

## Subject card

|                                             |                                                                                                                                                                                      |                                                          |                                         |                                     |         |                                                                             |     |
|---------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|-----------------------------------------|-------------------------------------|---------|-----------------------------------------------------------------------------|-----|
| Subject name and code                       | Economic Aspects of Renewable Energy Sources, PG_00177359                                                                                                                            |                                                          |                                         |                                     |         |                                                                             |     |
| Field of study                              | Economics, International Economic Relations                                                                                                                                          |                                                          |                                         |                                     |         |                                                                             |     |
| Date of commencement of studies             | October 2023                                                                                                                                                                         |                                                          | Academic year of realisation of subject |                                     |         | 2025/2026                                                                   |     |
| Education level                             | Bachelor's studies                                                                                                                                                                   |                                                          | Subject group                           |                                     |         | Obligatory subject group in the field of study<br>Optional subject group    |     |
| Mode of study                               | full-time studies                                                                                                                                                                    |                                                          | Mode of delivery                        |                                     |         | at the university                                                           |     |
| Year of study                               | 3                                                                                                                                                                                    |                                                          | Language of instruction                 |                                     |         | Polish<br>Language of instruction: Polish (partially with English content). |     |
| Semester of study                           | 6                                                                                                                                                                                    |                                                          | ECTS credits                            |                                     |         | 2.0                                                                         |     |
| Learning profile                            | academic                                                                                                                                                                             |                                                          | Assessment form                         |                                     |         | credit                                                                      |     |
| Conducting unit                             |                                                                                                                                                                                      |                                                          |                                         |                                     |         |                                                                             |     |
| Name and surname of lecturer (lecturers)    | Subject supervisor                                                                                                                                                                   |                                                          | mgr inż. Tomasz Laskowicz               |                                     |         |                                                                             |     |
|                                             | Teachers                                                                                                                                                                             |                                                          | mgr inż. Tomasz Laskowicz               |                                     |         |                                                                             |     |
| Lesson types                                | Lesson type                                                                                                                                                                          | Lecture                                                  | Tutorial                                | Laboratory                          | Project | Seminar                                                                     | SUM |
|                                             | Number of study hours                                                                                                                                                                | 30.0                                                     | 0.0                                     | 0.0                                 | 0.0     | 0.0                                                                         | 30  |
|                                             | E-learning hours included: 0.0                                                                                                                                                       |                                                          |                                         |                                     |         |                                                                             |     |
| Learning activity and number of study hours | Learning activity                                                                                                                                                                    | Participation in didactic classes included in study plan |                                         | Participation in consultation hours |         | Self-study                                                                  | SUM |
|                                             | Number of study hours                                                                                                                                                                | 30                                                       |                                         | 0.0                                 |         | 0.0                                                                         | 30  |
| Subject objectives                          | The aim of the course is to explain the economic aspects of the power system in Poland and Europe, in the context of the energy transition and the role of renewable energy sources. |                                                          |                                         |                                     |         |                                                                             |     |

