

COMMONWEALTH OF KENTUCKY
BEFORE THE
PUBLIC SERVICE COMMISSION

In the Matter of:

**Electronic Joint Application of Kentucky Utilities
Company and Louisville Gas and Electric
Company for Certificates of Public Convenience
and Necessity and Site Compatibility Certificates
and Approval of a Demand Side Management
Plan**

**Kentucky Public
Service Commission
Case No. 2022-00402**

EXPERT TESTIMONY OF
ANDREW LEVITT

ON BEHALF OF
**Sierra Club, The Lexington-Fayette Urban County Government, and
The Louisville/Jefferson County Metro Government**

FILED: JULY 14, 2023

UPDATED WITH REDLINE ERRATA: AUGUST 25, 2023

- 310 1. Diversity in hourly demand among pooled member utilities means that any one member's
311 share of the pool-wide peak is lower than its standalone peak. This is because the peak
312 demands of different utilities systematically occur at different times, so their combined peak is
313 less than the sum of individual peaks.
- 314 2. Lower reserve margins are needed to meet the same resource adequacy reliability targets,
315 because:
- 316 a. Extreme hot or cold weather is less likely to occur throughout the larger footprint, and;
317 b. Rare but credible risks of overlapping generator outages have a smaller impact on the
318 pool.
- 319 3. Solar provides more value towards meeting PJM's pool-wide peak demand than it does
320 towards meeting LG&E-KU's peak demand in the season that drives its resource planning
321 (i.e., winter).

322 Through analysis of hourly load shapes in LG&E-KU and PJM, I find a large demand diversity
323 effect, with a coincidence factor of 95%. Meanwhile, I find that PJM membership today would
324 confer a **2016** percentage point reduction in the relevant reserve margin, since comparable LOLE
325 studies performed by LG&E-KU and PJM conclude that, in order to achieve the standard 1-in-10
326 LOLE reliability, a 31% winter reserve margin is needed in the standalone LGE&-KU scenario,
327 whereas PJM requires only a 14.7% annual reserve margin throughout its footprint to achieve
328 that same reliability level.

329 I further find that circumstances in PJM and LG&E-KU are such that solar resources provide
330 more value towards meeting LG&E-KU's resource requirements in the PJM context than under
331 the status quo in winter (but provide less value in PJM vs. the status quo in summer).

332 Importantly, LG&E-KU's winter reserve requirement drives resource adequacy planning there,
333 and solar provides less reliability value in winter (by L&E-KU's reckoning, zero value). By
334 contrast, resource planning in PJM is currently performed on an annual basis, and historically has
335 been largely determined by summer conditions. Solar provides significant value in that context.

336 Table 2 shows the surplus or deficiency balance of resources relative to requirements. It
337 compares generation in LGE&E-KU's planned 2028 fleet (without the new build NGCCs, but

[9]: Difference between supply balance in ICAP terms vs. UCAP terms. Supply balance is total capacity of existing and planned resources minus the resource requirement. Balance is calculated using ICAP([7]) and PRM ([6]) for the ICAP balance, vs. UCAP and Forecast Pool Requirement are used for the UCAP balance. Forecast Pool Requirement from [PJM Reserve Requirement Report](#), p. 8

[10]: Total UCAP minus [6] × (1+PRM) / FPR. FPR from [PJM Reserve Requirement Report](#), p. 8. Total UCAP is [7] + [8] – Avg EFORd × Dispatchable Resources

[11]: [RTO Study](#), Case No. 2022-00402 Attachment 1 to Response to SC-2 Question No. 26(b) p. 101

[12]: [9] × [10] × 365 / 1,000,000

[13]: [5] – [11]