DeAnn T. Walker
Chairman
Arthur C. D'Andrea
Commissioner
Shelly Botkin



Commissioner

John Paul Urban

Executive Director

Public Utility Commission of Texas

TO: Interested Persons

FROM: Therese Harris, Infrastructure Division

DATE: November 4, 2020

RE: Project No. 38578 - Energy Efficiency Implementation Project under 16 TAC

§ 25.181(q)

Avoided Cost of Capacity and Energy for the 2021 Program Year

Avoided Cost of Capacity

As shown below from the United States Department of Energy's Energy Information Administration's (EIA) Cost and Performance Characteristics of New Central Station Electricity Generating Technologies associated with EIA's Annual Energy Outlook 2020, the base overnight cost of a combustion turbine—industrial frame is \$626 per kilowatt (kW) in the Texas Reliability Entity or Electric Reliability Council of Texas (ERCOT) region. Because this amount is less than the \$700 per kW threshold set by 16 Texas Administrative Code (TAC) § 25.181(d)(2)(A)(ii), the avoided cost of capacity is \$80 per kW-year for 2021.

Avoided Cost of Energy

As stated in its filing on November 2, 2020 in this project, ERCOT calculated the avoided cost of energy for 2021 using the methodology required in 16 TAC § 25.181(d)(3)(A). ERCOT's filing shows the avoided cost for energy for 2021 is \$101.61/MWh, which is equivalent to \$0.10161/kilowatt-hours (kWh).

DeAnn T. Walker Chairman Arthur C. D'Andrea Commissioner

Shelly Botkin Commissioner

John Paul Urban
Executive Director



Public Utility Commission of Texas

Table 2. Total overnight capital costs of new electricity generating technologies by region

