

In the article, a new hybrid model, ARIMA + LSTM, is proposed to predict CO₂ emissions for total China and for the three regions. We selected 14 factors that influence CO₂ emissions and used random forest method to calculate and rank their contributions. These factors are then fed into the ARIMA + LSTM hybrid model, which is better than the LR, BPNN, ARIMA and LSTM. As a result, the new model can predict CO₂ emission trends more accurately. Our results show that this new model can be effectively applied in the field of CO₂ prediction. After analyzing the influences of demographic, economy, transportation, and technological advances on CO₂ emissions in China as a whole and in the three regions, To summarize the following conclusions. Firstly, the production activities of the primary and secondary industries in different regions cause the largest amount of CO₂ emissions. Therefore, reducing their shares can effectively