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Perception of the Cultural Landscape Related to Wind Parks – Generation Y Perspective

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with 5 figures and 4 tables in the text

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Zusammenfassung

Wahrnehmung der Kulturlandschaft in Bezug auf Windparks – die Perspektive der Generation Y

Die Studie analysiert die Wahrnehmung der Kulturlandschaft durch lokale Gemeinschaften im Kontext der Entwicklung der Windenergie und eines Standortes von Windkraftwerken unter besonderer Berücksichtigung von Vertretern der Generation Y im Sinne der 16–34-Jährigen. Zum Ort der Studie wurde die Gemeinde Dąbrowa Chełmińska (LAU-2, Woiwodschaft Kujawien-Pommern [województwo kujawsko-pomorskie], NUTS-2)

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erwählt – ein vorstädtischer Raum, in welchem neben einem der ältesten Windkraftwerke Polens auch moderne Windkraftanlagen situiert wurden. Die Studie wurde mithilfe von Fragebogen und der WEJCHERTschen Methode durchgeführt. Die gegenwärtigen Umgestaltungen des Landschaftsbildes sind eng mit der sozio-ökonomischen Entwicklung dieses Raumes verbunden. Sie betreffen zwar jeden Einwohner, besonders aber die Generation Y. Wenn es um die Bewertung landschaftlicher Prozesse wie Windparks geht, unterscheiden sich die Ansichten Jüngerer und Älterer. Die Vertreter der Generation Y sind mit dem Standort der Windkraftanlagen nicht zufrieden, bezeichnen sie als disharmonische Objekte in der Landschaft, obwohl sie nicht als Dominanten der Landschaft gesehen werden.

Schlagwörter: Kulturlandschaft, Landschaftswahrnehmung, Windenergie, Generation Y

Summary

This study aims to analyse the perception of cultural landscape by local communities, with emphasis on representatives of Generation Y in the sense of people aged between 16 and 34 in the context of the development of wind energy identified through the location of wind-power plants. We have chosen to study the commune of Dąbrowa Chełmińska (LAU-2, Kuyavian-Pomeranian Voivodeship [województwo kujawsko-pomorskie], NUTS-2), a suburban area housing one of the oldest wind-power plants in Poland as well as modern installations. We achieved the aim of this paper by conducting a bipartite study using questionnaire interviews and WEJCHERT's impression-curve method. The analyses we have performed indicate that matters related to cultural landscape engage every resident of the commune, yet primarily the younger generation: Generation Y. This is a social group interested in processes, which are currently underway, especially those regarding innovation and ecological actions. The study shows that the perception of cultural landscape comprising wind-power plants by the local community, including Generation Y, is primarily ambivalent. We are dealing with diverse, sometimes even contrasting opinions, both among young people and the generation of their parents and grandparents. Generation Y gives a more negative assessment of the presence of wind turbines in cultural landscape than the generation of parents and grandparents. It may seem surprising that in the view of the respondents, wind-power plants do not dominate the landscape, although representatives of Generation Y stated that they should be removed as elements disharmonising the landscape.

Keywords: cultural landscape, landscape perception, wind energy, Generation Y

1 Introduction

Recently-constructed anthropogenic objects introduce radical changes to the landscape they are erected in, and often become its main actor – the dominant. This changes the landscape narrative because new large-scale objects dominate nature and existing architecture.

Contemporary landscape transformations are strictly associated with the socio-economic development of a given area because the implementation of modern technologies and different types of investments carries spatial implications, and thus modifies the cultural landscape.

Industrial production is one of the sectors of the economy whose functioning and developments generate largest spatial changes. It also encompasses power generation based on both conventional sources (coal, oil, gas) and the currently expanding renewable energy sources (RES), including wind energy.

This study aims to analyse the perception of cultural landscape by local communities, with particular emphasis on representatives of Generation Y (so-called millennials, which are a population cohort born between 1980 and 2000) in the context of the development of wind energy identified through the location of wind-power plants. In order to reach the study's objective, we need to answer the following questions: (1) How are wind-power plants perceived by local communities, including by representatives of Generation Y? (2) Does the period for which wind-power plants have operated in a given area impact the perception of those facilities by local communities, including representatives of Generation Y? (3) Can energy landscape coexist with cultural landscape, and on what terms?

2 Theoretical background

As a preliminary remark regarding landscape considerations, we should recognise landscape as a certain 'section of space' in the macro perspective.

Similar to space, landscape is a broad and ambiguous term. However, both constructs are inextricably interconnected because it is space that creates landscapes, and therefore landscape may not exist outside space (Richling & Solon 2011; Agnoletti 2014). The notion of landscape was defined in literature relatively long ago: It was present in German as early as in the 8th century. Yet, only in the 18th century the term landscape received a scientific dimension, reflected in geographical studies. It is worth citing the research of Alexander von Humboldt, who started the landscape direction in geography by analysing the natural values and the material and spiritual activity of man within the framework of broadly understood landscape (Kondracki 1976). Just like Paul Vidal de la Blache, he defined landscape as a "comprehensive whole", thus subscribing to the so-called classical trend.

