

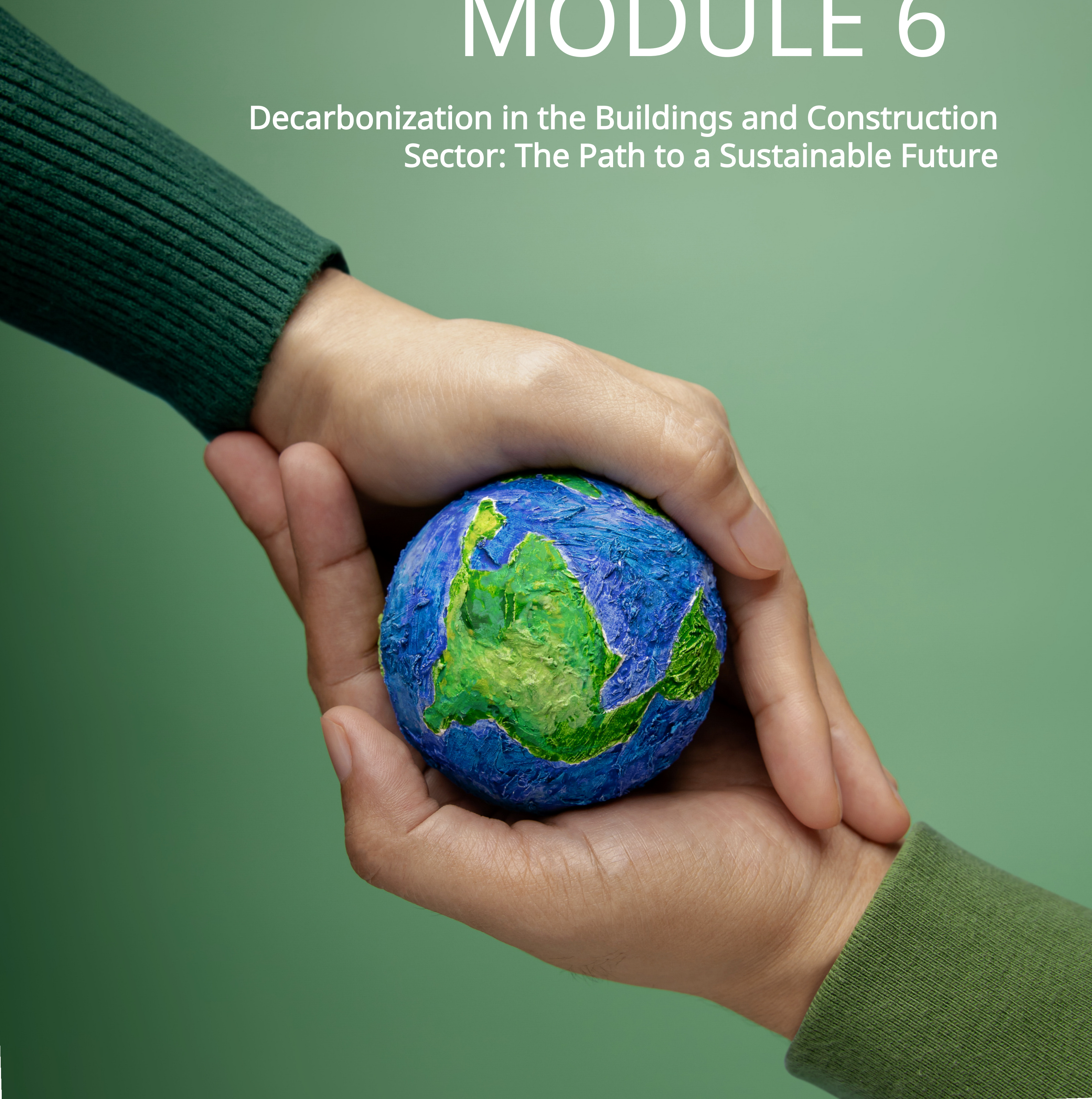


Ministry of Ecology and Natural
Resources of the Republic of
Kazakhstan



MODULE 6

Decarbonization in the Buildings and Construction
Sector: The Path to a Sustainable Future



Educational Module: "Decarbonization in the Buildings and Construction Sector: The Path to a Sustainable Future"

Module objective: Develop participants' awareness of the importance and urgency of decarbonizing buildings in Kazakhstan, provide understanding of key sources of greenhouse gas emissions, present methods for assessing decarbonization and climate risks, and offer an overview of the most effective measures and technologies for achieving sustainability.

