Filing Receipt

Received - 2022-06-22 01:58:01 PM
Control Number - 53401
ItemNumber - 8

PROJECT NO. 53401

ELECTRIC WEATHER PREPAREDNESS STANDARD – PHASE 2	**§ § §**	**PUBLIC UTILITY COMMISSION OF TEXAS**

COMMENTS OF ANDREW DESSLER

I am filing these Comments on the Commission's proposed repeal and replacement of 16 TAC §25.55 as approved at the Commission's May 26, 2022 Open Meeting and published in the Texas Register.

I am a Professor of Atmospheric Sciences and Director of the Texas Center for Climate Studies at Texas A&M. However, these comments are made in my capacity as a private citizen and should not be taken as representing the views of Texas A&M.

I am writing concerning the requirements that generation entities and transmission service providers need only consider historical temperatures in determining what weather need be prepared for. This proposed policy will negatively impact the energy and economic security of the citizens of Texas.

To be clear: the Earth is warming and humans are the main driver of this warming. For more background on what we know about human influence on climate system, I recommend the recent report from the Intergovernmental Panel on Climate Change. In Texas, it is clear that historical climate is no longer a reliable predictor for future conditions; the exceptional nature of temperatures this June underscores the fundamental non-stationarity of our long-term temperature.

Given that global warming is occurring, and that it is manifesting itself in Texas through increasing temperatures throughout the year, relying entirely on the historical record will result in a systemic underestimate of the chance of future extreme temperatures. For example, the proposed

rule requires generation entities to be able to operate "during the greater of the maximum ambient temperature at which the resource has experienced sustained operations or the 95th percentile maximum average 72-hour temperature reported in ERCOT's historical weather study".

Let's consider the 95th percentile requirement. One might conclude that there's about a 5% chance of exceeding this 95th percentile temperature in each year so that, over the next five years, the chance of exceeding the 95th percentile is about 23%.

But that's only true in a stable climate. Given that the climate is warming, we know that estimates based on the historical record will be wrong. But how wrong? To answer this, I turn to computer simulations of the climate system (also known as climate models). I have taken simulations of the period 1950-2026 from 21 different climate models use them to estimate the temperatures of the ten ERCOT weather zones.

I then determine the hottest 72-hour average temperature in each year of each model simulation and then estimate the 95th percentile of these annual values over the 1950-2021 period for each model. These 95th percentile estimates from each model are then compared to the hottest 72-hour average temperature in the 2022-2026 period from the same model. The details of the calculation are listed in the appendix to this comment.

Table 1 shows the results. For each ERCOT zone, I list the fraction of models in which at least one 72-hour average period in 2022-2026 is hotter than the 95th percentile of the values over the 1950-2021 period. As you can see, the chance of exceeding the historical 95th percentile temperature during 2022-2026 averages 45%, about twice as high as what we would expect in a stable climate (23%). This result lays bare the weakness of relying on historical observations: Because of climate change, there is a much higher chance that we will experience temperatures in

excess of the threshold prescribed in the proposed regulation compared to what we would expect in a stable climate.

Table 1. Percent of model ensemble where maximum 72-hour average temperature during 2022-2026 is above than 1950-2021 95th percentile.

Zone	Fraction
North	57%
North Central	48%
West	48%
Far West	38%
East	43%
Coast	33%
South Central	52%
Southern	43%
Valley	48%
Panhandle	38%
average	45%

There are some minor differences between my calculation and ERCOT's, such as the fact that ERCOT's historical analysis goes back to the beginning of the 20th century, but my calculation only extends back through 1950. However, since the climate has been warming, the vast majority of years (83%) with the hottest 72-hour periods in the ERCOT data occur after 1950, so we do not expect this to influence our overall conclusion.

CONCLUSION

The proposed regulation, which uses temperature metrics based purely on the historical record and ignores the impact of climate change, will cause regulators to underestimate the

occurrence of extreme weather. This is an unnecessary risk to the economic and energy security of the State of Texas.

I would strongly encourage this proposed rule to be changed to acknowledge that climate change exists and is affecting Texas weather. It should require ERCOT to incorporate the latest estimates of climate change into the metrics that ERCOT uses to evaluate the readiness of generation entities and transmission service providers. What is at stake is not some ideological turf war: it is the safety of Texas' citizens and the health of its economy and its infrastructure.

I appreciate the opportunity to provide these Comments and looks forward to working with the Commission and other interested parties on these issues.

Respectfully submitted,
Andrew Dessler
979-862-1427
adessler@tamu.edu

Appendix: Details of the calculations described in the comment

Climate model runs are taken from the CMIP6 archive, and they have been downscaled and bias corrected using ERA5 data. The data were obtained and the analysis was carried out on the Microsoft Planetary Computer Hub.

The models analyzed were ACCESS-CM2, ACCESS-ESM1-5, BCC-CSM2-MR, CMCC-CM2-SR5, CMCC-ESM2, EC-Earth3, EC-Earth3-AerChem, EC-Earth3-CC, EC-Earth3-Veg, EC-Earth3-Veg-LR, GFDL-CM4, GFDL-ESM4, HadGEM3-GC31-LL, MIROC-ES2L, MIROC6, MPI-ESM1-2-HR, MPI-ESM1-2-LR, NESM3, NorESM2-LM, NorESM2-MM, and UKESM1-0-LL.

Historical runs cover the period 1950-2014 and SSP2-4.5 runs were used to extend the time series to 2026. Daily minimum and maximum temperatures are provided and these are averaged to produce daily average temperature. These daily averages are then aggregated to produce the 72-hour average temperature.

For estimates of the temperature of each ERCOT weather zone, I take the temperature at the model grid point closest to these cities: Wichita Falls (North), Dallas (North Central), Abilene (West), Midland (Far West), Tyler (East), Houston (Coast), Austin (South Central), Corpus Christi (Southern), Brownsville (Valley), and Amarillo (Panhandle). This is the same way ERCOT estimates the temperature of the zones.

PROJECT NO. 53401

ELECTRIC WEATHER PREPAREDNESS STANDARD – PHASE 2	**§**	**PUBLIC UTILITY COMMISSION OF TEXAS**

EXECUTIVE SUMMARY OF COMMENTS OF ANDREW DESSLER

- Climate change is changing the weather of Texas and making some extreme weather more likely.
- The proposed rule requires ERCOT to use historical temperatures only in assessing the preparedness of our grid.
- This means that ERCOT will underestimate the occurrence of extreme weather.
- This will make our grid less reliable and will negatively impact the energy and economic security of Texans.
- ERCOT should be required to incorporate the latest estimates of climate change into their forecasts of future weather.