One of the basic criteria for landscape typology is the extent of human intervention in the natural environment. Three main landscape types may be distinguished on the above-mentioned basis: primary, natural and cultural (Buchwald & Engelhard 1975; Nitkiewicz-Jankowska & Jankowski 2010; Myga-Piątek 2014). Primary landscape was created as a result of natural factors without human intervention. This landscape type is of lowest prevalence and highest quality (Nitkiewicz-Jankowska & Jankowski 2010). The second landscape type is natural landscape. It shows certain expressions of primitive human activities related to gathering, hunting or herding. The third landscape type called *cultural landscape* is examined within the movement considering cultural landscapes from the

real, material perspective, represented by Friedrich RATZEL, Carl RITTER and above all Carl SAUER from the Berkeley School of Geography. The notion of cultural landscape developed on the basis of "The Morphology of Landscape", a 1925 paper by Carl SAUER, in which he pointed to the human factor in landscape formation. In line with the definition provided therein, landscape combines two spheres of reality: the physical and existing with the created and transformed (SAUER 1925). This idea was continued in contemporary papers where cultural landscape is understood as a set of diverse spatial forms (natural and anthropogenic) making up the image of the face of the earth (RICHLING & SOLON 2011). It bears the signs of civilisation development and is still subject to anthropogenic transformations; its existence is based on human activity of a supporting nature (SZYMAŃSKA 2008; NITKIEWICZ-JANKOWSKA & JANKOWSKI 2010). We may speak of two subtypes:

- harmonious cultural landscape – activities in the landscape are in line with the character of the natural environment of a given area (e.g., sustainable development of rural areas, rational forest management);
- disharmonious cultural landscape is related to the degradation and devastation of the natural environment, e.g., industrial areas, suburban areas (NITKIEWICZ-JANKOWSKA & JANKOWSKI 2010).

Contemporary research on cultural landscape underlines its multifunctional role (DE GROOT 2006; ANTROP 2006; AGNOLETTI 2014). It is a certain expectation or even a requirement of the modern society of the cultural landscapes to meet different human needs, in accordance with the neo-liberal principle emphasising the utilitarian approach to landscape (KOEN et al. 2017). In accordance with this trend, cultural landscape may be considered also in economic terms, as a good providing tangible material benefits (VOS & MEEKES 1999).

Therefore, if we consider the utilitarian function of cultural landscape, being a set of natural and anthropogenic forms, we should also take into account its transformations resulting from human activity related to the socio-economic development of a given area. The extent of those transformations is highly dependent on the scope and scale of investments. As mentioned before, the largest modifications of cultural landscape occur as a consequence of urbanisation and industrialisation. Landscape is subject to interest from corporations and international companies, which often transform it according to their business plan with little regard to its localness, causing spatial and social conflicts. LOREAU et al. (2003), among others, present an antagonistic approach as they posit that cultural landscape should be protected or even re-naturalised to become as primary as possible, in order to maintain biodiversity, cultural heritage, integrate the social and the cultural with the natural (FARINA 2000; AGNOLETTI 2014). Apart from the degradation and devastation of the natural environment, the erection of large-scale objects poses the largest threat. The emergence of this kind of objects is an inevitable element of the energy generation and distribution processes. In parallel to the production of energy based on conventional sources (coal, oil, gas), there has been a rise in significance of innovative and ecological installations using renewable energy sources (RES), i.e. solar energy, geothermal energy, hydropower, biomass, biogas and wind energy (CHODKOWSKA-MISZCZUK 2014).

When contemplating the issues related to energy generation and the construction of necessary accompanying infrastructure in the context of landscape analyses, it should be emphasised that researchers focus both on the acceptance of investments by local stakeholders (Wolsink 2012), and environmental effects stemming from the location of energy installations and landscape transformations (Frantal & Kunc 2011; Chodkowska-Miszczuk et al. 2016; Pasqualetti 2000, 2011; Pasqualetti et al. 2002). Most fears in discussions regarding potential landscape changes are raised by facilities and installations of above-average size and an unusual shape (for a given area). Wind-power plants are among such installations (Pasqualetti 2000, 2011; Pasqualetti et al. 2002; Braunholtz 2003; Pultowicz 2009; Łucki & Misiak 2010; Olwig 2011 after Delicado et al. 2016). On the one hand, wind-power plants are still a new element in the energy market, especially in Central Europe, including Poland (Frantal & Kunc 2011); on the other they are one of the fastest-developing RES installations worldwide (Chodkowska-Miszczuk et al. 2016). When new energy installations appear, it not only modifies the existing landscape, but also forms an energy landscape, and in the case of the developing renewable energy and proliferating RES installations also a renewable energy landscape (Pasqualetti 2000, 2011; Pasqualetti et al. 2002; Nadaï & Van der Horst 2010). The key issue associated with the emergence of energy landscapes, or more specifically renewable energy landscapes, comes down to the following question: How and to what extent do facilities and installations used for the production and distribution of energy change the structure of the cultural landscape and its perception? This question is most frequently posed in the context of forming the cultural landscape in rural areas where wind-energy installations are located (Wolsink 2012; Pasqualetti et al. 2002). This issue comes within the framework of research on the spatial implications of transformations in the energy sector, also referring to analyses of the formation of cultural space, geographical imaginaries and landscape representations (Calzonetti & Solomon 1985; Solomon & Pasqualetti 2004; Solomon et al. 2004; Zimmerer 2011).