Expected Outcomes:

By the end of the module, participants will be able to:

- Identify the main sources of greenhouse gas emissions in buildings in Kazakhstan.
- Assess and interpret the target indicators and metrics of decarbonization in the sector.
- Determine the most significant climate risks for companies in this sector.
- Analyze and compare various measures and technological solutions for decarbonization in the short and long term.

Organizational Forms:

- Lectures: Presentation of information on decarbonization, sources of emissions, and target indicators.
- Group Discussions: Discussion of climate risks and their prioritization for companies in the sector.
- Case Studies and Examples: Analysis of successful practices by companies implementing decarbonization projects.
- Interactive Surveys: Assessment of participants' understanding and readiness to implement decarbonization.

Content:

Informational-Theoretical Part:

1. **Introduction to decarbonization:** The significance of reducing greenhouse gas emissions in the context of climate change and the sustainability of industrial sectors.
2. **Main sources of emissions:** Overview of the stages of extraction, processing, and transportation that affect the level of carbon emissions.
3. **Target indicators and metrics:** Presentation of decarbonization metrics, measurement methods, and their importance for tracking success.

Practical part:

1. **Climate risk assessment:** Group work to identify and prioritize the most significant climate risks in buildings and construction.
2. **Analysis of Measures and Technologies:** Discussion and comparison of various technological and strategic solutions for reducing emissions in the short-term and long-term.
3. **Development of decarbonization plans:** Developing practical action plans for implementing measures and technologies in companies, considering climate risks and unique characteristics.

Conclusion:

Summarizing the module with an emphasis on the importance of each company's involvement in the decarbonization process to achieve sustainability and reduce negative environmental and climate impacts.

Detailed content:

Lecture 1 "The Concept of Decarbonization and Climate Challenges in Buildings and Construction"

The lecture will present current data on the impact of buildings on climate and greenhouse gases. Participants will learn about the main sources of emissions associated with various stages of building construction and operation, as well as the climate risks that could affect construction projects.



Part 1: Introduction

- Impact of the construction industry on climate: Understanding how the construction and operation of buildings and infrastructure contribute to greenhouse gas emissions and climate change.

Part 2: Climate Challenges in Construction

- Energy Consumption and Emissions: Analysis of energy consumption and emissions at all stages of the construction process, from design to operation.
- Sustainable Materials and Resources: Discussion on the selection of eco-friendly materials and the conservation of natural resources.
- Waste Management: Examination of waste generation in construction and the necessity of managing it.

Part 3: Impact on the Industry and Society

- Economic Aspects: Evaluation of economic losses and risks to the construction industry due to climate change.
- Legislation and Standards: Overview of regulations in the construction sector concerning climate resilience.

Part 4: Benefits of Decarbonization in Construction

- Reduction of Operating Costs: Discussion on how decarbonization can lead to lower energy and maintenance expenses.
- Enhanced Competitiveness: Consideration of how green practices impact companies' reputations and their market position.

Part 5: Sources of Decarbonization Funding

- Investments and Financing: Examination of various sources of funding for implementing decarbonization measures, including internal investments, government support, subsidies, and private investors.
- Green Bonds and Standards: Overview of the concept of "green bonds" and other financing mechanisms aimed at environmentally sustainable projects. Mention of standards and certifications for validating decarbonization efforts.

Conclusion:

A summary overview of the key concepts and ideas presented in the lecture, emphasizing the importance of understanding climate challenges and the urgency of implementing decarbonization measures in buildings. A concluding statement on how participants can contribute to this process and the significance of their involvement for the future of the industry and the planet as a whole.



Group Work 2 Identifying and Prioritizing Climate Risks

Group Work "Identifying and Prioritizing Climate Risks" is a key part of the decarbonization seminar for buildings. Its goal is to facilitate the analysis and understanding of the most significant climate risks faced by the sector, as well as to develop a strategy for prioritizing actions to mitigate these risks. This group work will involve the following stages and questions:

Stage 1: Identification of Climate Risks

- Divide participants into small groups.
- Each group analyzes climate risks associated with various aspects of construction and buildings, such as extreme weather conditions, heat loads, etc.
- Groups identify potential impacts and vulnerabilities in different scenarios.

