Asfaw et al. (2022) proposed a useful and simple stochastic PET model by perturbing an existing high-resolution PET dataset. The framework has wide application on decision-making. Overall, the manuscript is well written.

Major comments

*The author might need to discuss the limitation of using hPET for both input data and benchmarking data. I suggest having an independent benchmarking data for validation (observations or reanalysis). For example, it can be added to Figure7/8 with another observed-based dataset.

*How do you calculate PET when temperature is below freezing point?

Minor comments

Page 2 Line 9: Some of the climate models use PET concept while others not. For example, CLM do not use PET concept. So, it's not just an issue of outputting. (Same for page15, line33)

Section2.2.1: Is there any justification of assuming nighttime PET as 0? There is still ET at night. However, I am not sure whether it is important to your applications.

Section2.2.2-3: Does the noise ratio has an option to include the year-to-year variability?

Figure 4: Does the box plot showing numbers of (31*available hours) noise ratios?

Section2: Could author add a brief introduction of hPET dataset and PM method? I think that would be useful for the reader.

Figure8,9, Table1: it would be nice to have more scientific explanations. It seems to have larger ensemble spread in the drier regions. How is that related to the diurnal cycle, or year-to-year variations. pBias are larger in humid regions and why?

Page 12 line 35: "per hour"-> "for every hour" or "for each given time". The original statement is easily to be misunderstood (e.g., slope or rate of changes)

Section 4.1.3: Do you have a figure for historical trend in PET? What is the calculated period?

Figure 15, method3: What are the slopes? It seems the historical trends are not obvious.

Page35 line 30 (final conclusion): I suggest the author to emphasize the applications of this model to decision making rather except for evaluating land surface or hydrological models.