The perception of cultural landscape is an inherent component of those analyses; it is defined as a result of interactions between recipients and their physical and cultural surroundings (Scott 2003; Appleton 1994; Antrop 2005). Landscape perception not only determines the reception and apprehension of landscape, but is also an expression of a specific, subjective link with landscape and its elements. Even the first papers on landscape perception, dating back to the 1960s and 1970s (Neef 1967; Sonnenfeld 1967; Appleton 1975), observed that landscape apprehension depends on its components, prior experiences, and the sociological and cultural conditions of the observer. When contemplating the perception of cultural landscape in the context of the location of wind-power plants, scholars primarily point to the significance of visual changes stemming from the transformation of landscape structure (Badora 2014). It is precisely the material diversity of cultural landscape, also caused by the location of wind-power plants, that generates stimuli and signals, which help describing landscape also in aesthetic terms (Pietrzak 2009), with reference to individual landscape perception (Pasqualetti 2011).

M. Pasqualetti (2011) after Firestone et al. (2015), analysed four different paths of wind-power plant formation (at different project stages), and identified five premises underlying the current discussions regarding the impact of wind-power plants' location on

changes in the structure of cultural landscape and its perception. The first reason is that the physical locations of wind-power facilities are immobile and permanent. The second is landscapes' changelessness. The author further lists those related to the attitudes and behaviour of local communities residing in an area with a wind-power plant: additional costs incurred by the local community related to the location of wind-power plants in a given area; lack of understanding for (solidarity with) the extremely strong and inevitable links between the functioning of societies, socio-economic development and the use of space; and the threat posed by the fact that the presence of wind-power plants constantly reminds people of this interdependence. SHORT (2002) and WARREN et al. (2005) conclude that negative attitudes caused by the situation of wind-power plants in a given locality are often a product of ignorance, disinformation, prejudice, but also fashion. MADLENER & STAGL (2005) as well as POLATIDIS & HARALAMBOPOULOS (2007) stress that social participation covering all stages of the investment process plays a paramount role in mitigating radical emotions, as most fears related to the location of RES facilities, including those using wind energy, are generated at planning stage and decrease as the investment reaches its end (BRAUNHOLTZ 2003).

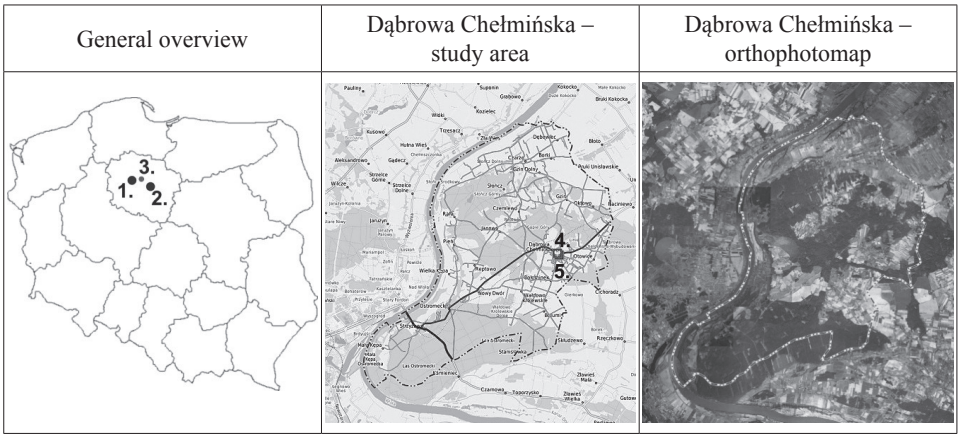
The question of acceptance for wind turbines in the cultural landscape is also associated with a particular psychological process described in 1969 by Elisabeth KÜBLER-ROSS. She distinguished psychological stages related to accepting or getting used to a new situation, which may be transferred to the field of cultural perception with certain modifications (KÜBLER-ROSS 2002). The emergence of a novelty in the landscape in the form of wind turbines engenders denial, the desire to remove the turbines from the landscape, protests, which are accompanied by anger related to the new situation/event. The next stage involves negotiation, the wish to meet halfway, and leads to the final acceptance of the existing state of affairs. Kurt Zadek LEWIN discussed a similar mechanism in his three-step model of change when analysing the organisation of enterprises and applied psychology. Firstly, people affected by changes have to "unfreeze", which means that changes have to be deemed necessary, the second step is change itself, and the final stage is "freezing", i.e. crystallising and supporting the new mindset, which becomes a part of the system (cultural landscape in this case). LEWIN's model is of indisputable value, it indicates the significance of planning change, persuading and informing recipients of its value, as well as reinforcing changes already implemented (LEWIN et al. 1939).

