

STATEMENT

of the dissertation for awarding the educational and scientific degree "Doctor"
by professional field **5.2. "Electrical Engineering, Electronics and Automation"**,
Specialty **"Automated systems for information processing and management"**

Author of the dissertation: **Milena Biserova Haralampieva**

Topic of the dissertation: **INTELLIGENT MANAGEMENT OF SOURCES FOR HEAT
ENERGY STORAGE**

Scientific adviser: **Prof. Dr. Dimitar Karastoyanov**

Member of the Scientific Jury: **Assoc. Prof. Dr. Nayden Chivarov**, Institute of Information
and Communication Technologies - BAS, Sofia, 2 Acad. G. Bonchev Str.

General data

The presented dissertation is in the volume of 126 pages, structured in 4 chapters, contributions, list of publications, literature from 61 literary sources.
6 publications were presented - 1 at an international conference indexed in SCOPUS and 5 at scientific conferences in Bulgaria.

1. Relevance of the problem developed in the dissertation

The dissertation refers to the study of technological solutions for the conversion, storage and use of heat sources. The aim of the dissertation is analyzes of solar thermal energy systems with elements of synthesis of the solar thermal energy system for domestic needs. Innovative solutions for solar heat storage systems are proposed.

I appreciate the topic of the dissertation. The research in the dissertation is relevant in the use of renewable energy sources for domestic consumption and the results are usable in practice.

2. Degree of knowledge of the state of the problem and creative interpretation of the literary material

The problems in the operation of renewable energy sources are presented.

Chapter 1 analyzes the principles of use and their potential for renewable energy sources. The review presents the characteristics of energy sources and their use for domestic consumption.

Chapter 2 analyzes the existing methods and tools that use and exploit energy from such sources - solar panels, heat exchanger, control system, domestic heating system.

Chapter 3 presents a project for domestic heating system with solar energy as the main energy source. Materials with phase change for storage of solar energy and its conversion into heat are described.

Chapter 4 makes a quantitative assessment of the parameters of a heating system using solar energy for domestic heating according to the adopted design solutions and characteristics.

3. Correspondence of the chosen research methodology and the set goal and tasks

In the Dissertation work a technological solution for the use of solar energy for heating purposes has been developed.

The PhD student shows a good knowledge of the process of designing domestic heating systems and the calculation of thermal and operational characteristics of systems and individual components.

4. Scientific and / or scientific-applied contributions of the dissertation

I believe that the developed topics and contributions have a scientific - applied nature. The system for domestic heating and its characteristics with the use of solar energy as an energy source are analyzed. I positively evaluate the results of the doctoral student's research.

The applied contribution is also proven by the practical interest of the company.

I appreciate these contributions as sufficient for this dissertation. The PhD student can independently conduct research activities, develop systems using renewable energy.

It is evident from the dissertation that the achieved results are mainly the personal work of the candidate.

5. Significance of the research and applied contributions of the dissertation

PhD student Milena Haralampieva has skills for analysis and evaluation of technological solutions applied in the use of solar energy for heating household consumers.

The dissertation research is useful and has led to pragmatic results and exemplary technological solutions for domestic heating.

6. Some recommendations and critical remarks

I have no remarks regarding the content of the dissertation and I do not dispute the contributions presented.

I have some remarks on the style of writing and technical errors that I have shared with the PhD student.

CONCLUSION

I believe that the requirements of ZRASRB, PPZRASRB and the IICT Regulations have been met. This gives me reason to give a positive assessment of the dissertation and to recommend to the Scientific Jury to award **Milena Biserova Haralampieva** for educational and scientific degree "**Doctor**" in professional field 5.2 "**Electrical Engineering, Electronics and Automation**", specialty "**Automated systems for information processing and management**".

03/18/2022
Sofia

Member of the Scientific
Ass

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