

18.0-20.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	1,094						
22,800-28,499	2,187	1,459					
28,500-34,199	3,280	2,552	1,824				
34,200-39,899	4,373	3,645	2,917	2,188			
39,900-45,599	5,467	4,738	4,010	3,282	2,553		
45,600-56,999	6,560	5,831	5,103	4,375	3,646	2,918	
57,000-64,499	8,746	8,017	7,289	6,561	5,832	5,104	3,647

21.0+ SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	1,390						
22,800-28,499	2,483	1,854					
28,500-34,199	3,576	2,947	2,317				
34,200-39,899	4,670	4,040	3,410	2,781			
39,900-45,599	5,763	5,133	4,503	3,874	3,244		
45,600-56,999	6,856	6,226	5,596	4,967	4,337	3,707	
57,000-64,499	9,042	8,412	7,783	7,153	6,523	5,894	4,634

Climate Zone 4: Valley Region Corpus Christi Weather Data

Table 2-90: Energy Savings (kWh) for 13.08 SEER Replace-on-Burnout Baseline—Zone 4

14.5-14.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	375						
22,800-28,499	1,587	500					
28,500-34,199	2,799	1,712	625				
34,200-39,899	4,011	2,924	1,837	750			
39,900-45,599	5,223	4,136	3,049	1,962	875		
45,600-56,999	6,435	5,348	4,261	3,174	2,087	1,000	
57,000-64,499	8,860	7,772	6,685	5,598	4,511	3,424	1,250

15.0-15.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	500						
22,800-28,499	1,712	667					
28,500-34,199	2,924	1,879	834				
34,200-39,899	4,137	3,091	2,046	1,001			
39,900-45,599	5,349	4,303	3,258	2,213	1,167		
45,600-56,999	6,561	5,515	4,470	3,425	2,379	1,334	
57,000-64,499	8,985	7,940	6,894	5,849	4,804	3,758	1,668
16.0-16.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	724						
22,800-28,499	1,936	966					
28,500-34,199	3,148	2,178	1,207				
34,200-39,899	4,361	3,390	2,419	1,449			
39,900-45,599	5,573	4,602	3,631	2,661	1,690		
45,600-56,999	6,785	5,814	4,843	3,873	2,902	1,931	
57,000-64,499	9,209	8,238	7,268	6,297	5,326	4,356	2,414
17.0-17.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	1,096						
22,800-28,499	2,308	1,462					
28,500-34,199	3,520	2,674	1,827				
34,200-39,899	4,733	3,886	3,039	2,192			
39,900-45,599	5,945	5,098	4,251	3,405	2,558		
45,600-56,999	7,157	6,310	5,463	4,617	3,770	2,923	
57,000-64,499	9,581	8,734	7,888	7,041	6,194	5,347	3,654

18.0-20.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	1,231						
22,800-28,499	2,443	1,641					
28,500-34,199	3,655	2,853	2,051				
34,200-39,899	4,867	4,065	3,263	2,461			
39,900-45,599	6,079	5,277	4,475	3,673	2,871		
45,600-56,999	7,291	6,489	5,687	4,885	4,084	3,282	
57,000-64,499	9,715	8,913	8,112	7,310	6,508	5,706	4,102

21.0+ SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	1,562						
22,800-28,499	2,774	2,083					
28,500-34,199	3,986	3,295	2,604				
34,200-39,899	5,199	4,507	3,816	3,125			
39,900-45,599	6,411	5,719	5,028	4,337	3,645		
45,600-56,999	7,623	6,931	6,240	5,549	4,857	4,166	
57,000-64,499	10,047	9,356	8,664	7,973	7,282	6,590	5,208

Climate Zone 5: West Region El Paso Weather Data

Table 2-91: Energy Savings (kWh) for 13.08 SEER Replace-on-Burnout Baseline—Zone 5

14.5-14.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	247						
22,800-28,499	1,046	329					
28,500-34,199	1,845	1,128	412				
34,200-39,899	2,644	1,927	1,211	494			
39,900-45,599	3,443	2,726	2,010	1,293	577		
45,600-56,999	4,242	3,525	2,809	2,092	1,376	659	
57,000-64,499	5,840	5,123	4,407	3,690	2,974	2,257	824

15.0-15.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	330						
22,800-28,499	1,129	440					
28,500-34,199	1,928	1,239	550				
34,200-39,899	2,727	2,038	1,349	660			
39,900-45,599	3,526	2,837	2,148	1,459	770		
45,600-56,999	4,325	3,636	2,947	2,258	1,569	879	
57,000-64,499	5,923	5,234	4,545	3,856	3,167	2,477	1,099
16.0-16.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	477						
22,800-28,499	1,276	637					
28,500-34,199	2,075	1,436	796				
34,200-39,899	2,874	2,235	1,595	955			
39,900-45,599	3,673	3,034	2,394	1,754	1,114		
45,600-56,999	4,472	3,833	3,193	2,553	1,913	1,273	
57,000-64,499	6,070	5,431	4,791	4,151	3,511	2,871	1,591
17.0-17.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	724						
22,800-28,499	1,523	965					
28,500-34,199	2,322	1,764	1,207				
34,200-39,899	3,121	2,563	2,006	1,448			
39,900-45,599	3,920	3,362	2,805	2,247	1,689		
45,600-56,999	4,719	4,161	3,604	3,046	2,488	1,931	
57,000-64,499	6,317	5,759	5,202	4,644	4,086	3,529	2,413

18.0-20.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	813						
22,800-28,499	1,612	1,083					
28,500-34,199	2,411	1,882	1,354				
34,200-39,899	3,210	2,681	2,153	1,625			
39,900-45,599	4,009	3,480	2,952	2,424	1,896		
45,600-56,999	4,808	4,279	3,751	3,223	2,695	2,167	
57,000-64,499	6,406	5,877	5,349	4,821	4,293	3,765	2,708

21.0+ SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	1,031						
22,800-28,499	1,830	1,374					
28,500-34,199	2,629	2,173	1,718				
34,200-39,899	3,428	2,972	2,517	2,061			
39,900-45,599	4,227	3,771	3,316	2,860	2,405		
45,600-56,999	5,026	4,570	4,115	3,659	3,204	2,748	
57,000-64,499	6,624	6,168	5,713	5,257	4,802	4,346	3,435

Early Retirement

Table 2-92 through Table 2-101 present the early retirement energy savings (kWh) associated with central air conditioners installed in homes for the five Texas climate zones. These savings can be used with the replace-on-burnout energy savings in Table 2-107 through Table 2-111 to calculate annual savings. In each table, the capacity of the efficient unit is represented in the columns and the capacity of the existing unit is represented in the rows. The savings are in the intersection of the appropriate efficient and existing capacities. Replacements where there has been no change in capacity are highlighted in light blue and bold text.

Climate Zone 1: Panhandle Region, Amarillo Weather Data

Table 2-92: Energy Savings (kWh) for 12.44 SEER Early Retirement Baseline—Zone 1

14.5-14.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	267						
22,800-28,499	873	356					
28,500-34,199	1,478	962	445				
34,200-39,899	2,084	1,567	1,051	534			
39,900-45,599	2,689	2,173	1,656	1,140	623		
45,600-56,999	3,295	2,778	2,262	1,745	1,229	712	
57,000-64,499	4,506	3,989	3,473	2,956	2,440	1,923	890
15.0-15.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	327						
22,800-28,499	932	435					
28,500-34,199	1,538	1,041	544				
34,200-39,899	2,143	1,647	1,150	653			
39,900-45,599	2,749	2,252	1,756	1,259	762		
45,600-56,999	3,354	2,858	2,361	1,864	1,368	871	
57,000-64,499	4,566	4,069	3,572	3,076	2,579	2,082	1,089
16.0-16.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	433						
22,800-28,499	1,039	577					
28,500-34,199	1,644	1,183	722				
34,200-39,899	2,250	1,789	1,327	866			
39,900-45,599	2,855	2,394	1,933	1,472	1,010		
45,600-56,999	3,461	3,000	2,538	2,077	1,616	1,155	
57,000-64,499	4,672	4,211	3,750	3,288	2,827	2,366	1,443

17.0-17.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	599						
22,800-28,499	1,204	799					
28,500-34,199	1,810	1,404	998				
34,200-39,899	2,416	2,010	1,604	1,198			
39,900-45,599	3,021	2,615	2,209	1,803	1,397		
45,600-56,999	3,627	3,221	2,815	2,409	2,003	1,597	
57,000-64,499	4,838	4,432	4,026	3,620	3,214	2,808	1,996
18.0-20.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	664						
22,800-28,499	1,269	885					
28,500-34,199	1,875	1,490	1,106				
34,200-39,899	2,480	2,096	1,712	1,327			
39,900-45,599	3,086	2,702	2,317	1,933	1,548		
45,600-56,999	3,691	3,307	2,923	2,538	2,154	1,770	
57,000-64,499	4,903	4,518	4,134	3,750	3,365	2,981	2,212
21.0+ SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	819						
22,800-28,499	1,425	1,092					
28,500-34,199	2,030	1,698	1,365				
34,200-39,899	2,636	2,304	1,971	1,639			
39,900-45,599	3,242	2,909	2,577	2,244	1,912		
45,600-56,999	3,847	3,515	3,182	2,850	2,517	2,185	
57,000-64,499	5,058	4,726	4,393	4,061	3,728	3,396	2,731

Table 2-93: Energy Savings (kWh) for 10.0 SEER Early Retirement Baseline—Zone 1

14.5-14.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	710						
22,800-28,499	1,464	947					
28,500-34,199	2,217	1,700	1,184				
34,200-39,899	2,970	2,454	1,937	1,421			
39,900-45,599	3,724	3,207	2,690	2,174	1,657		
45,600-56,999	4,477	3,960	3,444	2,927	2,411	1,894	
57,000-64,499	5,984	5,467	4,950	4,434	3,917	3,401	2,368
15.0-15.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	770						
22,800-28,499	1,523	1,027					
28,500-34,199	2,277	1,780	1,283				
34,200-39,899	3,030	2,533	2,036	1,540			
39,900-45,599	3,783	3,287	2,790	2,293	1,796		
45,600-56,999	4,537	4,040	3,543	3,046	2,550	2,053	
57,000-64,499	6,043	5,547	5,050	4,553	4,056	3,560	2,566
16.0-16.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	876						
22,800-28,499	1,630	1,168					
28,500-34,199	2,383	1,922	1,461				
34,200-39,899	3,136	2,675	2,214	1,753			
39,900-45,599	3,890	3,428	2,967	2,506	2,045		
45,600-56,999	4,643	4,182	3,721	3,259	2,798	2,337	
57,000-64,499	6,150	5,688	5,227	4,766	4,305	3,844	2,921

17.0-17.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	1,042						
22,800-28,499	1,796	1,390					
28,500-34,199	2,549	2,143	1,737				
34,200-39,899	3,302	2,896	2,490	2,084			
39,900-45,599	4,056	3,650	3,244	2,838	2,432		
45,600-56,999	4,809	4,403	3,997	3,591	3,185	2,779	
57,000-64,499	6,316	5,910	5,504	5,098	4,692	4,286	3,474
18.0-20.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	1,107						
22,800-28,499	1,860	1,476					
28,500-34,199	2,614	2,229	1,845				
34,200-39,899	3,367	2,983	2,598	2,214			
39,900-45,599	4,120	3,736	3,351	2,967	2,583		
45,600-56,999	4,874	4,489	4,105	3,720	3,336	2,952	
57,000-64,499	6,380	5,996	5,612	5,227	4,843	4,458	3,690
21.0+ SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	1,263						
22,800-28,499	2,016	1,683					
28,500-34,199	2,769	2,437	2,104				
34,200-39,899	3,523	3,190	2,858	2,525			
39,900-45,599	4,276	3,943	3,611	3,278	2,946		
45,600-56,999	5,029	4,697	4,364	4,032	3,699	3,367	
57,000-64,499	6,536	6,203	5,871	5,538	5,206	4,874	4,209

Climate Zone 2: North Region, Dallas / Ft. Worth Weather Data

Table 2-94: Energy Savings (kWh) for 12.44 SEER Early Retirement Baseline—Zone 2

14.5-14.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	433						
22,800-28,499	1,414	577					
28,500-34,199	2,396	1,559	721				
34,200-39,899	3,378	2,540	1,703	866			
39,900-45,599	4,359	3,522	2,684	1,847	1,010		
45,600-56,999	5,341	4,503	3,666	2,829	1,991	1,154	
57,000-64,499	7,304	6,467	5,629	4,792	3,955	3,117	1,443
15.0-15.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	529						
22,800-28,499	1,511	706					
28,500-34,199	2,493	1,687	882				
34,200-39,899	3,474	2,669	1,864	1,059			
39,900-45,599	4,456	3,651	2,846	2,040	1,235		
45,600-56,999	5,437	4,632	3,827	3,022	2,217	1,412	
57,000-64,499	7,400	6,595	5,790	4,985	4,180	3,375	1,765
16.0-16.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	702						
22,800-28,499	1,684	936					
28,500-34,199	2,665	1,917	1,170				
34,200-39,899	3,647	2,899	2,151	1,404			
39,900-45,599	4,628	3,881	3,133	2,385	1,638		
45,600-56,999	5,610	4,862	4,115	3,367	2,619	1,872	
57,000-64,499	7,573	6,825	6,078	5,330	4,583	3,835	2,340

17.0-17.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	977						
22,800-28,499	1,959	1,303					
28,500-34,199	2,940	2,284	1,629				
34,200-39,899	3,922	3,266	2,610	1,954			
39,900-45,599	4,903	4,248	3,592	2,936	2,280		
45,600-56,999	5,885	5,229	4,573	3,917	3,262	2,606	
57,000-64,499	7,848	7,192	6,536	5,881	5,225	4,569	3,257
18.0-20.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	1,081						
22,800-28,499	2,063	1,442					
28,500-34,199	3,045	2,424	1,802				
34,200-39,899	4,026	3,405	2,784	2,163			
39,900-45,599	5,008	4,387	3,766	3,145	2,523		
45,600-56,999	5,989	5,368	4,747	4,126	3,505	2,884	
57,000-64,499	7,953	7,331	6,710	6,089	5,468	4,847	3,605
21.0+ SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	1,336						
22,800-28,499	2,317	1,781					
28,500-34,199	3,299	2,763	2,226				
34,200-39,899	4,280	3,744	3,208	2,671			
39,900-45,599	5,262	4,726	4,189	3,653	3,117		
45,600-56,999	6,244	5,707	5,171	4,635	4,098	3,562	
57,000-64,499	8,207	7,670	7,134	6,598	6,061	5,525	4,452

Table 2-95: Energy Savings (kWh) for 10.0 SEER Early Retirement Baseline—Zone 2

14.5-14.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	1,151						
22,800-28,499	2,372	1,535					
28,500-34,199	3,593	2,756	1,919				
34,200-39,899	4,815	3,977	3,140	2,303			
39,900-45,599	6,036	5,198	4,361	3,524	2,686		
45,600-56,999	7,257	6,419	5,582	4,745	3,907	3,070	
57,000-64,499	9,699	8,862	8,024	7,187	6,350	5,512	3,838
15.0-15.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	1,248						
22,800-28,499	2,469	1,664					
28,500-34,199	3,690	2,885	2,080				
34,200-39,899	4,911	4,106	3,301	2,496			
39,900-45,599	6,132	5,327	4,522	3,717	2,912		
45,600-56,999	7,353	6,548	5,743	4,938	4,133	3,328	
57,000-64,499	9,796	8,990	8,185	7,380	6,575	5,770	4,160
16.0-16.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	1,420						
22,800-28,499	2,642	1,894					
28,500-34,199	3,863	3,115	2,367				
34,200-39,899	5,084	4,336	3,589	2,841			
39,900-45,599	6,305	5,557	4,810	4,062	3,314		
45,600-56,999	7,526	6,778	6,031	5,283	4,535	3,788	
57,000-64,499	9,968	9,220	8,473	7,725	6,978	6,230	4,735

17.0-17.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	1,696						
22,800-28,499	2,917	2,261					
28,500-34,199	4,138	3,482	2,826				
34,200-39,899	5,359	4,703	4,047	3,391			
39,900-45,599	6,580	5,924	5,268	4,612	3,957		
45,600-56,999	7,801	7,145	6,489	5,833	5,178	4,522	
57,000-64,499	10,243	9,587	8,932	8,276	7,620	6,964	5,652
18.0-20.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	1,800						
22,800-28,499	3,021	2,400					
28,500-34,199	4,242	3,621	3,000				
34,200-39,899	5,463	4,842	4,221	3,600			
39,900-45,599	6,684	6,063	5,442	4,821	4,200		
45,600-56,999	7,905	7,284	6,663	6,042	5,421	4,800	
57,000-64,499	10,348	9,727	9,105	8,484	7,863	7,242	6,000
21.0+ SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	2,054						
22,800-28,499	3,275	2,739					
28,500-34,199	4,496	3,960	3,424				
34,200-39,899	5,717	5,181	4,645	4,108			
39,900-45,599	6,939	6,402	5,866	5,330	4,793		
45,600-56,999	8,160	7,623	7,087	6,551	6,014	5,478	
57,000-64,499	10,602	10,065	9,529	8,993	8,456	7,920	6,847

Climate Zone 3: South Region, Houston Weather Data

Table 2-96: Energy Savings (kWh) for 12.44 SEER Early Retirement Baseline—Zone 3

14.5-14.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	507						
22,800-28,499	1,656	676					
28,500-34,199	2,805	1,825	845				
34,200-39,899	3,955	2,974	1,994	1,014			
39,900-45,599	5,104	4,124	3,143	2,163	1,182		
45,600-56,999	6,253	5,273	4,293	3,312	2,332	1,351	
57,000-64,499	8,552	7,572	6,591	5,611	4,630	3,650	1,689
15.0-15.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	620						
22,800-28,499	1,769	826					
28,500-34,199	2,919	1,976	1,033				
34,200-39,899	4,068	3,125	2,182	1,240			
39,900-45,599	5,217	4,274	3,332	2,389	1,446		
45,600-56,999	6,366	5,424	4,481	3,538	2,596	1,653	
57,000-64,499	8,665	7,722	6,780	5,837	4,894	3,952	2,066
16.0-16.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	822						
22,800-28,499	1,971	1,096					
28,500-34,199	3,121	2,245	1,370				
34,200-39,899	4,270	3,394	2,519	1,644			
39,900-45,599	5,419	4,544	3,668	2,793	1,918		
45,600-56,999	6,568	5,693	4,818	3,942	3,067	2,192	
57,000-64,499	8,867	7,992	7,116	6,241	5,366	4,490	2,740

17.0-17.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	1,140						
22,800-28,499	2,290	1,521					
28,500-34,199	3,439	2,670	1,901				
34,200-39,899	4,588	3,819	3,050	2,281			
39,900-45,599	5,738	4,968	4,199	3,430	2,661		
45,600-56,999	6,887	6,118	5,349	4,579	3,810	3,041	
57,000-64,499	9,186	8,416	7,647	6,878	6,109	5,340	3,801

