Method note: LL97 / BERDO projection weather set

EPW.tools, Utes Analytics LLC. Weather files for projecting a building's energy use and emissions to 2030 and 2035.

Site: New York Midtown, latitude 40.7549, longitude -73.9840. Order sample, note drawn 2026-11-29 03:17 UTC.

What the set holds

One actual year (2025): the weather that happened at the site, hour by hour. Four future years: 2030 and 2035, each under SSP2-4.5 (a middle path of emissions) and SSP5-8.5 (high emissions). Every file set comes as EnergyPlus EPW, DDY and STAT, eQUEST BIN, hourly CSV and a climate folder (ZIP).

Why the weather year matters for this projection

New York City's Local Law 97 and Boston's BERDO count the emissions a building actually had in a year. The texts we read carry no weather adjustment, so a hot summer or a cold winter moves the figure that is set against the limit (under Local Law 97, USD 268 for each tonne of CO2e over it). Running the model with each actual year shows how far the weather alone moves the result; the future years show the same building in the warmer climate of the 2030s. This note makes no claim about compliance: the law, its rules and the building's metered energy decide that.

The actual years

Each actual year is built from the hourly reports of the weather station named below, moved to the ground height of the site, with missing or failed hours filled from reanalysis first shifted to agree with the station. Every file is finished and checked as every EPW.tools file (epw.tools/methodology).

2025: Central Park (KNYC0), 3 km from the site, 93 % of hours from the station. Sun: NREL NSRDB (satellite).
Checks: file-set check passed; hourly checks 14 passed, 1 warned; provenance record matches the file.

The future years

2030 SSP2-4.5: the reanalysis year 2010 at the point, changed by the CMIP6 ensemble median of 10 models from 1985-2014 to the 30-year window around 2030.
Checks: file-set check passed; hourly checks 15 passed; provenance record matches the file.

2030 SSP5-8.5: the reanalysis year 2010 at the point, changed by the CMIP6 ensemble median of 10 models from 1985-2014 to the 30-year window around 2030.
Checks: file-set check passed; hourly checks 15 passed; provenance record matches the file.

2035 SSP2-4.5: the reanalysis year 2010 at the point, changed by the CMIP6 ensemble median of 10 models from 1985-2014 to the mean of the 30-year windows around 2030 and 2040 (2015-2044 and 2025-2054, centred on 2035).
Checks: file-set check passed; hourly checks 15 passed; provenance record matches the file.

2035 SSP5-8.5: the reanalysis year 2010 at the point, changed by the CMIP6 ensemble median of 10 models from 1985-2014 to the mean of the 30-year windows around 2030 and 2040 (2015-2044 and 2025-2054, centred on 2035).
Checks: file-set check passed; hourly checks 15 passed; provenance record matches the file.

What they are: weather that fits a year around 2030 or 2035 under each scenario, made by changing one real baseline year by the monthly change the climate models give for a 30-year period (the climate of a period, not of one year). The change is the median of the CMIP6 models of NASA NEX-GDDP-CMIP6 at the point, unless a file names a stand-in. 2035 has no 30-year window of its own in that archive: its change is the mean of the windows around 2030 and 2040. The morph: Belcher et al. (2005) shift and stretch of each calendar month: the dry bulb moved by the model's monthly mean change and its daily range stretched by the model's change of the daily maximum minus the daily minimum; humidity, sun, wind and rain scaled by the monthly ratio.

What they are not: a forecast of the weather of 2030 or 2035. No model can say whether a given year will be hot or cold; the future years keep the day-to-day pattern of the baseline year. Read the two scenarios as a range of climates and the actual years as the spread from one year to the next, not as a best and a worst case.

Sources

Each file's header (COMMENTS lines) names its own sources: the station reports (NOAA or Meteostat), the reanalysis for gaps and for the future baseline (ERA5 or NASA MERRA-2), satellite sun where named above, and the climate models for the future years. Sources are credited at epw.tools/credits.