In light of the above, while analysing the impact of wind-power plants on cultural landscape changes, we should consider both physical landscape transformation and socio-cultural factors, or even psychological aspects related to the functioning of landscape users. The groups of cultural landscape users, which require special attention are local communities, indigenous area users, and particularly young people from Generation Y, the so-called millennials. It is a population cohort born between 1980 and 2000, called Generation Y or the millennials (DELBOSC & CURRIE 2013; HOPKINS & STEPHENSON 2014). Members of this group boast extensive use of new technologies and digital media, are well-educated, tolerant, open, and have a good opinion of their own skills and qualifications. Millennials prefer high quality of life. Hence, it seems important to investigate how landscape is perceived by local communities and members of Generation Y, i.e. the generation forming the most dynamic, innovative and creative social group. Moreover, according to MANNHEIM (1996),

a generation is characterised by taking part in the same socio-historical events and having the same life experiences (experience the same cultural setting). In line with this concept, generations are the force shaping society and developing its culture.

3 Study area

We used the rural commune Dąbrowa Chełmińska (LAU-2) to consider the issue of perception of the cultural landscape in relation to the development of wind energy taking account of Generation Y members' opinions. This suburban commune neighbours Bydgoszcz and Toruń, the capitals of the Kuyavian-Pomeranian Voivodeship [województwo kujawsko-pomorskie] (NUTS-2) located in northern Poland (see Fig. 1). The analysed commune has an area of 124.6 sq. km and a population of 8,115, including 4,102 men and 4,013 women. Age structure shows that the local community is relatively young: residents under the age of 16 constitute 18.5% of the whole population, those aged 16–34 – 28%, aged 35–64 – 42.2%, and people aged 65 and older comprise 11.3% of the population (BDL 2015).



Note: 1. Bydgoszcz (co-capital of the Kuyavian-Pomeranian Voivodeship); 2. Toruń (co-capital of the Kuyavian-Pomeranian Voivodeship); 3. Dąbrowa Chełmińska (grey dot) – study area; 4. Location of the old wind-power plant; 5. Location of new wind-power plants

Source: Own work based on http://dabrowachelminska.e-mapa.net/, DoA: 01.05.2017

Fig. 1: Location of the study area in the Kuyavian-Pomeranian Voivodeship and in Poland

The commune selected for the study is an example of the coexistence of different elements of the cultural landscape, including those related to the natural environment, buildings, wind-power plants (one of the oldest in Poland together with modern wind-energy installations), recreational and tourist facilities. Therefore, the Dąbrowa Chełmińska commune is a representative study area well-suited for analysing the perception of

cultural landscape by local communities, with particular emphasis on representatives of Generation Y in relation to the development of wind energy. The discussed area may be an example presenting landscape issues related to the development of wind energy for the whole territory of Poland.

4 Research methods

We achieved the aim of this paper by conducting a bipartite study using questionnaire interviews and WEJCHERT's impression curve method. The study was also supplemented with on-site queries, an interview with local authorities and photographic stocktaking.

In order to learn how the local communities, including members of Generation Y, perceive the cultural landscape, we carried out a questionnaire survey. This paper is based on data collected in June 2016, containing information regarding primarily the residents' attitude towards environmental protection, local landscape, landscape perception in the context of wind-power plants and other anthropogenic elements. In this way, 232 questionnaires were collected; after thorough analysis, 207 of them were accepted as suitable material for further research. The remaining 25 questionnaires were eliminated due to missing data, which was predominantly the result of the specific conditions in which the survey was carried out. The survey subjects were the inhabitants of rural areas, so the majority of them were approached when they were working or commuting. Some of the responders were accompanied by underage children.

We must also stress that surveys in such a society face difficulties related to the level of acceptance for the research. In rural areas the inhabitants tend to show much more reluctance towards the canvassers and to speaking on sensitive matters concerning the society (see NACHMIAS & NACHMIAS 1992; LUTYŃSKI 1994; BABBIE 2004). Such topics include location and presence of wind farms. In contrast, being a responder in a survey and offering disinterested help in social research is much more natural for inhabitants of large cities. Thus the study was based on a non-random sample (increasingly considered an important alternative to random sampling (see REILLY 1990; RITCHIE & CROUCH 2003; DASZKIEWICZ 2012). The non-random sampling was related to the principle of accessibility. Anyhow, the number of interviews was deemed satisfactory due to reaching the saturation point (FRANCIS et al. 2010). It makes it possible for us to draw careful conclusions and generalise the obtained results. The collected raw data were coded and verified with the IBM SPSS software, which was also used for further summary statistics. It must be stressed that methodology-wise, the key element of the study was the division of the responders into two groups: Generation Y – aged 16–34 years (see DELBOSC & CURRIE 2013; HOPKINS & STEPHENSON 2014), which constituted 54.4% of the sample group – and the generation of parents and grandparents, aged 35–64 years, which amounted to 45.6% of the sample group. Such division of the sample group allowed us to compare matters relevant to the topic of this text.