18.0-20.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	1,263						
22,800-28,499	2,412	1,684					
28,500-34,199	3,562	2,833	2,105				
34,200-39,899	4,711	3,983	3,254	2,526			
39,900-45,599	5,860	5,132	4,404	3,675	2,947		
45,600-56,999	7,010	6,281	5,553	4,824	4,096	3,368	
57,000-64,499	9,308	8,580	7,851	7,123	6,395	5,666	4,210

21.0+ SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	1,559						
22,800-28,499	2,708	2,079					
28,500-34,199	3,858	3,228	2,598				
34,200-39,899	5,007	4,377	3,748	3,118			
39,900-45,599	6,156	5,527	4,897	4,267	3,638		
45,600-56,999	7,306	6,676	6,046	5,417	4,787	4,157	
57,000-64,499	9,604	8,975	8,345	7,715	7,086	6,456	5,197

Table 2-97: Energy Savings (kWh) for 10.0 SEER Early Retirement Baseline—Zone 3

14.5-14.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	1,348						
22,800-28,499	2,778	1,797					
28,500-34,199	4,208	3,227	2,247				
34,200-39,899	5,637	4,657	3,677	2,696			
39,900-45,599	7,067	6,087	5,106	4,126	3,145		
45,600-56,999	8,497	7,516	6,536	5,556	4,575	3,595	
57,000-64,499	11,356	10,376	9,396	8,415	7,435	6,454	4,494
15.0-15.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	1,461						
22,800-28,499	2,891	1,948					
28,500-34,199	4,321	3,378	2,435				
34,200-39,899	5,750	4,808	3,865	2,922			
39,900-45,599	7,180	6,237	5,295	4,352	3,409		
45,600-56,999	8,610	7,667	6,725	5,782	4,839	3,896	
57,000-64,499	11,469	10,527	9,584	8,641	7,699	6,756	4,871
16.0-16.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	1,663						
22,800-28,499	3,093	2,218					
28,500-34,199	4,523	3,647	2,772				
34,200-39,899	5,952	5,077	4,202	3,326			
39,900-45,599	7,382	6,507	5,631	4,756	3,881		
45,600-56,999	8,812	7,937	7,061	6,186	5,311	4,435	
57,000-64,499	11,671	10,796	9,921	9,045	8,170	7,295	5,544

17.0-17.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	1,982						
22,800-28,499	3,411	2,642					
28,500-34,199	4,841	4,072	3,303				
34,200-39,899	6,271	5,502	4,733	3,963			
39,900-45,599	7,701	6,932	6,162	5,393	4,624		
45,600-56,999	9,130	8,361	7,592	6,823	6,054	5,285	
57,000-64,499	11,990	11,221	10,452	9,682	8,913	8,144	6,606
18.0-20.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	2,104						
22,800-28,499	3,534	2,806					
28,500-34,199	4,964	4,235	3,507				
34,200-39,899	6,393	5,665	4,937	4,208			
39,900-45,599	7,823	7,095	6,367	5,638	4,910		
45,600-56,999	9,253	8,525	7,796	7,068	6,340	5,611	
57,000-64,499	12,112	11,384	10,656	9,927	9,199	8,471	7,014
21.0+ SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	2,400						
22,800-28,499	3,830	3,200					
28,500-34,199	5,260	4,630	4,001				
34,200-39,899	6,690	6,060	5,430	4,801			
39,900-45,599	8,119	7,490	6,860	6,230	5,601		
45,600-56,999	9,549	8,919	8,290	7,660	7,030	6,401	
57,000-64,499	12,409	11,779	11,149	10,520	9,890	9,260	8,001

Climate Zone 4: Valley Region Corpus Christi Weather Data

Table 2-98: Energy Savings (kWh) for 12.44 SEER Early Retirement Baseline—Zone 4

14.5-14.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	562						
22,800-28,499	1,836	749					
28,500-34,199	3,111	2,024	937				
34,200-39,899	4,385	3,298	2,211	1,124			
39,900-45,599	5,660	4,573	3,485	2,398	1,311		
45,600-56,999	6,934	5,847	4,760	3,673	2,586	1,498	
57,000-64,499	9,483	8,396	7,309	6,222	5,135	4,047	1,873
15.0-15.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	687						
22,800-28,499	1,962	916					
28,500-34,199	3,236	2,191	1,146				
34,200-39,899	4,511	3,465	2,420	1,375			
39,900-45,599	5,785	4,740	3,695	2,649	1,604		
45,600-56,999	7,060	6,014	4,969	3,924	2,878	1,833	
57,000-64,499	9,609	8,563	7,518	6,473	5,427	4,382	2,291
16.0-16.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	911						
22,800-28,499	2,186	1,215					
28,500-34,199	3,460	2,490	1,519				
34,200-39,899	4,735	3,764	2,793	1,823			
39,900-45,599	6,009	5,039	4,068	3,097	2,127		
45,600-56,999	7,284	6,313	5,342	4,372	3,401	2,430	
57,000-64,499	9,833	8,862	7,891	6,921	5,950	4,979	3,038

17.0-17.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	1,283						
22,800-28,499	2,558	1,711					
28,500-34,199	3,832	2,986	2,139				
34,200-39,899	5,107	4,260	3,413	2,567			
39,900-45,599	6,381	5,534	4,688	3,841	2,994		
45,600-56,999	7,656	6,809	5,962	5,116	4,269	3,422	
57,000-64,499	10,205	9,358	8,511	7,664	6,818	5,971	4,278
18.0-20.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	1,418						
22,800-28,499	2,692	1,890					
28,500-34,199	3,967	3,165	2,363				
34,200-39,899	5,241	4,439	3,637	2,835			
39,900-45,599	6,516	5,714	4,912	4,110	3,308		
45,600-56,999	7,790	6,988	6,186	5,384	4,582	3,781	
57,000-64,499	10,339	9,537	8,735	7,933	7,131	6,329	4,726
21.0+ SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	1,749						
22,800-28,499	3,024	2,332					
28,500-34,199	4,298	3,607	2,916				
34,200-39,899	5,573	4,881	4,190	3,499			
39,900-45,599	6,847	6,156	5,464	4,773	4,082		
45,600-56,999	8,122	7,430	6,739	6,048	5,356	4,665	
57,000-64,499	10,671	9,979	9,288	8,597	7,905	7,214	5,831

Table 2-99: Energy Savings (kWh) for 10.0 SEER Early Retirement Baseline—Zone 4

14.5-14.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	1,495						
22,800-28,499	3,080	1,993					
28,500-34,199	4,666	3,579	2,491				
34,200-39,899	6,251	5,164	4,077	2,990			
39,900-45,599	7,837	6,749	5,662	4,575	3,488		
45,600-56,999	9,422	8,335	7,248	6,161	5,073	3,986	
57,000-64,499	12,593	11,506	10,419	9,331	8,244	7,157	4,983
15.0-15.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	1,620						
22,800-28,499	3,206	2,160					
28,500-34,199	4,791	3,746	2,700				
34,200-39,899	6,377	5,331	4,286	3,241			
39,900-45,599	7,962	6,917	5,871	4,826	3,781		
45,600-56,999	9,547	8,502	7,457	6,411	5,366	4,321	
57,000-64,499	12,718	11,673	10,628	9,582	8,537	7,492	5,401
16.0-16.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	1,844						
22,800-28,499	3,430	2,459					
28,500-34,199	5,015	4,044	3,074				
34,200-39,899	6,601	5,630	4,659	3,689			
39,900-45,599	8,186	7,215	6,245	5,274	4,303		
45,600-56,999	9,771	8,801	7,830	6,859	5,889	4,918	
57,000-64,499	12,942	11,972	11,001	10,030	9,060	8,089	6,148

17.0-17.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	2,216						
22,800-28,499	3,802	2,955					
28,500-34,199	5,387	4,540	3,694				
34,200-39,899	6,972	6,126	5,279	4,432			
39,900-45,599	8,558	7,711	6,865	6,018	5,171		
45,600-56,999	10,143	9,297	8,450	7,603	6,757	5,910	
57,000-64,499	13,314	12,468	11,621	10,774	9,927	9,081	7,387
18.0-20.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	2,351						
22,800-28,499	3,936	3,134					
28,500-34,199	5,521	4,720	3,918				
34,200-39,899	7,107	6,305	5,503	4,701			
39,900-45,599	8,692	7,890	7,089	6,287	5,485		
45,600-56,999	10,278	9,476	8,674	7,872	7,070	6,268	
57,000-64,499	13,449	12,647	11,845	11,043	10,241	9,439	7,835
21.0+ SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	2,682						
22,800-28,499	4,268	3,576					
28,500-34,199	5,853	5,162	4,470				
34,200-39,899	7,439	6,747	6,056	5,364			
39,900-45,599	9,024	8,333	7,641	6,950	6,259		
45,600-56,999	10,609	9,918	9,227	8,535	7,844	7,153	
57,000-64,499	13,780	13,089	12,398	11,706	11,015	10,324	8,941

Climate Zone 5: West Region El Paso Weather Data

Table 2-100: Energy Savings (kWh) for 12.44 SEER Early Retirement Baseline—Zone 5

14.5-14.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	370						
22,800-28,499	1,211	494					
28,500-34,199	2,051	1,334	617				
34,200-39,899	2,891	2,174	1,457	741			
39,900-45,599	3,731	3,014	2,298	1,581	864		
45,600-56,999	4,571	3,854	3,138	2,421	1,704	988	
57,000-64,499	6,251	5,535	4,818	4,101	3,385	2,668	1,235
15.0-15.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	453						
22,800-28,499	1,293	604					
28,500-34,199	2,133	1,444	755				
34,200-39,899	2,973	2,284	1,595	906			
39,900-45,599	3,814	3,124	2,435	1,746	1,057		
45,600-56,999	4,654	3,965	3,276	2,586	1,897	1,208	
57,000-64,499	6,334	5,645	4,956	4,267	3,578	2,889	1,510
16.0-16.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	601						
22,800-28,499	1,441	801					
28,500-34,199	2,281	1,641	1,001				
34,200-39,899	3,121	2,481	1,841	1,202			
39,900-45,599	3,961	3,321	2,681	2,042	1,402		
45,600-56,999	4,801	4,161	3,522	2,882	2,242	1,602	
57,000-64,499	6,482	5,842	5,202	4,562	3,922	3,282	2,003

17.0-17.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	847						
22,800-28,499	1,687	1,130					
28,500-34,199	2,528	1,970	1,412				
34,200-39,899	3,368	2,810	2,252	1,695			
39,900-45,599	4,208	3,650	3,092	2,535	1,977		
45,600-56,999	5,048	4,490	3,933	3,375	2,817	2,259	
57,000-64,499	6,728	6,170	5,613	5,055	4,497	3,940	2,824
18.0-20.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	936						
22,800-28,499	1,776	1,248					
28,500-34,199	2,616	2,088	1,560				
34,200-39,899	3,456	2,928	2,400	1,872			
39,900-45,599	4,296	3,768	3,240	2,712	2,184		
45,600-56,999	5,136	4,608	4,080	3,552	3,024	2,496	
57,000-64,499	6,817	6,288	5,760	5,232	4,704	4,176	3,120
21.0+ SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	1,154						
22,800-28,499	1,994	1,539					
28,500-34,199	2,834	2,379	1,923				
34,200-39,899	3,674	3,219	2,763	2,308			
39,900-45,599	4,514	4,059	3,603	3,148	2,693		
45,600-56,999	5,354	4,899	4,444	3,988	3,533	3,077	
57,000-64,499	7,035	6,579	6,124	5,668	5,213	4,757	3,846

Table 2-101: Energy Savings (kWh) for 10.0 SEER Early Retirement Baseline—Zone 5

14.5-14.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	985						
22,800-28,499	2,030	1,314					
28,500-34,199	3,076	2,359	1,642				
34,200-39,899	4,121	3,404	2,687	1,971			
39,900-45,599	5,166	4,449	3,732	3,016	2,299		
45,600-56,999	6,211	5,494	4,778	4,061	3,344	2,628	
57,000-64,499	8,301	7,584	6,868	6,151	5,435	4,718	3,285
15.0-15.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	1,068						
22,800-28,499	2,113	1,424					
28,500-34,199	3,158	2,469	1,780				
34,200-39,899	4,203	3,514	2,825	2,136			
39,900-45,599	5,248	4,559	3,870	3,181	2,492		
45,600-56,999	6,294	5,604	4,915	4,226	3,537	2,848	
57,000-64,499	8,384	7,695	7,006	6,317	5,627	4,938	3,560
16.0-16.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	1,216						
22,800-28,499	2,261	1,621					
28,500-34,199	3,306	2,666	2,026				
34,200-39,899	4,351	3,711	3,071	2,431			
39,900-45,599	5,396	4,756	4,116	3,477	2,837		
45,600-56,999	6,441	5,801	5,162	4,522	3,882	3,242	
57,000-64,499	8,531	7,892	7,252	6,612	5,972	5,332	4,052

17.0-17.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	1,462						
22,800-28,499	2,507	1,950					
28,500-34,199	3,552	2,995	2,437				
34,200-39,899	4,598	4,040	3,482	2,925			
39,900-45,599	5,643	5,085	4,527	3,970	3,412		
45,600-56,999	6,688	6,130	5,572	5,015	4,457	3,899	
57,000-64,499	8,778	8,220	7,663	7,105	6,547	5,990	4,874
18.0-20.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	1,551						
22,800-28,499	2,596	2,068					
28,500-34,199	3,641	3,113	2,585				
34,200-39,899	4,686	4,158	3,630	3,102			
39,900-45,599	5,731	5,203	4,675	4,147	3,619		
45,600-56,999	6,776	6,248	5,720	5,192	4,664	4,136	
57,000-64,499	8,867	8,338	7,810	7,282	6,754	6,226	5,169
21.0+ SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	1,769						
22,800-28,499	2,814	2,359					
28,500-34,199	3,859	3,404	2,948				
34,200-39,899	4,904	4,449	3,993	3,538			
39,900-45,599	5,949	5,494	5,038	4,583	4,127		
45,600-56,999	6,994	6,539	6,083	5,628	5,173	4,717	
57,000-64,499	9,085	8,629	8,174	7,718	7,263	6,807	5,896

Deemed Summer Demand Savings Tables¹⁴⁵

Air conditioners 17 SEER or greater are assumed to be two-stage air conditioners, while those under 17 SEER are assumed to be single-stage air conditioners. This results in slightly lower summer demand savings for 17.0-17.9 SEER air conditioners as compared to 16.0-16.9 SEER units.

New Construction

Table 2-102 through Table 2-106 present the summer demand savings (kW) associated with central air conditioners installed during new construction (14.0 SEER baseline) for the five Texas climate zones.

Climate Zone 1: Panhandle Region, Amarillo Weather Data

Table 2-102: Summer Demand Savings for 14.0 SEER New Construction Baseline—Zone 1

Size (Btuh)	SEER Range					
	14.5–14.9	15.0–15.9	16.0–16.9	17.0–17.9	18.0–20.9	21.0+
< 22,800	0.06	0.12	0.22	0.16	0.24	0.35
22,800-28,499	0.08	0.16	0.29	0.21	0.31	0.47
28,500-34,199	0.10	0.19	0.36	0.27	0.39	0.59
34,200-39,899	0.12	0.23	0.43	0.32	0.47	0.71
39,900-45,599	0.14	0.27	0.50	0.37	0.55	0.82
45,600-56,999	0.16	0.31	0.58	0.42	0.63	0.94
57,000-64,499	0.20	0.39	0.72	0.53	0.79	1.18

Climate Zone 2: North Region, Dallas / Ft. Worth Weather Data

Table 2-103: Summer Demand Savings for 14.0 SEER New Construction Baseline—Zone 2

Size (Btuh)	SEER Range					
	14.5–14.9	15.0–15.9	16.0–16.9	17.0–17.9	18.0–20.9	21.0+
< 22,800	0.06	0.12	0.23	0.18	0.26	0.38
22,800-28,499	0.09	0.16	0.31	0.24	0.34	0.50
28,500-34,199	0.11	0.21	0.38	0.30	0.43	0.63
34,200-39,899	0.13	0.25	0.46	0.35	0.52	0.76
39,900-45,599	0.15	0.29	0.53	0.41	0.60	0.88
45,600-56,999	0.17	0.33	0.61	0.47	0.69	1.01
57,000-64,499	0.21	0.41	0.76	0.59	0.86	1.26

¹⁴⁵ Rated capacity ranges are specified with a 5% tolerance in accordance with AHRI Standard 210/240 to account for systems that are rated slightly below the applicable nominal capacity. AHRI Standard 210/240. Table J1.
http://www.ahrinet.org/App_Content/ahri/files/STANDARDS/AHRI/AHRI_Standard_210-240_2017.pdf.

Climate Zone 3: South Region, Houston Weather Data

Table 2-104: Summer Demand Savings for 14.0 SEER New Construction Baseline—Zone 3

Size (Btuh)	SEER Range					
	14.5–14.9	15.0–15.9	16.0–16.9	17.0–17.9	18.0–20.9	21.0+
< 22,800	0.06	0.12	0.22	0.15	0.23	0.35
22,800-28,499	0.08	0.16	0.30	0.21	0.31	0.46
28,500-34,199	0.10	0.20	0.37	0.26	0.39	0.58
34,200-39,899	0.12	0.24	0.45	0.31	0.47	0.69
39,900-45,599	0.15	0.28	0.52	0.36	0.55	0.81
45,600-56,999	0.17	0.32	0.59	0.41	0.62	0.92
57,000-64,499	0.21	0.40	0.74	0.51	0.78	1.16

Climate Zone 4: Valley Region Corpus Christi Weather Data

Table 2-105: Summer Demand Savings for 14.0 SEER New Construction Baseline—Zone 4

Size (Btuh)	SEER Range					
	14.5–14.9	15.0–15.9	16.0–16.9	17.0–17.9	18.0–20.9	21.0+
< 22,800	0.05	0.09	0.17	0.22	0.28	0.40
22,800-28,499	0.06	0.12	0.23	0.30	0.37	0.53
28,500-34,199	0.08	0.16	0.29	0.37	0.46	0.66
34,200-39,899	0.10	0.19	0.35	0.45	0.56	0.80
39,900-45,599	0.11	0.22	0.41	0.52	0.65	0.93
45,600-56,999	0.13	0.25	0.46	0.60	0.74	1.06
57,000-64,499	0.16	0.31	0.58	0.75	0.93	1.33

Climate Zone 5: West Region El Paso Weather Data

Table 2-106: Summer Demand Savings for 14.0 SEER New Construction Burnout Baseline—Zone 5

Size (Btuh)	SEER Range					
	14.5–14.9	15.0–15.9	16.0–16.9	17.0–17.9	18.0–20.9	21.0+
< 22,800	0.06	0.11	0.21	0.19	0.26	0.39
22,800-28,499	0.08	0.15	0.28	0.25	0.35	0.52
28,500-34,199	0.10	0.19	0.35	0.31	0.43	0.65
34,200-39,899	0.12	0.23	0.42	0.38	0.52	0.78
39,900-45,599	0.14	0.27	0.49	0.44	0.61	0.90
45,600-56,999	0.16	0.30	0.57	0.50	0.70	1.03
57,000-64,499	0.20	0.38	0.71	0.63	0.87	1.29

Replace-on-Burnout

Table 2-107 through Table 2-111 present the summer demand savings (kW) associated with central air conditioners installed in replace-on-burnout homes (13.08 SEER baseline) for the five Texas climate zones. In each table, the capacity of the efficient unit is represented in the columns and the capacity of the existing unit is represented in the rows. The savings are in the intersection of the appropriate efficient and existing capacities. Replacements where there has been no change in capacity are highlighted in light blue and bold text.