2019 dollars per kilowatt

Technology	1 TRE	FRCC	MISW	4 MISC	5 MISE	6 MISS	7 ISNE	8 NYCW	9 NYUP	10 PJME	11 PJMW	12 PJMC	13 PJMD
Ultra-supercritical coal (USC)	3,402	3,523	3,892	3,923	3,973	3,521	4,242	NA	4,146	4,280	3,651	4,601	3,940
USC with 30% CCS	4,362	4,499	4,906	4,959	5,004	4,506	5,338	NA	5,231	5,372	4,651	5,710	5,000
USC with 90% CCS	5,660	5,826	6,273	6,395	6,407	5,860	6,785	NA	6,611	6,796	5,975	7,236	6,350
CC—single shaft	974	1,011	1,125	1,119	1,147	1,003	1,294	1,717	1,298	1,296	1,075	1,299	1,237
CC—multi shaft	848	886	1,003	1,004	1,030	880	1,131	1,549	1,112	1,137	931	1,192	1,051
CC with 90% CCS	2,409	2,466	2,614	2,604	2,644	2,454	2,728	3,090	2,666	2,706	2,488	2,820	2,592
Internal combustion engine	1,695	1,744	1,871	1,924	1,903	1,756	1,972	2,472	1,898	1,973	1,768	2,150	1,836
CT—aeroderivative	1,035	1,087	1,242	1,227	1,264	1,078	1,316	1,685	1,270	1,309	1,122	1,438	1,191
CT—industrial frame	626	658	754	746	769	653	801	1,034	772	797	680	878	723
Fuel cells	7,042	7,191	7,531	7,793	7,653	7,272	7,939	9,346	7,617	7,871	7,251	8,392	7,474
Advanced nuclear	5,963	6,120	6,494	7,008	6,766	6,290	7,156	NA	6,676	6,992	6,180	7,688	6,432
Dist. generation—base	1,384	1,425	1,536	1,597	1,581	1,390	1,778	2,540	1,799	1,862	1,596	1,597	1,358
Dist. Generation—peak	1,795	1,864	1,847	1,905	1,852	1,818	1,940	2,631	1,915	2,055	1,894	1,899	1,767
Battery storage	1,383	1,385	1,363	1,431	1,386	1,415	1,425	1,420	1,388	1,392	1,379	1,397	1,392
Biomass	3,808	3,944	4,292	4,371	4,385	3,944	4,873	6,614	4,888	4,974	4,182	4,982	4,766
Geothermal	NA	NA	NA	NA.	NA	NA	NA	NA	NA	NA	NA.	NA	NA
MSW-landfill gas	1,467	1,509	1,613	1,662	1,642	1,520	1,702	2,120	1,637	1,701	1,528	1,850	1,587
Conventional hydropower	NA	4,905	1,609	NA	NA	NA	1,808	NA	3,699	3,843	3,530	3,349	3,399
Wind	1,231	NA	1,260	1,259	1,509	1,260	1,670	NA	2,037	1,670	1,260	1,668	1,739
Wind offshore	5,319	5,446	5,446	NA	6,521	NA	5,446	5,478	6,643	5,446	5,446	7,210	5,672
Solar thermal	6,937	7,049	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Solar PV— tracking	1,289	1,265	1,318	1,355	1,341	1,275	1,354	1,593	1,341	1,381	1,304	1,423	1,301
Technology	14 SRCA	15 SRSE	16 SRCE	17 SPPS	18 SPPC	19 SPPN	20 SRSG	21 CANO	22 CASO	23 NWPP	24 RMRG	25 BASN	
Ultra-supercritical coal (USC)	SRCA 3,522	SRSE 3,615	SRCE 3,593	SPPS 3,546	SPPC 3,768	SPPN 3,586	SRSG 3,737	CANO NA	CASO NA	NWPP 3,959	RMRG 3,701	BASN 3,861	
	SRCA	SRSE	SRCE	SPPS	SPPC	SPPN	SRSG	CANO	CASO	NWPP	RMRG	BASN	
Ultra-supercritical coal (USC)	SRCA 3,522	SRSE 3,615	SRCE 3,593	SPPS 3,546	3,768 4,772 6,136	SPPN 3,586	SRSG 3,737	CANO NA	NA NA NA	NWPP 3,959	RMRG 3,701	BASN 3,861	
Ultra-supercritical coal (USC) USC with 30% CCS	3,522 4,509	3,615 4,610	3,593 4,578	3,546 4,522	3,768 4,772	3,586 4,564	SRSG 3,737 4,761	CANO NA NA	CASO NA NA	3,959 5,004	RMRG 3,701 4,711	3,861 4,888	