The next step of the research procedure involved analysing and assessing cultural landscape by applying WEJCHERT's impression curve (LITWIN & PIECH 2013). The impression curve method presents graphically the level of aesthetic and emotional sensations of an

observer (The observer was a member of Generation Y from the local community in this case.) who is moving along a space-time continuum. When moving, the observer experiences different emotional states related to the changing cultural landscape. He registers the shifting landscape at intervals, evaluates and records the results of his studies. Despite the subjective experiences and landscape assessments by different observers, we may assume that they have similar reactions to the images they see (for example: landscape). The impression curve is thus an illustration of average impressions. We assessed the landscape using Wejchert's impression-curve method based on the following assumptions:

- Two measurement routes were selected to analyse the area (A–B and C–D).
- Measurement stands are located on average 250 m from one another.
- Landscape assessments were made in each stand for the left-hand side and right-hand side.

The assessment was made on a scale of 1 to 10 (see Table 1) and covered the following cultural landscape parameters (Litwin & Piech 2013):

– level of landscape diversity (1–10 points),
– devastation level (1–10 points),
– composition harmony (1–10 points),

Area attractiveness category (points)	Level of landscape diversity	Devastation level	Composition harmony	Infrastructure saturation	Observer's aesthetic impressions
I (1)	monotonous, homogeneous	more than 50% of devastated area	no infrastructure / infrastructural elements covering over 50% of the area	no harmony	few impressions with a meagre effect on perception
II – low (2–4)	monotonous with isolated inspiriting moments	degraded areas cover between 10% and 50% of the area	isolated infrastructural elements covering 10–50% of the area	some of the elements make up a good composition	low-quality sensory impressions
III – average (5–7)	high diversity	degraded areas cover up to 10% of the area	less than 10%	most elements make up a good composition	large number of positive impressions
IV – high (8–10)	perfect diversity	not devastated	less than 10%, good infrastructure quality	all elements make up a good composition	high-quality stimuli, with powerful effect on the senses

Source: Litwin & Piech 2013, p. 56

Tab. 1: Criteria for the aesthetic values of the cultural landscape

– infrastructure saturation (1–10 points),
– observer's aesthetic impressions (1–10 points).

During the study, observers assessed and graded the right- and the left-hand side in each of the stands according to the abovementioned criteria, and the final grade reflected the cultural landscape's value (lowest grade: 5 points, highest grade: 50 points).

5 Analysis and research results

An analysis of the attitudes and behaviour of the local community towards the surrounding cultural landscape indicates that more than 47% of the respondents are moderately interested in matters related to broadly-understood environmental protection, and every fifth person declares that they are not willing to learn about the same. Generation Y members are most inclined to reflect upon environmental protection: 32.7% of the respondents aged 16–34 are interested in environmental issues and another 50.9% describe their level of interest as moderate. Among people in the 35-65 age group, 42.3% are moderately interested in environmental protection and 28.8% voice no interest at all (Table 2).

Age	Yes	Average	No
16–34	32.7%	50.9%	16.4%
35–65	28.8%	42.3%	28.9%
Total	29.8%	47.4%	22.8%

Source: Own work based on the results of a questionnaire survey (N=207)

Tab. 2: Distribution of answers to the question: Are you interested in issues related to environmental protection?

Almost 75% of the respondents know renewable energy sources, with more men (80.6%) than women (67.3%). The group aged 16–34 had the largest portion of respondents with a knowledge of renewable energy sources (80%), which indicates that representatives of Generation Y are interested in innovative technological solutions and demonstrate pro-ecological awareness. Regardless of respondent age, the most frequently listed RES were wind energy (83.5%) and solar energy (57.7%), i.e. sources of energy used in energy installations located in the commune: wind-power plants, solar collectors and photovoltaic cells.

Only 28.3% of the surveyed residents answered "yes" to the question: Do you know the actions of the commune's authorities concerning the development of renewable energy? In this number, we had on average every fourth person from Generation Y and 31.4% of residents aged 35–65 (Table 3). However, only 15.8% of the respondents indicated particular ventures, primarily wind energy investments, followed by the construction of street lights using photovoltaic cells in the centre of the commune and the thermal mod-

ernisation works carried out of public utility buildings, which was an expression of the local low-emission economy programme, i.e. investments also mentioned by local officials. In general, half of the respondents consider actions of local authorities average, and more than 33% good. The residents indicate that there are too few renewable energy undertakings, that they are not popularised within the local community, and that there is limited funding for new investments. They expect broader action, which would take into account their ideas and opinions in the context of renewable energy sources as well as new investments into a cultural landscape, especially macro changes. On the other hand, local authorities do not see a need to implement large-scale promotional actions related to wind energy because the existing investments were private initiatives; moreover, no more wind-power plants are expected to be built in the commune.