Climate Zone 1: Panhandle Region, Amarillo Weather Data

Table 2-107: Summer Demand Savings for 13.08 SEER Replace-on-Burnout Baseline—Zone 1

14.5-14.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.17						
22,800-28,499	0.71	0.22					
28,500-34,199	1.25	0.76	0.28				
34,200-39,899	1.79	1.30	0.82	0.33			
39,900-45,599	2.33	1.84	1.36	0.87	0.39		
45,600-56,999	2.87	2.38	1.90	1.41	0.93	0.45	
57,000-64,499	3.94	3.46	2.98	2.49	2.01	1.52	0.56
15.0-15.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.22						
22,800-28,499	0.76	0.30					
28,500-34,199	1.30	0.84	0.37				
34,200-39,899	1.84	1.38	0.91	0.45			
39,900-45,599	2.38	1.92	1.45	0.99	0.52		
45,600-56,999	2.92	2.46	1.99	1.52	1.06	0.59	
57,000-64,499	4.00	3.53	3.07	2.60	2.14	1.67	0.74

16.0-16.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.32						
22,800-28,499	0.86	0.43					
28,500-34,199	1.40	0.97	0.54				
34,200-39,899	1.94	1.51	1.08	0.64			
39,900-45,599	2.48	2.05	1.62	1.18	0.75		
45,600-56,999	3.02	2.59	2.16	1.72	1.29	0.86	
57,000-64,499	4.10	3.67	3.24	2.80	2.37	1.94	1.07
17.0-17.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.27						
22,800-28,499	0.81	0.35					
28,500-34,199	1.34	0.89	0.44				
34,200-39,899	1.88	1.43	0.98	0.53			
39,900-45,599	2.42	1.97	1.52	1.07	0.62		
45,600-56,999	2.96	2.51	2.06	1.61	1.16	0.71	
57,000-64,499	4.04	3.59	3.14	2.69	2.24	1.79	0.88
18.0-20.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.34						
22,800-28,499	0.88	0.46					
28,500-34,199	1.42	1.00	0.57				
34,200-39,899	1.96	1.54	1.11	0.68			
39,900-45,599	2.50	2.08	1.65	1.22	0.80		
45,600-56,999	3.04	2.61	2.19	1.76	1.34	0.91	
57,000-64,499	4.12	3.69	3.27	2.84	2.42	1.99	1.14

21.0+ SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.46						
22,800-28,499	1.00	0.61					
28,500-34,199	1.54	1.15	0.76				
34,200-39,899	2.08	1.69	1.30	0.92			
39,900-45,599	2.62	2.23	1.84	1.46	1.07		
45,600-56,999	3.16	2.77	2.38	2.00	1.61	1.22	
57,000-64,499	4.24	3.85	3.46	3.08	2.69	2.30	1.53

Climate Zone 2: North Region, Dallas / Ft. Worth Weather Data

Table 2-108: Summer Demand Savings for 13.08 SEER Replace-on-Burnout Baseline—Zone 2

14.5-14.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.18						
22,800-28,499	0.75	0.24					
28,500-34,199	1.32	0.81	0.29				
34,200-39,899	1.89	1.38	0.87	0.35			
39,900-45,599	2.47	1.95	1.44	0.93	0.41		
45,600-56,999	3.04	2.53	2.01	1.50	0.99	0.47	
57,000-64,499	4.18	3.67	3.16	2.64	2.13	1.62	0.59

15.0-15.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.24						
22,800-28,499	0.81	0.31					
28,500-34,199	1.38	0.89	0.39				
34,200-39,899	1.95	1.46	0.97	0.47			
39,900-45,599	2.53	2.03	1.54	1.04	0.55		
45,600-56,999	3.10	2.60	2.11	1.62	1.12	0.63	
57,000-64,499	4.24	3.75	3.26	2.76	2.27	1.77	0.79

16.0-16.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.34						
22,800-28,499	0.91	0.46					
28,500-34,199	1.49	1.03	0.57				
34,200-39,899	2.06	1.60	1.14	0.68			
39,900-45,599	2.63	2.17	1.71	1.26	0.80		
45,600-56,999	3.20	2.75	2.29	1.83	1.37	0.91	
57,000-64,499	4.35	3.89	3.43	2.97	2.52	2.06	1.14

17.0-17.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.29						
22,800-28,499	0.86	0.39					
28,500-34,199	1.43	0.96	0.48				
34,200-39,899	2.01	1.53	1.06	0.58			
39,900-45,599	2.58	2.10	1.63	1.15	0.68		
45,600-56,999	3.15	2.68	2.20	1.72	1.25	0.77	
57,000-64,499	4.30	3.82	3.34	2.87	2.39	1.92	0.97

18.0-20.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.37						
22,800-28,499	0.94	0.49					
28,500-34,199	1.52	1.07	0.62				
34,200-39,899	2.09	1.64	1.19	0.74			
39,900-45,599	2.66	2.21	1.76	1.31	0.87		
45,600-56,999	3.23	2.78	2.34	1.89	1.44	0.99	
57,000-64,499	4.38	3.93	3.48	3.03	2.58	2.13	1.24

21.0+ SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.49						
22,800-28,499	1.06	0.66					
28,500-34,199	1.64	1.23	0.82				
34,200-39,899	2.21	1.80	1.39	0.98			
39,900-45,599	2.78	2.37	1.96	1.55	1.15		
45,600-56,999	3.35	2.94	2.54	2.13	1.72	1.31	
57,000-64,499	4.50	4.09	3.68	3.27	2.86	2.45	1.64

Climate Zone 3: South Region, Houston Weather Data

Table 2-109: Summer Demand Savings for 13.08 SEER Replace-on-Burnout Baseline—Zone 3

14.5-14.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.17						
22,800-28,499	0.73	0.23					
28,500-34,199	1.28	0.79	0.29				
34,200-39,899	1.84	1.34	0.84	0.34			
39,900-45,599	2.40	1.90	1.40	0.90	0.40		
45,600-56,999	2.95	2.45	1.96	1.46	0.96	0.46	
57,000-64,499	4.07	3.57	3.07	2.57	2.07	1.57	0.57

15.0-15.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.23						
22,800-28,499	0.79	0.31					
28,500-34,199	1.34	0.86	0.38				
34,200-39,899	1.90	1.42	0.94	0.46			
39,900-45,599	2.46	1.98	1.50	1.02	0.54		
45,600-56,999	3.01	2.53	2.05	1.57	1.09	0.61	
57,000-64,499	4.12	3.64	3.16	2.68	2.20	1.73	0.77

16.0-16.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.33						
22,800-28,499	0.89	0.44					
28,500-34,199	1.45	1.00	0.55				
34,200-39,899	2.00	1.56	1.11	0.66			
39,900-45,599	2.56	2.11	1.67	1.22	0.78		
45,600-56,999	3.11	2.67	2.22	1.78	1.33	0.89	
57,000-64,499	4.23	3.78	3.34	2.89	2.44	2.00	1.11

17.0-17.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.26						
22,800-28,499	0.82	0.35					
28,500-34,199	1.38	0.91	0.44				
34,200-39,899	1.93	1.46	1.00	0.53			
39,900-45,599	2.49	2.02	1.55	1.08	0.62		
45,600-56,999	3.05	2.58	2.11	1.64	1.17	0.70	
57,000-64,499	4.16	3.69	3.22	2.75	2.28	1.82	0.88

18.0-20.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.34						
22,800-28,499	0.90	0.46					
28,500-34,199	1.46	1.01	0.57				
34,200-39,899	2.01	1.57	1.13	0.69			
39,900-45,599	2.57	2.13	1.69	1.24	0.80		
45,600-56,999	3.13	2.68	2.24	1.80	1.36	0.92	
57,000-64,499	4.24	3.80	3.36	2.91	2.47	2.03	1.15

21.0+ SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.46						
22,800-28,499	1.01	0.61					
28,500-34,199	1.57	1.17	0.76				
34,200-39,899	2.13	1.72	1.32	0.91			
39,900-45,599	2.68	2.28	1.87	1.47	1.07		
45,600-56,999	3.24	2.83	2.43	2.03	1.62	1.22	
57,000-64,499	4.35	3.95	3.54	3.14	2.73	2.33	1.52

Climate Zone 4: Valley Region Corpus Christi Weather Data

Table 2-110: Summer Demand Savings for 13.08 SEER Replace-on-Burnout Baseline—Zone 4

14.5-14.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.13						
22,800-28,499	0.57	0.18					
28,500-34,199	1.00	0.61	0.22				
34,200-39,899	1.44	1.05	0.66	0.27			
39,900-45,599	1.87	1.48	1.09	0.70	0.31		
45,600-56,999	2.31	1.92	1.53	1.14	0.75	0.36	
57,000-64,499	3.18	2.79	2.40	2.01	1.62	1.23	0.45

15.0-15.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.18						
22,800-28,499	0.61	0.24					
28,500-34,199	1.05	0.67	0.30				
34,200-39,899	1.48	1.11	0.73	0.36			
39,900-45,599	1.92	1.54	1.17	0.79	0.42		
45,600-56,999	2.35	1.98	1.60	1.23	0.85	0.48	
57,000-64,499	3.22	2.85	2.47	2.10	1.72	1.35	0.60

16.0-16.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.26						
22,800-28,499	0.69	0.35					
28,500-34,199	1.13	0.78	0.43				
34,200-39,899	1.56	1.22	0.87	0.52			
39,900-45,599	2.00	1.65	1.30	0.95	0.61		
45,600-56,999	2.43	2.09	1.74	1.39	1.04	0.69	
57,000-64,499	3.30	2.96	2.61	2.26	1.91	1.56	0.87
17.0-17.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.31						
22,800-28,499	0.74	0.41					
28,500-34,199	1.18	0.85	0.52				
34,200-39,899	1.61	1.28	0.95	0.62			
39,900-45,599	2.05	1.72	1.39	1.05	0.72		
45,600-56,999	2.48	2.15	1.82	1.49	1.16	0.83	
57,000-64,499	3.35	3.02	2.69	2.36	2.03	1.70	1.03
18.0-20.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.36						
22,800-28,499	0.80	0.48					
28,500-34,199	1.23	0.92	0.61				
34,200-39,899	1.67	1.35	1.04	0.73			
39,900-45,599	2.10	1.79	1.48	1.16	0.85		
45,600-56,999	2.54	2.22	1.91	1.60	1.28	0.97	
57,000-64,499	3.41	3.09	2.78	2.47	2.15	1.84	1.21

21.0+ SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.48						
22,800-28,499	0.92	0.65					
28,500-34,199	1.35	1.08	0.81				
34,200-39,899	1.79	1.52	1.24	0.97			
39,900-45,599	2.22	1.95	1.68	1.40	1.13		
45,600-56,999	2.66	2.38	2.11	1.84	1.56	1.29	
57,000-64,499	3.53	3.25	2.98	2.71	2.43	2.16	1.61

Climate Zone 5: West Region El Paso Weather Data

Table 2-111: Summer Demand Savings for 13.08 SEER Replace-on-Burnout Baseline—Zone 5

14.5-14.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.16						
22,800-28,499	0.69	0.22					
28,500-34,199	1.22	0.75	0.27				
34,200-39,899	1.75	1.28	0.80	0.33			
39,900-45,599	2.28	1.81	1.33	0.86	0.38		
45,600-56,999	2.81	2.34	1.86	1.39	0.91	0.44	
57,000-64,499	3.87	3.40	2.92	2.45	1.97	1.50	0.55

15.0-15.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.22						
22,800-28,499	0.75	0.29					
28,500-34,199	1.28	0.82	0.36				
34,200-39,899	1.81	1.35	0.89	0.44			
39,900-45,599	2.34	1.88	1.42	0.97	0.51		
45,600-56,999	2.87	2.41	1.95	1.50	1.04	0.58	
57,000-64,499	3.93	3.47	3.01	2.56	2.10	1.64	0.73

16.0-16.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.32						
22,800-28,499	0.85	0.42					
28,500-34,199	1.38	0.95	0.53				
34,200-39,899	1.90	1.48	1.06	0.63			
39,900-45,599	2.43	2.01	1.59	1.16	0.74		
45,600-56,999	2.96	2.54	2.12	1.69	1.27	0.84	
57,000-64,499	4.02	3.60	3.17	2.75	2.33	1.90	1.05
17.0-17.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.29						
22,800-28,499	0.82	0.39					
28,500-34,199	1.35	0.92	0.49				
34,200-39,899	1.88	1.45	1.02	0.59			
39,900-45,599	2.41	1.98	1.55	1.12	0.68		
45,600-56,999	2.94	2.51	2.08	1.65	1.21	0.78	
57,000-64,499	4.00	3.57	3.14	2.70	2.27	1.84	0.98
18.0-20.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.37						
22,800-28,499	0.89	0.49					
28,500-34,199	1.42	1.02	0.61				
34,200-39,899	1.95	1.55	1.14	0.73			
39,900-45,599	2.48	2.08	1.67	1.26	0.85		
45,600-56,999	3.01	2.61	2.20	1.79	1.38	0.97	
57,000-64,499	4.07	3.66	3.26	2.85	2.44	2.03	1.22

21.0+ SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.49						
22,800-28,499	1.02	0.66					
28,500-34,199	1.55	1.19	0.82				
34,200-39,899	2.08	1.72	1.35	0.98			
39,900-45,599	2.61	2.24	1.88	1.51	1.15		
45,600-56,999	3.14	2.77	2.41	2.04	1.68	1.31	
57,000-64,499	4.20	3.83	3.47	3.10	2.74	2.37	1.64

Early Retirement

Table 2-112 through Table 2-121 present the early retirement summer demand savings (kW) associated with central air conditioners installed in homes for the five Texas climate zones. These savings can be used with the replace-on-burnout energy savings in Table 2-107 through Table 2-111 to calculate summer demand savings. In each table, the capacity of the efficient unit is represented in the columns and the capacity of the existing unit is represented in the rows. The savings are in the intersection of the appropriate efficient and existing capacities. Replacements where there has been no change in capacity are highlighted in light blue and bold text.

Climate Zone 1: Panhandle Region, Amarillo Weather Data

Table 2-112: Summer Demand Savings for 12.44 SEER Early Retirement Baseline—Zone 1

14.5-14.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.25						
22,800-28,499	0.82	0.33					
28,500-34,199	1.39	0.90	0.42				
34,200-39,899	1.95	1.47	0.98	0.50			
39,900-45,599	2.52	2.04	1.55	1.07	0.58		
45,600-56,999	3.09	2.60	2.12	1.64	1.15	0.67	
57,000-64,499	4.22	3.74	3.25	2.77	2.29	1.80	0.83

15.0-15.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.31						
22,800-28,499	0.87	0.41					
28,500-34,199	1.44	0.98	0.51				
34,200-39,899	2.01	1.54	1.08	0.61			
39,900-45,599	2.58	2.11	1.64	1.18	0.71		
45,600-56,999	3.14	2.68	2.21	1.75	1.28	0.82	
57,000-64,499	4.28	3.81	3.35	2.88	2.42	1.95	1.02
16.0-16.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.41						
22,800-28,499	0.97	0.54					
28,500-34,199	1.54	1.11	0.68				
34,200-39,899	2.11	1.68	1.24	0.81			
39,900-45,599	2.68	2.24	1.81	1.38	0.95		
45,600-56,999	3.24	2.81	2.38	1.95	1.51	1.08	
57,000-64,499	4.38	3.95	3.51	3.08	2.65	2.22	1.35
17.0-17.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.35						
22,800-28,499	0.92	0.46					
28,500-34,199	1.48	1.03	0.58				
34,200-39,899	2.05	1.60	1.15	0.70			
39,900-45,599	2.62	2.17	1.72	1.26	0.81		
45,600-56,999	3.19	2.73	2.28	1.83	1.38	0.93	
57,000-64,499	4.32	3.87	3.42	2.97	2.52	2.06	1.16

18.0-20.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.43						
22,800-28,499	0.99	0.57					
28,500-34,199	1.56	1.13	0.71				
34,200-39,899	2.13	1.70	1.28	0.85			
39,900-45,599	2.70	2.27	1.84	1.42	0.99		
45,600-56,999	3.26	2.84	2.41	1.99	1.56	1.13	
57,000-64,499	4.40	3.97	3.55	3.12	2.69	2.27	1.42

21.0+ SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.54						
22,800-28,499	1.11	0.72					
28,500-34,199	1.68	1.29	0.90				
34,200-39,899	2.24	1.86	1.47	1.08			
39,900-45,599	2.81	2.43	2.04	1.65	1.27		
45,600-56,999	3.38	2.99	2.61	2.22	1.83	1.45	
57,000-64,499	4.51	4.13	3.74	3.35	2.97	2.58	1.81

Table 2-113: Summer Demand Savings for 10.0 SEER Early Retirement Baseline—Zone 1

14.5-14.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.67						
22,800-28,499	1.37	0.89					
28,500-34,199	2.08	1.59	1.11				
34,200-39,899	2.78	2.30	1.82	1.33			
39,900-45,599	3.49	3.00	2.52	2.04	1.55		
45,600-56,999	4.19	3.71	3.23	2.74	2.26	1.77	
57,000-64,499	5.61	5.12	4.64	4.15	3.67	3.19	2.22

15.0-15.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.72						
22,800-28,499	1.43	0.96					
28,500-34,199	2.13	1.67	1.20				
34,200-39,899	2.84	2.37	1.91	1.44			
39,900-45,599	3.54	3.08	2.61	2.15	1.68		
45,600-56,999	4.25	3.79	3.32	2.85	2.39	1.92	
57,000-64,499	5.66	5.20	4.73	4.27	3.80	3.34	2.40
16.0-16.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.82						
22,800-28,499	1.53	1.09					
28,500-34,199	2.23	1.80	1.37				
34,200-39,899	2.94	2.51	2.07	1.64			
39,900-45,599	3.64	3.21	2.78	2.35	1.92		
45,600-56,999	4.35	3.92	3.49	3.05	2.62	2.19	
57,000-64,499	5.76	5.33	4.90	4.47	4.03	3.60	2.74
17.0-17.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.76						
22,800-28,499	1.47	1.02					
28,500-34,199	2.18	1.72	1.27				
34,200-39,899	2.88	2.43	1.98	1.53			
39,900-45,599	3.59	3.14	2.69	2.23	1.78		
45,600-56,999	4.29	3.84	3.39	2.94	2.49	2.04	
57,000-64,499	5.71	5.25	4.80	4.35	3.90	3.45	2.55

