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Reply

Response to Comments by Yaolin Lin and Wei Yang "Development of a Data-Driven Predictive Model of Supply Air Temperature in an Air-Handling Unit for Conserving Energy". *Energies* 2018, *11*, 407

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We would like to thank Yaolin Lin and Wei Yang for their comments [1].

The objective of the article [2] was to develop an adaptive model that could predict supply air temperature (SAT) of an air-handling unit (AHU) by using AHU operational and historical data and an artificial neural network. Via a case study, we discovered that the SAT of an AHU exhibits a certain pattern and is modulated by the return air temperature (RAT). In the case study, the SAT was changed to remove the heating and cooling load. This was performed using the constant air volume (CAV) system, and the indoor temperature was set at 26 °C. Accordingly, we wanted to predict the SAT by using measurable values in real AHUs. These data were return air temperature, outdoor air temperature, mixed air temperature, and supply and return air flow. A time series method was also used to extend the input variables. We used an artificial neural network as a black box model to confirm the likelihood of the prediction.

We agree with the second comment that the information-related energy consumption was not shown in this article. By predicting SAT, we are researching and analyzing various control strategies for energy conservation. For example, we examined an airside economizer, which is one way to conserve energy [3] by using predictive SAT. Heating and cooling energy consumption increases when outdoor air is introduced [4]. The data from the AHU was used to observe the outdoor air flow applied in summer and intermediary conditions, and the optimal outdoor air flow by economizer control types (ASHRAE 90.1) was calculated and analyzed. The cooling coil load was calculated by economizer control types and the outdoor air flow for energy conservation was analyzed using the data. We will submit another manuscript which will feature a related economizer study using the predictive temperature data.

We thank the editor for giving us the opportunity to provide a reply to the letter.

Author Contributions: G.H. initiated the research idea and wrote the manuscript. B.S.K. supervised the study and provided advice on the data analysis.

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