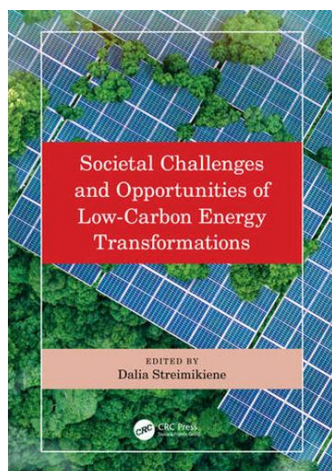


Reviewed book: Dalia STREIMIKIENE (Ed.) (2025), Societal Challenges and Opportunities of Low-Carbon Energy Transformations, CRC Press, 400 p.

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Nowadays, social challenges are given great attention. Especially wide response is received when social challenges related to energy security, gender inequality, climate change mitigation are analyzed. The authors present their point of view on the analyzed problem, very thoroughly justifying their statements. In this book, the authors examine such important problems as low carbon energy transition, energy poverty, energy security, gender inequality, energy efficiency, renewable energy, green jobs and green investments. All these topics are interconnected through sustainability, through political international relations, environmental ecology, energy independence. The book presents both theoretical and practical research results, shows problems and proposes solutions to solve them. This book addresses the societal challenges and opportunities that come with the transition in EU member states such as energy poverty and inequality, energy security, gender inequality, energy efficiency improvements, climate change mitigation, growth in green investments, etc.

The book, based on a literature review and case studies, systematically and consistently analyzes and systematizes the main social challenges and opportunities for the transition to low-carbon energy transition. The authors sought to develop concepts and frameworks of indicators and key barriers and drivers, as well as policy measures, addressing the challenges and opportunities of the transition to low-carbon technologies in the Member States of the European Union. The book consists of eight chapters,

which consistently analyze and demonstrate the challenges of the low carbon energy transition, ways to solve them.

1. Introduction to Low-Carbon Energy Transition

The author (*Dalia Streimikiene*) analyses the concept of low-carbon energy transition in eight European Union countries (Germany, France, Sweden, United Kingdom, Norway, Denmark, Netherlands, Spain), by providing the theory for the transition to a carbon-neutral society. The author states that key elements of the low-carbon transition include renewable energy sources, energy efficiency, carbon capture and storage, smart grids and energy storage, policy and regulatory measures, research and innovation. The author also focused on the analysis of policy documents of low-carbon energy transition, analyzing the National Climate Action Plan, providing examples and goals from several EU countries, which need to be achieved. The author devotes one chapter to targets and indicators of low-carbon transition, indicating what limited financial resources can be encountered and how they limit the possibilities of achieving the goal. In the author's opinion, the circular business model will actually reduce environmental impact and efficiently use resources. The author also indicates what policy areas encompass low-carbon energy transition. After extensive scientific discussion and case studies, the author concludes that there is an urgent need for close cooperation in addressing climate change and achieving sustainability goals.

2. Energy Poverty

The author (*Dalia Streimikiene*) carried out a detailed analysis of scientists' opinions on energy shortage. In her opinion, the analysis of scientific literature showed that energy poverty is closely linked to material deprivation and poor or marginalized groups of society are especially vulnerable to energy or fuel poverty, as health problems are specifically impactful for elderly, chronically sick or disabled people. The author indicates that on a macro-scale energy poverty is analyzed based on energy services deprivation indicators and based on energy inequality data as energy inequalities are linked first of all with the fact that specific groups of society are being affected by energy services deprivation in different ways and with different consequences. While researching energy poverty indicators, the author claims that there is no one, commonly established definition of energy poverty. However, it is not possible to measure universally what is the absolute minimum level of necessary daily energy consumption. The author, conducting an analysis of the scientific literature, points out that the analysis of various energy poverty concepts allowed to highlight that the lack of energy services can be understood as the broadest energy poverty definition, however it cannot be measured directly.

A large body of literature shows that energy poverty is closely linked to material deprivation, and that poor or marginalized groups in society are particularly vulnerable to energy or fuel poverty, as health problems particularly affect the elderly, those with chronic diseases or those with disabilities. The author extensively describes a study conducted by the European Commission in 2016, which tested and validated a number of energy poverty indicators, where 178 indicators were analyzed and just 42 of them were nominated based on existing statistics and data available at the EU level. Analyzing the statistical indicators of energy poverty, the author created a map of people in the European Union who cannot afford sufficient heat in their homes, the data of which show that there are doubts about the reliability of the indicator.

In the conclusions, the author states that the simplicity criteria for indicators selection are very important for data collection and clear communication for policy-makers. In the author's opinion, the energy poverty indicators can be analyzed and systematized based on various approaches, like access of population to electricity and modern cooking fuels; energy consumption inputs; the outcomes of energy use and the

quality of energy delivered. The author states that more empirical work is needed to demonstrate the relevance of energy poverty indicators recommended by the European Commission to monitor the energy poverty level at EU MS due to methodological drawbacks of expenditure-based and consensual-based indicators.