18.0-20.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.84						
22,800-28,499	1.55	1.12					
28,500-34,199	2.25	1.83	1.40				
34,200-39,899	2.96	2.53	2.11	1.68			
39,900-45,599	3.66	3.24	2.81	2.39	1.96		
45,600-56,999	4.37	3.94	3.52	3.09	2.67	2.24	
57,000-64,499	5.78	5.36	4.93	4.50	4.08	3.65	2.80

21.0+ SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.96						
22,800-28,499	1.66	1.28					
28,500-34,199	2.37	1.98	1.60				
34,200-39,899	3.08	2.69	2.30	1.92			
39,900-45,599	3.78	3.39	3.01	2.62	2.23		
45,600-56,999	4.49	4.10	3.71	3.33	2.94	2.55	
57,000-64,499	5.90	5.51	5.13	4.74	4.35	3.97	3.19

Climate Zone 2: North Region, Dallas / Ft. Worth Weather Data

Table 2-114: Summer Demand Savings for 12.44 SEER Early Retirement Baseline—Zone 2

14.5-14.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.27						
22,800-28,499	0.87	0.35					
28,500-34,199	1.47	0.96	0.44				
34,200-39,899	2.07	1.56	1.04	0.53			
39,900-45,599	2.67	2.16	1.65	1.13	0.62		
45,600-56,999	3.27	2.76	2.25	1.73	1.22	0.71	
57,000-64,499	4.48	3.96	3.45	2.94	2.42	1.91	0.88

15.0-15.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.32						
22,800-28,499	0.93	0.43					
28,500-34,199	1.53	1.03	0.54				
34,200-39,899	2.13	1.64	1.14	0.65			
39,900-45,599	2.73	2.24	1.74	1.25	0.76		
45,600-56,999	3.33	2.84	2.35	1.85	1.36	0.87	
57,000-64,499	4.54	4.04	3.55	3.06	2.56	2.07	1.08

16.0-16.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.43						
22,800-28,499	1.03	0.57					
28,500-34,199	1.63	1.18	0.72				
34,200-39,899	2.24	1.78	1.32	0.86			
39,900-45,599	2.84	2.38	1.92	1.46	1.00		
45,600-56,999	3.44	2.98	2.52	2.06	1.61	1.15	
57,000-64,499	4.64	4.18	3.73	3.27	2.81	2.35	1.43

17.0-17.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.38						
22,800-28,499	0.98	0.50					
28,500-34,199	1.58	1.11	0.63				
34,200-39,899	2.18	1.71	1.23	0.76			
39,900-45,599	2.79	2.31	1.83	1.36	0.88		
45,600-56,999	3.39	2.91	2.44	1.96	1.48	1.01	
57,000-64,499	4.59	4.11	3.64	3.16	2.69	2.21	1.26

18.0-20.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.46						
22,800-28,499	1.06	0.61					
28,500-34,199	1.66	1.21	0.77				
34,200-39,899	2.26	1.82	1.37	0.92			
39,900-45,599	2.87	2.42	1.97	1.52	1.07		
45,600-56,999	3.47	3.02	2.57	2.12	1.67	1.22	
57,000-64,499	4.67	4.22	3.77	3.33	2.88	2.43	1.53

21.0+ SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.58						
22,800-28,499	1.18	0.77					
28,500-34,199	1.78	1.37	0.97				
34,200-39,899	2.38	1.98	1.57	1.16			
39,900-45,599	2.99	2.58	2.17	1.76	1.35		
45,600-56,999	3.59	3.18	2.77	2.36	1.95	1.55	
57,000-64,499	4.79	4.38	3.97	3.57	3.16	2.75	1.93

Table 2-115: Summer Demand Savings for 10.0 SEER Early Retirement Baseline—Zone 2

14.5-14.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.71						
22,800-28,499	1.45	0.94					
28,500-34,199	2.20	1.69	1.18				
34,200-39,899	2.95	2.44	1.93	1.41			
39,900-45,599	3.70	3.19	2.67	2.16	1.65		
45,600-56,999	4.45	3.94	3.42	2.91	2.40	1.88	
57,000-64,499	5.95	5.43	4.92	4.41	3.89	3.38	2.35

15.0-15.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.77						
22,800-28,499	1.51	1.02					
28,500-34,199	2.26	1.77	1.28				
34,200-39,899	3.01	2.52	2.02	1.53			
39,900-45,599	3.76	3.27	2.77	2.28	1.79		
45,600-56,999	4.51	4.01	3.52	3.03	2.53	2.04	
57,000-64,499	6.01	5.51	5.02	4.52	4.03	3.54	2.55
16.0-16.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.87						
22,800-28,499	1.62	1.16					
28,500-34,199	2.37	1.91	1.45				
34,200-39,899	3.12	2.66	2.20	1.74			
39,900-45,599	3.87	3.41	2.95	2.49	2.03		
45,600-56,999	4.61	4.16	3.70	3.24	2.78	2.32	
57,000-64,499	6.11	5.65	5.19	4.74	4.28	3.82	2.90
17.0-17.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.82						
22,800-28,499	1.57	1.09					
28,500-34,199	2.32	1.84	1.36				
34,200-39,899	3.06	2.59	2.11	1.64			
39,900-45,599	3.81	3.34	2.86	2.39	1.91		
45,600-56,999	4.56	4.09	3.61	3.13	2.66	2.18	
57,000-64,499	6.06	5.58	5.11	4.63	4.16	3.68	2.73

18.0-20.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.90						
22,800-28,499	1.65	1.20					
28,500-34,199	2.40	1.95	1.50				
34,200-39,899	3.15	2.70	2.25	1.80			
39,900-45,599	3.89	3.45	3.00	2.55	2.10		
45,600-56,999	4.64	4.19	3.75	3.30	2.85	2.40	
57,000-64,499	6.14	5.69	5.24	4.79	4.35	3.90	3.00

21.0+ SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	1.02						
22,800-28,499	1.77	1.36					
28,500-34,199	2.52	2.11	1.70				
34,200-39,899	3.27	2.86	2.45	2.04			
39,900-45,599	4.01	3.61	3.20	2.79	2.38		
45,600-56,999	4.76	4.35	3.95	3.54	3.13	2.72	
57,000-64,499	6.26	5.85	5.44	5.03	4.63	4.22	3.40

Climate Zone 3: South Region, Houston Weather Data

Table 2-116: Summer Demand Savings for 12.44 SEER Early Retirement Baseline—Zone 3

14.5-14.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.26						
22,800-28,499	0.84	0.34					
28,500-34,199	1.43	0.93	0.43				
34,200-39,899	2.01	1.51	1.01	0.52			
39,900-45,599	2.60	2.10	1.60	1.10	0.60		
45,600-56,999	3.18	2.68	2.18	1.69	1.19	0.69	
57,000-64,499	4.35	3.85	3.35	2.86	2.36	1.86	0.86

15.0-15.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.32						
22,800-28,499	0.90	0.42					
28,500-34,199	1.49	1.01	0.53				
34,200-39,899	2.07	1.59	1.11	0.63			
39,900-45,599	2.66	2.18	1.70	1.22	0.74		
45,600-56,999	3.24	2.76	2.28	1.80	1.32	0.84	
57,000-64,499	4.41	3.93	3.45	2.97	2.49	2.01	1.05
16.0-16.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.42						
22,800-28,499	1.00	0.56					
28,500-34,199	1.59	1.14	0.70				
34,200-39,899	2.17	1.73	1.28	0.84			
39,900-45,599	2.76	2.31	1.87	1.42	0.98		
45,600-56,999	3.34	2.90	2.45	2.01	1.56	1.12	
57,000-64,499	4.51	4.07	3.62	3.18	2.73	2.29	1.39
17.0-17.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.35						
22,800-28,499	0.93	0.47					
28,500-34,199	1.52	1.05	0.58				
34,200-39,899	2.10	1.64	1.17	0.70			
39,900-45,599	2.69	2.22	1.75	1.28	0.82		
45,600-56,999	3.27	2.81	2.34	1.87	1.40	0.93	
57,000-64,499	4.44	3.98	3.51	3.04	2.57	2.10	1.17

18.0-20.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.43						
22,800-28,499	1.01	0.57					
28,500-34,199	1.60	1.16	0.72				
34,200-39,899	2.18	1.74	1.30	0.86			
39,900-45,599	2.77	2.33	1.89	1.44	1.00		
45,600-56,999	3.35	2.91	2.47	2.03	1.59	1.15	
57,000-64,499	4.52	4.08	3.64	3.20	2.76	2.32	1.43

21.0+ SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.54						
22,800-28,499	1.13	0.72					
28,500-34,199	1.71	1.31	0.90				
34,200-39,899	2.30	1.89	1.49	1.08			
39,900-45,599	2.88	2.48	2.07	1.67	1.27		
45,600-56,999	3.47	3.06	2.66	2.25	1.85	1.45	
57,000-64,499	4.64	4.23	3.83	3.42	3.02	2.62	1.81

Table 2-117: Summer Demand Savings for 10.0 SEER Early Retirement Baseline—Zone 3

14.5-14.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.69						
22,800-28,499	1.41	0.91					
28,500-34,199	2.14	1.64	1.14				
34,200-39,899	2.87	2.37	1.87	1.37			
39,900-45,599	3.60	3.10	2.60	2.10	1.60		
45,600-56,999	4.32	3.83	3.33	2.83	2.33	1.83	
57,000-64,499	5.78	5.28	4.78	4.28	3.78	3.29	2.29

15.0-15.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.74						
22,800-28,499	1.47	0.99					
28,500-34,199	2.20	1.72	1.24				
34,200-39,899	2.93	2.45	1.97	1.49			
39,900-45,599	3.65	3.17	2.69	2.22	1.74		
45,600-56,999	4.38	3.90	3.42	2.94	2.46	1.98	
57,000-64,499	5.84	5.36	4.88	4.40	3.92	3.44	2.48
16.0-16.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.85						
22,800-28,499	1.57	1.13					
28,500-34,199	2.30	1.86	1.41				
34,200-39,899	3.03	2.58	2.14	1.69			
39,900-45,599	3.76	3.31	2.87	2.42	1.98		
45,600-56,999	4.49	4.04	3.59	3.15	2.70	2.26	
57,000-64,499	5.94	5.50	5.05	4.60	4.16	3.71	2.82
17.0-17.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.78						
22,800-28,499	1.51	1.04					
28,500-34,199	2.23	1.76	1.30				
34,200-39,899	2.96	2.49	2.02	1.56			
39,900-45,599	3.69	3.22	2.75	2.28	1.81		
45,600-56,999	4.42	3.95	3.48	3.01	2.54	2.07	
57,000-64,499	5.87	5.40	4.93	4.47	4.00	3.53	2.59

18.0-20.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.86						
22,800-28,499	1.59	1.14					
28,500-34,199	2.31	1.87	1.43				
34,200-39,899	3.04	2.60	2.16	1.72			
39,900-45,599	3.77	3.33	2.89	2.44	2.00		
45,600-56,999	4.50	4.05	3.61	3.17	2.73	2.29	
57,000-64,499	5.95	5.51	5.07	4.63	4.19	3.74	2.86

21.0+ SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.97						
22,800-28,499	1.70	1.29					
28,500-34,199	2.43	2.02	1.62				
34,200-39,899	3.15	2.75	2.35	1.94			
39,900-45,599	3.88	3.48	3.07	2.67	2.26		
45,600-56,999	4.61	4.21	3.80	3.40	2.99	2.59	
57,000-64,499	6.06	5.66	5.26	4.85	4.45	4.04	3.24

Climate Zone 4: Valley Region Corpus Christi Weather Data

Table 2-118: Summer Demand Savings for 12.44 SEER Early Retirement Baseline—Zone 4

14.5-14.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.20						
22,800-28,499	0.66	0.27					
28,500-34,199	1.12	0.73	0.34				
34,200-39,899	1.57	1.18	0.79	0.40			
39,900-45,599	2.03	1.64	1.25	0.86	0.47		
45,600-56,999	2.49	2.10	1.71	1.32	0.93	0.54	
57,000-64,499	3.40	3.01	2.62	2.23	1.84	1.45	0.67

15.0-15.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.25						
22,800-28,499	0.70	0.33					
28,500-34,199	1.16	0.79	0.41				
34,200-39,899	1.62	1.24	0.87	0.49			
39,900-45,599	2.08	1.70	1.33	0.95	0.58		
45,600-56,999	2.53	2.16	1.78	1.41	1.03	0.66	
57,000-64,499	3.45	3.07	2.70	2.32	1.95	1.57	0.82
16.0-16.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.33						
22,800-28,499	0.78	0.44					
28,500-34,199	1.24	0.89	0.54				
34,200-39,899	1.70	1.35	1.00	0.65			
39,900-45,599	2.16	1.81	1.46	1.11	0.76		
45,600-56,999	2.61	2.26	1.92	1.57	1.22	0.87	
57,000-64,499	3.53	3.18	2.83	2.48	2.13	1.79	1.09
17.0-17.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.38						
22,800-28,499	0.83	0.50					
28,500-34,199	1.29	0.96	0.63				
34,200-39,899	1.75	1.42	1.09	0.75			
39,900-45,599	2.21	1.87	1.54	1.21	0.88		
45,600-56,999	2.66	2.33	2.00	1.67	1.34	1.01	
57,000-64,499	3.58	3.25	2.91	2.58	2.25	1.92	1.26

18.0-20.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.43						
22,800-28,499	0.89	0.57					
28,500-34,199	1.34	1.03	0.72				
34,200-39,899	1.80	1.49	1.17	0.86			
39,900-45,599	2.26	1.95	1.63	1.32	1.00		
45,600-56,999	2.72	2.40	2.09	1.78	1.46	1.15	
57,000-64,499	3.63	3.32	3.00	2.69	2.38	2.06	1.44

21.0+ SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.55						
22,800-28,499	1.01	0.74					
28,500-34,199	1.47	1.19	0.92				
34,200-39,899	1.92	1.65	1.38	1.10			
39,900-45,599	2.38	2.11	1.83	1.56	1.29		
45,600-56,999	2.84	2.56	2.29	2.02	1.74	1.47	
57,000-64,499	3.75	3.48	3.20	2.93	2.66	2.38	1.84

Table 2-119: Summer Demand Savings for 10.0 SEER Early Retirement Baseline—Zone 4

14.5-14.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.54						
22,800-28,499	1.10	0.71					
28,500-34,199	1.67	1.28	0.89				
34,200-39,899	2.24	1.85	1.46	1.07			
39,900-45,599	2.81	2.42	2.03	1.64	1.25		
45,600-56,999	3.38	2.99	2.60	2.21	1.82	1.43	
57,000-64,499	4.52	4.13	3.74	3.35	2.96	2.57	1.79

15.0-15.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.58						
22,800-28,499	1.15	0.77					
28,500-34,199	1.72	1.34	0.97				
34,200-39,899	2.29	1.91	1.54	1.16			
39,900-45,599	2.86	2.48	2.11	1.73	1.36		
45,600-56,999	3.42	3.05	2.67	2.30	1.92	1.55	
57,000-64,499	4.56	4.19	3.81	3.44	3.06	2.69	1.94
16.0-16.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.66						
22,800-28,499	1.23	0.88					
28,500-34,199	1.80	1.45	1.10				
34,200-39,899	2.37	2.02	1.67	1.32			
39,900-45,599	2.94	2.59	2.24	1.89	1.54		
45,600-56,999	3.50	3.16	2.81	2.46	2.11	1.76	
57,000-64,499	4.64	4.29	3.95	3.60	3.25	2.90	2.21
17.0-17.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.71						
22,800-28,499	1.28	0.95					
28,500-34,199	1.85	1.52	1.19				
34,200-39,899	2.42	2.09	1.75	1.42			
39,900-45,599	2.99	2.66	2.32	1.99	1.66		
45,600-56,999	3.56	3.22	2.89	2.56	2.23	1.90	
57,000-64,499	4.69	4.36	4.03	3.70	3.37	3.04	2.37

18.0-18.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.77						
22,800-28,499	1.33	1.02					
28,500-34,199	1.90	1.59	1.28				
34,200-39,899	2.47	2.16	1.84	1.53			
39,900-45,599	3.04	2.73	2.41	2.10	1.79		
45,600-56,999	3.61	3.29	2.98	2.67	2.35	2.04	
57,000-64,499	4.75	4.43	4.12	3.81	3.49	3.18	2.55

21.0+ SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.89						
22,800-28,499	1.45	1.18					
28,500-34,199	2.02	1.75	1.48				
34,200-39,899	2.59	2.32	2.05	1.77			
39,900-45,599	3.16	2.89	2.61	2.34	2.07		
45,600-56,999	3.73	3.46	3.18	2.91	2.64	2.36	
57,000-64,499	4.87	4.59	4.32	4.05	3.77	3.50	2.95

Climate Zone 5: West Region El Paso Weather Data

Table 2-120: Summer Demand Savings for 12.44 SEER Early Retirement Baseline—Zone 5

14.5-14.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.25						
22,800-28,499	0.80	0.33					
28,500-34,199	1.36	0.88	0.41				
34,200-39,899	1.92	1.44	0.97	0.49			
39,900-45,599	2.47	2.00	1.52	1.05	0.57		
45,600-56,999	3.03	2.55	2.08	1.60	1.13	0.65	
57,000-64,499	4.14	3.67	3.19	2.72	2.24	1.77	0.82

15.0-15.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.30						
22,800-28,499	0.86	0.40					
28,500-34,199	1.41	0.96	0.50				
34,200-39,899	1.97	1.51	1.06	0.60			
39,900-45,599	2.53	2.07	1.61	1.16	0.70		
45,600-56,999	3.08	2.63	2.17	1.71	1.26	0.80	
57,000-64,499	4.20	3.74	3.28	2.83	2.37	1.91	1.00
16.0-16.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.40						
22,800-28,499	0.95	0.53					
28,500-34,199	1.51	1.09	0.66				
34,200-39,899	2.07	1.64	1.22	0.80			
39,900-45,599	2.63	2.20	1.78	1.35	0.93		
45,600-56,999	3.18	2.76	2.33	1.91	1.49	1.06	
57,000-64,499	4.30	3.87	3.45	3.02	2.60	2.18	1.33
17.0-17.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.37						
22,800-28,499	0.93	0.50					
28,500-34,199	1.49	1.06	0.62				
34,200-39,899	2.05	1.61	1.18	0.75			
39,900-45,599	2.60	2.17	1.74	1.31	0.87		
45,600-56,999	3.16	2.73	2.30	1.86	1.43	1.00	
57,000-64,499	4.27	3.84	3.41	2.98	2.55	2.11	1.25

