



REVIEW BY SUPERVISOR OF THE DIPLOMA THESIS

Topic: **Assessment of effectiveness the use of solar panels**

Author: **Aleksandr Bulgakov**

Supervisor: **Július Bemš, Ph.D.**

This thesis is covering problems of electricity supply to consumers in distant regions of Russia.

There are many distant locations in Russia that have no centralized electricity supply. The thesis covers decentralized energy supplies using combination of diesel generators and photovoltaic panels. The topic is therefore very current.

The first part of the thesis is devoted to description of specific conditions regarding power supply in Russia. General information about solar systems is included also. Author describes methodology that will be used to evaluate profitability of decentralized energy supply consisting of diesel generators and photovoltaic panels. In the practical part of the thesis, author calculates minimal price of electricity for specific location with several thousand inhabitants.

Cooperation with Mr. Bulgakov was not easy-going. He started serious work (data gathering, calculations, Russian legislation research) too late. Therefore, there was not enough time to make the thesis in extent I was expecting. I also expected author to have better background in technical issues regarding photovoltaic installations. Author was mostly not able to come with own, reasonable ideas in problem solving during diploma thesis writing process. I had to give him subtasks that he was able to solve. This approach was successful and author fulfilled aims of his thesis. Unfortunately, in final version of master thesis, I don't see many interesting outcomes (and partial results) of the topics discussed with author during his work on thesis. Moreover I think it is pity, that I was not able to see (author did not send me) the final version of thesis that was submitted to system.

Formal look of the thesis and English level are below-average. Some parts of the text are difficult to understand and look inconsistent. Even though I informed author about formal shortcomings, only some of them were resolved. I cannot avoid of claim that author had superficial approach to his work.

Finally, I am not sure about authors capability of fully independent work. Anyway, he is able to fulfil working tasks under reasonably supervising person. I recommend to author be more precise, diligent and hard-working in his future career.

I recommend grade this thesis

E – sufficient

using the ECTS grading scale and I recommend work for defense.

I have several questions:

1. How much energy will be produced by diesel generator and PV panels (individually) in both scenarios?
2. What is the diesel freeze point? (temperature) What are the lowest temperatures in the area of the system installation?
3. How can you interpret production from PV in scenario 2 for June when the consumption is much lower? What means red line? (appendix 4)
4. The similar question applies for the September (appendix 4). Can you cover almost whole consumption (13th hour) only by PV panels? Explain your answer.
5. What was the difference in discount rate estimation process for business investor and municipality investor? What was the difference in approach to taxation?

Tomsk, 4th June 2016
Július Bemš, Ph.D.