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).

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

2019 dollars per kilowatt

Technology	1 TRE	2 FRCC	3 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)	3,522	3,615	3,593	3,546	3,768	3,586	3,737	NA	NA	3,959	3,701	3,861
USC with 30% CCS	4,509	4,610	4,578	4,522	4,772	4,564	4,761	NA	NA	5,004	4,711	4,888
USC with 90% CCS	5,871	5,976	5,951	5,839	6,136	5,881	6,117	NA	NA	6,418	6,027	6,306
CC—single shaft	991	1,003	1,023	1,001	1,063	992	975	1,451	1,374	1,135	919	994
CC—multi shaft	869	883	901	879	944	872	839	1,278	1,202	985	790	887
CC with 90% CCS	2,424	2,425	2,477	2,427	2,508	2,390	2,211	2,802	2,708	2,558	2,079	2,335
Internal combustion engine	1,765	1,785	1,785	1,752	1,847	1,770	1,787	2,157	2,098	1,904	1,764	1,888
CT—aeroderivative	1,072	1,081	1,109	1,080	1,156	1,087	981	1,406	1,324	1,212	950	1,082
CT— industrial frame	649	656	673	654	702	659	594	860	808	737	575	658
Fuel cells	7,325	7,372	7,368	7,191	7,492	7,256	7,357	8,480	8,305	7,705	7,216	7,686
Advanced nuclear	6,371	6,382	6,438	6,116	6,468	6,114	6,342	NA	NA	6,865	6,143	6,872
Dist. Generation—base	1,358	1,418	1,409	1,460	1,515	1,521	1,555	1,933	1,933	1,569	1,638	1,569
Dist. Generation—peak	1,767	1,868	1,786	1,850	1,888	1,848	2,157	2,145	2,145	1,956	2,246	1,956
Battery storage	1,428	1,408	1,419	1,376	1,385	1,368	1,400	1,440	1,441	1,416	1,371	1,426
Biomass	3,959	4,033	4,009	3,962	4,209	4,045	4,333	5,616	5,389	4,480	4,292	4,292
Geothermal	NA	NA	NA	NA	NA	NA	2,817	2,794	2,262	2,734	NA	2,680
MSW—landfill gas	1,529	1,545	1,545	1,515	1,595	1,529	1,545	1,859	1,809	1,645	1,525	1,632
Conventional hydropower	1,892	4,105	1,297	NA	1,711	1,971	3,262	3,323	4,478	2,752	3,286	3,591
Wind	1,503	1,703	1,260	1,260	1,260	1,260	1,260	2,782	2,185	1,670	1,260	1,260
Wind offshore	4,901	NA	NA	NA	NA	NA	NA	7,126	5,446	5,446	NA	NA
Solar thermal	NA	NA	NA	7,007	7,279	6,936	7,268	8,614	8,430	7,736	6,984	7,751
Solar PV—tracking	1,327	1,284	1,282	1,263	1,313	1,272	1,285	1,443	1,409	1,317	1,300	1,312

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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https://www.eia.gov/outlooks/aeo/assumptions/pdf/table_8.2.pdf