Age	Yes	Average	No
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Total	29.8%	47.4%	22.8%

Source: Own work based on the results of a questionnaire survey (N=207)

Tab. 3: Distribution of answers to the question: Do you know the actions of the commune's authorities concerning the development of renewable energy?

The majority of the respondents (57.5%) have a good opinion of the cultural landscape in the Dąbrowa Chełmińska commune, and as many as 28.9% rate it as very good. It is symptomatic that 70.9% of Generation Y members assess the landscape as good, and another 23.6% as very good. Such a high rating surely results from the optimistic attitudes of young people (Biegańska et al. 2016). Older respondents answered with less enthusiasm: Just over 46% of them take a positive view of the local cultural landscape, every third grades it as very good, and every fifth as average. The main indicated advantages of the area include features defining places of rest and recreation: much greenery, cleanliness, peace and no pollution, well-developed areas, forests, much free, undifferentiated space (open landscape). Regardless of age, residents value the commune's cultural landscape and agree as to its protection because 90.4% of the respondents confirm the need to protect the landscape, arguing that it is a pivotal and attractive common (national) good, which determines the commune's image and bespeaks the quality of life in a given area, which should remain unscathed for future generations and for animals.

The respondents also answered the following question: Which elements would you add to the cultural landscape? Representatives of Generation Y favour trees and shrubs (13.11%) and water, i.e. lakes, rivers, ponds (42.62%), which suggests a traditional approach of this innovative age group to the perception of and care for the surrounding landscape. Generation Y see cultural landscape as a harmonious one, which can be a base for, e.g., tourism and recreation; this is expressed by their intent to 'fit out' the landscape with natural elements. The distribution of answers is similar in the 35–65 age group: 42.9% of the respondents posit that the landscape should receive more water, mostly in the form of water reservoirs, and 22.5% – trees and shrubs.

36% of the surveyed residents confirm the impact of wind-power plants on the cultural landscape, and 33.3% do not notice such relationship. The study confirms that the older the persons, the fewer answers indicating the said interdependency. Thus, 51% of the 16–34 age group believe that wind turbines influence the landscape, while among respondents aged 35–65 such answer was given by 31.4% We should note that in the case of the residents of the Dąbrowa Chełmińska village, housing the oldest energy installation based on wind energy in its very centre, 46.7% of the respondents indicated no impact, and 40% said that there was one. People residing in the village of Bolumin, where a wind farm is located, produce similar discrepancies in their answers. 43.7% of them confirm the facility's impact on the landscape, while 37.5% notice no such relation.

What is more, over half of the surveyed residents of the commune (55.8%), both representing Generation Y (57.4%) and the generation of their fathers and grandfathers (55.8%), claim that wind-power plants do not dominate the cultural landscape (Table 4). They gather that they are too scant and peripherally located to dominate the local landscape. In the case of positive answers to the question about the impact of wind turbines on the landscape, the residents imply a positive effect, they emphasise that the wind-power plants "do not interfere in anything", "do not harm the environment", "do not pollute the environment", "they are in the fields and do not disturb", "they are in one place", "they are well located", "they are coherent within the commune", "they look nice". Negative opinions regarding the impact of wind installations on the landscape include such remarks as: "they are high and visible", "they make noise", "they are ugly: barely aesthetic infrastructure", "they destroy the landscape", "they darken it", "they restrict visibility", "they spoil the landscape", "they change its looks".

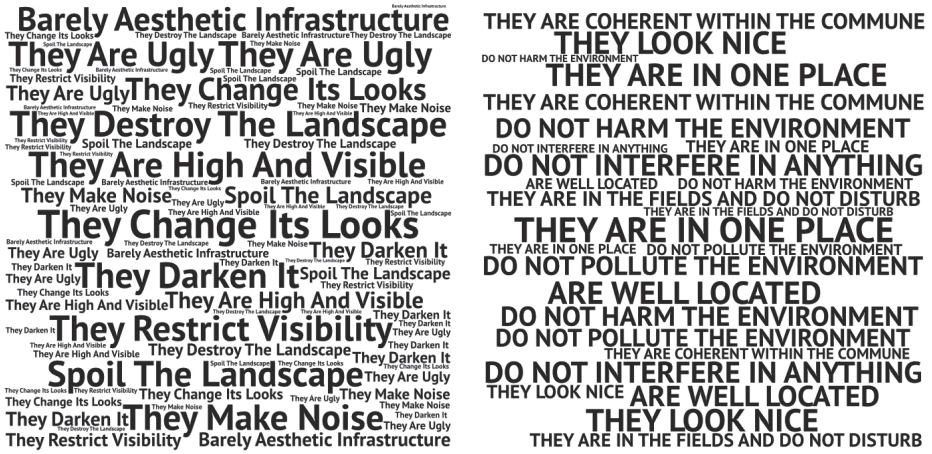
Age	Yes	Average	No
16–34	7.4%	57.4%	35.2%
35–65	5.8%	55.8%	38.5%
Total	6.2%	55.8%	38.1%

Source: Own work based on the results of a questionnaire survey (N=207)

Tab. 4: Distribution of answers to the question: Do you think that wind turbines dominate the cultural landscape?