File fingerprints (SHA-256 of each file as downloaded)

Confirm a file with: sha256sum <file> (Linux, macOS) or certutil -hashfile <file> SHA256 (Windows). The same list, with the climate folders, is in SHA256SUMS.txt in the set.

```
4bfda3f0036c0c0da431334ea3e2307c5ddf65e76e5df60bf71db2eae37af110  New_York_Midtown_2025.epw
524699d89f79537f62f8000267fb6e1e34b5e39b6d7cc69d80c146a70d0904c0  New_York_Midtown_2025.ddy
4eaea1dae223348c84c62c734cba68c81db21457cbf4730f68def4387ad2952d  New_York_Midtown_2025.stat
7360c804c3bdac5ba85701eeb67ad23d556dc1bf019f85a280e791c877e8e506  New_York_Midtown_2025.bin
3659c5f9403c42f838464080cb0758b9c21f7295ccbef7a67ee452e154d4dd12  New_York_Midtown_2025.csv
f2278987d9f53318af3a8576d725044b4c2da5d5b1074707985a953ef8c96394  New_York_Midtown_Future_SSP245_2030_CMIP6-median-of-10-models.epw
c4511130eb6b63b5cb43cfe4ab3ff05c45e8a2665106fa079287a52ef9305db5  New_York_Midtown_Future_SSP245_2030_CMIP6-median-of-10-models.ddy
afcdea98ad86cb99d6edcfb47b936cd1ddcf7f92ed81205b6a1879377eabacdc  New_York_Midtown_Future_SSP245_2030_CMIP6-median-of-10-models.stat
a5c5ea08ae6cd2283b94d252e8e73e21ad7d531c01d4fa3d474ce96510556bb7  New_York_Midtown_Future_SSP245_2030_CMIP6-median-of-10-models.bin
567367e696c8cdabd5d3a1eb09524c835079417e2454b978007dd198083aea56  New_York_Midtown_Future_SSP245_2030_CMIP6-median-of-10-models.csv
d1b2eeb3c78aeac2f582efd17930fad1a406731a882703af942b93935c10a496  New_York_Midtown_Future_SSP585_2030_CMIP6-median-of-10-models.epw
b3a71c6ba49da412d441ae31f227ad3f7c311e904965f06f239091bd6714eef7  New_York_Midtown_Future_SSP585_2030_CMIP6-median-of-10-models.ddy
51e89318e19573c0cbf0d1811dc176c2105505fcc5565fcc9e5968929dbfa210  New_York_Midtown_Future_SSP585_2030_CMIP6-median-of-10-models.stat
20f552a7b4a918ddfa4df898623f5c9019512599518f2c9284052771b2eb7b0d  New_York_Midtown_Future_SSP585_2030_CMIP6-median-of-10-models.bin
```

File fingerprints, continued

```
d5de058387b7e31aed051e3fee4dfe39202b77ea5bb3d7d47ec19dc577b1618f  New_York_Midtown_Future_SSP585_2030_CMIP6-median-of-10-models.csv
b25352735819927e63f0e4030e4aac09e8cada7c8698e25507d9587c2124e147  New_York_Midtown_Future_SSP245_2035_CMIP6-median-of-10-models.epw
6d78c0224b14c0181f15c2a3d9070e80b9c4d219cb0c96a9d45705d3c22f6602  New_York_Midtown_Future_SSP245_2035_CMIP6-median-of-10-models.ddy
602c66c5c4819afd445d2e9a4ed6022aa10248976e0e04b1ca60852aec1fba71  New_York_Midtown_Future_SSP245_2035_CMIP6-median-of-10-models.stat
a64da3d928469eb46d35ff78c9a372771fac84f87fd738d1cde60a001403fabf  New_York_Midtown_Future_SSP245_2035_CMIP6-median-of-10-models.bin
061e72a4fb73fbb5e9bd4c83a10779247133fba9debff2c4db15b933dab751a3  New_York_Midtown_Future_SSP245_2035_CMIP6-median-of-10-models.csv
a2303a243023b6edce1f294f3ba1f75d57f3a11a18ce3f90412430d68fca81f2  New_York_Midtown_Future_SSP585_2035_CMIP6-median-of-10-models.epw
2b74d2c11e494f99460858474e9744a5e004236031067b7cad9af6f32e23a4bd  New_York_Midtown_Future_SSP585_2035_CMIP6-median-of-10-models.ddy
8703f3a750c4ef52780d976ca3b748c5442c39f8d8710581234103d4a98621dd  New_York_Midtown_Future_SSP585_2035_CMIP6-median-of-10-models.stat
944b663ed4fb23a0603af478c4382d6bf2e8562d448449c4f74dce38be294698  New_York_Midtown_Future_SSP585_2035_CMIP6-median-of-10-models.bin
084996d75e14b7a93f1a72bb25e652def74bb9eb572ca417b1fe3834a3d34715  New_York_Midtown_Future_SSP585_2035_CMIP6-median-of-10-models.csv
```