Stage 2: Risk Prioritization

- Each group selects a few of the most significant and likely climate risks.
- Groups discuss and justify their choices, considering practical and strategic aspects.

Stage 3: Discussion and Synthesis

- Group representatives share their findings and lists of prioritized climate risks.
- Discussion and analysis of common trends and patterns in the selected risks.

Stage 3: Developing an Action Plan

- Groups are reformed to review the prioritized risk lists and develop action plans for mitigation and adaptation.
- Each group develops short-term and long-term measures, identifies responsible parties, and resources needed for implementation.



Stage 4: Presentation and Discussion of Results

- Each group presents their results, discusses them with other seminar participants, and receives feedback. This creates a platform for exchanging ideas and best practices for managing climate risks in buildings.

Group work "Identifying and Prioritizing Climate Risks" facilitates a deeper understanding among participants of the climate challenges that may impact their companies and how to develop the most effective strategies for decarbonization and sustainable development.

3 "Decarbonizing Buildings: Technologies and Pathways to Emissions Reduction"

This lecture will provide an in-depth overview of the most effective and applicable technologies for decarbonization. Significant attention will be given to both short-term measures and long-term strategies that can help the sector reduce its carbon footprint.

Part 1: Major Sources of Emissions in Buildings

- Energy Consumption: An overview of the impact of energy consumption on greenhouse gas emissions in buildings.

Part 2: Technological Pathways to Decarbonization

- Energy Efficiency and Insulation: Examination of methods for reducing energy consumption through insulation, sealing, and efficient conditioning technologies.
- Use of Renewable Energy Sources: Discussion of integrating solar panels, wind turbines, and other renewable sources into building energy systems.
- Smart Homes and Automation: Introduction to the concept of smart homes that optimize energy consumption and system management.

Part 3: Materials and Constructions

- **Environmentally friendly materials:** Introduction to selecting environmentally sustainable materials for construction and finishing.

Part 4: Examples of Successful Practices

- **Energy-efficient buildings:** Presentation of successful examples of buildings implementing decarbonization technologies, such as passive houses or zero-emission buildings.
- **Green certifications:** Review of various green standards and certifications for buildings, such as LEED, BREEAM, and others.

Part 5: Challenges and Perspectives

- **Technical and economic challenges:** Analysis of the challenges faced by builders and developers in implementing new technologies.
- **The future of building decarbonization:** Discussion of the prospects and trends in the field of zero-emission or low-emission building construction.

Conclusion:

Summarizing the lecture with an emphasis on the importance of sustainable construction for reducing negative climate impacts and creating buildings that contribute to sustainable development.

4 Digital Survey "Assessment of Readiness and Interest in Implementation"

After completing the module, participants will take an interactive survey to assess their understanding of decarbonization, readiness to implement new methods and technologies, and interest in collaboration and knowledge sharing in this area. Questions for the interactive survey:

- What processes lead to greenhouse gas emissions in scopes 1 and 2 in your buildings?
- Does your company have established goals related to the decarbonization of buildings?
- Rate the technical and economic feasibility of implementing decarbonization measures for buildings (from 1 – low to 5 – high):
- What measures have already been implemented in your company?
- Assess the IMPACT that the risk may have on your company, and the PROBABILITY of the risk materializing (from 1 – low to 5 – high):

Action	Technologically possible	Economically justified
Energy efficiency and modernization of existing buildings		
Construction of new high-performance buildings (passive houses)		
Application of green technologies and materials in construction		
Electrification and transition to (RES)		

Risk	Impact	Possibility
Credit Risk: Access to Capital		
Regulatory Risk: Stricter Legislation		
Operational risk: Changes in precipitation levels		
Operational risk: Extreme temperatures		
Operational risk: Extreme weather conditions		
Operational risk: Water scarcity		

5 Final Discussion and Action Plan

The module concludes with a discussion of the survey results and the development of an action plan. Participants exchange ideas on the steps each company can take to improve its environmental performance and long-term sustainability.

This educational module provides participants with a comprehensive understanding of climate challenges related to buildings and teaches practical methods for reducing greenhouse gas emissions. It allows participants to assess the current situation in their companies, share experiences, and build a knowledge base for making sustainable decisions in the future.