Ultra-supercritical coal (USC) USC with 30% CCS USC with 90% CCS	3,522 4,509 5,871	3,615 4,610 5,976	3,593 4,578 5,951	3,546 4,522 5,839	3,768 4,772 6,136	3,586 4,564 5,881	3,737 4,761 6,117	NA NA NA	NA NA NA	3,959 5,004 6,418	3,701 4,711 6,027	3,861 4,888 6,306	
Ultra-supercritical coal (USC) USC with 30% CCS USC with 90% CCS CC—single shaft	3,522 4,509 5,871 991	3,615 4,610 5,976 1,003	3,593 4,578 5,951 1,023	3,546 4,522 5,839 1,001	3,768 4,772 6,136 1,063	3,586 4,564 5,881 992	3,737 4,761 6,117 975	NA NA NA NA 1,451	NA NA NA NA 1,374	3,959 5,004 6,418 1,135	3,701 4,711 6,027 919	3,861 4,888 6,306 994	
Ultra-supercritical coal (USC) USC with 30% CCS USC with 90% CCS CC—single shaft CC—multi shaft	3,522 4,509 5,871 991 869	3,615 4,610 5,976 1,003 883	3,593 4,578 5,951 1,023 901	3,546 4,522 5,839 1,001 879	3,768 4,772 6,136 1,063 944	3,586 4,564 5,881 992 872	SRSG 3,737 4,761 6,117 975 839	NA NA NA NA 1,451 1,278	NA NA NA NA 1,374 1,202	3,959 5,004 6,418 1,135 985	3,701 4,711 6,027 919 790	3,861 4,888 6,306 994 887	
Ultra-supercritical coal (USC) USC with 30% CCS USC with 90% CCS CC—single shaft CC—multi shaft CC with 90% CCS	3,522 4,509 5,871 991 869 2,424	\$R\$E 3,615 4,610 5,976 1,003 883 2,425	5RCE 3,593 4,578 5,951 1,023 901 2,477	5PPS 3,546 4,522 5,839 1,001 879 2,427	3,768 4,772 6,136 1,063 944 2,508	3,586 4,564 5,881 992 872 2,390	5R5G 3,737 4,761 6,117 975 839 2,211	NA NA NA NA 1,451 1,278 2,802	NA NA NA NA 1,374 1,202 2,708	3,959 5,004 6,418 1,135 985 2,558	RMRG 3,701 4,711 6,027 919 790 2,079	3,861 4,888 6,306 994 887 2,335	
Ultra-supercritical coal (USC) USC with 30% CCS USC with 90% CCS CC—single shaft CC—multi shaft CC with 90% CCS Internal combustion engine	\$RCA 3,522 4,509 5,871 991 869 2,424 1,765	3,615 4,610 5,976 1,003 883 2,425 1,785	\$RCE 3,593 4,578 5,951 1,023 901 2,477 1,785	\$PP\$ 3,546 4,522 5,839 1,001 879 2,427 1,752	3,768 4,772 6,136 1,063 944 2,508 1,847	3,586 4,564 5,881 992 872 2,390 1,770	SRSG 3,737 4,761 6,117 975 839 2,211 1,787	NA NA NA 1,451 1,278 2,802 2,157	NA NA NA 1,374 1,202 2,708 2,098	3,959 5,004 6,418 1,135 985 2,558 1,904	RMRG 3,701 4,711 6,027 919 790 2,079 1,764	8ASN 3,861 4,888 6,306 994 887 2,335 1,888	
Ultra-supercritical coal (USC) USC with 30% CCS USC with 90% CCS CC—single shaft CC—multi shaft CC with 90% CCS Internal combustion engine CT—aeroderivative	\$RCA 3,522 4,509 5,871 991 869 2,424 1,765 1,072	\$R\$E 3,615 4,610 5,976 1,003 883 2,425 1,785 1,081	\$RCE 3,593 4,578 5,951 1,023 901 2,477 1,785 1,109	\$PP\$ 3,546 4,522 5,839 1,001 879 2,427 1,752 1,080	3,768 4,772 6,136 1,063 944 2,508 1,847 1,156	3,586 4,564 5,881 992 872 2,390 1,770 1,087	\$R\$G 3,737 4,761 6,117 975 839 2,211 1,787 981	NA NA NA 1,451 1,278 2,802 2,157 1,406	NA NA NA 1,374 1,202 2,708 2,098 1,324	3,959 5,004 6,418 1,135 985 2,558 1,904 1,212	RMRG 3,701 4,711 6,027 919 790 2,079 1,764 950	8ASN 3,861 4,888 6,306 994 887 2,335 1,888 1,082	
