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THE INTERDISCIPLINARY NATURE OF GREEN ENERGY TERMINOLOGY AND THE FACTORS CONTRIBUTING TO ITS FORMATION

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Annotation: This article examines the terminology of green energy, its interdisciplinary nature, and the factors influencing its formation. Green energy is a rapidly developing field at the intersection of economics, ecology, and politics. Terms such as *solar panels, wind turbines, hydrogen fuel, net zero,* and *carbon neutrality* have become internationally widespread, largely through English and global climate and energy documents. The study emphasizes the importance of clear and consistent green energy terminology for addressing climate change and promoting long-term environmental sustainability.

Keywords: green energy, terminology, cognitive linguistics, semantics, renewable energy, environmental terms, concept, translation, English, Uzbek.

Green energy is an important area in the global energy system, and this term includes energy sources based on natural resources. The term green energy is often used synonymously with words such as renewable or *clean* energy. Dictionaries define it as a method of generating energy without harming people or nature. According to *the Cambridge* dictionary, the word *green energy refers to energy that is obtained from* natural resources such as wind, water and sun and serves to preserve the ecological environment. In the United States, green energy consumption is based on environmental protection, and resources are obtained from renewable sources. The popular science article *Inspire Clean Energy* refers to this term as energy from renewable sources, emphasizing that such energy does not emit exhaust gases, as a result, there is almost no environmental damage.

According to the analysis, green energy is energy obtained from natural resources, which indicates that there are differences between renewable energy and green energy. To fully understand these differences, it is necessary to pay attention to the history of the formation of terms. In the process of using energy sources, there is a need for a clear expression of terminology to combat short-term climate change and ensure long-term environmental sustainability. Therefore, it is an important scientific task to consistently study the concept of green energy, indicate its main sources, and form a scientific approach to the origin of terms.

The sign that makes the field interdisciplinary is its object. Green energy covers the processes of converting solar radiation, wind flow, water movement and chemical energy in biomass into electrical energy, that is, it is related to physics and energy engineering. At the same time, it is closely related to ecology through issues of atmospheric composition, climate change and impact on ecosystems, and to economics, legislation, national strategy and international obligations through issues of price, investment, tariffs and carbon trading, and to law and political science through issues of law. As a result, one concept manifests itself in different aspects in the minds of specialists in different fields. P. Faber calls this phenomenon conceptual multidimensionality and includes precisely the terms of the

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environmental field among the most multidimensional units. In this respect, green energy terms serve as a typical example of being located at the intersection points of interdisciplinary fields.

The vocabulary of green energy belongs to the sphere of language for special purposes, that is, technical language. Technical language is not a system completely separated from the general literary language, but rather its specialized layer, striving for clarity and consistency. There is a constant exchange between technical language and general language: a word in general language acquires a technical meaning and becomes a term, and a term, having entered wide use, undergoes determinologization, that is, partial loss of terminologicality. This process is especially intense in the field of green energy, since units such as *carbon footprint* or *green energy* are used simultaneously in scientific texts, in everyday speech, and in advertising language. This mobility makes it difficult to study technical vocabulary from a purely terminological point of view and requires us to consider the term in conjunction with its social life.

Given that green energy terminology is a rapidly developing field from a linguistic point of view, the article prepared by Laura Mrhar, a researcher at the University of Ljubljana, presents the results of a study of green energy terms in the Slovenian language. According to the author, due to the rapid development of the field, terms are often borrowed from English, and new concepts emerging as a result of globalization are quickly entering the language. The article analyzes more than 300 terms, some of which are borrowed from ancient Greek and Latin, while modern ones are mainly formed in English. The article provides vivid examples of word combinations such as “eco-auditor” and shows that the prefix “eco-” in them consists of parts such as the Greek “oikos” (“house”) and the Latin “auditor”. The study pays special attention to short-term and long-term borrowings in the process of lexical acquisition, dividing them into types such as hybrid words and semantic borrowings. The article states that English terms for new concepts are adopted directly or through translation, which requires a balance between national terminology standards and international adaptation.

There are significant differences in the terminology used in the energy sector in different languages. The TWI article highlights the difference between green energy and renewable energy, noting that green energy refers to energy that is naturally renewable and does not cause environmental pollution, while renewable energy sources can be renewed, but some of them (*such as burning biomass*) can release carbon emissions into the atmosphere. *The Valda Energy* blog also explains this difference, noting that while renewable energy sources can be renewed continuously, their production processes are not always environmentally friendly. The term green energy is used for sources with the least environmental impact. *Huawei Digital Power* notes that green energy is also referred to as *clean energy*, and that this term is used to refer to resources that emit minimal or no harmful gases and are easily renewable. It is also necessary to consider the entire life cycle of the energy when determining which energy source is truly green. Academic sources have highlighted the importance of government policies and economic incentives in the transition to renewable energy. The expansion of renewable energy has significant global health, economic growth, and climate benefits. However, it is also important to acknowledge that not all renewable energy is green.

The study of green energy terminology is at the intersection of science, linguistics, and practical policy, and plays an important role in achieving sustainable development goals. As scientific sources show, green energy is derived from natural resources and does not emit harmful gases. It is part of the concept of renewable energy, but not every renewable resource can be called green.

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The issue of the boundary between the terms that represent the core concept of the field is of particular interest. Although the terms alternative energy, renewable energy, clean energy, and green energy are often used interchangeably, they differ in their cognitive emphasis. Alternative energy emphasizes the contrast with conventional fuels, renewable energy emphasizes the natural renewal of the source, clean energy emphasizes the non-polluting nature, and green energy emphasizes the general environmental acceptability. Thus, the same reality is named from four different cognitive angles, and these names are not entirely equivalent. For example, large-scale hydropower, although renewable, is sometimes excluded from the clean or green category due to its impact on aquatic ecosystems, and nuclear power, although low-carbon, is not included in the renewable category. These subtle differences indicate the need to consider their intrinsic semantic emphasis when studying industry terms.

In the analysis of the industry lexicon, the distinction between the concepts of term, nomen and professional word is also of methodological importance. While a term is a unit that is systematically linked to a specific concept and is defined, a nomen is the name of a single object or product, and a professional word is an informal unit that arises in oral communication. In the field of green energy, these three layers coexist: the term photovoltaic converter is a term, the commercial name of a specific solar panel model is a nomen, and simplified expressions such as sunny or windy in the speech of specialists are considered professional words. The main attention in the study is paid to the terminological layer, but it is taken into account that the other two layers have a constant influence on the terminological system.

When analyzing the linguistic structure of green energy terms, the difference in the term formation models of the two languages is clearly visible. In English, industry terms are formed mainly through word addition and attributive compounding, that is, several roots are placed side by side to express a single concept, for example, in compounds such as offshore wind farm or photovoltaic module. In Uzbek, these concepts are expressed through adverbial addition and isophagy, that is, through the relationship of focus and determination, as a result of which a compact English compound often turns into a longer descriptive compound in Uzbek. This typological difference affects the compactness of the term and increases the share of multi-word terms in Uzbek, which requires special attention to the criterion of convenience of the term in terminological standardization.

The role of international standardization in regulating the terminological system is also noteworthy. International organizations for the standardization of terminology develop principles for the creation and recording of terms, and national standards adapt these principles to the local language. In the field of green energy, many terms are first consolidated in international standards and reports, and then transferred to national languages. This process leads to the stabilization of the term, on the one hand, and the emergence of variants on the national level, on the other hand, because there may be several ways to express a standard term in the national language. Thus, although standardization is a force regulating the terminological system, it cannot completely eliminate variability.

The boundaries of green energy terminology overlap with neighboring sectoral terminologies. It intersects with climate change terminology (emissions, carbon neutrality, climate adaptation) on the one hand, with environmental terminology (sustainability, ecosystem, resource efficiency) on the other, and with energy economics terminology (tariff, investment, cost) on the third. In these intersections, many terms are common, and it is difficult to determine to which sector they fully belong. For example, carbon neutrality occupies a central place in both climate policy and energy documents. This

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requires that green energy terminology be viewed not as a closed system, but as a field in open communication with neighboring fields, and that its analysis also takes into account the impact of bordering sectors.

In Uzbek linguistics, the issues of terminology and terminological systems have a significant tradition. R. Doniyorov, having specially studied Uzbek scientific and technical terminology, put forward the idea of dividing terms into thematic groups and studying the terminological system as a holistic phenomenon. A. Hojiyev, having clarified the issue of the term and its national equivalent, as well as the area of the term concept, compiled an explanatory dictionary of linguistic terms and paid attention to the national background of term formation. H. Dadaboyev conducted generalizing research on the historical formation and modern state of Uzbek terminology. In the works of E. Begmatov, the term was analyzed as a special layer of lexical content, from the point of view of terminological norms and criteria for selecting terms. This tradition provides a solid basis for regulating the sectoral lexicon, but it is mainly onomasiological and normative in nature, relegating the analysis of the cognitive structure of the term to secondary place.

This tradition emphasizes the standardization of the sectoral lexicon, but it limits the analysis of the cognitive and communicative aspects of terms. In studying a new and metaphorically loaded field like green energy, the need for new theoretical tools that overcome this limitation arises. Here, the continuity between the structural linguistic tradition and the cognitive approach is also noticeable: while structural analysis, founded by A. Nurmonov, teaches the study of language units through relationships within the system, the cognitive approach seeks to reveal the mechanisms of thought behind these relationships. The combination of the two traditions allows us to analyze green energy terms both systematically and substantively.

Summarizing the factors discussed above, the following table presents the main forces shaping green energy terminology and their terminological consequences.

Factors shaping green energy terminology

Factor group	Content	Term result
Scientific and technological	Creation of new devices, processes and materials	photoelectric converter, energy storage system, fuel cell
Ecological-climate discourse	The need to assess the impact of human activity on nature	carbon footprint, carbon sink, emissions, sustainability
Political-institutional	Codification in international agreements and national strategies	net zero, just transition, nationally determined contribution
Media and commercial speech	Simplification of concepts and emotional coloring	green energy, clean technology, greenwashing
Globalization, English	Mastering a ready-made conceptual model	decarbonization, smart-grid, offshore
Russian language mediation (in Uzbek)	Access to basic terms through secondary sources	energy, power plant, generator, tariff

As the table shows, the terminology of green energy does not come from a single source, but from several fields of force, which conflict and complement each other. This is precisely why it cannot

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be fully explained from a purely standardizing perspective, nor from a purely linguistic perspective. The phenomena of metaphoricity, evaluativeness, multidimensionality and interlingual interaction in the sectoral lexicon require an approach that interprets the term as a complex entity at the intersection of knowledge, language and communication.

In terms of terminology, the global scientific community should continue to develop multilingual dictionaries and standards to ensure mutual understanding. Future research could also examine the impact of terminology on society, its role in shaping energy policy, and how terminology evolves as new technologies emerge. Clear and logical terminology can contribute to sustainable economic development, environmental protection, and international cooperation.

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