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**Interactive
comment**

Interactive comment on "Projected Changes in Haze Pollution Potential in China: An Ensemble of Regional Climate Model Simulations" *by* Zhenyu Han et al.

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The authors examined the performance of the RegCM4 downscaling simulations on the air environment carrying capacity (AEC) and weak ventilation days (WVD) in China. Then, the AEC and WVD were projected for the period of 2046-2065 and 2080-2099 and some discussions were included.

General Comments: 1. The tile was "Projected Changes in Haze Pollution Potential in China", but what were analyzed were the AEC and WVD. Thus, the quantized relationships between haze pollution (days) and AEC, WVD should be proved and illustrated. That is, why the AEC and WVD could be used to represent the haze?

2. According to prior studies, the relative humidity was vital for the incident of haze. If you want to evaluate the haze pollution potential, the moisture conditions must be

considered.

3. "If each of the 6-hourly ventilation coefficients within one day is less than 6000 m2 s-1 , this day is counted as one weak ventilation day (WVD)". The threshold was cited from (Leung and Gustafson, 2005), a study of U.S. air quality, and was actually and firstly used by Pielke et al (1991). The question was that if the same threshold was reasonable for the recent haze pollution in China.

Pielke, R. A., R. A. Stocker, R. W. Arritt, and R. T. McNider (1991), A procedure to estimate worst-case air quality in complex terrain, Environ. Int., 17, 559– 574.

4. The recent winter haze pollution in North China or BTH area was severest, but the bias of historical estimations in winter and in North China was very significant. Thus, the error bars or confidence intervals must be discussed.

Specific Comments: 1. As well known, there were dozens of models in the CMIP5 project, so the reasons why only three models were selected should be supplemented. Furthermore, why did the authors only analyze two periods, i.e., 2046-2065 and 2080-2099?

2. The definition of Beijing-Tianjin-Hebei region (BTH), Northeast China (NEC), Yangtze River Delta economic zone (YRD), and Pearl River Delta economic zone (PRD) must be illustrated clearly.

3. In Figure 1–3, the resolutions of the observations was bad for evaluating the performance of Regcm4 downscaling. I noticed that the Era-interim used here was with the resolution 1.5*1.5o, and suggest that the data 0.5*0.5o should be better.

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