Ultra-supercritical coal (USC) USC with 30% CCS USC with 90% CCS CC—single shaft CC—multi shaft CC with 90% CCS Internal combustion engine CT—aeroderivative CT—industrial frame	\$RCA 3,522 4,509 5,871 991 869 2,424 1,765 1,072 649	\$R\$E 3,615 4,610 5,976 1,003 883 2,425 1,785 1,081 656	\$RCE 3,593 4,578 5,951 1,023 901 2,477 1,785 1,109 673	\$PP\$ 3,546 4,522 5,839 1,001 879 2,427 1,752 1,080 654	\$PPC 3,768 4,772 6,136 1,063 944 2,508 1,847 1,156 702	3,586 4,564 5,881 992 872 2,390 1,770 1,087 659	\$R\$G 3,737 4,761 6,117 975 839 2,211 1,787 981 594	NA NA NA 1,451 1,278 2,802 2,157 1,406 860	NA NA NA 1,374 1,202 2,708 2,098 1,324 808	3,959 5,004 6,418 1,135 985 2,558 1,904 1,212 737	RMRG 3,701 4,711 6,027 919 790 2,079 1,764 950 575	8ASN 3,861 4,888 6,306 994 887 2,335 1,888 1,082 658	
Ultra-supercritical coal (USC) USC with 30% CCS USC with 90% CCS CC—single shaft CC—multi shaft CC with 90% CCS Internal combustion engine CT—aeroderivative CT— industrial frame Fuel cells	\$RCA 3,522 4,509 5,871 991 869 2,424 1,765 1,072 649 7,325	\$R\$E 3,615 4,610 5,976 1,003 883 2,425 1,785 1,081 656 7,372	\$RCE 3,593 4,578 5,951 1,023 901 2,477 1,785 1,109 673 7,368	\$PP\$ 3,546 4,522 5,839 1,001 879 2,427 1,752 1,080 654 7,191	\$PPC 3,768 4,772 6,136 1,063 944 2,508 1,847 1,156 702 7,492	\$PPN 3,586 4,564 5,881 992 872 2,390 1,770 1,087 659 7,256	\$R\$G 3,737 4,761 6,117 975 839 2,211 1,787 981 594 7,357	NA NA NA 1,451 1,278 2,802 2,157 1,406 860 8,480	NA NA NA 1,374 1,202 2,708 2,098 1,324 808 8,305	3,959 5,004 6,418 1,135 985 2,558 1,904 1,212 737 7,705	RMRG 3,701 4,711 6,027 919 790 2,079 1,764 950 575 7,216	8ASN 3,861 4,888 6,306 994 887 2,335 1,888 1,082 658 7,686	
Ultra-supercritical coal (USC) USC with 30% CCS USC with 90% CCS CC—single shaft CC—multi shaft CC with 90% CCS CT—aircl combustion engine CT—aeroderivative CT—industrial frame Fuel cells Advanced nuclear	\$RCA 3,522 4,509 5,871 991 869 2,424 1,765 1,072 649 7,325 6,371	\$RSE 3,615 4,610 5,976 1,003 883 2,425 1,785 1,081 656 7,372 6,382	\$RCE 3,593 4,578 5,951 1,023 901 2,477 1,785 1,109 673 7,368 6,438	\$PP\$ 3,546 4,522 5,839 1,001 879 2,427 1,752 1,080 654 7,191 6,116	3,768 4,772 6,136 1,063 944 2,508 1,847 1,156 702 7,492 6,468	\$PPN 3,586 4,564 5,881 992 872 2,390 1,770 1,087 659 7,256 6,114	3,737 4,761 6,117 975 839 2,211 1,787 981 594 7,357 6,342	NA NA NA 1,451 1,278 2,802 2,157 1,406 860 8,480 NA	CASO NA NA NA 1,374 1,202 2,708 2,098 1,324 808 8,305 NA	3,959 5,004 6,418 1,135 985 2,558 1,904 1,212 737 7,705 6,865	8MRG 3,701 4,711 6,027 919 790 2,079 1,764 950 575 7,216 6,143	8ASN 3,861 4,888 6,306 994 887 2,335 1,888 1,082 658 7,686 6,872	
