



## **Bachelor thesis supervisor's review**

**Master thesis:** Wind Energy in Izmir - How to Face the Extra Demand Caused by the Population Increase?

**Author:** Ayhan Atahan

**Thesis supervisor:** Ing. Michaela Makešová

Rating (1 – 5) (1 = best; 5 = worst):

1. Fulfillment of assignment requirements:	<input type="text" value="4"/>
2. Self-reliance and initiative during the thesis solution:	<input type="text" value="4"/>
3. Systematic solutions of individual tasks:	<input type="text" value="1-1-2-4"/>
4. Ability to apply knowledge and to use literature:	<input type="text" value="3"/>
5. Collaboration and consultations with the thesis supervisor:	<input type="text" value="4"/>
6. Thesis formal and language level:	<input type="text" value="2"/>
7. Thesis readability and structuring:	<input type="text" value="2"/>
8. Thesis professional level:	<input type="text" value="4"/>
9. Conclusions and their formulation:	<input type="text" value="4"/>
<b>10. Final mark evaluation (A, B, C, D, E, F):</b>	<input type="text" value="D"/>

**verbal:** satisfactory

### **Brief summary evaluation of the thesis (compulsory):**

The bachelor thesis deals with electricity consumption in Izmir, Turkey. The student wanted to analyze the option of partial coverage of electricity consumption in the region only by renewable sources. Due to the complexity of the energy field and also due to the fact, that the student was not so familiar with the topic, we agreed that for simplicity and the needs of the bachelor thesis, he would estimate the population growth in the following period in a very simplified model and calculate properly and the economic efficiency of a solution covering the extra needs of the increased population based only on wind generation.

So, the student modeled the population growth (a bit incomprehensibly in my opinion and I am not sure that it is correct) and in the very simple and basic approach he calculated how much wind power would be needed to meet their needs. For the economic evaluation, he mainly relied on data provided by the company installing the wind farms to get all the raw data (installation costs, operating costs, etc.). He then independently processed this data and determined in a simplified model how much installed capacity would be needed and how much it would cost.



He sufficiently fulfilled the requirements of the first three points of the thesis. The fourth (Technical and economical evaluation of the solution and results discussion) was not sufficiently presented. My idea was the standard economical evaluation of the project (investment costs, operational costs, revenues, profitability evaluation by standard metrics (NPV, IRR), proper discussion of all inputs, growth of inputs - inflation - e.g. energy prices, and discussion of these increases and finally sensitivity analysis of all model parameters), but some of these requirements were not presented (but they are in the enclosed excel) or done at all.

Considering that the thesis was rarely consulted, especially towards the end of the term, and finally extended for a year, during which the student had the chance to finish the thesis at any time, I consider this to be a failure to use the potential of this thesis.

Data formatting and presentation are at a low level. Data descriptions are often missing (e.g. units in tables, e.g. Table 9, 12, 26), references are sometimes missing (e.g. page 18), formatting is inconsistent (Tables 13. and 14), the text contains grammatical errors and typos, and final editing is required.

### **Questions:**

#### **Key questions:**

- Please start with a detailed description of the economic evaluation. All the important calculations presented in the enclosed Excel are missing in the text of the thesis (NPV calculation, IRR calculation), all the estimations of the profitability of the project. So, the project you assume – is it profitable or not?
- Please explain precisely the estimation of the Growth rate (how did you estimate the 0.71 % value?) and estimation of the population development. (Explain Fig. 3). Please focus on the possible decrease in the population. How it is possible?
- Could you explain in more words the data acquisition for the economic calculation? You state here that you obtained the data from the mentioned file, which is not an attachment to the thesis. Please describe the situation.
- Why did you multiply the values in Table 23 by 9.1? Isn't this a fixed cost? Again, do you have fixed costs somewhere in your calculations that do not need to be multiplied by the size of the project?
- Which of the numbers in Table 19 are essential to your project and which are not? What does ECA Credit Amount mean?

#### **Minors:**

- Page 17 – don't you think that the average values will change during the time - also, all inputs of your technical-economical evaluation? (Price of the electricity, yearly production...)
- How did you estimate the capacity of the possible installed wind power?

Date: 5<sup>th</sup> June 5, 2023

Signature