3. Energy security

Energy security is essential at both the national and international levels. Therefore, the topic examined by the author is very important. The author (*Indre Siksnelyte-Butkiene*) indicates that the traditional comprehension of energy security revolves around the concern of guaranteed access to energy. Safe and uninterrupted energy supply is important for all countries, as it allows for reliable access to the necessary energy resources needed to support their economic and social functions. Researching energy security, the author indicates that numerous tools have been developed to assess energy security across different countries, country groups, or regions. The author's research has shown that the perception of energy security must respond to the changing circumstances of the global energy environment. The author argues that this ability to adapt is very important in developing effective policies and strategies that would ensure a stable and secure energy supply in the face of challenges. The author's extensive analysis of the scientific literature has led to the conclusion that a proper understanding of energy security allows researchers, policy makers, and stakeholders to make informed decisions that increase the resilience and sustainability of energy systems.

4. Gender Equality

The author (*Lina Volodzkiene*) has chosen a very interesting topic. The author points out that economic development has a distinct inverse correlation with gender disparity, as affluent nations possess greater capacity to commit resources towards social initiatives that support women, encompassing healthcare, education, and employment engagement. The author's research once again proves that an increase in per capita GDP correlates with a reduction in gender inequality. In her opinion, economic progress does not yet guarantee gender equality. The author's research shows that the main obstacle to achieving gender equality is the relationship between men and women, so it is necessary to overcome not only economic obstacles, but also cultural and social ones. The author's research shows that a comprehensive strategy is vital for attaining enduring advancements in gender equality. She points out that economic growth must be accompanied by specific social and labor market changes, as well as robust legal frameworks that promote gender equality. Cultural and institutional reforms are equally vital for eliminating the structural impediments that sustain gender disparity. The author concludes that governments must invest in social safety and education while aggressively transforming societal beliefs that limit women's potential.

5. Energy Efficiency

The authors (*Mindaugas Butkus* and *Raimonda Valaseviciene*) analyse the energy efficiency concept, energy efficiency indicators, drivers of and barriers to energy efficiency, policies and measures to increase energy efficiency. One major aspect the authors delve deeply into is A case study to explore drivers and barriers to energy efficiency in the EU countries during 2000– 2022. This case study is based on regression analysis aiming to find which factors are indicated in the literature and in which direction they affect energy efficiency. The authors' study showed that it is important to consider various economic and policy aspects in order to effectively increase energy efficiency across the European Union.

6. Renewable Energy

The author (*Ahmad Bathaei*) shares his insights on the emergence of the concept of renewable energy, the evolution of these ideas. In the author's opinion, renewable energy sources embody significant benefits, such as high availability, zero pollution, and decreasing costs associated with the popularity and advancement of technology. Therefore, in his opinion, it is important for governments, businesses, and global communities to intervene and cooperate to promulgate favorable policies, reinforce the electric grid network, and offer fiscal incentives. The author emphasizes that spending on renewable energy stimulates economic development and employment, while increasing energy availability and use, mainly in the developing world. This dual benefit emphasizes the advantages of renewable energy in creating a new social reality in which all stakeholders can benefit and more resources are allocated to ensure the environmental balance of the planet. In the author's opinion, comprehensive comparative reviews of renewable energy policies in different regions can provide useful recommendations for future research on how to effectively improve the rate of renewable energy penetration.

7. Green Jobs

When researching green jobs, the author (*Justas Streimikis*) points out that the idea gained prominence in the late 20th and early 21st centuries as awareness of environmental issues, such as climate change, pollution, and resource depletion, increased worldwide. Further in his chapter, he consistently develops the concept of green jobs, noting that it is essential in the transition towards a sustainable and resilient economy. The author points out that the evolution of green jobs from a niche concern to a mainstream economic driver highlights their importance in addressing global challenges such as climate change, resource depletion, and environmental degradation.

By monitoring and analyzing indicators of green jobs, the authors provide valuable insights into the progress and impact of sustainable employment initiatives. By tracking the adoption of green technologies, economic and social benefits, policy and regulatory frameworks, and environmental outcomes, stakeholders can gauge the effectiveness of green job programs and policies. The author's case study on green jobs assessment in EU member states showed that the best results in green job expansion can be noticed in Estonia and Finland, where the shares of green employment in total employment make up more than 5% of all jobs. In the author's opinion, the variations in green job statistics among European Union member states indicate the need for tailored policies and measures to promote and maximize green jobs in the EU while addressing barriers.

8. Green Investments

The author (*Karolis Andriuskevicius*) focused on green investment, financial activities that support environmentally sustainable projects or companies. In the author's opinion, the field of green investment has significantly advanced and is seen as a way to not only make a profit but also to contribute to a more sustainable future for the planet. In this chapter, the author conducted an analysis of the concept of green investments, analyzed key indicators, and investigated challenges in the field of green investments. The author's ability to conduct a case study was limited by the fact that finding accurate and up-to-date data on global green investment statistics is challenging due to.