Ultra-supercritical coal (USC) USC with 30% CCS USC with 90% CCS CC—single shaft CC—multi shaft CC with 90% CCS Internal combustion engine CT—aeroderivative CT—industrial frame Fuel cells Advanced nuclear Dist. Generation—base	\$RCA 3,522 4,509 5,871 991 869 2,424 1,765 1,072 649 7,325 6,371 1,358	\$RSE 3,615 4,610 5,976 1,003 883 2,425 1,785 1,081 656 7,372 6,382 1,418	\$RCE 3,593 4,578 5,951 1,023 901 2,477 1,785 1,109 673 7,368 6,438 1,409	\$PPS 3,546 4,522 5,839 1,001 879 2,427 1,752 1,080 654 7,191 6,116 1,460	\$PPC 3,768 4,772 6,136 1,063 944 2,508 1,847 1,156 702 7,492 6,468 1,515	\$PPN 3,586 4,564 5,881 992 872 2,390 1,770 1,087 659 7,256 6,114 1,521	\$R\$G 3,737 4,761 6,117 975 839 2,211 1,787 981 594 7,357 6,342 1,555	CANO NA NA NA 1,451 1,278 2,802 2,157 1,406 860 8,480 NA 1,933	CASO NA NA NA 1,374 1,202 2,708 2,098 1,324 808 8,305 NA 1,933	3,959 5,004 6,418 1,135 985 2,558 1,904 1,212 737 7,705 6,865 1,569	7,216 6,163 7,216 8,163	8ASN 3,861 4,888 6,306 994 887 2,335 1,888 1,082 658 7,686 6,872 1,569	
Ultra-supercritical coal (USC) USC with 30% CCS USC with 90% CCS CC—single shaft CC —multi shaft CC with 90% CCS Internal combustion engine CT—aeroderivative CT—industrial frame Fuel cells Advanced nuclear Dist. Generation—peak	\$RCA 3,522 4,509 5,871 991 869 2,424 1,765 1,072 649 7,325 6,371 1,358 1,767	\$RSE 3,615 4,610 5,976 1,003 883 2,425 1,785 1,081 656 7,372 6,382 1,418 1,868	\$RCE 3,593 4,578 5,951 1,023 901 2,477 1,785 1,109 673 7,368 6,438 1,409 1,786	\$PPS 3,546 4,522 5,839 1,001 879 2,427 1,752 1,080 654 7,191 6,116 1,460 1,850	\$PPC 3,768 4,772 6,136 1,063 944 2,508 1,847 1,156 702 7,492 6,468 1,515 1,888	\$PPN 3,586 4,564 5,881 992 872 2,390 1,770 1,087 659 7,256 6,114 1,521 1,848	\$R\$G 3,737 4,761 6,117 975 839 2,211 1,787 981 594 7,357 6,342 1,555 2,157	CANO NA NA NA 1,451 1,278 2,802 2,157 1,406 860 8,480 NA 1,933 2,145	CASO NA NA NA 1,374 1,202 2,708 2,098 1,324 808 8,305 NA 1,933 2,145	3,959 5,004 6,418 1,135 985 2,558 1,904 1,212 737 7,705 6,865 1,569	3,701 4,711 6,027 919 790 2,079 1,764 950 575 7,216 6,143 1,638 2,246	8ASN 3,861 4,888 6,306 994 887 2,335 1,888 1,082 658 7,686 6,872 1,569 1,956	
Ultra-supercritical coal (USC) USC with 30% CCS USC with 90% CCS CC—single shaft CC—multi shaft CC with 90% CCS Internal combustion engine CT—aeroderivative CT— industrial frame Fuel cells Advanced nuclear Dist. Generation—peak Battery storage	\$RCA 3,522 4,509 5,871 991 869 2,424 1,765 1,072 649 7,325 6,371 1,358 1,767 1,428	\$RSE 3,615 4,610 5,976 1,003 883 2,425 1,785 1,081 656 7,372 6,382 1,418 1,868 1,408	\$RCE 3,593 4,578 5,951 1,023 901 2,477 1,785 1,109 673 7,368 6,438 1,409 1,786 1,419	\$PPS 3,546 4,522 5,839 1,001 879 2,427 1,752 1,080 654 7,191 6,116 1,460 1,850 1,376	\$PPC 3,768 4,772 6,136 1,063 944 2,508 1,847 1,156 702 7,492 6,468 1,515 1,888 1,385	\$PPN 3,586 4,564 5,881 992 872 2,390 1,770 1,087 659 7,256 6,114 1,521 1,848 1,368	\$R\$G 3,737 4,761 6,117 975 839 2,211 1,787 981 594 7,357 6,342 1,555 2,157 1,400	CANO NA NA NA 1,451 1,278 2,802 2,157 1,406 860 8,480 NA 1,933 2,145 1,440	CASO NA NA NA 1,374 1,202 2,708 2,098 1,324 808 8,305 NA 1,933 2,145 1,441	3,959 5,004 6,418 1,135 985 2,558 1,904 1,212 737 7,705 6,865 1,569 1,956	8MRG 3,701 4,711 6,027 919 790 2,079 1,764 950 575 7,216 6,143 1,638 2,246 1,371	8ASN 3,861 4,888 6,306 994 887 2,335 1,888 1,082 658 7,686 6,872 1,569 1,956	