18.0-20.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.45						
22,800-28,499	1.00	0.60					
28,500-34,199	1.56	1.15	0.75				
34,200-39,899	2.12	1.71	1.30	0.89			
39,900-45,599	2.67	2.27	1.86	1.45	1.04		
45,600-56,999	3.23	2.82	2.42	2.01	1.60	1.19	
57,000-64,499	4.34	3.94	3.53	3.12	2.71	2.31	1.49

21.0+ SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.57						
22,800-28,499	1.13	0.77					
28,500-34,199	1.69	1.32	0.96				
34,200-39,899	2.24	1.88	1.51	1.15			
39,900-45,599	2.80	2.44	2.07	1.70	1.34		
45,600-56,999	3.36	2.99	2.63	2.26	1.90	1.53	
57,000-64,499	4.47	4.11	3.74	3.37	3.01	2.64	1.91

Table 2-121: Summer Demand Savings for 10.0 SEER Early Retirement Baseline—Zone 5

14.5-14.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.65						
22,800-28,499	1.35	0.87					
28,500-34,199	2.04	1.56	1.09				
34,200-39,899	2.73	2.26	1.78	1.31			
39,900-45,599	3.42	2.95	2.47	2.00	1.52		
45,600-56,999	4.12	3.64	3.17	2.69	2.22	1.74	
57,000-64,499	5.50	5.03	4.55	4.08	3.60	3.13	2.18

15.0-15.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.71						
22,800-28,499	1.40	0.94					
28,500-34,199	2.09	1.64	1.18				
34,200-39,899	2.79	2.33	1.87	1.42			
39,900-45,599	3.48	3.02	2.56	2.11	1.65		
45,600-56,999	4.17	3.71	3.26	2.80	2.34	1.89	
57,000-64,499	5.56	5.10	4.64	4.19	3.73	3.27	2.36
16.0-16.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.81						
22,800-28,499	1.50	1.07					
28,500-34,199	2.19	1.77	1.34				
34,200-39,899	2.88	2.46	2.04	1.61			
39,900-45,599	3.58	3.15	2.73	2.30	1.88		
45,600-56,999	4.27	3.84	3.42	3.00	2.57	2.15	
57,000-64,499	5.65	5.23	4.81	4.38	3.96	3.53	2.69
17.0-17.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.78						
22,800-28,499	1.48	1.04					
28,500-34,199	2.17	1.74	1.30				
34,200-39,899	2.86	2.43	2.00	1.56			
39,900-45,599	3.55	3.12	2.69	2.26	1.83		
45,600-56,999	4.25	3.81	3.38	2.95	2.52	2.09	
57,000-64,499	5.63	5.20	4.77	4.34	3.90	3.47	2.61

18.0-20.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.85						
22,800-28,499	1.55	1.14					
28,500-34,199	2.24	1.83	1.42				
34,200-39,899	2.93	2.52	2.12	1.71			
39,900-45,599	3.62	3.22	2.81	2.40	1.99		
45,600-56,999	4.32	3.91	3.50	3.09	2.69	2.28	
57,000-64,499	5.70	5.30	4.89	4.48	4.07	3.66	2.85

21.0+ SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	0.98						
22,800-28,499	1.67	1.31					
28,500-34,199	2.37	2.00	1.64				
34,200-39,899	3.06	2.69	2.33	1.96			
39,900-45,599	3.75	3.39	3.02	2.66	2.29		
45,600-56,999	4.44	4.08	3.71	3.35	2.98	2.62	
57,000-64,499	5.83	5.46	5.10	4.73	4.37	4.00	3.27

Deemed Winter Demand Savings Tables

Refer to Volume 1, Appendix B: Peak Demand Reduction Documentation for further details on winter peak demand savings and methodology.

Claimed Peak Demand Savings

Refer to Volume 1, Appendix B: Peak Demand Reduction Documentation for further details on peak demand savings and methodology.

Additional Calculators and Tools

This section is not applicable.

Measure Life and Lifetime Savings

The estimated useful life (EUL) of a central air conditioning unit is 18 years based on the current DOE Final Rule standards for central air conditioners.¹⁴⁶

Program Tracking Data and Evaluation Requirements

Primary inputs and contextual data that should be specified and tracked by the program database to inform the evaluation and apply the savings properly are:

- Climate zone
- Decision/action type (early retirement, replace-on-burnout, new construction)
- Cooling capacity of the installed unit (tons)
- Seasonal Energy Efficiency Ratio (SEER) and Energy Efficiency Ratio (EER) of the installed unit
- Age of replaced unit (Early Retirement only)
- Retired unit model number, serial number, manufacturer, and cooling capacity (Early Retirement or Rightsizing)
- Photograph of retired unit nameplate (Early Retirement or Rightsizing)
- If photograph of retired unit nameplate is unavailable or not legible, provide a photo and/or description documenting the reason why the nameplate photo was unobtainable (Early Retirement only)
- If photograph of retired unit nameplate is unavailable or not legible, provide estimated square footage of conditioned area served by the retired unit (Rightsizing only)
- Photograph demonstrating functionality of existing equipment and/or customer responses to survey questionnaire documenting the condition of the replaced unit and their motivation for measure replacement for early retirement eligibility determination (Early Retirement only)
- If replacing an evaporative cooler, application should include a statement that the customer decision to change equipment types predates or is independent of the decision to install efficient equipment

References and Efficiency Standards

Petitions and Rulings

This section is not applicable.

¹⁴⁶ Final Rule: Standards, Federal Register, 76 FR 37408 (June 27, 2011) and associated Technical Support Document. Accessed 10/21/2014.
http://www1.eere.energy.gov/buildings/appliance_standards/product.aspx/productid/75. Download TSD at: <http://www.regulations.gov/#!documentDetail;D=EERE-2011-BT-STD-0011-0012>.

Relevant Standards and Reference Sources

- ASHRAE 90.1-1999 (Residential Buildings)
- ACCA Manual J Residential Load Calculation (8th Edition)¹⁴⁷

Document Revision History

Table 2-122: Residential Central Air Conditioners Revision History

TRM Version	Date	Description of Change
v1.0	11/25/2013	TRM v1.0 origin.
v2.0	4/18/2014	TRM v2.0 update. Low-income and Hard-to-Reach Market Transformation section merged with main measure as "Early Retirement" option. Updated by Frontier Associates, March 2014, based on new federal standards.
v2.1	1/30/2015	TRM v2.1 update. Reversion to TRM v1.0 savings tables to reflect deferred enforcement of new regional standards. A court-ordered settlement allows SEER 13 split-system units to be sold without penalty until July 1, 2016.
v3.0	4/10/2015	TRM v3.0 update. Savings values incorporated corresponding with federal and regional standards effective January 1, 2015. Early retirement savings may be claimed through any appropriately designed program in accordance with EM&V team's memo, "Considerations for early replacement of residential equipment." Remaining useful lifetimes updated.
v3.1	11/05/2015	TRM v3.1 update. Removal of legacy language around baseline. Extension of Early Retirement savings tables to higher SEER values.
v4.0	10/10/2016	TRM v4.0 update. Added RUL value for units with an age of one year. Added a default RUL value for when the age of the unit is unknown. Eliminated the eligibility requirement of the existing unit to have a minimum age of five years. Updated savings for 15.0-15.9 SEER range.
v5.0	10/2017	TRM v5.0 update. Updated energy savings to use TMY3 temperature bin hours. Updated demand savings for compliance with current peak definition. Added 12.44 SEER baseline savings tables previously referencing earlier version of TRM. Added savings for system downsizing.
v6.0	11/2018	TRM v6.0 update. Updated baseline and eligibility requirements. Added language clarifying use of rated capacity vs nominal and updated the deemed savings tables to show rated Btuh. Clarified required documentation for early retirement.

¹⁴⁷ <https://www.acca.org/store/product.php?pid=172>.

2.2.4 Ground Source Heat Pumps Measure Overview

TRM Measure ID: R-HV-GH

Market Sector: Residential

Measure Category: HVAC

Applicable Building Types: Single-family, duplex and triplex; multifamily; manufactured

Fuels Affected: Electricity

Decision/Action Type(s): Replace-on-burnout, new construction

Program Delivery Type(s): Prescriptive

Deemed Savings Type: Deemed savings calculation

Savings Methodology: Engineering algorithms and estimates

Measure Description

This measure requires the installation of a ground-source heat pump (GSHP) meeting the minimum requirements of ENERGY STAR® Tier 3 geothermal heat pump key product criteria. The deemed savings are dependent upon the energy efficiency rating (EER) and coefficient of performance (COP) of the installed equipment. Savings calculations are presented for systems both with and without desuperheaters.

Eligibility Criteria

The deemed savings apply to units with a capacity of $\leq 65,000$ Btu/hour.

Energy savings for desuperheaters only apply if the desuperheater is attached to an electric storage water heater. The electric storage water heating cannot replace a gas water heater in a retrofit installation.

Baseline Condition

The baseline unit is assumed to be an air-source heat pump (ASHP) for new construction, and either an ASHP or an electric resistance furnace for replace-on-burnout projects. New construction baseline efficiency values for ASHPs are compliant with the current federal minimum standard,¹⁴⁸ effective January 1, 2015.

¹⁴⁸ DOE minimum efficiency standard for residential air conditioners/heat pumps.
http://www1.eere.energy.gov/buildings/appliance_standards/product.aspx/productid/75.

For replace-on-burnout (ROB) projects, the cooling baseline is reduced to 13.08 SEER. This value incorporates an adjustment to the baseline SEER value to reflect the percentage of current replacements that do not include the installation of an AHRI-matched system.¹⁴⁹ The heating baseline for replace-on-burnout projects is dependent on the heating type of the baseline equipment.

Table 2-123: Ground Source Heat Pump Baseline Efficiencies

Project Type	Cooling Mode ¹⁵⁰	Heating Mode ¹⁵¹
New Construction	11.8 EER (14 SEER)	2.4 COP (8.2 HSPF)
ROB—Air Source Heat Pump Baseline	11.4 EER (13.08 SEER)	2.4 COP (8.2 HSPF)
ROB—Electric Resistance Baseline		1 COP (3.41 HSPF)

High-Efficiency Condition

Table 2-124 displays the ENERGY STAR® requirements for eligible Tier 3 geothermal heat pumps as of January 1, 2012. Energy efficiency service providers are expected to comply with the latest ENERGY STAR® requirements.

Table 2-124: Ground Source Heat Pump ENERGY STAR® Tier 3 Requirements

Product Type	Cooling Mode (EER)	Heating Mode (COP)
Closed Loop Water-to-Air	17.1	3.6
Open Loop Water-to-Air	21.1	4.1
Closed Loop Water-to-Water	16.1	3.1
Open Loop Water-to-Water	20.1	3.5
Direct Geoexchange (DGX)	16.0	3.6

The specifications in the charts above apply to single-stage models. Multi-stage models may be qualified based on:¹⁵²

¹⁴⁹ Frontier Associates on behalf of the Electric Utility Marketing Managers of Texas (EUMMOT). "Petition to revise Existing Commission-Approved Deemed Savings Values for Central Air Conditioning and Heat Pump Systems: Docket No. 36780." Public Utility Commission of Texas. Approved August 27, 2009. <http://interchange.puc.state.tx.us/WebApp/Interchange/application/dbapps/filings/pgSearch.asp>. Adapted for new 14 SEER baseline.

¹⁵⁰ Code specified EER value converted to SEER using $EER = -0.02 \times SEER^2 + 1.12 \times SEER$. National Renewable Energy Laboratory (NREL). "Building America House Simulation Protocols." U.S. Department of Energy. Revised October 2010. <http://www.nrel.gov/docs/fy11osti/49246.pdf>.

¹⁵¹ Code specified HSPF value converted to COP using $COP = HSPF \times 1,055 \text{ J/Btu} \div 3,600 \text{ J/W-h}$.

¹⁵² Geothermal Heat Pumps Key Product Criteria, https://www.energystar.gov/index.cfm?c=geo_heat.pr_crit_geo_heat_pumps. Accessed February 2014.

$$EER = (\text{highest rated capacity } EER + \text{lowest rated capacity } EER) \div 2$$

Equation 56

$$COP = (\text{highest rated capacity } COP + \text{lowest rated capacity } COP) \div 2$$

Equation 57

Energy and Demand Savings Methodology

Savings Algorithms and Input Variables

Peak demand and annual energy savings for GSHP systems should be calculated as shown below. Where a desuperheater is also installed, please see the Deemed Energy Savings Tables section for additional energy savings, and the Deemed Summer Demand Savings Tables for additional demand savings.

Energy and demand savings for desuperheaters were adapted from a 2001 study conducted by Oak Ridge National Laboratory (ORNL) on ground source heat pumps in Texas.¹⁵³ Desuperheater savings were calculated for each climate zone by taking the difference in savings between GSHPs with and without desuperheaters and averaging the savings between low and high efficiency units. Savings for GSHP systems with desuperheaters should be calculated using the algorithms below with an additional energy credit based on the system capacity and efficiency.

The ORNL study draws from a 1998 analysis based on a study conducted at the Fort Polk Joint Readiness Training Center in Leesville, Louisiana. The Fort Polk study used calibrated simulations of 200 multifamily residences in the complex to estimate energy savings attributable to replacement of air source heat pumps with ground source heat pumps. These estimates were found to be within 5 percent of actual post-retrofit savings. Building models were developed using TRNSYS.¹⁵⁴

Using the Fort Polk models, the ORNL study assumed a baseline of a 1.5 ton, 10 SEER air source heat pump. Simulations of low-, medium-, and high-efficiency ground source heat pumps with and without desuperheaters were compared against the baseline unit. The models were run using TMY-2 weather profiles for climate zones 1-4. Energy and demand differences between the pre- and post-retrofit models were used to estimate average savings per ton of cooling capacity.

In the 1998 analysis, low-efficiency GSHPs were assumed to be units with an EER of 12.4 and capacity of 19 kBtuh, while medium-efficiency units had an EER of 16.8 and capacity of 21 kBtuh. High-efficiency units had an EER of 18.3, with a capacity of 22 kBtuh.

¹⁵³ Shonder, J. A., Hughes, P., and Thornton, J. Development of Deemed Energy and Demand Savings for Residential Ground Source Heat Pump Retrofits in the State of Texas. Transactions-American Society of Heating, Refrigerating, and Air Conditioning Engineers. 108, no. 1: 953-961, 2001. <http://web.ornl.gov/~webworks/cppr/y2001/pres/112677.pdf>.

¹⁵⁴ Klein, S. A. TRNSYS Manual: A Transient Simulation Program. Solar Engineering Laboratory, University of Wisconsin-Madison, Version 14.2 for Windows, September 1996.

These models were used to derive the energy and demand savings associated with installation of a desuperheater along with a ground source heat pump, as shown in Table 2-127 and Table 2-128, respectively.

Energy Savings Algorithms

$$kWh_{Savings} = kWh_{Savings,Summer} + kWh_{Savings,Winter} + kWh_{desuperheater}$$

Equation 58

$$kWh_{Savings,C} = CAP_C \times \frac{1 \text{ kW}}{1,000 \text{ W}} \times EFLH_C \times \left(\frac{1}{SEER_{Base}} - \frac{1}{EER_{GSHP}} \right)$$

Equation 59

$$kWh_{Savings,H} = CAP_H \times \frac{1 \text{ kWh}}{1,000 \text{ Wh}} \times EFLH_H \times \left(\frac{1}{HSPF_{Base}} - \frac{1}{3.412 \times COP_{GSHP}} \right)$$

Equation 60

Where:

$kWh_{desuperheater}$ = Energy savings (kWh) associated with installation of a desuperheater (see Table 2-127). These savings should only be added if a desuperheater is installed.

CAP_C = Rated equipment cooling capacity of the installed GSHP (Btu/hr)

CAP_H = Rated equipment heating capacity of the installed GSHP (Btu/hr)

$EFLH_C$ = Equivalent full load hours for cooling)

$EFLH_H$ = Equivalent full load hours for heating (Table 2-125)

$SEER_{Base}$ = Seasonal Energy Efficiency Ratio of the baseline cooling equipment (Table 2-123)

EER_{GSHP} = Energy Efficiency Ratio of the installed GSHP

$HSPF_{Base}$ = Heating Seasonal Performance Factor of the baseline heating equipment (Table 2-123)

COP_{GSHP} = Coefficient of Performance of the installed GSHP

Table 2-125: Equivalent Full Load Cooling/Heating Hours¹⁵⁵

Climate Zone	EFLH _C	EFLH _H
Climate Zone 1: Panhandle	1,142	1,880
Climate Zone 2: North	1,926	1,343
Climate Zone 3: South	2,209	1,127
Climate Zone 4: Valley	2,958	776
Climate Zone 5: West	1,524	1,559

Demand Savings Algorithms

$$kW_{Savings,C} = CAP_C \times \frac{1 \text{ kW}}{1,000 \text{ W}} \times \left(\frac{1}{EER_{Base}} - \frac{1}{EER_{GSHP}} \right) \times CF_C + kW_{desuperheater}$$

Equation 61

$$kW_{Savings,H} = CAP_H \times \frac{1 \text{ kWh}}{3,412 \text{ Btu}} \times \left(\frac{1}{COP_{Base}} - \frac{1}{COP_{GSHP}} \right) \times CF_H$$

Equation 62

Where:

CAP_C	=	Rated equipment cooling capacity of the installed GSHP (Btu/hr)
CAP_H	=	Rated equipment heating capacity of the installed GSHP (Btu/hr)
EER_{Base}	=	Energy Efficiency Ratio of the baseline cooling equipment (Table 2-123)
EER_{GSHP}	=	Energy Efficiency Ratio of the installed GSHP
COP_{Base}	=	Coefficient of Performance of the baseline heating equipment (Table 2-123)
COP_{GSHP}	=	Coefficient of Performance of the installed GSHP
CF_C	=	Coincidence Factor = (Table 2-4)
CF_H	=	Coincidence Factor = (Table 2-4)
$kW_{desuperheater}$	=	Summer demand savings (kW) associated with installation of a desuperheater (see Table 2-128). These savings should only be added if a desuperheater is installed.

¹⁵⁵ ENERGY STAR® Central AC/HP Savings Calculator. http://www.energystar.gov/certified-products/detail/heat_pumps_air_source.

Table 2-126: Ground Source Heat Pumps—Coincidence Factors for GSHPs¹⁵⁶

Season	Climate Zone 1: Amarillo	Climate Zone 2: Dallas	Climate Zone 3: Houston	Climate Zone 4: Corpus Christi	Climate Zone 5: El Paso
Summer	0.634	0.677	0.626	0.583	0.725
Winter	0.549	0.478	0.515	0.453	0.437

Deemed Energy Savings Tables

Table 2-127: Energy Savings for Desuperheaters

Climate Zone	kWh/ton
Climate Zone 1: Panhandle	612
Climate Zone 2: North	791
Climate Zone 3: South	802
Climate Zone 4: Valley	847
Climate Zone 5: West	791

Deemed Summer Demand Savings Tables

Table 2-128: Summer Peak Demand Savings for Desuperheaters

Climate Zone	kW/ton
Climate Zone 1: Panhandle	0.440
Climate Zone 2: North	0.405
Climate Zone 3: South	0.405
Climate Zone 4: Valley	0.410
Climate Zone 5: West	0.405

Deemed Winter Demand Savings Tables

Refer to Volume 1, Appendix B: Peak Demand Reduction Documentation for further details on winter peak demand savings and methodology.

