD · Shipments)							1,209,656,149
Weighted HDD							3314

Table E.7 Census Division 2 (West South Central minus Texas): Calculation of 30-year Average CDD and HDD

Weather Station	State	Weather Station Population	Total State Weather Station Population	Shipments per State	Shipments per Weather Station	CDD	HDD
FORT SMITH, AR	AR	72,798			13,972	1894	3478
LITTLE ROCK, AR	AR	175,727			33,728	2005	3155
NORTH LITTLE ROCK, AR	AR	61,829	310,354	59,568	11,867	1916	3228
BATON ROUGE, LA	LA	219,531			17,338	2690	1669
LAKE CHARLES, LA	LA	70,580			5,574	2650	1616
NEW ORLEANS, LA	LA	496,938			39,247	2655	1513
SHREVEPORT, LA	LA	198,518	985,567	77,837	15,678	2368	2264
OKLAHOMA CITY, OK	OK	444,724			31,409	1859	3659
TULSA, OK	OK	367,302	812,026	57,349	25,941	2017	3691
Total Shipments				194,754			
Sum-Product CDD (CDD · Shipments)						430,273,606	
Weighted CDD						2209	
Sum-Product CDD (CDD · Shipments)						536,807,361	
Weighted HDD						2756	

Table E.8 Census Division 8 (Mountain): Calculation of 30-year Average CDD and HDD

Weather Station	State	Weather Station Population	Total State Weather Station Population	Shipments per State	Shipments per Weather Station	CDD	HDD
FLAGSTAFF, AZ	AZ	45,857			3,124	145	7131
PHOENIX, AZ	AZ	988,015			67,312	4162	1350
TUCSON, AZ	AZ	415,444			28,304	2954	1678
WINSLOW, AZ	AZ	9,279			632	1141	4776
YUMA, AZ	AZ	56,966	1,515,561	103,253	3,881	4305	927
ALAMOSA, CO	CO				0	62	8749
COLORADO SPRINGS, CO	CO	280,430			5,884	419	6415
DENVER, CO	CO	467,610			9,812	679	6020
GRAND JUNCTION, CO	CO	32,893			690	1183	5548
PUEBLO, CO	CO	98,640	879,573	18,456	2,070	973	5413
BOISE, ID	ID	126,685			6,485	754	5861
LEWISTON, ID	ID	28,082			1,437	814	5270
POCATELLO, ID	ID	46,117	200,884	10,283	2,361	421	7180
BILLINGS, MT	MT	81,125			1,066	652	7164
GLASGOW, MT	MT				0	558	8745
GREAT FALLS, MT	MT	55,125			724	388	7741
HELENA, MT	MT	24,609			323	386	8031
KALISPELL, MT	MT	11,917			157	149	8378
MISSOULA, MT	MT	42,918	215,694	2,834	564	280	7792
ALBUQUERQUE, NM	NM	384,915			2,926	1244	4425
CLAYTON, NM	NM				0	772	5064
ROSWELL, NM	NM	44,260	429,175	3,263	337	1776	3267
ELKO, NV	NV	14,836			1,215	457	7077
ELY, NV	NV				0	208	7621
LAS VEGAS, NV	NV	258,877			21,208	3201	2407
RENO, NV	NV	134,230			10,997	508	5674
WINNEMUCCA, NV	NV		407,943	33,420	0	538	6315
SALT LAKE CITY, UT	UT	159,928	159,928	21,554	21,554	1047	5765
CASPER, WY	WY	46,765			319	445	7682
CHEYENNE, WY	WY	50,008			341	285	7326
LANDER, WY	WY	10,000			68	479	7889
SHERIDAN, WY	WY	13,904	120,677	822	95	439	7804
				Total Shipments	193,885		
					Sum-Product CDD (CDD · Shipments)	503,085,009	
					Weighted CDD	2595	
					Sum-Product CDD (CDD · Shipments)		629,757,117
					Weighted HDD		3248

Table E.9 Census Division 9 (Pacific minus California): Calculation of 30-year Average CDD and HDD

Weather Station	State	Weather Station Population	Total State Weather Station Population	Shipments per State	Shipments per Weather Station	CDD	HDD
ANCHORAGE, AK	AK	226,338			19	0	10570
FAIRBANKS, AK	AK	30,843			3	84	13940
JUNEAU, AK	AK	26,751	283,932	24	2	0	8897
EUGENE, OR	OR	112,733			6,228	300	4546
MEDFORD, OR	OR	47,021			2,598	725	4611
PENDLETON, OR	OR	15,142			837	701	5294
PORTLAND, OR	OR	485,975			26,850	371	4522
SALEM, OR	OR	107,793	768,664	42,468	5,955	247	4927
OLYMPIA, WA	WA	33,729			694	101	5655
QUILLAYUTE, WA	WA	20,000			412	6	5858
SEATTLE C.O., WA	WA	516,259			10,626	167	4611
SEATTLE SEA-TAC AP, WA	WA	176,664			3,636	190	4908
SPOKANE, WA	WA	177,165			3,647	398	6842
YAKIMA, WA	WA	58,427	982,244	20,217	1,203	458	5967
				Total Shipments	62,709		
						Sum-Product CDD (CDD · Shipments)	20,311,010
						Weighted CDD	324
						Sum-Product CDD (CDD · Shipments)	301,043,854
						Weighted HDD	4801