Ultra-supercritical coal (USC) USC with 30% CCS USC with 90% CCS CC—single shaft CC—multi shaft CC with 90% CCS Internal combustion engine CT—aeroderivative CT— industrial frame Fuel cells Advanced nuclear Dist. Generation—base Dist. Generation—peak Battery storage Biomass	\$RCA 3,522 4,509 5,871 991 869 2,424 1,765 1,072 649 7,325 6,371 1,358 1,767 1,428 3,959	\$RSE 3,615 4,610 5,976 1,003 883 2,425 1,785 1,081 656 7,372 6,382 1,418 1,868 1,408 4,033	\$RCE 3,593 4,578 5,951 1,023 901 2,477 1,789 673 7,368 6,438 1,409 1,786 1,419 4,009	\$PPS 3,546 4,522 5,839 1,001 879 2,427 1,752 1,080 654 7,191 6,116 1,460 1,850 1,376 3,962	\$PPC 3,768 4,772 6,136 1,063 944 2,508 1,847 1,156 702 7,492 6,468 1,515 1,888 1,385 4,209	\$PPN 3,586 4,564 5,881 992 872 2,390 1,770 1,087 659 7,256 6,114 1,521 1,848 1,368 4,045	\$R\$G 3,737 4,761 6,117 975 839 2,211 1,787 981 594 7,357 6,342 1,555 2,157 1,400 4,333	CANO NA NA NA 1,451 1,278 2,802 2,157 1,406 860 8,480 NA 1,933 2,145 1,440 5,616	CASO NA NA NA 1,374 1,202 2,708 2,098 1,324 808 8,305 NA 1,933 2,145 1,441 5,389	3,959 5,004 6,418 1,135 985 2,558 1,904 1,212 737 7,705 6,865 1,569 1,956 1,416 4,480	RMRG 3,701 4,711 6,027 919 790 2,079 1,764 950 575 7,216 6,143 1,638 2,246 1,371 4,292	8ASN 3,861 4,888 6,306 994 887 2,335 1,888 1,082 658 7,686 6,872 1,569 1,956 1,426 4,292	
Ultra-supercritical coal (USC) USC with 30% CCS USC with 90% CCS CC—single shaft CC—multi shaft CC with 90% CCS Internal combustion engine CT—aeroderivative CT—industrial frame Fuel cells Advanced nuclear Dist. Generation—base Dist. Generation—peak Battery storage Biomass Geothermal	5RCA 3,522 4,509 5,871 991 869 2,424 1,765 1,072 649 7,325 6,371 1,358 1,767 1,428 3,959 NA	3,615 4,610 5,976 1,003 883 2,425 1,785 1,081 656 7,372 6,382 1,488 1,868 1,408 4,033 NA	\$RCE 3,593 4,578 5,951 1,023 901 2,477 1,785 1,109 673 7,368 6,438 1,409 1,786 1,419 4,009 NA	\$PPS 3,546 4,522 5,839 1,001 879 2,427 1,752 1,080 654 7,191 6,116 1,460 1,850 1,376 3,962 NA	\$PPC 3,768 4,772 6,136 1,063 944 2,508 1,847 1,156 702 7,492 6,468 1,515 1,888 1,385 4,209 NA	\$PPN 3,586 4,564 5,881 992 872 2,390 1,770 1,087 659 7,256 6,114 1,521 1,848 1,368 4,045 NA	\$R\$G 3,737 4,761 6,117 975 839 2,211 1,787 981 594 7,357 6,342 1,555 2,157 1,400 4,333 2,817	CANO NA NA NA 1,451 1,278 2,802 2,157 1,406 860 8,480 NA 1,933 2,145 1,440 5,616 2,794	CASO NA NA NA 1,374 1,202 2,708 2,098 1,324 808 8,305 NA 1,933 2,145 1,441 5,389 2,262	3,959 5,004 6,418 1,135 985 2,558 1,904 1,212 737 7,705 6,865 1,566 1,416 4,480 2,734	3,701 4,711 6,027 919 790 2,079 1,764 950 575 7,216 6,143 1,638 2,246 1,371 4,292 NA	8ASN 3,861 4,888 6,306 994 887 2,335 1,888 1,082 658 7,686 6,872 1,569 1,956 1,426 4,292 2,680	