The most frequent negative and positive opinions related to the perception of wind-power plants in the cultural landscape of the Dąbrowa Chełmińska commune voiced by the representatives of Generation Y are presented in the so-called tag cloud or word cloud, a method regularly used by millennials in social media (see Fig. 2).

The distribution of answers to the question "Which elements would you remove from the cultural landscape?" attracts some attention. As many as 43% of the respondents representing Generation Y stated that wind-power plants are the very elements that should be removed from the landscape of the Dąbrowa Chełmińska commune. On the other hand, respondents aged 35–65 asserted that "old and ugly buildings" present a bigger disturbance of the landscape. Only 10% of them pointed to wind-power plants as a re-



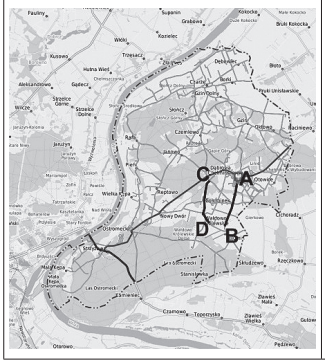
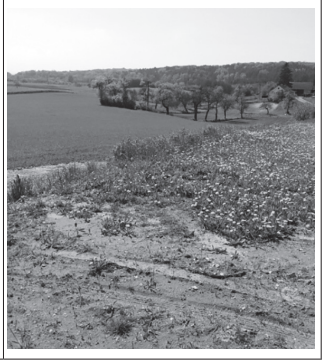
Source: Own work based on the results of a questionnaire survey (N=207)

Fig. 2: The most common negative (left side) and positive (right side) quotes related to the perception of wind turbines by Generation Y in the cultural landscape of the Dąbrowa Chełmińska commune

dundant element of the landscape. Having said that, both analysed age groups are aware that landscape is an important element impact in the commune's development. The vast majority of Generation Y members (72.3%) and residents aged 35–65 (74.2%) deem cultural landscape an "element of the commune's promotion that attracts tourists and encourages residence".

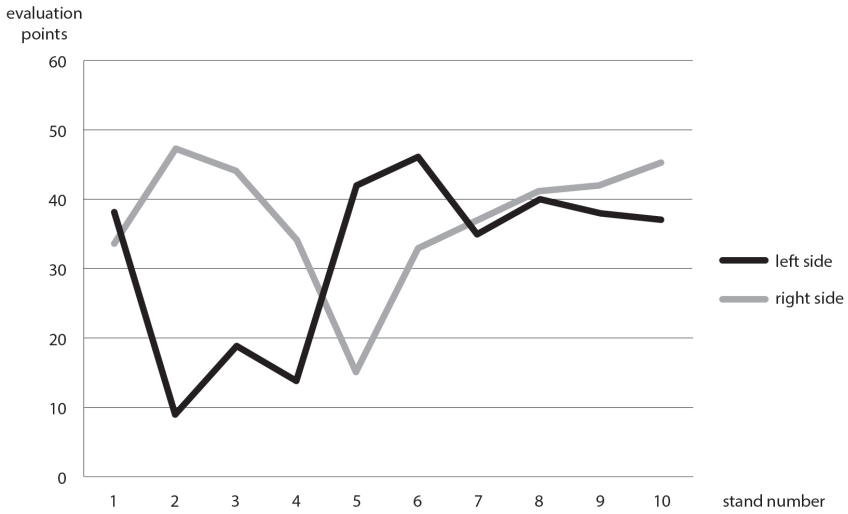
In order to answer the question "How are wind-power plants perceived by representatives of Generation Y?" we charted WEJCHERT's impression curves for the two analysed measurement routes (A–B and C–D) (see Fig. 3). They are a graphic illustration of the power of impressions and emotional experiences in the two selected measurement routes. The horizontal axis delineates subsequent stands (stand numbers) and the vertical axis presents number of points (evaluation points).

The analysis of WEJCHERT's impression curve for measurement route A–B demonstrates that observers' impressions related to assessing landscape value are distinctly lower where the landscape is traversed by large-scale infrastructural elements, namely wind turbines and high-voltage posts and lines, which aggressively dominate the landscape. Such instances occur in measurement Stand 2 (left-hand side: wind turbines) and in measurement Stand 5 (right hand side: high-voltage posts and lines). This landscape type, whose characteristics include a high level of devastation, lack of compositional harmony, high infrastructure saturation, may be referred to as a disharmonious cultural landscape. However, further analysis indicates that there are also enclaves of harmonious cultural landscape in the Dąbrowa Chełmińska commune, as manifested in observers' impressions in stands 7, 8, 9, 10, both on the right- and the left-hand side (e.g., Stand 8 – left-hand side: 40 points, right-hand side: 41 points) (see Fig. 4).