Claimed Peak Demand Savings

Refer to Volume 1, Appendix B: Peak Demand Reduction Documentation for further details on peak demand savings and methodology.

Additional Calculators and Tools

This section is not applicable.

¹⁵⁶ See Volume 1, Appendix B.

Measure Life and Lifetime Savings

The estimated useful life (EUL) of a high-efficiency ground source heat pump unit is 20 years.

This value is consistent with the EUL reported in the Department of Energy GSHP guide.¹⁵⁷

Program Tracking Data and Evaluation Requirements

It is required that the following list of primary inputs and contextual data be specified and tracked by the program database to inform the evaluation and apply the savings properly:

- Climate zone
- Decision/action type (new construction, replace-on-burnout)
- Replaced unit type (heat pump, electric resistance)
- Cooling and heating capacity (Btu/hr)
- Energy Efficiency Ratio (EER) of the unit installed
- Coefficient of Performance (COP) of the unit installed
- Whether a desuperheater was also installed or present

References and Efficiency Standards

Petitions and Rulings

This section is not applicable.

Relevant Standards and Reference Sources

- ISO/AHRI 13256-1
- Shonder, J. A., Hughes, P., and Thornton, J. Development of Deemed Energy and Demand Savings for Residential Ground Source Heat Pump Retrofits in the State of Texas. Transactions-American Society of Heating, Refrigerating, and Air Conditioning Engineers. 108, no. 1: 953-961, 2001.
<http://web.ornl.gov/~webworks/cppr/y2001/pres/112677.pdf>
- The applicable version of ENERGY STAR®'s specifications and requirements addressing residential ground source heat pumps.

¹⁵⁷ Department of Energy. "Guide to Geothermal Heat Pumps. February 2011.
http://www.energy.gov/sites/prod/files/guide_to_geothermal_heat_pumps.pdf.

Document Revision History

Table 2-129: Residential Ground Source Heat Pumps Revision History

TRM Version	Date	Description of Change
v1.0	11/25/2013	TRM v1.0 origin.
v2.0	4/18/2014	TRM v2.0 update. Updated by Frontier Associates, March 2014, based on new federal standards and alternative methodology.
v2.1	1/30/2015	TRM v2.1 update. No revision.
v3.0	4/10/2015	TRM v3.0 update. No revision.
v3.1	11/05/2015	TRM v3.1 update. No revision.
v4.0	10/10/2016	TRM v4.0 update. No revision.
v5.0	10/2017	TRM v5.0 update. Updated peak coincidence factors for compliance with current Texas peak definition. Single coincidence factor replaced with individual factors for each climate zone.
v6.0	11/2018	TRM v6.0 update. No revision.

2.2.5 Central Heat Pumps Measure Overview

TRM Measure ID: R-HV-HP

Market Sector: Residential

Measure Category: HVAC

Applicable Building Types: Single-family, duplex and triplex; multifamily; manufactured

Fuels Affected: Electricity

Decision/Action Type(s): Replace-on-burnout, new construction, early retirement

Program Delivery Type(s): Prescriptive, direct Install (early retirement)

Deemed Savings Type: Look-up tables

Savings Methodology: Engineering spreadsheets and estimates

Measure Description

Residential replacement of existing heating and cooling equipment with a new central air-source heat pump in an existing building, or the installation of a new central heat pump in a new residential construction. Downsized systems that are right-sized per a heat load calculation are also eligible. A new central heat pump includes an entire packaged unit, or a split system consisting of an indoor unit with a matching remote condensing unit. This measure also applies to the installation of mini-split, DC inverter, or dual-fuel heat pumps that meet all existing measure eligibility criteria.

All measure installation standards and baseline data from the central air conditioner measure shall apply to the heat pump measure.

Eligibility Criteria

Newly installed units must have a cooling capacity of less than 65,000 Btu/hour (5.4 tons) to be eligible for these deemed savings. Gas furnaces are not eligible to be awarded savings for replacement through this measure.

Equipment shall be properly sized to dwelling based on ASHRAE or ACCA Manual J standards. Manufacturer data sheets on installed heat pump equipment or AHRI reference numbers must be provided. Savings should be calculated using rated capacities whenever possible. Reported system capacities and efficiencies should always match those verified by AHRI as tested under AHRI operating conditions for a specific combination of equipment, including condenser, coil, and furnace (or condenser only for packaged units). Savings should never be calculated using efficiency ratings for individual system components.

For early retirement or rightsizing projects, attempt to determine the rated capacity of the existing unit. The rated capacity may be found on the manufacturer specification sheet for the existing unit if AHRI is not available. If the model number of the existing unit is unobtainable or if the manufacturer specification sheet cannot be found, use nominal tonnage for both the existing and new unit. Never use nominal tonnage for the existing unit in combination with rated tonnage for the new unit, which can lead to overstated savings. Additionally, never use nominal tonnage to determine savings for projects where no early retirement or rightsizing has occurred.

For early retirement projects, in order to receive savings, the unit to be replaced must be functioning at the time of removal with a maximum age of 20 years. Otherwise claim savings for a replace on burnout project.

Replacement of an evaporative cooler with a central heat pump is eligible where the decision to change equipment types predates or is independent of the decision to install efficient equipment and should be claimed against the new construction baseline.

New construction projects are not eligible to receive deemed savings for system rightsizing.¹⁵⁸ For system upsizing, savings should generally be claimed against the new construction baseline. However, when upsizing while going from a single larger capacity system to multiple smaller capacity systems, savings may be claimed against the applicable replace-on-burnout or early retirement baseline if the total pre and post tonnage are within ½ ton.¹⁵⁹ For this scenario, savings must be looked up using the lower pre-tonnage. If the multiple installed units do not share the same efficiency value, savings should be looked up using the most conservative efficiency value.

When replacing a single unit with multiple units where the capacity is the same or has been downsized, savings should be looked up using the total system pre and post capacities. Again, if the multiple installed units do not share the same efficiency value, savings should be looked up using the most conservative efficiency value.

Baseline Condition

New Construction, Replace-on-Burnout, or Early Retirement of an Air-Source Heat Pump

New construction baseline efficiency values for heat pumps are compliant with the current federal minimum standard,¹⁶⁰ effective January 1, 2015. The baseline is assumed to be a new heat pump system with an AHRI-listed SEER rating of 14.0. This baseline is also applicable to central heat pump installations replacing air conditioners with central gas heat, evaporative coolers with central, space, or no heating, or room/window air conditioners with central, space, or no heating.

¹⁵⁸ For projects using a custom baseline see TRMv6.0 Volume 4.

¹⁵⁹ This exception is allowed to account for efficiency improvements due to zoning that are not reflected in the current savings methodology.

¹⁶⁰ DOE minimum efficiency standard for residential air conditioners/heat pumps.
http://www1.eere.energy.gov/buildings/appliance_standards/product.aspx/productid/75.

For replace-on-burnout (ROB) projects, the cooling baseline is reduced to 13.08 SEER. This value incorporates an adjustment to the baseline SEER value to reflect the percentage of current replacements that do not include the installation of an AHRI-matched system.¹⁶¹

For early retirement (ER) projects, the cooling baseline is reduced to 10 SEER for systems installed before January 23, 2006. For systems installed on or after January 23, 2006, the ER baseline increases to 12.44 SEER.

For ROB projects, heating baseline efficiency values for heat pumps are compliant with the current federal minimum standard, effective January 1, 2015. These standards specify an HSPF of 8.2 for split systems, or 8.0 for packaged systems. This baseline reflects updates to federal standards that take effect January 1, 2015, as defined in the Department of Energy (DOE) energy efficiency standards (10 CFR Part 430).¹⁶² For ER projects where the existing system was installed on or after January 23, 2006, the heating baseline efficiency is assumed to be an HSPF of 7.7 based on the federal minimum standard in effect from January 23, 2006 through December 31, 2014.¹⁶³ For ER projects where the existing system was installed before January 23, 2006, the heating baseline efficiency is reduced to 6.8 HSPF based on the federal minimum standard in effect prior to January 23, 2006.

Replace-on-Burnout or Early Retirement of an Electric Resistance Furnace

By the nature of the technology, all electric resistance furnaces have the same efficiency with HSPF = 3.41.¹⁶⁴ Projects in which an electric resistance furnace is replaced, either in replace-on-burnout or early retirement scenarios, use this baseline for heating-side savings.

For ROB projects, cooling savings are the same as for new construction and ROB of an air-source heat pump. For early retirement (ER) projects, the cooling baseline is reduced to 10 SEER for systems installed before January 23, 2006. For systems installed on or after January 23, 2006, the ER baseline increases to 12.44 SEER.

¹⁶¹ Frontier Associates on behalf of the Electric Utility Marketing Managers of Texas (EUMMOT). "Petition to revise Existing Commission-Approved Deemed Savings Values for Central Air Conditioning and Heat Pump Systems: Docket No. 36780." Public Utility Commission of Texas. Approved August 27, 2009. <http://interchange.puc.state.tx.us/WebApp/Interchange/application/dbapps/filings/pgSearch.asp>. Adapted for new 14 SEER baseline.

¹⁶² 10 CFR Part 430.32(c)2. *Energy Conservation Program: Energy Conservation Standards for Residential Water Heaters, Direct Heating Equipment, and Pool Heaters; Final Rule*. Online. Available: <http://www.gpo.gov/fdsys/pkg/CFR-2012-title10-vol3/pdf/CFR-2012-title10-vol3-sec430-32.pdf>. Accessed February 2014.

¹⁶³ Ibid.

¹⁶⁴ COP = HSPF × 1,055 J/BTU / 3,600 J/W-hr. For Electric Resistance, heating efficiency is 1 COP. Therefore, HSPF = 1 × 3,600 / 1,055 = 3.41.

Table 2-130: Central Heat Pump Baseline Efficiencies

Project Type	Cooling Mode	Heating Mode
New construction	14 SEER	8.2 HSPF
Replace-on-burnout, heat pump	13.08 SEER	8.2 HSPF
Replace-on-burnout, electric resistance furnace		3.41 HSPF
Early retirement, heat pump (as of 1/23/2006)	12.44 SEER	7.7 HSPF
Early retirement, electric resistance furnace (as of 1/23/2006)		3.41 HSPF
Early retirement, heat pump (before 1/23/2006)	10 SEER	6.8 HSPF
Early retirement, electric resistance furnace (before 1/23/2006)		3.41 HSPF

High-Efficiency Condition

Table 2-131 displays the Consortium for Energy Efficiency (CEE) requirements for eligible Tier 1 heat pumps as of January 1, 2009. Energy efficiency service providers are expected to at least comply with the latest CEE Tier 1 requirements.

Table 2-131: Central Heat Pump CEE Tier 1 Requirements

SEER	EER	HSPF
14.5	12.0	8.5

Energy and Demand Savings Methodology

Savings Algorithms and Input Variables

Replace-on-Burnout or New Construction

Energy, summer demand, and winter demand savings were estimated using heat pump performance curves developed by the National Renewable Energy Laboratory¹⁶⁵ for typical units in each of the following SEER ranges:

- Baseline units
- 14.5–14.9
- 15.0–15.9
- 16.0–16.9
- 17.0–17.9
- 18.0–20.9
- 21.0 and above

¹⁶⁵ D. Cutler et al. Improved Modeling of Residential Air Conditioners and Heat Pumps for Energy Calculations. National Renewable Energy Laboratory. NREL/TP-5500-56354. January 2013. Tables 12 and 13. <http://www.nrel.gov/docs/fy13osti/56354.pdf>

14.5–16.9 SEER units were assumed to be single stage. 17.0 and above SEER units were assumed to be multi-stage cooling units.

These performance curves provide the capacity and efficiency of the heat pump operating in cooling mode across a wide range of outside air temperatures. Unit loading was estimated as a function of outside air temperature, and hours of cooling mode operation under different loadings were estimated using bin weather data for each weather zone. In heating mode, predicted HVAC operation was limited to meeting 77 percent of load, using a factor applied in Manual J to correlate design load hours to equivalent full load hours under actual operating conditions. This approach accounts for the observation that heating systems are not always operated even when outdoor conditions indicate they should.

Summer and winter demand savings were estimated according to the expected unit performance under design conditions. For all weather zones, it is assumed that typical HVAC systems are sized to 115 percent of their design cooling load (oversized by 15 percent). Heating mode capacity was related to rated cooling capacity using the rated capacity in cooling and heating mode of the residential market heat pump products of four major manufacturers according to data exported from AHRI. Data were exported from the AHRI directory and the average ratio for each equipment size of heating capacity to cooling capacity was multiplied by the rated (cooling side) capacity to estimate the heat pump capacity. Heat pump system output was then compared to its loading under design conditions.

The model uses the following set of normalized performance curves to scale the rated performance values as a function of outdoor dry-bulb temperature ranging from 65 to 115 degrees Fahrenheit. The total capacity and Energy Input Ratio (EIR = 1/COP) curves are a function of entering wet-bulb temperature (EWB) and outdoor dry-bulb temperature (ODB) and are both quadratic curve fits of the form:

$$y = a + b \times T_{EWB} + c \times T_{EWB}^2 + d \times T_{ODB} + e \times T_{ODB}^2 + f \times T_{EWB} \times T_{ODB}$$

Equation 63

Table 2-132: Heat Pump Capacity Curve Coefficients¹⁶⁶

Coeff.	Cooling			Heating		
	Single Stage	Multi-Stage/Speed		Single Stage	Multi-Stage/Speed	
		Low	High		Low	High
a	3.670270705	3.940185508	3.109456535	0.566333415	0.335690634	0.306358843
b	-0.098652414	-0.104723455	-0.085520461	-0.000744164	0.002405123	0.005376987
c	0.000955906	0.001019298	0.000863238	-0.0000103	-0.0000464	-0.0000579
d	0.006552414	0.006471171	0.00863049	0.009414634	0.013498735	0.011645092
e	-0.0000156	-0.00000953	-0.000021	0.0000506	0.0000499	0.0000591
f	-0.000131877	-0.000161658	-0.000140186	-0.00000675	-0.00000725	-0.0000203

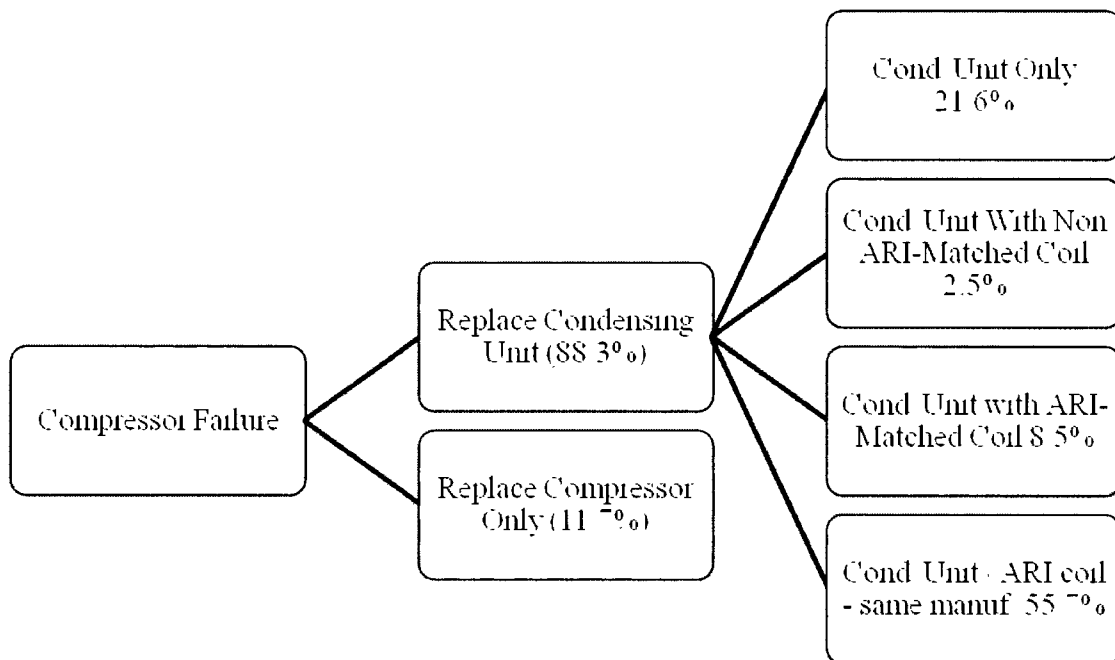
¹⁶⁶ Using air conditioner capacity curve coefficients for heat pump cooling savings.

Table 2-133: Heat Pump EIR Curve Coefficients¹⁶⁷

Coeff.	Cooling			Heating		
	Single Stage	Multi-Stage/Speed		Single Stage	Multi-Stage/Speed	
		Low	High		Low	High
a	-3.302695861	-3.87752688	-1.990708931	0.718398423	0.36338171	0.981100941
b	0.137871531	0.164566276	0.093969249	0.003498178	0.013523725	-0.005158493
c	-0.001056996	-0.001272755	-0.00073335	0.000142202	0.000258872	0.000243416
d	-0.012573945	-0.019956043	-0.009062553	-0.005724331	-0.009450269	-0.005274352
e	0.000214638	0.000256512	0.000165099	0.00014085	0.000439519	0.000230742
f	-0.000145054	-0.000133539	-0.0000997	-0.000215321	-0.000653723	-0.000336954

To estimate the baseline SEER value for retrofit installations, Texas A&M's Energy Systems Laboratory (ESL) surveyed dealers across the State to determine installation practices. The research found that in the event of a compressor failure out of warranty, dealers replaced the compressor 11.7 percent of the time, and replaced the condensing unit 88.3 percent of the time. Further, the condensing unit replacements consist of condensing unit-only replacements, replacements with mismatched evaporator coils, and replacements with matching evaporator coils. The percentages for these installations are as follows:

Figure 2-3: Unit Replacement Percentages upon Compressor Failure



Source: Docket No. 36780

¹⁶⁷ Using air conditioner capacity EIR coefficients for heat pump cooling savings.

To calculate a weighted average SEER for these installations, ESL assumed that a compressor-only replacement resulted in no increase in SEER, and that the SEER of a condensing unit installed without a matching coil would be 85 percent of the SEER value for a matched system. The ESL estimate of the baseline SEER for replacement AC units is given by the following equation:

$$SEER_{Base} = (SEER_{Compressor Replacement}) \times (Actual \% Compressor Replacement) + (SEER_{Condenser Replacement}) \times (Actual \% Condenser Replacement) + (SEER_{System Replacement}) \times (Actual \% System Replacement)$$

Equation 64

Substituting ESL SEER estimates and survey data provides the following baseline SEER estimate:

$$SEER_{Base} = (9.5) \times (11.7\%) + (11.05) \times (24.1\%) + (13.5) \times (64.2\%) = 12.44$$

Adjusting for the increased 14 SEER baseline:

$$SEER_{Base} = (10.5) \times (11.7\%) + (11.9) \times (24.1\%) + (14) \times (64.2\%) = 13.08$$

In new construction, there is no possibility of a partial system (e.g. condensing unit-only) change out, so the 13.08 baseline would not be appropriate. Therefore, the baseline for new construction installations is set at the federal government's minimum efficiency standard of 14 SEER.

