



## REVIEW

By Prof. DrSc, PhD Sonia Varadinova Mileva-Bojanova,

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of "Industrial Economics and Management"

**Grounds for submitting an opinion:** participation in a scientific jury, determined by Order No. 1127 / 22 . 11,202 3 years of the Rector of SA "D. A. Tsenov" - Svishtov and decision of the first meeting of the scientific jury on 24 11.202 3 years ( Decision of FS "Finance" Protocol No. 3/21.11.2023 )

**Regarding:** public defence of a doctoral student in the field of higher education: 3. Social, economic and legal sciences, professional direction: 3.8. Economy

**Dissertation topic** "Financial and economic evaluation of investments in production of energy-efficient building materials"

**With author** Emil Hristov Alexandrov, D 010219215, doctoral student full-time in the doctoral program "Finance, money circulation, credit and insurance" (Finance)

**Scientific supervisor:** Prof. Dr. Stoyan Stanimirov Prodanov

This review was prepared in compliance with the requirements of the Law on the Development of the Academic Staff, the Rules for its Implementation, as procedurally all requirements were met and according to Art. 61 and Art. 64 of the Regulations for the development of the academic staff of the SA "D.A. Tsenov", Svishtov.

### I. General presentation of the dissertation work

The dissertation work of doctoral student Emil Alexandrov is dedicated to an extremely topical topic related to the financial and economic evaluation of investments in energy-efficient building materials as part of efforts to reduce global warming.

The dissertation has a **volume** of 266 pages. Structurally, it consists of an introduction, an exposition in three chapters, a conclusion, **references** with a total of 107 sources , incl. 69 in a foreign language, 38 in Bulgarian language. The three chapters are well balanced, logically connected to each other. Illustrative materials include a total of 76 tables and 28 figures.

The dissertation has a clearly defined object, subject, goals and tasks of the scientific research and a formulated dissertation thesis. **The subject** of research is the consumer attitude towards the search for energy efficiency insulating building materials, as an incentive for investment in their production . **The object** of research is the insulating building materials that ensure energy efficiency.

**The main goal** of the dissertation is the justification of the demand for investments in the production of insulating building materials for the purposes of improving energy efficiency and the financial and economic impact of these investments on consumers. **The defended thesis** is that the development of technologies for the production of insulating building materials forms a supply that ensures the demand for financial-economically justified solutions for investments in energy efficiency projects of the building stock with clear goals, a consequence of the "Green Deal" and price dynamics of energy for end users. A total of three **tasks** corresponding to the objectives of the dissertation have been presented - derivation of theoretical statements of investments in energy efficiency; justification of the methodological framework and management in the process of implementation of projects in the field of energy efficiency; a survey (survey) on the attitudes of end users for investments in energy efficiency and consumption of energy efficient building insulation materials. The limitations of the study are clearly stated.

**The methodology** used corresponds to the specifics of the research, including a literature review, historical research, analysis and synthesis, system analysis, inductive-deductive method, questionnaire survey. Data from NSI, Eurostat for the period 2019-2023 were used, as well as primary data from an own field study with a survey among 143 respondents with different profiles. Empirical data were processed with SPSS , illustrated with figures and tables.

## **II. Assessment of the form and content of the dissertation.**

The dissertation is dedicated to a significant, current economic problem, on a topic that is extremely relevant in the context of the Green Deal, the goals for climate neutrality in the EU until 2050 and the need for investments in environmentally friendly technologies, decarbonization and better energy efficiency of buildings. The dissertation work is supported logically with a transition from the general to the particular. The applicability of the study is the evaluation of the possibilities for a sustainable transition to energy efficiency in the construction sector, including influence on supply chains, promoting the transition to 'circular material economies'.

In **the first chapter**, the issues related to theoretical and practical dimensions of investments and the implementation of non-energy efficiency are discussed. The focus is on the financial and economic approaches for evaluation and analysis of the processes for implementing energy efficient solutions. Attention is given to the design and construction of a plant for the production of energy efficient building materials from waste materials as an opportunity for innovation. The main dimensions of the concept of energy efficiency for buildings are systematized. Based on this, an author's definition has been introduced. The analysis is supplemented with an overview of European instruments and the National Plan for Recovery and Sustainability with a focus on energy efficiency.