| Learning outcomes | Course outcome                                                                                                                                                                                                                             | Subject outcome                                                                                                                                                                                                                                            | Method of verification                                                       |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|
|                   | [MSG3_U01] can correctly interpret and explain economic and social phenomena, analyse their causes, course and connections between these phenomena using the acquired knowledge of economics, finance and international economic relations | Is able to analyse and interpret phenomena occurring in the energy market, and understands the role of public authorities and commercial entities that make economic decisions based on data.                                                              | [SU2] presentation/project/paper/report<br>[SU4] test/exam - oral or written |
|                   | [MSG3_K01] is ready to recognise the importance of knowledge in the field of economics in the process of identifying and solving economic problems and to consult experts in case of difficulties in solving them independently            | Understands the economic mechanisms underlying energy transition policy and is able to identify and use sources of knowledge related to the economic dimension of national energy policy.                                                                  | [SK4] test/exam - oral or written                                            |
|                   | [EKONL3_K02] is aware of the level of knowledge in the field of economics and understands the need to deepen and update this knowledge throughout life                                                                                     | Understands the dynamics of how the energy market evolves and the changing conditions that shape it over time. Recognizes the need to continuously update knowledge based on reliable sources.                                                             | [SK4] test/exam - oral or written                                            |
|                   | [MSG3_W08] knows and understands the fundamental dilemmas of contemporary civilisation, including the strategy of sustainable development and corporate social responsibility                                                              | Understands the impact of human activity on the climate and the concept of corporate social responsibility in the context of the energy transition.                                                                                                        | [SW4] test/exam - oral or written                                            |
|                   | [MSG3_K02] critically assesses the level of his/her knowledge in the field of economics; is willing to deepen and update this knowledge throughout his/her life                                                                            | Understands the need for continuous learning and updating of knowledge in the field of energy transition and the role of renewable energy sources as a key component of the energy system.                                                                 | [SK4] test/exam - oral or written                                            |
|                   | [EKONL3_K03] participates in the preparation of economic and social projects, being able to reconcile legal, economic, ecological, political and social requirements                                                                       | Understands the complex nature of the energy transition and is able to identify both the positive and negative impacts of its development, maintaining scientific objectivity and academic integrity in evaluating real-world processes.                   | [SK4] test/exam - oral or written                                            |
|                   | [EKONL3_W02] has advanced knowledge of the different types of existing business entities and organisations and public institutions                                                                                                         | Understands the role of key public institutions such as the Energy Regulatory Office (URE), the National Power System (KSE), and the Polish Transmission System Operator (PSE), as well as other relevant bodies, in the functioning of the energy system. | [SW4] test/exam - oral or written                                            |
|                   | [MSG3_W04] has an advanced knowledge of different types and essential elements of the structures of economic entities and organisations, and public institutions                                                                           | Understands the mechanisms used by actors to implement national energy policy and is aware of the economic consequences of decisions made by participants in the electricity market.                                                                       | [SW4] test/exam - oral or written                                            |
|                   | [EKONL3_K01] recognises the importance of economic knowledge in identifying and solving economic problems and of consulting experts when difficulties in solving them independently                                                        | Is able to apply economic indicators such as LCOE and the cost of electricity generation, and distinguishes the significance of measurement units and basic economic principles in the context of energy policy and economic competitiveness.              | [SK4] test/exam - oral or written                                            |
|                   | [MSG3_K03] participates in the preparation of economic and social projects; can reconcile legal, economic, ecological, political and social requirements                                                                                   | Understands the importance of active social participation in creating an environment conducive to the development of the energy system. Is able to assess phenomena related to the energy transition and take a data-driven position.                      | [SK4] test/exam - oral or written                                            |

|  | Course outcome                                                                                                                                                                                                                                                       | Subject outcome                                                                                                                                                                                                                                                              | Method of verification            |
|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|
|  | [EKONL3_U06] uses the knowledge acquired in economics, finance and management to solve economic and social dilemmas arising in the professional context                                                                                                              | Is able to apply acquired knowledge in practice and make rational assessments to support decision-making in economic contexts. Demonstrates resistance to misinformation and manipulation regarding energy supplier choices and other aspects of the energy market.          | [SU4] test/exam - oral or written |
|  | [EKONL3_U01] can correctly interpret economic and social phenomena and apply knowledge of economics, finance and management sciences to explain economic phenomena                                                                                                   | Understands current economic phenomena and is able to interpret the concept of energy transition based on market data, including company financial results and the impact of energy prices on the competitiveness of the economy and individual firms.                       | [SU4] test/exam - oral or written |
|  | [MSGL3_W03] has an advanced and structured knowledge of the world economy and international economic relations; understands the process of their evolution, including its causes and consequences                                                                    | Understands Poland's position within EU and international climate policies, as well as the impact of climate organizations and agreements on economic and social realities.                                                                                                  | [SW4] test/exam - oral or written |
|  | [MSGL3_U02] can assess economic and social phenomena occurring in an open economy, interpret necessary statistical data and economic indicators, as well as forecast economic phenomena and processes, using standard methods and tools applied in economic sciences | Is able to search for and analyse data on energy prices, consumption, production, and power system load. Understands the concepts of installed capacity and generated power, as well as their economic significance.                                                         | [SU4] test/exam - oral or written |
|  | [MSGL3_W06] knows and understands the relations between economic entities and public institutions functioning in the national, international and intercultural realms                                                                                                | Is familiar with and able to assess the relationships between state institutions, including stakeholders in the energy market. Distinguishes between national and international institutions and organizations, and understands their role in the energy transition process. | [SW4] test/exam - oral or written |
|  | [MSGL3_U04] uses the acquired theoretical knowledge in economics to analyse and evaluate the operation of economic entities on the international market, with particular emphasis on the European Union market                                                       | Is able to identify the motivations and understands the decision-making processes of entities operating in the energy market, including both prosumers and professional energy producers.                                                                                    | [SU4] test/exam - oral or written |

