

Review of: "Increasing Renewables and Building Retrofit in a Coal-Based Cogeneration District Heating System"

Nikos Margaritis¹

¹ The Centre for Research and Technology, Hellas

Potential competing interests: No potential competing interests to declare.

This work deals with an interesting subject, presenting the investigation of the behavior of district heating systems when RES penetrate the energy mixture and Building Retrofits take place in a city. A number of scenarios are examined concerning the expansion of the district system in order to cover more energy needs in the city of Pristina while significant energy efficiency measures are installed in order to reduce the energy needs. The simulations based on the aforementioned scenarios are processed in the EnergyPLAN software in order to determine the energy efficiency of the buildings, what happens to the excess energy and wind power generation, and the behavior of factors such as the CO₂/year that can be mitigated.

The proposed approach appears to be promising as it can be implemented as a guide for other district heating systems.

The content of the abstract is well-written, brief, and describes the objective of the work while reflecting the title in a comprehensive manner. However, in the reviewer's opinion, the manuscript cannot be published in the present form in this journal, as authors should address first the following points:

1. A reference to the different types of generations of the DH systems should be mentioned according to the referee's opinion.
2. Significant upgrades to the Introduction should be made, as the information is not given in a concise and tangible manner. There is no connection from paragraph to paragraph. Please go from general to specific information.
3. In paragraph 6, it is mentioned that "The study concludes that it is possible to reach a 98% renewable energy share in district heating if the cost of gas boilers is reduced. How can this be achieved? Is it correct? Reduced or increased?"
4. In paragraph 6, it is mentioned that "Åberg and Henning [25] analyze the potential reduction due to energy efficiency measures in the existing building stock". The reduction of what?
5. Why was the year 2018 taken as a reference? Wouldn't it be safer for the results to consider the average of a number of years? Each year does not have the same energy requirements as the heating degree days vary. For example, data concerning a decade or the total periods that data are available would be more representative for the investigation of the system.
6. In page 5, it is mentioned that the capacity factor of wind is 25%. Can you please provide a reference? Do you mean that this factor is referred to wind turbines?
7. The climate data were taken from Meteonorm. Can you please mention the station? Are these data representative for the city of Pristina?

8. Please provide information on the energy efficiency types of measures. Which types are used, and how much energy is reduced per type of measure.
9. Does the increase of the district heating system occur due to population upgrade or due to the decision for switching from one heating system to the other? What is the percentage of people using district heating? Can you please provide a graph showing the actual data for those connected to the DH grid throughout the years? This can help in making projections for future DH users.
10. Which equations were used in order to determine the supply distribution profiles of wind and solar irradiation? Did you use a significant software in order to get these profiles?
11. In Table 2, do you illustrate the primary energy consumption? Please provide such information as it can be more suitable for comparisons.
12. Can you please breakdown the columns of Figures 3 and 4 concerning energy generation for each renewable energy technology?
13. Please proofread the manuscript, as significant syntax errors are present.

Finally, the results and conclusions in this study are analyzed and presented explicitly.

Based on the above considerations, this reviewer can recommend the current version of the manuscript for publication on Qeios after the aforementioned revisions.