Early Retirement

Annual energy (kWh) and summer peak demand (kW) savings must be calculated separately for two time periods:

1. The estimated remaining life of the equipment that is being removed, designated the remaining useful life (RUL), and
2. The remaining time in the EUL period (15—RUL)

Annual energy and summer peak demand savings are calculated by weighting the early retirement and replace-on-burnout savings by the RUL of the unit and the remainder of the EUL period, as outlined in the Volume 3 appendices.

Where:

RUL = *Remaining Useful Life (see Table 2-134); if unknown, assume the age of the replaced unit is equal to the EUL resulting in a default RUL of 6.0 years. If individual system components were installed at separate times, use the condenser age as a proxy for the entire system. Default RUL may be used exclusively if applied consistently for all projects. Otherwise, the default should only be used when a project is reported and documented as having a nameplate that is illegible. For heat pumps replacing an air conditioner with an electric resistance furnace, use the RUL table from the Central Air conditioner measure instead.*

EUL = *Estimated Useful Life* = 15 years

Table 2-134: Remaining Useful Life of Replaced Unit

Age of Replaced Unit (years)	Remaining Useful Life (years)	Age of Replaced Unit (years)	Remaining Useful Life (years)
1	13.7	12	7.9
2	12.7	13	7.6
3	12.0	14	7.0
4	11.3	15	6.0
5	10.7	16	5.0
6	10.2	17	4.0
7	9.7	18	3.0
8	9.3	19	2.0
9	8.9	20	1.0
10	8.5	21 ^{168,169}	0.0
11	8.2		

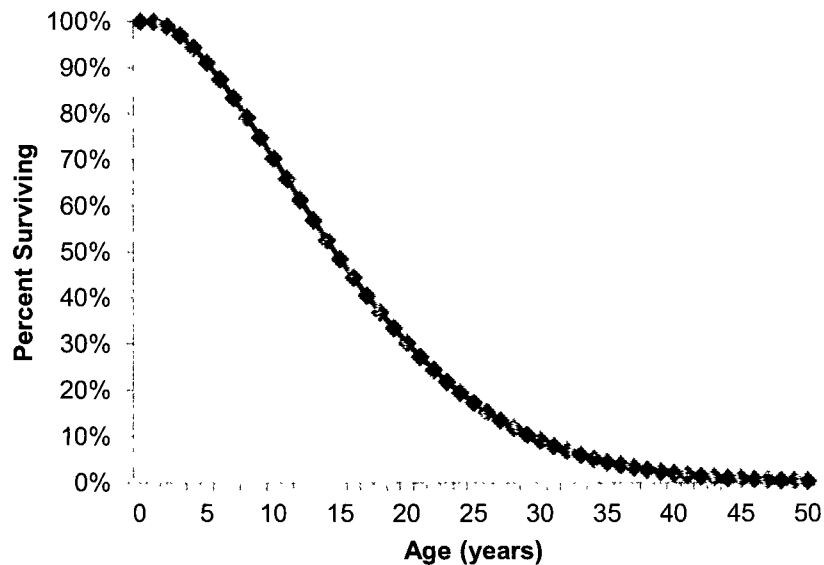
Derivation of RULs

Central heat pumps have an estimated useful life of 15 years. This estimate is consistent with the age at which approximately 50 percent of the central heat pumps installed in a given year will no longer be in service, as described by the survival function in Figure 2-4.

¹⁶⁸ RULs are capped at the 75th percentile of equipment age, 21 years, as determined based on DOE survival curves (Figure 2-4). Systems older than 21 years should use the ROB baseline. See the January 2015 memo, "Considerations for early replacement of residential equipment," for further detail.

¹⁶⁹ Ward, B., Bodington, N., Farah, H., Reeves, S., and Lee, L. "Considerations for early replacement of residential equipment." Prepared by the Evaluation, Measurement, and Verification (EM&V) team for the Electric Utility Marketing Managers of Texas (EUMMOT). January 2015. This document has been made available to Texas investor-owned utilities through the EM&V team's SharePoint.

Figure 2-4: Survival Function for Central Heat Pumps¹⁷⁰



The method for estimating the remaining useful life (RUL) of a replaced system uses the age of the existing system to re-estimate the projected unit lifetime based on the survival function shown in Figure 2-4. The age of the central heat pump being replaced is found on the horizontal axis, and the corresponding percentage of surviving heat pumps is determined from the chart. The surviving percentage value is then divided in half, creating a new estimated useful lifetime applicable to the current unit age. The age (year) that corresponds to this new percentage is read from the chart. RUL is estimated as the difference between that age and the current age of the system being replaced.

¹⁷⁰ Department of Energy, Federal Register, 76 FR 37408, Technical Support Document: 8.2.3.5 Lifetime. June 2011. http://www1.eere.energy.gov/buildings/appliance_standards/product.aspx/productid/75. Download TSD at: <http://www.regulations.gov/#!documentDetail;D=EERE-2011-BT-STD-0011-0012>.

Deemed Energy Savings Tables¹⁷¹

Cooling, New Construction

Table 2-135 through Table 2-139 present the energy savings (kWh) for cooling load types associated with a central heat pump being installed during new construction for all five Texas climate zones.

Climate Zone 1: Panhandle Region, Amarillo Weather Data

Table 2-135: Energy Savings (Cooling kWh) for 14.0 SEER New Construction Baseline—Zone 1

Size (Btuh)	SEER Range					
	14.5–14.9	15.0–15.9	16.0–16.9	17.0–17.9	18.0–20.9	21.0+
< 22,800	65	124	231	396	461	617
22,800-28,499	86	166	307	529	615	822
28,500-34,199	108	207	384	661	769	1,028
34,200-39,899	129	248	461	793	922	1,234
39,900-45,599	151	290	538	925	1,076	1,439
45,600-56,999	172	331	615	1,057	1,230	1,645
57,000-64,499	215	414	769	1,322	1,537	2,056

Climate Zone 2: North Region, Dallas / Ft. Worth Weather Data

Table 2-136: Energy Savings (Cooling kWh) for 14.0 SEER New Construction Baseline—Zone 2

Size (Btuh)	SEER Range					
	14.5–14.9	15.0–15.9	16.0–16.9	17.0–17.9	18.0–20.9	21.0+
< 22,800	105	201	374	649	753	1,008
22,800-28,499	140	268	498	865	1,004	1,343
28,500-34,199	174	335	623	1,082	1,256	1,679
34,200-39,899	209	403	748	1,298	1,507	2,015
39,900-45,599	244	470	872	1,514	1,758	2,351
45,600-56,999	279	537	997	1,731	2,009	2,687
57,000-64,499	349	671	1,246	2,163	2,511	3,359

¹⁷¹ Rated capacity ranges are specified with a 5% tolerance in accordance with AHRI Standard 210/240 to account for systems that are rated slightly below the applicable nominal capacity. AHRI Standard 210/240. Table J1.
http://www.ahrinet.org/App_Content/ahri/files/STANDARDS/AHRI/AHRI_Standard_210-240_2017.pdf.

Climate Zone 3: South Region, Houston Weather Data

Table 2-137: Energy Savings (Cooling kWh) for 14.0 SEER New Construction Baseline—Zone 3

Size (Btuh)	SEER Range					
	14.5–14.9	15.0–15.9	16.0–16.9	17.0–17.9	18.0–20.9	21.0+
< 22,800	123	236	438	756	879	1,175
22,800-28,499	163	314	584	1,008	1,172	1,566
28,500-34,199	204	393	729	1,260	1,465	1,958
34,200-39,899	245	471	875	1,512	1,757	2,350
39,900-45,599	286	550	1,021	1,764	2,050	2,741
45,600-56,999	327	628	1,167	2,017	2,343	3,133
57,000-64,499	409	786	1,459	2,521	2,929	3,916

Climate Zone 4: Valley Region Corpus Christi Weather Data

Table 2-138: Energy Savings (Cooling kWh) for 14.0 SEER New Construction Baseline—Zone 4

Size (Btuh)	SEER Range					
	14.5–14.9	15.0–15.9	16.0–16.9	17.0–17.9	18.0–20.9	21.0+
< 22,800	136	261	485	857	992	1,323
22,800-28,499	181	348	647	1,143	1,322	1,764
28,500-34,199	226	436	809	1,429	1,653	2,206
34,200-39,899	272	523	971	1,715	1,983	2,647
39,900-45,599	317	610	1,132	2,000	2,314	3,088
45,600-56,999	362	697	1,294	2,286	2,644	3,529
57,000-64,499	453	871	1,618	2,858	3,306	4,411

Climate Zone 5: West Region El Paso Weather Data

Table 2-139: Energy Savings (Cooling kWh) for 14.0 SEER New Construction Baseline—Zone 5

Size (Btuh)	SEER Range					
	14.5–14.9	15.0–15.9	16.0–16.9	17.0–17.9	18.0–20.9	21.0+
< 22,800	90	172	320	566	655	873
22,800-28,499	119	230	427	755	873	1,164
28,500-34,199	149	287	533	944	1,092	1,455
34,200-39,899	179	345	640	1,133	1,310	1,746
39,900-45,599	209	402	746	1,322	1,528	2,037
45,600-56,999	239	459	853	1,511	1,747	2,328
57,000-64,499	299	574	1,066	1,888	2,183	2,910

Cooling, Replace-on-Burnout

Table 2-140 through Table 2-144 present the energy savings (kWh) for cooling load types associated with a central heat pump replacing on burnout an HVAC system for all five Texas climate zones. In each table, the capacity of the efficient unit is represented in the columns and the capacity of the existing unit is represented in the rows. The savings are in the intersection of the appropriate efficient and existing capacities. Replacements where there has been to change in capacity are highlighted in light blue and bold text.

Climate Zone 1: Panhandle Region, Amarillo Weather Data

Table 2-140: Energy Savings (Cooling kWh) for 13.08 SEER Replace-on-Burnout Baseline—Zone 1

14.5-14.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	178						
22,800-28,499	754	237					
28,500-34,199	1,330	813	297				
34,200-39,899	1,906	1,389	873	356			
39,900-45,599	2,482	1,965	1,449	932	416		
45,600-56,999	3,058	2,541	2,025	1,508	992	475	
57,000-64,499	4,210	3,693	3,177	2,660	2,143	1,627	594
15.0-15.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	238						
22,800-28,499	814	317					
28,500-34,199	1,390	893	396				
34,200-39,899	1,966	1,469	972	475			
39,900-45,599	2,541	2,045	1,548	1,051	555		
45,600-56,999	3,117	2,621	2,124	1,627	1,131	634	
57,000-64,499	4,269	3,773	3,276	2,779	2,283	1,786	792

16.0-16.9 SEER

Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	344						
22,800-28,499	920	459					
28,500-34,199	1,496	1,035	574				
34,200-39,899	2,072	1,611	1,150	688			
39,900-45,599	2,648	2,187	1,725	1,264	803		
45,600-56,999	3,224	2,763	2,301	1,840	1,379	918	
57,000-64,499	4,376	3,915	3,453	2,992	2,531	2,070	1,147

17.0-17.9 SEER

Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	510						
22,800-28,499	1,086	680					
28,500-34,199	1,662	1,256	850				
34,200-39,899	2,238	1,832	1,426	1,020			
39,900-45,599	2,814	2,408	2,002	1,596	1,190		
45,600-56,999	3,390	2,984	2,578	2,172	1,766	1,360	
57,000-64,499	4,542	4,136	3,730	3,324	2,918	2,512	1,700

18.0-20.9 SEER

Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	575						
22,800-28,499	1,151	766					
28,500-34,199	1,727	1,342	958				
34,200-39,899	2,303	1,918	1,534	1,149			
39,900-45,599	2,879	2,494	2,110	1,725	1,341		
45,600-56,999	3,454	3,070	2,686	2,301	1,917	1,533	
57,000-64,499	4,606	4,222	3,838	3,453	3,069	2,684	1,916

21.0+ SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	730						
22,800-28,499	1,306	974					
28,500-34,199	1,882	1,550	1,217				
34,200-39,899	2,458	2,126	1,793	1,461			
39,900-45,599	3,034	2,702	2,369	2,037	1,704		
45,600-56,999	3,610	3,278	2,945	2,613	2,280	1,948	
57,000-64,499	4,762	4,430	4,097	3,765	3,432	3,100	2,435

Climate Zone 2: North Region, Dallas / Ft. Worth Weather Data

Table 2-141: Energy Savings (Cooling kWh) for 13.08 SEER Replace-on-Burnout Baseline—Zone 2

14.5-14.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	289						
22,800-28,499	1,222	385					
28,500-34,199	2,156	1,318	481				
34,200-39,899	3,089	2,252	1,415	577			
39,900-45,599	4,023	3,186	2,348	1,511	674		
45,600-56,999	4,956	4,119	3,282	2,445	1,607	770	
57,000-64,499	6,824	5,986	5,149	4,312	3,474	2,637	962

15.0-15.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	385						
22,800-28,499	1,319	514					
28,500-34,199	2,252	1,447	642				
34,200-39,899	3,186	2,381	1,576	771			
39,900-45,599	4,120	3,314	2,509	1,704	899		
45,600-56,999	5,053	4,248	3,443	2,638	1,833	1,028	
57,000-64,499	6,920	6,115	5,310	4,505	3,700	2,895	1,284

16.0-16.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	558						
22,800-28,499	1,491	744					
28,500-34,199	2,425	1,677	930				
34,200-39,899	3,359	2,611	1,863	1,116			
39,900-45,599	4,292	3,544	2,797	2,049	1,302		
45,600-56,999	5,226	4,478	3,730	2,983	2,235	1,488	
57,000-64,499	7,093	6,345	5,598	4,850	4,102	3,355	1,859
17.0-17.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	833						
22,800-28,499	1,767	1,111					
28,500-34,199	2,700	2,044	1,388				
34,200-39,899	3,634	2,978	2,322	1,666			
39,900-45,599	4,567	3,911	3,256	2,600	1,944		
45,600-56,999	5,501	4,845	4,189	3,533	2,877	2,221	
57,000-64,499	7,368	6,712	6,056	5,400	4,744	4,089	2,777
18.0-20.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	937						
22,800-28,499	1,871	1,250					
28,500-34,199	2,805	2,183	1,562				
34,200-39,899	3,738	3,117	2,496	1,875			
39,900-45,599	4,672	4,051	3,429	2,808	2,187		
45,600-56,999	5,605	4,984	4,363	3,742	3,121	2,500	
57,000-64,499	7,472	6,851	6,230	5,609	4,988	4,367	3,125

21.0+ SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	1,192						
22,800-28,499	2,125	1,589					
28,500-34,199	3,059	2,522	1,986				
34,200-39,899	3,992	3,456	2,920	2,383			
39,900-45,599	4,926	4,389	3,853	3,317	2,780		
45,600-56,999	5,859	5,323	4,787	4,250	3,714	3,178	
57,000-64,499	7,727	7,190	6,654	6,117	5,581	5,045	3,972

Climate Zone 3: South Region, Houston Weather Data

Table 2-142: Energy Savings (Cooling kWh) for 13.08 SEER Replace-on-Burnout Baseline—Zone 3

14.5-14.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	338						
22,800-28,499	1,431	451					
28,500-34,199	2,524	1,544	563				
34,200-39,899	3,617	2,637	1,656	676			
39,900-45,599	4,710	3,730	2,750	1,769	789		
45,600-56,999	5,803	4,823	3,843	2,862	1,882	901	
57,000-64,499	7,990	7,009	6,029	5,048	4,068	3,088	1,127

15.0-15.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	451						
22,800-28,499	1,544	602					
28,500-34,199	2,637	1,695	752				
34,200-39,899	3,730	2,788	1,845	902			
39,900-45,599	4,823	3,881	2,938	1,995	1,053		
45,600-56,999	5,917	4,974	4,031	3,089	2,146	1,203	
57,000-64,499	8,103	7,160	6,217	5,275	4,332	3,389	1,504

16.0 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	653						
22,800-28,499	1,746	871					
28,500-34,199	2,839	1,964	1,089				
34,200-39,899	3,932	3,057	2,182	1,306			
39,900-45,599	5,026	4,150	3,275	2,399	1,524		
45,600-56,999	6,119	5,243	4,368	3,493	2,617	1,742	
57,000-64,499	8,305	7,429	6,554	5,679	4,803	3,928	2,177
17.0 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	972						
22,800-28,499	2,065	1,296					
28,500-34,199	3,158	2,389	1,619				
34,200-39,899	4,251	3,482	2,713	1,943			
39,900-45,599	5,344	4,575	3,806	3,036	2,267		
45,600-56,999	6,437	5,668	4,899	4,130	3,360	2,591	
57,000-64,499	8,623	7,854	7,085	6,316	5,547	4,777	3,239
18.0 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	1,094						
22,800-28,499	2,187	1,459					
28,500-34,199	3,280	2,552	1,824				
34,200-39,899	4,373	3,645	2,917	2,188			
39,900-45,599	5,467	4,738	4,010	3,282	2,553		
45,600-56,999	6,560	5,831	5,103	4,375	3,646	2,918	
57,000-64,499	8,746	8,017	7,289	6,561	5,832	5,104	3,647

21.0+ SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	1,390						
22,800-28,499	2,483	1,854					
28,500-34,199	3,576	2,947	2,317				
34,200-39,899	4,670	4,040	3,410	2,781			
39,900-45,599	5,763	5,133	4,503	3,874	3,244		
45,600-56,999	6,856	6,226	5,596	4,967	4,337	3,707	
57,000-64,499	9,042	8,412	7,783	7,153	6,523	5,894	4,634

Climate Zone 4: Valley Region Corpus Christi Weather Data

Table 2-143: Energy Savings (Cooling kWh) for 13.08 SEER Replace-on-Burnout Baseline—Zone 4

14.5-14.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	375						
22,800-28,499	1,587	500					
28,500-34,199	2,799	1,712	625				
34,200-39,899	4,011	2,924	1,837	750			
39,900-45,599	5,223	4,136	3,049	1,962	875		
45,600-56,999	6,435	5,348	4,261	3,174	2,087	1,000	
57,000-64,499	8,860	7,772	6,685	5,598	4,511	3,424	1,250

15.0-15.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	500						
22,800-28,499	1,712	667					
28,500-34,199	2,924	1,879	834				
34,200-39,899	4,137	3,091	2,046	1,001			
39,900-45,599	5,349	4,303	3,258	2,213	1,167		
45,600-56,999	6,561	5,515	4,470	3,425	2,379	1,334	
57,000-64,499	8,985	7,940	6,894	5,849	4,804	3,758	1,668

