

I. IDENTIFICATION DATA

Thesis name:	Power supply system of the Narym rural settlement
Author's name:	Anna Terenteva
Type of thesis :	master
Faculty/Institute:	Faculty of Electrical Engineering (FEE)
Department:	Department of Economics, Management and Humanities
Thesis reviewer:	Ing. Ondřej Grygar, MBA
Reviewer's department:	ČEZ, a.s.

II. EVALUATION OF INDIVIDUAL CRITERIA

Assignment	challenging
<i>Evaluation of thesis difficulty of assignment.</i>	
The topic of this thesis is quite challenging and complex. Analytical, technical, as well as economic knowledge and skills are required to successfully master the assigned goals. Exploration of locality from the point of view of climate potential for renewable resources, determination of consumption character of rural settlement and right design of hybrid power system are key for this task. The economic evaluation of proposed power system variant is also an important part of this thesis.	

Satisfaction of assignment	fulfilled
<i>Assess that handed thesis meets assignment. Present points of assignment that fell short or were extended. Try to assess importance, impact or cause of each shortcoming.</i>	
In this thesis, the author fulfill all predetermined goals of the assignment.	

Method of conception	correct
<i>Assess that student has chosen correct approach or solution methods.</i>	
Analysis of the current power supply system and consumption characteristic of the Narym settlement was right initial step for solving the assigned topic. I appreciate the comparison of the different methodologies used for the design and evaluation of hybrid systems with renewable resources, which was described in Chapter 1.3. Analysis of the location from the point of view of climate potential for renewable resources, subsequent design and optimization of hybrid power supply system with appropriate renewable resource and final economical evaluation are correct steps for solving the task of this thesis.	

Technical level	C - good.
<i>Assess level of thesis specialty, use of knowledge gained by study and by expert literature, use of sources and data gained by experience.</i>	
From the presented work it is clear that author understands the principles of the issue. In whole work author worked well with information from individual sources, but also there are several shortcomings. On page 30, there is shown calculated value 2182 kW, the final capacity of Narym rural settlement. This value related to the calculations in Table 10, but in table, neither in attached excel file, there is no such value. Through the whole thesis I several times met uncertainties in essential terminology. Power [kW] and energy [kWh] were switched as is for example on page 31 in formula description. I also disagree with the statement that this cost-based project has no cash flows, as is note on page 42. In design of the hybrid power system I would recommend include accumulation instead of ballast resistance. In economic evaluation there wasn't taken into account method of financing of the project. This key part would strongly shift economy of the whole project. Overall the application of knowledges of the author is good, but results of this thesis are usable in practice with essential limitations.	

Formal and language level, scope of thesis	C - good.
<i>Assess correctness of usage of formal notation. Assess typographical and language arrangement of thesis.</i>	
From a language point of view, the work is correct. Formally and graphically it has several shortcomings. For example the	

work starts with subtitle 1.1 (title 1 is missing), on the page 12 there is doubled paragraph starting "Another issue relating ...", in Table 8 there are wrong values in row "Total for each village" (just copied values from row "House") or in Table 17 related to DG, in header there is "Ammount of wind turbine". Also I would recommend not to start sentence from reference link as on page 17 "[22] uses a stochastic...". Overall, the work is well edited and structured.

Selection of sources, citation correctness

B - very good.

Present your opinion to student's activity when obtaining and using study materials for thesis creation. Characterize selection of sources. Assess that student used all relevant sources. Verify that all used elements are correctly distinguished from own results and thoughts. Assess that citation ethics has not been breached and that all bibliographic citations are complete and in accordance with citation convention and standards.

The author used many published and internet sources which are correctly listed in the list of bibliography and reference. However the format of online references sometimes differed, I would recommend using the same format of online references through the whole list.

Additional commentary and evaluation

Present your opinion to achieved primary goals of thesis, e.g. level of theoretical results, level and functionality of technical or software conception, publication performance, experimental dexterity etc.

The work has well prepared theoretical part, but in the practical part, there are several errors in calculations. From my point of view the main practical mistake is overrated value of wind speed in Narym location. Even from source [44] the wind speed of Narym location is lower than average annual speed 5,6 m/s at 10 meters, which is more close to wind speed in northern areas of Russia near sea. Also technical construction of wind power plant park with 26 turbines on sand and swamp ground of Narym location will be hard for realization. I also consider as a shortcoming absence of accumulation in hybrid power supply system. Accumulation will help to cover consumption demand more efficiently, because often the power generation from wind power plants doesn't correlate with consumption. Storing surpluses of power generation in accumulation will be more effective than disposal this power in ballast load.

III. OVERALL EVALUATION, QUESTIONS FOR DEFENSE, CLASSIFICATION SUGGESTION

Summarize thesis aspects that swayed your final evaluation. Please present apt questions which student should answer during defense.

Submitted work is generally well structured and meets all the predetermined goals of the assignment. Even if the chosen method is correct there are few shortcomings in the work, which were described above in this review. The outputs of the work have limited application in practice.

I evaluate handed thesis with classification grade **C - good**.

Questions:

- 1.) How would you provide safe operation of wind power plants during winter according to local climate conditions?
- 2.) The way of project financing often affects its viability. In this project, the method of financing was not calculated. Please indicate from what sources the project could be financed and how it would roughly affect its economy.

Date: **8.6.2022**

Signature: