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ALTERNATIVE ENERGY METAPHORS – A BACKGROUND TO ENGINEERING ENGLISH VOCABULARY

Summary: This paper aims at examining the understanding of the concept of alternative energy among the speakers of English, working within the theoretical framework of Conceptual Metaphor Theory. The data for the analysis include a corpus of articles compiled from the trade magazines from the field of alternative energy, published in English. The primary purpose of the analysis is to identify the conceptual metaphors underlying the view of alternative energy and thus attempt to improve and facilitate the vocabulary teaching for the classes of Engineering English. The methodology which is applied in the research involves the techniques suggested by Lakoff (1987:380-381) and Knowles and Moon (2006:123-4) as well as the procedure of Pragglejaz Group (2007:3-39). The analysis points at the existence of three conceptual metaphors. In the conclusion we present the pedagogical implications and the potential aspects for further research.

Key words*: alternative energy, conceptual metaphors, English, vocabulary teaching*

1.Introduction

Due to the ruthless exploitation of fossil fuels, the point is reached when it is obvious that the reserves of these conventional energy sources are being depleted without a possibility of their sooner replenishment. Such a situation made the search for the alternative sources absolutely necessary. Thus, the concept of alternative energy has been accustomed for some time and nowadays it becomes ever more popular. Still, we don't know how this concept is structured. According to the Report of *Renewable Energy Policy Network for the 21st century*[1] (REN21) the concept of transition to alternative energy marked a jubilee, the first decade (2004-2014), a decade of excellence and progress, a decade which brought the success beyond all expectations in terms of the widespread acceptance and utilization of alternative energy. This report draws attention to the considerable change of the global perception of alternative energy. Namely, only in the past ten years was the potential of the

1 REN21 is the global renewable energy policy multi-stakeholder network, an international non-profit association and is based at the United Nations Environment Programme (UNEP) in Paris, France. It brings together governments, non-governmental organisations, research and academic institutions, international organisations and industry to learn from one another and build on successes that advance renewable energy. http://www.ren21.net/about-ren21/about-us/

alternative energy acknowledged, but "large-scale deployment still had to be demonstrated" (REN21, 2014:5). Continual advances in alternative energy technologies proved this potential. Today, renewable energy technologies are viewed as tools for improving energy security and air quality, inciting economic development and decreasing costs.

The transition from the conventional energy to the alternative was set in motion in the past decade, and a promising future is predicted to it by REN21 experts. From this REN21 report we can draw the following conclusion: the understanding of alternative energy altered through years and it is still changing. For instance, the term alternative is very frequently replaced with the term renewable, that is, they are being used interchangeably, but with the tendency of the latter term to prevail. The reason for this situation lies in the fact that, when the idea of finding new energy sources first appeared, the focus was on the nature of those sources as different and alternative to the existing ones. As the concept itself was encountered with acceptance and interest, the attention was focused specifically on the ability of such sources to renew themselves naturally and be inexhaustible. For the purposes of this research we will consider these terms to be interchangeable and signifying the same concept.

This concept is becoming ever more familiar, not only among the specialists from the energy industry, but among the laypeople as well, for the obvious reasons. Yet, there is no published research on how exactly alternative energy is conceptualised. Consequently, it seems viable to approach this problem from the perspective of Conceptual Metaphor Theory (CMT) and analyse the conceptual metaphors that structure our thinking about the alternative energy with the ultimate goal of applying the results of that analysis in the improvement of vocabulary teaching for the classes of Engineering English. In the following subsection, the theoretical grounds for the research will be provided. In the second section data and method of analysis are presented, the third section provides the results of the analysis, followed by the discussion in the fourth section. In conclusion, some pedagogical implications will be proposed along with the potential aspects for further research.

2.Theoretical framework

Following the ideas of Lakoff and Johnson (1980), Lakoff (1987, 2006) and Ungerer and Schmid (2006:117-120) we approach metaphor as a cognitive instrument helping us to construe new concepts. Metaphors structure our perceptions, thinking, actions and they are manifested in language. According to Lakoff (2006:189-194), conceptual metaphor is a kind of relationship between two experiential domains, which involves mapping of specific properties from the source domain which is usually more tangible to a more abstract target domain. It is conventionally represented as TARGET DOMAIN IS SOURCE DOMAIN. These mappings of properties are unidirectional and partial because we understand target partially as a source; one part of the source is projected on one part of the target. When they are activated, we project inference patterns and knowledge about the source onto target inference patterns. What will map from the source onto the target is determined by the invariance principle (Lakoff 2006:199-200, Kövecses 2010: 130-132). This principle limits the fixed correspondences so that the inherent structure of the target domain cannot be infringed by the mapping. By means of mapping only some aspects of target domain are highlighted, while others are necessarily hidden. For this reason, various metaphors are required in order to understand one conceptual domain. As Lakoff

and Johnson (1980:89) explain one metaphor is not sufficient to provide consistent and complete understanding of target domain and various source domains that structure one target domain comprise a coherent system. Conceptual metaphors that Lakoff and Johnson (1980:5-6) describe are motivated by our most basic physical experience and cultural knowledge. They are conventional, deeply entrenched and relied upon by people automatically for their everyday communication needs. Their manifestations are present in everyday language in the form of conventionalised metaphorical linguistic expressions, but sometimes they can also be realised in the more creative and novel form.

In their paper *Intuitive Ontologies for Energy in Physics* (Scherr, Close and McKagan 2012:344-346) established that conceptual domain of energy in physics is represented by means of substance, stimulus and vertical position metaphors. They studied the language used in physics textbooks and the audio-video material documenting the language that students used in their classroom activities when they discussed the subject of energy. All metaphors identified in this study contribute equally to the understanding of energy, but the conceptualisation of energy as substance is especially promoted due to its productivity. Their study showed that in this conceptualisation the following aspects of energy are included: conservation, presence in the objects, transfer and flow. Their results were specially emphasised in the training of physics teachers, who were enabled to identify metaphors in the speech of their students and then help them to better understand the subject matter.

Lancor (2014:1245-6) uses metaphor theory to examine the understanding of energy in chemistry, biology and physics and notices that different conceptions of energy in these fields significantly decelerate the learning process. She established that energy is represented through six different substance metaphors. It can be quantified, can flow, can be transferred, can be an ingredient, can change form, can be lost, can be a product and can be stored. These results were based on the analysis of language used in textbooks and science education literature.

3.Materials and Method

For the purposes of this research a corpus of articles was compiled, comprising about 106,000 words in 136 articles, written in English and published in the online trade magazines concerned with the subject matter of alternative energy. The articles were taken from the following magazines: *Alternative Energy Magazine, Renewable Energy World, Renewable Energy Focus, Renewable Energy Magazine, Solar Industry Magazine, Solar Power World*, *Wind Systems Magazine, Wind Energy Update, Tidal Today, Energy Harvesting Journal and Sun & Wind Energy.*

The intended readership of these magazines dealing with the news from the energy industry is engineers, executives, researchers, laypeople, etc. Thus, we could expect to encounter different perspectives and both the expert and layperson language in these articles.

The articles were collected for the corpus from the archives on the websites of the magazines, by means of key word search. Namely, the key words were typed into the search box and then from the rendered results the articles were chosen randomly. In many textbooks about alternative energy the expressions *to harvest energy* and *to harness power* are frequently encountered. The same collocations are found in the newer editions of dictionaries when defining alternative energy. Thus, by intuition, we selected key words

related to fields of agriculture and animals (*plant*, *seed*, *plough*, *grow, harvest, crops, store, harness, catch, capture)*.

The method that is applied in the corpus analysis involves two stages. Firstly, we deployed the procedure proposed by Lakoff (1987: 380-381), Knowles and Moon (2006:123) and started the analysis by checking the dictionary and thesaurus entries (*Longman Dictionary of Contemporary English 5th Edition, The Free Dictionary, Roget Thesaurus)* related to the target concept of ALTERNATIVE ENERGY and looking for potential correspondences with other experiential domains.

Then, we continued following the suggestion by Knowles and Moon (2006:124) and applied the same procedure on the source domains of AGRICULTURE, WILD ANIMALS and SUBSTANCE and looked for their possible correspondences with the domain of ALTERNATIVE ENERGY. The source domain of SUBSTANCE was selected because the findings of Lancor and Scherr et al. indicated that ontological metaphor ENERGY IS SUBSTANCE is very productive in the view of energy and very likely to surface in the language used to describe alternative energy. The next step consisted in the manual detection for the pertaining words and phrases from these domains in the corpus. Such linguistic expressions found in the corpus were examined for the possibility of their being the manifestations of conceptual metaphors.

The second stage included the application of Pragglejaz Group MIP (2007:3) in order to assess the results obtained in the first stage. The MIP was modified in the sense that steps 3 and 4 were applied only on those sentences where the existence of metaphorical linguistic expressions was established in the first stage.

4. Results and Discussion

After searching in 136 articles, about 1,271 metaphorical expressions were found. Our analysis of the corpus indicated the existence of three conceptual metaphors by which these metaphorical expressions describing alternative energy in English are motivated. As it is presented in ***Figure 1***, applying the methodology described in the previous section conceptual metaphors ALTERNATIVE ENERGY IS CROP, ALTERNATIVE ENERGY IS SUBSTANCE and ALTERNATIVE ENERGY IS WILD ANIMAL were detected.

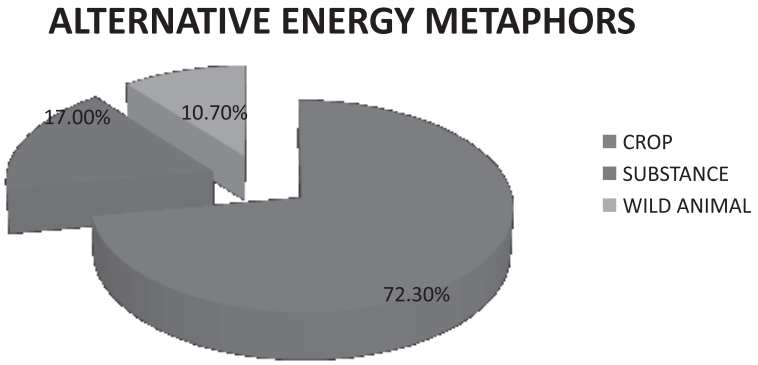

Figure 1

The source domain of CROPS was the most productive, with 919 linguistic realisations in the corpus, while the mappings from the domain of SUBSTANCE and WILD ANIMALS were manifested in 216 and 136 linguistic metaphors respectively. In the ***Table 1*** below the findings concerning the frequency of particular expressions pertaining to the established source domains in the corpus are provided.

Word	**harvest**	**gather**	**collect**	**yield**	**field**	**collector**	**farm**	**storage**	**harness**	**trap**	**tap**	**capture**	**produce**	**lost**
Frequency	156	2	77	119	35	79	235	104	51	17	11	57	101	11

Table 1

The field of alternative energy is developing and changing, as well as the perspective that people have about it. The nature of sun, wind, tides, etc. as energy sources in comparison to coal, oil or natural gas was the reason to expect the conceptualisation of alternative energy to be different and creative because of its novelty for the general public. Also, the impact of new technologies in this field creates the need for development of new concepts and pertaining terminology. According to fundamental postulates of CMT (Lakoff and Johnson 1980:5, Kövecses 2010:7) such a situation demands the utilization of knowledge from the more familiar experiential domains.

The results that our analysis rendered reveal that there are two structural metaphors and one ontological metaphor that structure the grasping of alternative energy by English speakers. ALTERNATIVE ENERGY IS CROP is well developed, but its realisations are conventional. In *Encyclopaedia of Food and Culture*[2] harvesting is defined as "the act of removing a crop from where it was growing and moving it to a more secure location for processing, consumption, or storage." A demand and an adequate price are a prerequisite for the growers to produce, harvest, market or store the crop. Crop may sometimes be left in the field. As the following examples prove there are many correspondences between energy and crops. In this corpus we did not find anything that could be considered as a correspondence to maturity of crops, because these natural energy sources are always available. The tools and machines that are used in harvesting crops have their correspondence in various collectors and harvesters conceptualised mostly by means of personification.

(1) Solar PV systems based on micro-inverters *harvest* from 5 to 20% more *energy* over the life of the system, compared to traditional string inverter based systems.

(2) Initially, the intention is to generate 3,000 megawatts of electricity, the government's long-term objective being *to harvest 6,000 megawatts* from offshore *wind farms* by 2020.

2 http://www.encyclopedia.com/topic/Harvesting.aspx

(3) Their ability *to harvest stronger winds* higher up in the air gives wind drones the potential to provide power where it is needed irrespective of the existing wind resource.
(4) They variously *harvest heat, vibration, strain, solar and other ambient energy*, increasingly employing several modes in one device to reduce or eliminate battery use.
(5) The device his team has developed, essentially a thin, mouldable sheet of small antennas called nantenna, *can harvest the heat* from industrial processes and convert it into usable electricity.
(6) By providing a larger area for *gathering light*, the technique would maximize the amount of *energy produced* from strong sunlight, as well as generate respectable power levels even in weak light.
(7) The *light collectors* on the surface of the 3-D cell are engineered *to gather light* and guide it into the 3-dimensional structure.
(8) CSP systems have the additional advantage that *the energy they collect* is thermal and thus *easy to store for later use* when *energy demand* is high or the sun is not shining
(9) Customers who install the *storage* system will be able to bank any excess energy generated by their solar panels and *store* it for future use, including at night, during peak pricing hours or when there is a power outage.
(10) For some time now, 100 *collectors* with a total *thermal output* of 150 kW *have been producing* more than half of the domestic hot water needs at the Novotel Bengaluru Techpark in the southern Indian city of Bangalore.
(11) *The heat* that is *produced is stored* in a latent *heat storage* system based on polyethylene that was developed at the University of Karlsruhe.
(12) In addition, a seasonal *heat storage reservoir* filled with 150,000 m^3 of water will be built at a later date *to store solar heat*, so that it can be used during the winter months
(13) The breakthrough could lead to a 35% increase in *light-harvesting yield* in cells for photovoltaics and solar fuels
(14) The team tackled dozens of similar seemingly minor issues, resulting in *higher energy yields* that translate into increased revenue for each *wind farm* and the company.
(15) This information is crucial for developers of *wind farms*. They use the data to enable them to calculate as accurately as possible *the anticipated yield* from *the planned wind farms* in the Borssele *wind farm* zone.
(16) Multiple islands connected together make up a *solar field* of 50 MW or more, *producing* enough electricity for 30,000 people.
(17) One to two percent *power yield gains* realized through more efficient inverter and solar module technology have made a tremendous impact on the photovoltaic market;

ALTERNATIVE ENERGY IS SUBSTANCE is exemplified as follows:

(18) Built into the wings are 17,248 ultra-efficient solar cells that *transfer solar energy* to four electrical motors that power the plane's propellers.
(19) *The produced energy is transferred* to the electrical grid via a long tether leading down to the ground or to buoys out at sea.

(20) In the United States, more than half of the energy we burn each year *gets lost* as heat instead of being put to use with most of the *energy going out* the exhaust pipe of a car or out the smokestack of a power plant.
(21) *Storing the sun's heat* in chemical form — rather than converting it to electricity or *storing* the heat itself in a heavily insulated container — has significant advantages, since in principle the chemical material *can be stored* for long periods of time without *losing* any of its *stored* energy

Similar to other ontological metaphors which enable us to reason about and refer to, to categorise and quantify our experiences, this metaphor also describes alternative energy coherently with the CROP metaphor in aspects of producing, storing and losing. Yet, clearly, the view of alternative energy as a crop is richer and more delineated.

Metaphor ALTERNATIVE ENERGY IS WILD ANIMAL is manifested through the following expressions:

(22) ...(I)t is *a trap* – one that *will capture the heat of the day* or the *cool of the night***,** *hold onto it* and *then slowly release* the thermal energy to help warm or cool the building.
(23) Nonetheless, in the U.K. alone, there is some 15-20 GW of *tidal energy* that could be *captured*
(24) *High-energy winds* are at altitudes high above us, not just a few hundred feet where they *can be captured* by tower-based turbine rotors.
(25) Solar *Trackers* Help *Capture 22% More Energ*y
(26) This novel structure leverages optical *light trapping* mechanisms to increase the current output of III-V thin-film solar cells.
(27) When people think of "wind power" they often picture *huge wind farms* with towers dotting the horizon, but there are other means of *harnessing the power of the wind* as well
(28) Most technologies for *harnessing the sun's energy capture the light itself,* which is turned into electricity using photovoltaic materials.

Our corpus provided examples of understanding alternative energy as a wild animal that is being tracked and then caught in the trap. Another image is of the animal that is caught and harnessed so that its power can be used. Not many details are given about the aspect of trappers or hunters, but as we know, in the experiential domain of wild animals, trappers and trackers are people, in the domain of alternative energy they are devices or machines. The examples of linguistic metaphors that we examined are conventional.

5. Pedagogical implications

Relying upon the ideas summarised in Kövecses (2010:239-242) and Boers and Lindstromberg (2008:21-28) we can conclude that the findings of our research have some implications for vocabulary teaching to ESP learners from an Engineering background. As these authors suggest, in order to accelerate their uptake of vocabulary and deepen the understanding of target language the students' awareness of metaphors has to be raised. It can be accomplished by presenting the prototypical meaning of a polysemous word first

and then showing or eliciting how the extensions of the central meaning are motivated. By drawing the attention of students to particular lexical items and then stimulating the retention in the long term memory, we create better conditions for students to acquire vocabulary easier. Stimulation involves mental operations that students perform in relation to such lexical items and that demand more cognitive effort. The most effective way of elaborating the memory of lexical units, as it is proposed by Kövecses (2010:239), is through dual coding presentation. Boers (2000:140-142) who tested this view in the case of economic discourse, is in favour of enhancing the metaphorical awareness of language learners as a channel for acquisition and retention of figurative expressions. He proposes the simplest means to this goal – drawing the attention of students to the source domain or to the origin of unfamiliar figurative expressions. Cortés de los Rios (2007:94-95) deals with teaching metaphors and vocabulary in financial advertising and proposes a linguistic analysis between Spanish and English as a procedure of raising the metaphorical awareness of students and acquiring vocabulary. She also includes the technique of grouping the target vocabulary by means of particular orientational metaphors. Fernández and Remondino (2013:625) support the development of the metaphorical competence as a more stimulating approach and suggest various activities to teach students to recognise and interpret metaphors in scientific texts. In our case, dual coding is necessary to present successfully the connection between domains of CROPS, SUBSTANCE and WILD ANIMALS with the domain of ALTERNATIVE ENERGY. The unified visual and linguistic representation will strongly indicate the correspondences between these domains and then the students will be able to recognise and understand the metaphorical motivation for the extensions of central meaning. Then, a comparison to pertaining vocabulary in the native language should be made in order to establish conceptual and linguistic similarities and differences. Next, it is necessary to offer various activities that demand cognitive effort and will help students to retain the targeted vocabulary in their memory. With the goal of helping ESP learners to understand specific engineering lexis here presented are the ideas for vocabulary exercises which can be used for presentation, practice and consolidation.

A) Find the correspondences between things shown in the Video1 and Video2 / on the pictures a) and b). Write them down in the table below. A video material or pictures of harvesting, fields, harvesters, crops, wild horses, harnessed horses, etc. versus solar modules and trackers, wind turbines, etc. supported by linguistic representation should be used here to introduce the literal meaning (the prototype) and the motivation for the targeted extensions of meaning. It is geared toward the elicitation and students are expected to provide the mappings for metaphors ALTERNATIVE ENERGY IS CROP and ALTERNATIVE ENERGY IS WILD ANIMAL.

B) Read the definition of HARVESTING **and then use the words written in bold to complete the sentences below.**

Harvesting is the act of removing a crop from where it was growing and moving it to a more secure location for processing, consumption, or **storage**. Some root crops and tree fruit can be left in the **field** or orchard and harvested as needed, but most crops reach a period of maximum quality—that is, they ripen or mature—and will deteriorate if left exposed to the elements …Before the crop can be harvested, the grower must be sure that there is a **demand** for the crop and that the price is sufficient to make **harvesting** the crop profitable. If the price is less than adequate to cover the costs of production, harvesting,

and marketing, growers are faced with the difficult decision whether t**o harvest** and **store** the crop, to wait for a better market, or to cut their losses and leave the crop in the field.

(Source: *Encyclopaedia of Food and Culture, http://www.encyclopedia.com/topic/Harvesting.aspx)*

Solar energy _____ is the method of choice to power a system that consumes several mW using a reasonably small module. Solar panels and energy_____elements (batteries) have different voltage-current characteristics, which must be matched to each other as well as the energy requirements of the system to maximize _____ efficiency.

Actually, multiple islands connected together make up that solar _____.
Thermal energy is easy to _____ for later use when energy _____ is high.
New technology will help customers to _____ more energy from their panels.

Solutions: 1. harvesting, 2. storage; 3. harvesting; 4. field; 5. store; 6. demand; 7. harvest

C) Unscramble. (C-crop, A-animal)

1.Solar lefid (C) is a larger area for gringetha (A) light.
2.Engineers found a way to ctrapeu (A) more light energy.
3.This system could snesrah (A) the energy of 1000 suns.

Solutions: 1. field, gathering; 2. capture; 3. harness

D) What are the source domains of the italicized metaphorical expressions in the following sentences?

1) By using cutting-edge technology you can *harvest* the power of wind ever more efficiently. _____
2) The towers are expected to *produce* nearly 400,000 MWh of electricity per year. _____
3) There are three main types of energy that can be *captured* from the space. _____
4) The coloured window panes can *harness* energy._____
5) Larger wind turbines will increase *yields*. _____

Solutions: 1) CROP; 2) CROP; 3) ANIMAL; 4) ANIMAL; 5) CROP
(Adapted from Z. Kövecses (2010), *Metaphor. A Practical Introduction*, p. 30)

E) Read this trade magazine article and find the words and expressions related to the themes mentioned in the table below. (Authentic articles should be used in this case.)

CROPS	ANIMALS	SUBSTANCE

6. Conclusion

In this paper an attempt has been made to reveal the conceptual structures underpinning the understanding of alternative energy in the English language, by examining a corpus of trade magazine articles, from the perspective of the CMT. The analysis established the existence of three conceptual metaphors, with ALTERNATIVE ENERGY IS CROP being the most exploited and delineated and manifested by means of conventional linguistic expressions. The systematicity and the level of coherence with other two metaphors are evidenced. It was shown that CROPS, WILD ANIMALS and SUBSTANCE domains, as more tangible and related to physical experience, are exploited on the part of speakers of English to construe the concept of ALTERNATIVE ENERGY. They highlight some aspects of ALTERNATIVE ENERGY and hide others. The main objective of our research was to try to find a way or tool to facilitate teaching of ESP lexis for engineering students. Familiarising them with the metaphorical motivation of certain words and expressions combined with the extensive amount of exercises that stimulate cognitive effort, has been proved to a great extent as a successful way of fostering vocabulary acquisition and recall. We offer some ideas for vocabulary activities that represent a step in the raising of students' metaphor awareness and provide the opportunities to pictorially elucidate and manipulate the targeted vocabulary and retain it in memory. In this research we used as evidence the language of trade magazines which are intended for diverse readership. Thus, the language used in the scientific journals treating the issue of alternative energy seems to be a viable object for further research in order to broaden the findings rendered in this analysis.

Sources of the examples

http://www.sunwindenergy.com/news/enecsys-solar-pv-micro-inverter-becomes-worlds-first-without-electrolytic-capacitors-gain-ul

http://www.sunwindenergy.com/news/green-light-offshore-wind-farms

http://www.windsystemsmag.com/article/detail/992/reaching-new-heights

http://www.energyharvestingjournal.com/articles/2665/energy-harvesting-and-wireless-sensors-ready-for-prime-time

http://www.solarpowerworldonline.com/2011/05/engineer-finds-way-to-capture-more-light-energy/

http://www.solarpowerworldonline.com/2009/11/new-technology-may-eliminate-large-panels/

http://www.altenergymag.com/content.php?post_type=1640

http://www.altenergymag.com/content.php?post_type=1606

http://www.renewableenergymagazine.com/article/sonnenbatterie-and-sungevity-announce-partnership-to-offer-20150430

http://www.sunwindenergy.com/solar-thermal/bosch-builds-large-scale-solar-thermal-plant-india

http://www.sunwindenergy.com/solar-thermal/innovation-award-solar-process-steam

http://www.sunwindenergy.com/solar-thermal/savo-solar-delivers-large-area-collectors-denmark

http://www.solarpowerworldonline.com/2011/02/more-harvest-for-hungry-solar-cells/

http://www.windsystemsmag.com/article/detail/180/maximizing-wind-energy-yield-

http://www.sunwindenergy.com/wind-energy-press-releases/fugro-awarded-contract-to-investigate-wind-farm-sites

http://www.altenergymag.com/news/2012/10/30/dnv-unveils-its-sundy-floating-solar-field-concept-/26901

http://www.sunwindenergy.com/news/tecnosun-solar-usa-introduces-new-innovative-cable-driven-solar-tracking-system

http://www.altenergymag.com/story/2015/03/solar-power-plane-airborne-on-historic-round-the-world-trip/2472/

www.altenergymag.com/article/2008/10/clean-energy-from.../472/

http://www.altenergymag.com/article/2014/12/harvesting-energy-from-heat/1535/

http://www.solarpowerworldonline.com/2011/07/new-way-to-store-sun%E2%80%99s-heat/

http://www.renewableenergyworld.com/articles/2009/06/labyrinth-to-store-energy-in-basement-for-later-use.html

http://www.renewableenergyworld.com/articles/print/volume-17/issue-3/hydropower/harnessing-the-power-of-the-tides.html

www.altenergymag.com/article/2008/10/clean-energy-from.../472/

http://www.solarpowerworldonline.com/2012/07/solar-trackers-help-capture-22-more-energy/

http://www.solarpowerworldonline.com/2015/04/magnolia-solar-awarded-3-u-s-patents-for-flexible-solar-cell-technologies/

http://www.windsystemsmag.com/article/detail/158/structural-adhesives-for-wind-turbines

http://www.renewableenergyworld.com/articles/2011/12/a-novel-way-to-concentrate-suns-heat.html

References

Boers, F. (2000). Enhancing metaphoric awareness in specialised reading, *English for Specific Purposes*, 19/2, 97–195.

Boers, F. and S. Lindstromberg. (2008). *Cognitive Linguistics Approaches to Teaching Vocabulary and Phraseology. (Applications of Cognitive Linguistics)*. Berlin, New York: Mouton de Gruyter.

Cortés de los Rios, E. (2007). The Teaching of Metaphor and Vocabulary Used in Financial Advertising, *The ESPecialist,* Vol.28, 1, 87-113.

Fernández, L.J and L.G. Remondino. (2013). The Use of Metaphors in Scientific Texts in English: A Proposal for Improving Reading Competence, *Sino-US English Teaching,* Vol.10, 8, 621-626.

Knowles, M. and R. Moon. (2006). *Introducing Metaphor*. London: Rutledge.

Kövecses, Z. (2010). *Metaphor: A Practical Introduction.* New York: Oxford University Press.

Lakoff, G. and M. Johnson. (1980). *Metaphors We Live By.* Chicago: Chicago University Press.

Lakoff, G. (1987). *Women, Fire and Dangerous Things*. Chicago and London: University of Chicago Press.

Lakoff, G. (2006). The contemporary theory of metaphor. In: *Cognitive Linguistics: Basic Readings* (D. Geeraerts, ed.), Berlin: Mouton de Gruyter, 185-239.

Lancor, R. (2014). Using Metaphor Theory to Examine Conceptions of Energy in Biology, Chemistry, and Physics. In: *Science and Education*, Vol.23, 6, 1245-1267.

Pragglejaz Group (2007). MIP: A Method for Identifying Metaphorically Used Words in Discourse. *Metaphor and Symbol,* 22(1), 1-39.

REN21(2014). *10 Years Report - The First Decade: 2004-2014.* Paris: REN21, 5. http://www.ren21.net/resources/publications/

Scherr et al. (2012). Intuitive Ontologies for Energy in Physics. *AIP Conference Proceedings*, 2011 Physics Education Research Conference, 1413, 343-346.

Ungerer, F. and H.J. Schmid. (2006). *An Introduction to Cognitive Linguistics, 2nd edition*. Harlow: Pearson Education Limited

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МЕТАФОРЕ АЛТЕРНАТИВНЕ ЕНЕРГИЈЕ У ПОЗАДИНИ ЛЕКСИКЕ ЕНГЛЕСКОГ ЈЕЗИКА ТЕХНИЧКЕ СТРУКЕ

Сажетак: Циљ овог рада је да са аспекта теорије појмовне метафоре проучи разумијевање појма алтернативне енергије међу говорницима енглеског језика. Грађа за анализу укључује корпус чланака прикупљених из стручних часописа из области алтернативне енергије, објављених на енглеском језику. Примарни задатак ове анализе јесте да утврди појмовне метафоре на којима се заснива схватање алтернативне енергије и да се на основу добијених резултата покуша побољшати и олакшати настава лексике из области енглеског као језика техничке струке. У истраживању су примијењене технике које су назначили Lakoff (1987:380-381) и Knowles and Moon (2006:124), те метода Pragglejaz групе (2007:3-39). Анализа указује на постојање три појмовне метафоре. У закључку су представљене педагошке импликације и аспекти могућег даљег истраживања.

Кључне ријечи: алтернативна енергија, концептуалне метафоре, енглески, настава лексике