16.0-16.9 SEER

Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	724						
22,800-28,499	1,936	966					
28,500-34,199	3,148	2,178	1,207				
34,200-39,899	4,361	3,390	2,419	1,449			
39,900-45,599	5,573	4,602	3,631	2,661	1,690		
45,600-56,999	6,785	5,814	4,843	3,873	2,902	1,931	
57,000-64,499	9,209	8,238	7,268	6,297	5,326	4,356	2,414

17.0-17.9 SEER

Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	1,096						
22,800-28,499	2,308	1,462					
28,500-34,199	3,520	2,674	1,827				
34,200-39,899	4,733	3,886	3,039	2,192			
39,900-45,599	5,945	5,098	4,251	3,405	2,558		
45,600-56,999	7,157	6,310	5,463	4,617	3,770	2,923	
57,000-64,499	9,581	8,734	7,888	7,041	6,194	5,347	3,654

18.0-20.9 SEER

Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	1,231						
22,800-28,499	2,443	1,641					
28,500-34,199	3,655	2,853	2,051				
34,200-39,899	4,867	4,065	3,263	2,461			
39,900-45,599	6,079	5,277	4,475	3,673	2,871		
45,600-56,999	7,291	6,489	5,687	4,885	4,084	3,282	
57,000-64,499	9,715	8,913	8,112	7,310	6,508	5,706	4,102

21.0+ SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	1,562						
22,800-28,499	2,774	2,083					
28,500-34,199	3,986	3,295	2,604				
34,200-39,899	5,199	4,507	3,816	3,125			
39,900-45,599	6,411	5,719	5,028	4,337	3,645		
45,600-56,999	7,623	6,931	6,240	5,549	4,857	4,166	
57,000-64,499	10,047	9,356	8,664	7,973	7,282	6,590	5,208

Climate Zone 5: West Region El Paso Weather Data

Table 2-144: Energy Savings (Cooling kWh) for 13.08 SEER Replace-on-Burnout Baseline—Zone 5

14.5-14.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	247						
22,800-28,499	1,046	329					
28,500-34,199	1,845	1,128	412				
34,200-39,899	2,644	1,927	1,211	494			
39,900-45,599	3,443	2,726	2,010	1,293	577		
45,600-56,999	4,242	3,525	2,809	2,092	1,376	659	
57,000-64,499	5,840	5,123	4,407	3,690	2,974	2,257	824

15.0-15.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	330						
22,800-28,499	1,129	440					
28,500-34,199	1,928	1,239	550				
34,200-39,899	2,727	2,038	1,349	660			
39,900-45,599	3,526	2,837	2,148	1,459	770		
45,600-56,999	4,325	3,636	2,947	2,258	1,569	879	
57,000-64,499	5,923	5,234	4,545	3,856	3,167	2,477	1,099

16.0-16.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	477						
22,800-28,499	1,276	637					
28,500-34,199	2,075	1,436	796				
34,200-39,899	2,874	2,235	1,595	955			
39,900-45,599	3,673	3,034	2,394	1,754	1,114		
45,600-56,999	4,472	3,833	3,193	2,553	1,913	1,273	
57,000-64,499	6,070	5,431	4,791	4,151	3,511	2,871	1,591
17.0-17.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	724						
22,800-28,499	1,523	965					
28,500-34,199	2,322	1,764	1,207				
34,200-39,899	3,121	2,563	2,006	1,448			
39,900-45,599	3,920	3,362	2,805	2,247	1,689		
45,600-56,999	4,719	4,161	3,604	3,046	2,488	1,931	
57,000-64,499	6,317	5,759	5,202	4,644	4,086	3,529	2,413
18.0-20.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	813						
22,800-28,499	1,612	1,083					
28,500-34,199	2,411	1,882	1,354				
34,200-39,899	3,210	2,681	2,153	1,625			
39,900-45,599	4,009	3,480	2,952	2,424	1,896		
45,600-56,999	4,808	4,279	3,751	3,223	2,695	2,167	
57,000-64,499	6,406	5,877	5,349	4,821	4,293	3,765	2,708

21.0+ SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	1,031						
22,800-28,499	1,830	1,374					
28,500-34,199	2,629	2,173	1,718				
34,200-39,899	3,428	2,972	2,517	2,061			
39,900-45,599	4,227	3,771	3,316	2,860	2,405		
45,600-56,999	5,026	4,570	4,115	3,659	3,204	2,748	
57,000-64,499	6,624	6,168	5,713	5,257	4,802	4,346	3,435

Cooling, Early Retirement

Table 2-145 through Table 2-154 present the cooling energy savings (kWh) associated with the installation of a central heat pump following the early retirement of an HVAC system for all five Texas climate zones. These savings can be used with the replace-on-burnout energy savings in Table 2-140 through Table 2-144 to calculate annual cooling savings. In each table, the capacity of the efficient unit is represented in the columns and the capacity of the existing unit is represented in the rows. The savings are in the intersection of the appropriate efficient and existing capacities. Replacements where there has been no change in capacity are highlighted in light blue and bold text.

Climate Zone 1: Panhandle Region, Amarillo Weather Data

Table 2-145: Energy Savings (Cooling kWh) for 12.44 SEER Early Retirement Baseline—Zone 1

14.5-14.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	267						
22,800-28,499	873	356					
28,500-34,199	1,478	962	445				
34,200-39,899	2,084	1,567	1,051	534			
39,900-45,599	2,689	2,173	1,656	1,140	623		
45,600-56,999	3,295	2,778	2,262	1,745	1,229	712	
57,000-64,499	4,506	3,989	3,473	2,956	2,440	1,923	890

15.0-15.9 SEER

Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	327						
22,800-28,499	932	435					
28,500-34,199	1,538	1,041	544				
34,200-39,899	2,143	1,647	1,150	653			
39,900-45,599	2,749	2,252	1,756	1,259	762		
45,600-56,999	3,354	2,858	2,361	1,864	1,368	871	
57,000-64,499	4,566	4,069	3,572	3,076	2,579	2,082	1,089

16.0-16.9 SEER

Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	433						
22,800-28,499	1,039	577					
28,500-34,199	1,644	1,183	722				
34,200-39,899	2,250	1,789	1,327	866			
39,900-45,599	2,855	2,394	1,933	1,472	1,010		
45,600-56,999	3,461	3,000	2,538	2,077	1,616	1,155	
57,000-64,499	4,672	4,211	3,750	3,288	2,827	2,366	1,443

17.0-17.9 SEER

Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	599						
22,800-28,499	1,204	799					
28,500-34,199	1,810	1,404	998				
34,200-39,899	2,416	2,010	1,604	1,198			
39,900-45,599	3,021	2,615	2,209	1,803	1,397		
45,600-56,999	3,627	3,221	2,815	2,409	2,003	1,597	
57,000-64,499	4,838	4,432	4,026	3,620	3,214	2,808	1,996

18.0-20.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	664						
22,800-28,499	1,269	885					
28,500-34,199	1,875	1,490	1,106				
34,200-39,899	2,480	2,096	1,712	1,327			
39,900-45,599	3,086	2,702	2,317	1,933	1,548		
45,600-56,999	3,691	3,307	2,923	2,538	2,154	1,770	
57,000-64,499	4,903	4,518	4,134	3,750	3,365	2,981	2,212

21.0+ SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	819						
22,800-28,499	1,425	1,092					
28,500-34,199	2,030	1,698	1,365				
34,200-39,899	2,636	2,304	1,971	1,639			
39,900-45,599	3,242	2,909	2,577	2,244	1,912		
45,600-56,999	3,847	3,515	3,182	2,850	2,517	2,185	
57,000-64,499	5,058	4,726	4,393	4,061	3,728	3,396	2,731

Table 2-146: Energy Savings (Cooling kWh) for 10.0 SEER Early Retirement Baseline—Zone 1

14.5-14.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	710						
22,800-28,499	1,464	947					
28,500-34,199	2,217	1,700	1,184				
34,200-39,899	2,970	2,454	1,937	1,421			
39,900-45,599	3,724	3,207	2,690	2,174	1,657		
45,600-56,999	4,477	3,960	3,444	2,927	2,411	1,894	
57,000-64,499	5,984	5,467	4,950	4,434	3,917	3,401	2,368

15.0-15.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	770						
22,800-28,499	1,523	1,027					
28,500-34,199	2,277	1,780	1,283				
34,200-39,899	3,030	2,533	2,036	1,540			
39,900-45,599	3,783	3,287	2,790	2,293	1,796		
45,600-56,999	4,537	4,040	3,543	3,046	2,550	2,053	
57,000-64,499	6,043	5,547	5,050	4,553	4,056	3,560	2,566
16.0-16.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	876						
22,800-28,499	1,630	1,168					
28,500-34,199	2,383	1,922	1,461				
34,200-39,899	3,136	2,675	2,214	1,753			
39,900-45,599	3,890	3,428	2,967	2,506	2,045		
45,600-56,999	4,643	4,182	3,721	3,259	2,798	2,337	
57,000-64,499	6,150	5,688	5,227	4,766	4,305	3,844	2,921
17.0-17.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	1,042						
22,800-28,499	1,796	1,390					
28,500-34,199	2,549	2,143	1,737				
34,200-39,899	3,302	2,896	2,490	2,084			
39,900-45,599	4,056	3,650	3,244	2,838	2,432		
45,600-56,999	4,809	4,403	3,997	3,591	3,185	2,779	
57,000-64,499	6,316	5,910	5,504	5,098	4,692	4,286	3,474

18.0-20.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	1,107						
22,800-28,499	1,860	1,476					
28,500-34,199	2,614	2,229	1,845				
34,200-39,899	3,367	2,983	2,598	2,214			
39,900-45,599	4,120	3,736	3,351	2,967	2,583		
45,600-56,999	4,874	4,489	4,105	3,720	3,336	2,952	
57,000-64,499	6,380	5,996	5,612	5,227	4,843	4,458	3,690

21.0+ SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	1,263						
22,800-28,499	2,016	1,683					
28,500-34,199	2,769	2,437	2,104				
34,200-39,899	3,523	3,190	2,858	2,525			
39,900-45,599	4,276	3,943	3,611	3,278	2,946		
45,600-56,999	5,029	4,697	4,364	4,032	3,699	3,367	
57,000-64,499	6,536	6,203	5,871	5,538	5,206	4,874	4,209

Climate Zone 2: North Region, Dallas / Ft. Worth Weather Data

Table 2-147: Energy Savings (Cooling kWh) for 12.44 SEER Early Retirement Baseline—Zone 2

14.5-14.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	433						
22,800-28,499	1,414	577					
28,500-34,199	2,396	1,559	721				
34,200-39,899	3,378	2,540	1,703	866			
39,900-45,599	4,359	3,522	2,684	1,847	1,010		
45,600-56,999	5,341	4,503	3,666	2,829	1,991	1,154	
57,000-64,499	7,304	6,467	5,629	4,792	3,955	3,117	1,443

15.0-15.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	529						
22,800-28,499	1,511	706					
28,500-34,199	2,493	1,687	882				
34,200-39,899	3,474	2,669	1,864	1,059			
39,900-45,599	4,456	3,651	2,846	2,040	1,235		
45,600-56,999	5,437	4,632	3,827	3,022	2,217	1,412	
57,000-64,499	7,400	6,595	5,790	4,985	4,180	3,375	1,765
16.0-16.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	702						
22,800-28,499	1,684	936					
28,500-34,199	2,665	1,917	1,170				
34,200-39,899	3,647	2,899	2,151	1,404			
39,900-45,599	4,628	3,881	3,133	2,385	1,638		
45,600-56,999	5,610	4,862	4,115	3,367	2,619	1,872	
57,000-64,499	7,573	6,825	6,078	5,330	4,583	3,835	2,340
17.0-17.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	977						
22,800-28,499	1,959	1,303					
28,500-34,199	2,940	2,284	1,629				
34,200-39,899	3,922	3,266	2,610	1,954			
39,900-45,599	4,903	4,248	3,592	2,936	2,280		
45,600-56,999	5,885	5,229	4,573	3,917	3,262	2,606	
57,000-64,499	7,848	7,192	6,536	5,881	5,225	4,569	3,257

18.0-20.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	1,081						
22,800-28,499	2,063	1,442					
28,500-34,199	3,045	2,424	1,802				
34,200-39,899	4,026	3,405	2,784	2,163			
39,900-45,599	5,008	4,387	3,766	3,145	2,523		
45,600-56,999	5,989	5,368	4,747	4,126	3,505	2,884	
57,000-64,499	7,953	7,331	6,710	6,089	5,468	4,847	3,605

21.0+ SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	1,336						
22,800-28,499	2,317	1,781					
28,500-34,199	3,299	2,763	2,226				
34,200-39,899	4,280	3,744	3,208	2,671			
39,900-45,599	5,262	4,726	4,189	3,653	3,117		
45,600-56,999	6,244	5,707	5,171	4,635	4,098	3,562	
57,000-64,499	8,207	7,670	7,134	6,598	6,061	5,525	4,452

Table 2-148: Energy Savings (Cooling kWh) for 10.0 SEER Early Retirement Baseline—Zone 2

14.5-14.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	1,151						
22,800-28,499	2,372	1,535					
28,500-34,199	3,593	2,756	1,919				
34,200-39,899	4,815	3,977	3,140	2,303			
39,900-45,599	6,036	5,198	4,361	3,524	2,686		
45,600-56,999	7,257	6,419	5,582	4,745	3,907	3,070	
57,000-64,499	9,699	8,862	8,024	7,187	6,350	5,512	3,838

15.0-15.9 SEER

Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	1,248						
22,800-28,499	2,469	1,664					
28,500-34,199	3,690	2,885	2,080				
34,200-39,899	4,911	4,106	3,301	2,496			
39,900-45,599	6,132	5,327	4,522	3,717	2,912		
45,600-56,999	7,353	6,548	5,743	4,938	4,133	3,328	
57,000-64,499	9,796	8,990	8,185	7,380	6,575	5,770	4,160

16.0-16.9 SEER

Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	1,420						
22,800-28,499	2,642	1,894					
28,500-34,199	3,863	3,115	2,367				
34,200-39,899	5,084	4,336	3,589	2,841			
39,900-45,599	6,305	5,557	4,810	4,062	3,314		
45,600-56,999	7,526	6,778	6,031	5,283	4,535	3,788	
57,000-64,499	9,968	9,220	8,473	7,725	6,978	6,230	4,735

17.0-17.9 SEER

Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	1,696						
22,800-28,499	2,917	2,261					
28,500-34,199	4,138	3,482	2,826				
34,200-39,899	5,359	4,703	4,047	3,391			
39,900-45,599	6,580	5,924	5,268	4,612	3,957		
45,600-56,999	7,801	7,145	6,489	5,833	5,178	4,522	
57,000-64,499	10,243	9,587	8,932	8,276	7,620	6,964	5,652

18.0-20.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	1,800						
22,800-28,499	3,021	2,400					
28,500-34,199	4,242	3,621	3,000				
34,200-39,899	5,463	4,842	4,221	3,600			
39,900-45,599	6,684	6,063	5,442	4,821	4,200		
45,600-56,999	7,905	7,284	6,663	6,042	5,421	4,800	
57,000-64,499	10,348	9,727	9,105	8,484	7,863	7,242	6,000

21.0+ SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	2,054						
22,800-28,499	3,275	2,739					
28,500-34,199	4,496	3,960	3,424				
34,200-39,899	5,717	5,181	4,645	4,108			
39,900-45,599	6,939	6,402	5,866	5,330	4,793		
45,600-56,999	8,160	7,623	7,087	6,551	6,014	5,478	
57,000-64,499	10,602	10,065	9,529	8,993	8,456	7,920	6,847

Climate Zone 3: South Region, Houston Weather Data

Table 2-149: Energy Savings (Cooling kWh) for 12.44 SEER Early Retirement Baseline—Zone 3

14.5-14.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	507						
22,800-28,499	1,656	676					
28,500-34,199	2,805	1,825	845				
34,200-39,899	3,955	2,974	1,994	1,014			
39,900-45,599	5,104	4,124	3,143	2,163	1,182		
45,600-56,999	6,253	5,273	4,293	3,312	2,332	1,351	
57,000-64,499	8,552	7,572	6,591	5,611	4,630	3,650	1,689

15.0-15.9 SEER

Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	620						
22,800-28,499	1,769	826					
28,500-34,199	2,919	1,976	1,033				
34,200-39,899	4,068	3,125	2,182	1,240			
39,900-45,599	5,217	4,274	3,332	2,389	1,446		
45,600-56,999	6,366	5,424	4,481	3,538	2,596	1,653	
57,000-64,499	8,665	7,722	6,780	5,837	4,894	3,952	2,066

16.0-16.9 SEER

Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	822						
22,800-28,499	1,971	1,096					
28,500-34,199	3,121	2,245	1,370				
34,200-39,899	4,270	3,394	2,519	1,644			
39,900-45,599	5,419	4,544	3,668	2,793	1,918		
45,600-56,999	6,568	5,693	4,818	3,942	3,067	2,192	
57,000-64,499	8,867	7,992	7,116	6,241	5,366	4,490	2,740

17.0-17.9 SEER

Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	1,140						
22,800-28,499	2,290	1,521					
28,500-34,199	3,439	2,670	1,901				
34,200-39,899	4,588	3,819	3,050	2,281			
39,900-45,599	5,738	4,968	4,199	3,430	2,661		
45,600-56,999	6,887	6,118	5,349	4,579	3,810	3,041	
57,000-64,499	9,186	8,416	7,647	6,878	6,109	5,340	3,801

18.0-20.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	1,263						
22,800-28,499	2,412	1,684					
28,500-34,199	3,562	2,833	2,105				
34,200-39,899	4,711	3,983	3,254	2,526			
39,900-45,599	5,860	5,132	4,404	3,675	2,947		
45,600-56,999	7,010	6,281	5,553	4,824	4,096	3,368	
57,000-64,499	9,308	8,580	7,851	7,123	6,395	5,666	4,210

21.0+ SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	1,559						
22,800-28,499	2,708	2,079					
28,500-34,199	3,858	3,228	2,598				
34,200-39,899	5,007	4,377	3,748	3,118			
39,900-45,599	6,156	5,527	4,897	4,267	3,638		
45,600-56,999	7,306	6,676	6,046	5,417	4,787	4,157	
57,000-64,499	9,604	8,975	8,345	7,715	7,086	6,456	5,197

Table 2-150: Energy Savings (Cooling kWh) for 10.0 SEER Early Retirement Baseline—Zone 3

14.5-14.9 SEER							
Size (Btuh) Post	< 22,800	22,800-28,499	28,500-34,199	34,200-39,899	39,900-45,599	45,600-56,999	57,000-64,499
Size (Btuh) Pre							
< 22,800	1,348						
22,800-28,499	2,778	1,797					
28,500-34,199	4,208	3,227	2,247				
34,200-39,899	5,637	4,657	3,677	2,696			
39,900-45,599	7,067	6,087	5,106	4,126	3,145		
45,600-56,999	8,497	7,516	6,536	5,556	4,575	3,595	
57,000-64,499	11,356	10,376	9,396	8,415	7,435	6,454	4,494