Ultra-supercritical coal (USC) USC with 30% CCS USC with 90% CCS CC—single shaft CC—multi shaft CC with 90% CCS Internal combustion engine CT—aeroderivative CT—industrial frame Fuel cells Advanced nuclear Dist. Generation—base Dist. Generation—peak Battery storage Biomass Geothermal MSW—landfill gas	\$RCA 3,522 4,509 5,871 991 869 2,424 1,765 1,072 649 7,325 6,371 1,358 1,767 1,428 3,959 NA 1,529	3,615 4,610 5,976 1,003 883 2,425 1,785 1,081 656 7,372 6,382 1,418 1,868 1,408 4,033 NA 1,545	\$RCE 3,593 4,578 5,951 1,023 901 2,477 1,785 1,109 673 7,368 6,438 1,409 1,786 1,419 4,009 NA 1,545	\$PPS 3,546 4,522 5,839 1,001 879 2,427 1,752 1,080 654 7,191 6,116 1,460 1,850 1,376 3,962 NA 1,515	\$PPC 3,768 4,772 6,136 1,063 944 2,508 1,847 1,156 702 7,492 6,468 1,515 1,888 1,385 4,209 NA 1,595	\$PPN 3,586 4,564 5,881 992 872 2,390 1,770 1,087 659 7,256 6,114 1,521 1,848 1,368 4,045 NA 1,529	\$R\$G 3,737 4,761 6,117 975 839 2,211 1,787 981 594 7,357 6,342 1,555 2,157 1,400 4,333 2,817 1,545	NA NA NA 1,451 1,278 2,802 2,157 1,406 860 8,480 NA 1,933 2,145 1,440 5,616 2,794 1,859	NA NA NA 1,374 1,202 2,708 2,998 1,324 808 8,305 NA 1,933 2,145 1,441 5,389 2,262 1,809	3,959 5,004 6,418 1,135 985 2,558 1,904 1,212 737 7,705 6,865 1,569 1,956 1,416 4,480 2,734 1,645	3,701 4,711 6,027 919 790 2,079 1,764 950 575 7,216 6,143 1,638 2,246 1,371 4,292 NA	8ASN 3,861 4,888 6,306 994 887 2,335 1,888 1,082 658 7,686 6,872 1,566 1,426 4,292 2,680 1,632	
Ultra-supercritical coal (USC) USC with 30% CCS USC with 90% CCS CC—single shaft CC —multi shaft CC with 90% CCS Internal combustion engine CT—aeroderivative CT—industrial frame Fuel cells Advanced nuclear Dist. Generation—base Dist. Generation—peak Battery storage Biomass Geothermal MSW—landfill gas Conventional hydropower	\$RCA 3,522 4,509 5,871 991 869 2,424 1,765 1,072 649 7,325 6,371 1,358 1,767 1,428 3,959 NA 1,529 1,892	3,615 4,610 5,976 1,003 883 2,425 1,785 1,081 656 7,372 6,382 1,418 1,868 1,408 4,033 NA 1,545 4,105	\$RCE 3,593 4,578 5,951 1,023 901 2,477 1,785 1,109 673 7,368 6,438 1,409 1,786 1,419 4,009 NA 1,545 1,297	\$PPS 3,546 4,522 5,839 1,001 879 2,427 1,752 1,080 654 7,191 6,116 1,460 1,850 1,376 3,962 NA 1,515 NA	\$PPC 3,768 4,772 6,136 1,063 944 2,508 1,847 1,156 702 7,492 6,468 1,515 1,888 1,385 4,209 NA 1,595 1,711	\$PPN 3,586 4,564 5,881 992 872 2,390 1,770 1,087 659 7,256 6,114 1,521 1,848 1,368 4,045 NA 1,529 1,971	\$R\$G 3,737 4,761 6,117 975 839 2,211 1,787 981 594 7,357 6,342 1,555 2,157 1,400 4,333 2,817 1,545 3,262	NA NA NA 1,451 1,278 2,802 2,157 1,406 860 8,480 NA 1,933 2,145 1,440 5,616 2,794 1,859 3,323	CASO NA NA NA 1,374 1,202 2,708 2,098 1,324 808 8,305 NA 1,933 2,145 1,441 5,389 2,262 1,809 4,478	3,959 5,004 6,418 1,135 985 2,558 1,904 1,212 737 7,705 6,865 1,956 1,956 1,416 4,480 2,734 1,645 2,752	3,701 4,711 6,027 919 790 2,079 1,764 950 575 7,216 6,143 1,638 2,246 1,371 4,292 NA 1,525 3,286	8ASN 3,861 4,888 6,306 994 887 2,335 1,888 1,082 658 7,686 6,872 1,956 1,956 1,426 4,292 2,680 1,632 3,591	