Conclusion and Final Assessment

The monograph "Societal Challenges and Opportunities of Low-Carbon Energy Transformations" is written in a highly scientific language. It is necessary to emphasize the timeliness of the monograph in a changing

environment. The monograph is very visual, with many graphic illustrations, easy to read and understand. The interdisciplinary nature of the book, the economic assessments performed, and the sustainability issues addressed give the book many advantages. The main contribution of the book is the theoretical and practical discussion, during which the main societal challenges and opportunities of low-carbon energy transition are discussed. It is also important that the authors present the ideas of the concepts under consideration, analyze case studies, encourage discussion on policies and measures necessary to overcome identified barriers and propose how to promote a just and smooth low-carbon energy transition.

This book is well suited for academics, researchers, graduate students and specialists, such as energy producers, urban planners, policymakers, etc., who are interested in existing and new trends in sustainable energy.

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SANTRAUKA

Monografijoje „Visuomeniniai iššūkiai ir mažai anglies dioksido į aplinką išskiriančios energijos transformacijos galimybės“ autoriai nagrinėja tokias svarbias problemas: perėjimą prie mažai anglies dioksido į aplinką išskiriančios energijos, energijos nepriteklių, energetinį saugumą, lyčių nelygybę, energijos vartojimo efektyvumą, atsinaujinančią energiją, darbo vietų ekologiją, ekologiškas investicijas. Autoriai Dalia Štreimikienė, Indrė Šikšnelytė-Butkienė, Lina Volodzkienė, Mindaugas Butkus, Raimonda Valasevičienė, Ahmad Bathaei, Justas Štreimikis, Karolis Andriuškevičius knygoje pateikė tiek teorinius, tiek praktinius tyrimų rezultatus, iškėlė problemas ir siūlo sprendimus joms išspręsti.

Pirmoje knygos dalyje analizuojama perėjimo prie mažai anglies dioksido į aplinką išskiriančios energetikos aštuoniose Europos Sąjungos šalyse (Vokietijoje, Prancūzijoje, Švedijoje, Jungtinėje Karalystėje, Norvegijoje, Danijoje, Nyderlanduose ir Ispanijoje) samprata, pateikta perėjimo prie anglies dvideginio neutralumo visuomenės teorija.

Antroje dalyje atlikta išsami mokslininkų nuomonių apie energijos trūkumą analizė. Autorių nuomone, mokslinės literatūros analizė atskleidė, kad energetinis nepriteklis yra glaudžiai susijęs su materialiniu nepriteklumi.

Trečioje knygos dalyje pabrėžiama, kad energetinis saugumas yra būtinas tiek nacionaliniu, tiek tarptautiniu lygiu. Todėl nagrinėjama tema yra labai svarbi. Nurodoma, kad tradicinis energinio saugumo supratimas susijęs su rūpesčiu užtikrinti garantuotą prieigą prie energijos.

Ketvirtoje dalyje atkreipiamas dėmesys į tai, kad ekonominis vystymasis turi aiškią atvirkštinę koreliaciją su lyčių skirtumais, nes turtingos šalys turi daugiau galimybių skirti išteklius socialinėms iniciatyvoms. Jos susijusios su moterų sveikatos priežiūroje, švietime ir užimtume rėmimu.

Penktoje dalyje autoriai analizuoja energijos vartojimo efektyvumo koncepciją, energijos vartojimo efektyvumo rodiklius, energijos vartojimo efektyvumo veiksnius ir kliūtis, energijos vartojimo efektyvumo didinimo politiką ir priemones. Vienas iš pagrindinių aspektų – atvejo tyrimas, skirtas ištirti energijos vartojimo efektyvumo veiksnius ir kliūtis ES šalyse 2000–2022 m.

Šeštoje dalyje dalijamasi įžvalgomis apie atsinaujinančios energijos sampratos atsiradimą, šių idėjų raidą. Pateikiama nuomonė, kad atsinaujinantys energijos šaltiniai įkūnija didelę naudą, kuri apima platų prieinamumą, nulinę taršą, mažėjančias sąnaudas, susijusias su technologijų populiarumu ir pažanga.

Septintoje dalyje nuosekliai plėtojama žaliųjų darbo vietų samprata, pažymima, kad ji yra būtina pereinant prie tvarios ir atsparios ekonomikos. Stebint ir analizuojant ekologiškų darbo vietų rodiklius, pateikiama vertingų įžvalgų apie tvaraus užimtumo iniciatyvų pažangą ir poveikį.

Aštuntoje dalyje daugiausia dėmesio skirta žaliosioms investicijoms, finansinei veiklai, remiančiai aplinką tausojančius projektus ar įmones. Pateikiama nuomonė, kad žaliųjų investicijų sritis itin pažengė į priekį ir yra vertinama kaip būdas ne tik pasipelninti, bet ir prisidėti prie tvaresnės planetos ateities.

Apibendrinant būtina pabrėžti monografijos pasirodymą tinkamu laiku kintančioje aplinkoje. Knygos tarpdalykiškumas, atlikti ekonominiai vertinimai ir sprendžiamos tvarumo problemos suteikia daug privalumų. Pagrindinis autorių indėlis – teorinė ir praktinė diskusija, kurioje aptariami pagrindiniai visuomeniniai iššūkiai ir galimybės pereiti prie mažai anglies dioksido į aplinką išskiriančių energijos šaltinių.

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