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| Subject contents                | <p>As part of the course, students will become familiar with key concepts and issues related to the energy transition, including in particular:</p> <ol style="list-style-type: none"> <li>1. The significance of climate change and the impact of human activity on climate processes.</li> <li>2. The development of renewable energy technologies.</li> <li>3. The role of the energy mix in Poland and Europe, and national and international initiatives to mitigate climate change.</li> <li>4. Key economic concepts related to energy systems and the structure of the energy mix.</li> <li>5. The importance of energy security.</li> <li>6. The national energy infrastructure and its role in ensuring energy security, with reference to a just energy transition.</li> <li>7. Economic indicators for comparing energy prices and generation costs across different technologies, including renewables.</li> <li>8. Social acceptance and conflicts of interest surrounding the development of renewable energy.</li> <li>9. Overview and understanding of offshore wind energy technologies.</li> <li>10. Global trends in the development of renewable energy sources.</li> <li>11. The impact of renewable energy development on the labour market and economic growth.</li> </ol> |                                                                                                                                                                                                                                                                                                  |                               |
| Prerequisites and co-requisites | Participants are expected to have a basic knowledge of macroeconomics and an English proficiency sufficient for engaging with academic and professional literature.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                  |                               |
| Assessment methods and criteria | Subject passing criteria                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Passing threshold                                                                                                                                                                                                                                                                                | Percentage of the final grade |
|                                 | Assessment project                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 51.0%                                                                                                                                                                                                                                                                                            | 40.0%                         |
|                                 | Exam                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 51.0%                                                                                                                                                                                                                                                                                            | 60.0%                         |
| Recommended reading             | Basic literature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <p>OECD/IEA (2023). World Energy Outlook 2023. International Energy Agency.<br/> IRENA (2023). Renewable Power Generation Costs in 2022. International Renewable Energy Agency.<br/> European Commission (2023). Energy Union and Climate Action: National Energy and Climate Plans (NECPs).</p> |                               |
|                                 | Supplementary literature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <p>OECD/IEA (2023). World Energy Outlook 2023. International Energy Agency.<br/> IRENA (2023). Renewable Power Generation Costs in 2022. International Renewable Energy Agency.<br/> European Commission (2023). Energy Union and Climate Action: National Energy and Climate Plans (NECPs).</p> |                               |
|                                 | eResources addresses                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                  |                               |

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| Example issues/<br>example questions/<br>tasks being completed | <p>Climate change as a challenge for energy policy review of scientific evidence and IPCC scenarios.</p> <p>Renewable energy technologies photovoltaics, wind power, biogas, hydropower, and others.</p> <p>The energy mix in Poland and the European Union structural analysis, trends, and climate targets.</p> <p>Concepts of marginal cost, externalities, and efficiency in the context of the energy sector.</p> <p>Energy security indicators, strategies, and threats in an international context.</p> <p>Just energy transition infrastructure and public policy for regions dependent on fossil fuels.</p> <p>Introduction to the LCOE indicator and comparative analysis of different energy sources based on LCOE.</p> <p>Mechanisms of social acceptance and conflicts of interest in renewable energy investments, including an introduction to NIMBY effect analysis.</p> <p>Offshore wind energy technologies foundations, turbines, logistics, and operational challenges.</p> <p>Global trends in renewable energy development case studies from Europe, Asia, and North America.</p> <p>The impact of renewable energy development on employment and economic growth data analysis and public policy overview.</p> |
| Work placement                                                 | Not applicable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

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