Table E.10 New York State: Calculation of 30-year Average CDD and HDD

Weather Station	State	Weather Station Population	Total State Weather Station Population	Shipments per State	Shipments per Weather Station	CDD	HDD
ALBANY, NY	NY	100,031			1,125	507	6894
BINGHAMTON, NY	NY	53,008			596	337	7273
BUFFALO, NY	NY	328,175			3,690	477	6747
ISLIP, NY	NY				0	706	5647
NEW YORK (JFK AP), NY	NY	7,322,564			0	921	5027
NEW YORK (LAGUARDIA AP), NY	NY				0	1052	4910
NEW YORK C.PARK, NY	NY				82,328	1096	4805
ROCHESTER, NY	NY	230,356			2,590	425	6734
SYRACUSE, NY	NY	163,860	8,197,994	92,170	1,842	438	6834
				Total Shipments	112,387		
						Sum-Product CDD (CDD · Shipments)	94,669,621
						Weighted CDD	842
						Sum-Product CDD (CDD · Shipments)	462,596,309
						Weighted HDD	4116

Table E.11 Florida State: Calculation of 30-year Average CDD and HDD

Weather Station	State	Weather Station Population	Total State Weather Station Population	Shipments per State	Shipments per Weather Station	CDD	HDD
APALACHICOLA, FL	FL				0	2582	1429
DAYTONA BEACH, FL	FL	61,991			16,003	2919	909
FORT MYERS, FL	FL	44,947			11,603	3855	418
GAINESVILLE, FL	FL				0	2570	1316
JACKSONVILLE, FL	FL	653,069			168,591	2551	1434
KEY WEST, FL	FL	24,832			6,410	4798	100
MIAMI, FL	FL	358,648			92,586	4198	200
ORLANDO, FL	FL	164,674			42,511	3381	686
PENSACOLA, FL	FL	59,198			15,282	2636	1617
TALLAHASSEE, FL	FL	124,773			32,210	2518	1705
TAMPA, FL	FL	280,015			72,287	3427	725
VERO BEACH, FL	FL	17,350			4,479	3278	548
WEST PALM BEACH, FL	FL		1,789,497	461,963	0	3891	323
				Total Shipments	461,963		
						Sum-Product CDD (CDD · Shipments)	1,468,478,780
						Weighted CDD	3179
						Sum-Product CDD (CDD · Shipments)	443,969,605
						Weighted HDD	961

Table E.12 Texas State: Calculation of 30-year Average CDD and HDD

Weather Station	State	Weather Station Population	Total State Weather Station Population	Shipments per State	Shipments per Weather Station	CDD	HDD
ABILENE, TX	TX	106,707			6,649	2451	2584
AMARILLO, TX	TX	157,571			9,818	1354	4258
AUSTIN, TX	TX	472,020			29,410	3016	1688
BROWNSVILLE, TX	TX	107,027			6,669	3888	635
CORPUS CHRISTI, TX	TX	257,428			16,040	3439	1016
DALLAS-FORT WORTH, TX	TX	1,455,237			90,672	2603	2407
DEL RIO, TX	TX	20,000			1,246	3142	1506
EL PASO, TX	TX	515,342			32,110	2094	2708
HOUSTON, TX	TX	1,654,348			103,078	2700	1599
LUBBOCK, TX	TX	186,206			11,602	1689	3431
MIDLAND-ODESSA, TX	TX	179,042			11,156	2163	2751
PORT ARTHUR, TX	TX	58,551			3,648	2764	1499
SAN ANGELO, TX	TX	84,462			5,263	2400	2414
SAN ANTONIO, TX	TX	976,514			60,844	2996	1644
VICTORIA, TX	TX	55,076			3,432	3118	1296
WACO, TX	TX	103,590			6,454	2816	2179
WICHITA FALLS, TX	TX	96,259	6,485,380	404,088	5,998	2340	3042
				Total Shipments	404,088		
						Sum-Product CDD (CDD · Shipments)	1,076,501,988
						Weighted CDD	2664
						Sum-Product CDD (CDD · Shipments)	826,512,953
						Weighted HDD	2045

Table E.13 California State: Calculation of 30-year Average CDD and HDD

Weather Station	State	Weather Station Population	Total State Weather Station Population	Shipments per State	Shipments per Weather Station	CDD	HDD
BAKERSFIELD, CA	CA	176,264			7,722	2365	2182
BISHOP, CA	CA				0	1039	4310
FRESNO, CA	CA	354,091			15,512	1967	4496
LONG BEACH, CA	CA	429,321			18,807	1201	2556
LOS ANGELES AP, CA	CA	0			0	727	1430
LOS ANGELES C.O., CA	CA	3,485,557			152,691	1537	1458
REDDING, CA	CA	66,176			2,899	1797	1154
SACRAMENTO, CA	CA	369,365			16,181	1237	2855
SAN DIEGO, CA	CA	1,110,623			48,653	984	2749
SAN FRANCISCO AP, CA	CA	723,959			31,714	145	1256
SAN FRANCISCO C.O., CA	CA				0	65	3016
SANTA BARBARA, CA	CA	85,571			3,749	289	3005
SANTA MARIA, CA	CA	61,552			2,696	169	2438
STOCKTON, CA	CA	210,943	7,073,422	309,864	9,241	1470	2984
				Total Shipments	309,864		
						Sum-Product CDD (CDD · Shipments)	398,867,733
						Weighted CDD	1287
						Sum-Product CDD (CDD · Shipments)	625,817,890
						Weighted HDD	2020