**The second chapter** is a methodological framework for the conducted consumer research as well as the approaches for financial and economic evaluation of investments in energy efficiency in the "Construction" sector in Bulgaria. A questionnaire was prepared with 70 questions grouped into 9 sections.

**The third chapter** is a presentation of the results of a study conducted on investments in the production and consumption of energy efficient building materials. The profile of the



respondents, motives for investments in energy efficiency and budgeting of energy needs are indicated. Environmental aspects and insulation technologies are reported. Results are visualized through Technology Efficiency Grant Programs, Impact of Covid and Social Attitudes to Energy Efficiency. A financial assessment of state investments to support the increase of energy efficiency in Bulgaria was made, and three main options were derived for different parameters of state aid and square footage of the residential area.

Stylistically and linguistically, the text is robust in terms of the terminology and stylistics used. Citation of the used sources is correct. The data and statistical processing used conform to the rules of computing and scientific ethics.

The abstract is 32 pages long and reflects the content, main results and conclusions in a synthesized form. It contains all the necessary elements for an abstract of a dissertation work, including justifying the topicality of the topic, the degree of development, outline of the object, the subject, the goals and tasks, the research thesis, structure and content of the dissertation, directions for future research, as well as a reference to the contributions, a list of publications on the topic, a reference to compliance with the national requirements under the Regulations for the Application of the Law on the Development of Academic Staff (PPZRASRB) and a list of the doctoral student's publications.

The three articles and 1 scientific report included in the abstract are on the topic of the dissertation, two of which are in Bulgarian, the other two in English. Of these, one article is co-authored, for which no separation protocol has been provided. All are in non-refereed peer-reviewed journals.

### **III. Scientific and scientific-applied contributions of the dissertation work.**

The dissertation submitted for review is an independent and completed study of the financial and economic evaluation of investments in the production of energy-efficient building materials. The doctoral student convincingly demonstrates his skills for scientific research work on significant and current issues, including to systematize and formulate problems and seek guidance for their solution.

**The main contributions** of the dissertation are related to the introduction of the author's definition of energy efficiency, development of an innovative option for building an integrated installation for the production of high-quality energy-efficient building materials. An author's study was conducted with the aim of financial and economic evaluation of investments in the production of energy-efficient building materials. The need for adequate measures based on optimal Styrofoam remediation percentage values (as % and cost) are outlined. A new vision for expert evaluation of state investments to support the increase of energy efficiency in Bulgaria has been approved.

### **IV. Dissertation critical notes, questions and recommendations.**

As a main note and recommendation to the doctoral student is an increase in publication activity, incl. in English and in global and indexed databases with the aim of greater visibility and recognition of the achieved research results.

Regarding the structure of the dissertation, I would question the appropriateness of the presentation of an integrated installation for the production of building materials in the first,

theoretical chapter, especially since the conclusions are not directly related to the research part and contribution of the doctoral student.

Questions for the PhD student:

1. The text states that energy efficiency is key tool for achieve on climatically neutral economy. What kind are the specific one's benefits in the short term from the promotion on energy efficiency in Bulgaria (reduction of energy consumption, reduction of energy costs, improvement of air quality and quality of life, reduction of dependence on energy imports, other)?
2. To ac the promotion on energy efficiency will contributed for reduction on expenses for energy and improvement on the economic efficiency ?

#### **V. Summary Conclusion and Opinion.**

The dissertation submitted for review meets the requirements of the Law on the Development of the Academic Staff of the Republic of Bulgaria and the Regulations for its implementation, as well as the additional requirements of the Regulations of the CA "D. A. Tsenov". It represents a completed research work, which contains scientific and applied contributions on a current and important topic dedicated to the financial and economic evaluation of investments in the production of energy-efficient building materials.

Bearing in mind that the dissertation is an independent work of the doctoral student, as well as the fact that the candidate possesses the qualities, experience and competences to conduct independent scientific research and fulfils the minimum national requirements for obtaining the educational and scientific degree "doctor", I propose to the respected members of the scientific jury to vote positively and make a decision to award Emil Hristov Alexandrov the educational and scientific degree "DOCTOR" in PN 3.8 Economics.

12/18/2023

Reviewer:

Prof. DrSc, PhD. Sonia Mileva-Bojanova