Ultra-supercritical coal (USC) USC with 30% CCS USC with 90% CCS CC—single shaft CC —multi shaft CC with 90% CCS Internal combustion engine CT—aeroderivative CT—industrial frame Fuel cells Advanced nuclear Dist. Generation—base Dist. Generation—peak Battery storage Biomass Geothermal MSW—landfill gas Conventional hydropower Wind	\$RCA 3,522 4,509 5,871 991 869 2,424 1,765 1,072 649 7,325 6,371 1,358 1,767 1,428 3,959 NA 1,529 1,892 1,503	3,615 4,610 5,976 1,003 883 2,425 1,785 1,081 656 7,372 6,382 1,418 1,468 1,408 4,033 NA 1,545 4,105 1,703	\$RCE 3,593 4,578 5,951 1,023 901 2,477 1,785 1,109 673 7,368 6,438 1,409 1,786 1,419 4,009 NA 1,545 1,297 1,260	\$PPS 3,546 4,522 5,839 1,001 879 2,427 1,752 1,080 654 7,191 6,116 1,460 1,850 1,376 3,962 NA 1,515 NA 1,260	\$PPC 3,768 4,772 6,136 1,063 944 2,508 1,847 1,156 702 7,492 6,468 1,515 1,888 1,888 4,209 NA 1,595 1,711 1,260	\$PPN 3,586 4,564 5,881 992 872 2,390 1,770 1,087 659 7,256 6,114 1,521 1,848 1,368 4,045 NA 1,529 1,971 1,260	\$R\$G 3,737 4,761 6,117 975 839 2,211 1,787 981 594 7,357 6,342 1,555 2,157 1,400 4,333 2,817 1,545 3,262 1,260	CANO NA NA 1,451 1,278 2,802 2,157 1,406 860 8,480 NA 1,933 2,145 1,440 5,616 2,794 1,859 3,323 2,782	CASO NA NA 1,374 1,202 2,708 2,098 1,324 808 8,305 NA 1,933 2,145 1,441 5,389 2,262 1,809 4,478 2,185	3,959 5,004 6,418 1,135 985 2,558 1,904 1,212 737 7,705 6,865 1,956 1,956 1,418 2,734 1,645 2,752 1,670	3,701 4,711 6,027 919 790 2,079 1,764 950 575 7,216 6,143 1,638 2,246 1,371 4,292 NA 1,525 3,286 1,260	8ASN 3,861 4,888 6,306 994 887 2,335 1,888 1,082 658 7,686 6,872 1,569 1,956 1,426 4,292 2,680 1,632 3,591 1,260	

Notes: Costs include contingency factors and regional cost and ambient conditions multipliers. Interest charges are excluded. The costs are shown before investment tax credits are applied.

NA = not available; plant type cannot be built in the region because of a lack of resources, sites, or specific state legislation.

USC = ultra-supercritical, CCS = carbon capture and sequestration, CC = combined cycle, CT = combustion turbine, PV = photovoltaic, MSW = municipal solid waste Electricity Market Module region map

Source: U.S. Energy Information Administration, Office of Electricity, Coal, Nuclear and Renewables Analysis

Updated March 2020: EIA changed regional costs for solar thermal to NA in regions where resource quality may be insufficient to support significant development of solar thermal power.



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