Measurement routes: A–B and C–D	Harmonious cultural landscape	Disharmonious cultural landscape
		

Source: Own work based on *http://dabrowachelminska.e-mapa.net/* (last access: 01.05.2017)

Fig. 3: Location of measurement routes A–B and C–D and examples of harmonious and disharmonious cultural landscapes in the commune of Dąbrowa Chełmińska

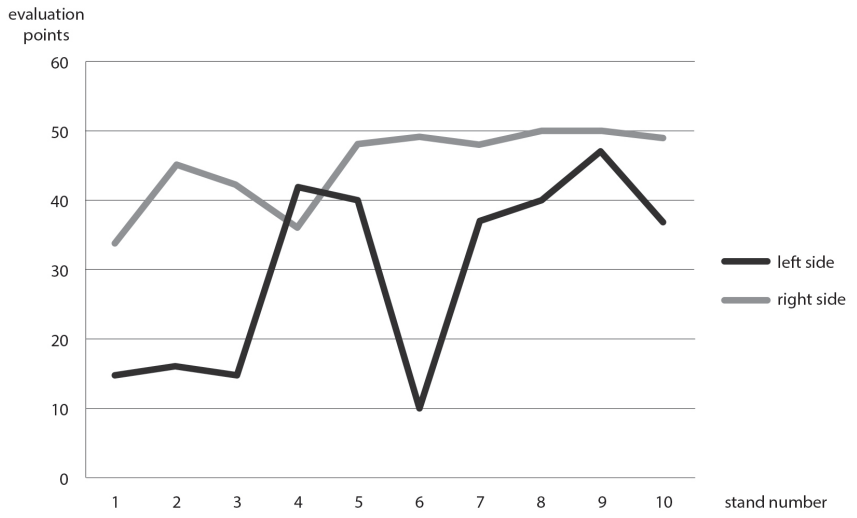


Note: 1–10 – stand numbers

Fig. 4: WEJCHERT's impression curve for Measurement Route A–B

The second measurement route (C–D) boasted high ratings of the value of the cultural landscape on its left-hand side, especially in Stand 9 where the right-hand side obtained 47 points and the left-hand side 50. High grades are related to the occurrence of vernacular architecture, which increases the value of the cultural landscape. This architecture type is present in the commune of Dąbrowa Chełmińska, e.g., in Stand 4 (left-hand side). This is

the element of the cultural landscape which shows signs of harmony because observers' aesthetic experiences are high, as are the composition's harmony and landscape diversity levels (see Fig. 5).



Note: 1–10 – stand numbers

Fig. 5: WEJCHERT's impression curve for Measurement Route C–D

On the left-hand side, the landscape in stands 1, 2, 3, 6 received a low rating due to the presence of wind turbines, which, similar to Measurement Route A–B, lower the cultural landscape's value rating.

6 Discussion and conclusions

The analyses we have performed indicate that matters related to cultural landscape engage every resident of the commune, yet primarily the younger generation: Generation Y. This is a social group interested in processes, which are currently underway, especially those regarding innovation and ecological actions. Therefore, most millennials know installations using renewable energy sources, treated as technological novelties in the sphere of pro-ecological solutions.

It is noteworthy that both Generation Y and the generation of 'grown-ups' present scarce knowledge of the actions of local authorities with respect to renewable energy, including investments in wind-power plants. However, information provided by the local authorities reveals that once the wind farm in Bolumin was launched, local residents started complaining about the installations' onerousness, especially the flickering shadows and noise. This may mean that the process of social participation in the analysed area is

not implemented to a satisfactory extent. Hence, the negative feelings instigated by the location of wind-power plants may result precisely from ignorance, disinformation and prejudices, but this study thread need future in-depth research. We should underline that in accordance with applicable regulations, local authorities as managers of the area are responsible for key decisions, which may trigger landscape transformations. Therefore, it is important to monitor landscape changes, prepare landscape audits and periodical assessments of changes that occur, so that the cultural landscape, as one of the key drivers of local development, may be kept in good shape.

The study that we have carried out shows that the perception of cultural landscape comprising wind-power plants by the local community, including Generation Y, is primarily ambivalent. We are dealing with diverse, sometimes even contrasting opinions, both among young people and the generation of their parents and grandparents. Generation Y gives a more negative assessment of the presence of wind turbines in cultural landscape than the generation of parents and grandparents. It may seem surprising that in the view of the respondents wind-power plants do not dominate the landscape, although representatives of Generation Y stated that they should be removed as elements disharmonising the landscape.

Acceptance for wind turbines in cultural landscape, especially from older residents, relates to the psychological process of accepting changes and becoming gradually convinced to novelties. It therefore seems correct to assert that the period for which wind-power plants have operated in a given area impacts the perception of those facilities by local communities, including representatives of Generation Y. Typically, each novelty receives a negative or very reserved opinion in the first phase of its functioning.

It is important that the planning and management processes combine various functions in one area and strive to avoid conflict. The answer to avoiding or minimising conflicts in landscape management seems to lie in zoning, which is being successfully implemented in the Dąbrowa Chełmińska commune, where areas containing investments, agricultural land and land with large-scale infrastructure are separated from areas interesting for tourists and intended for leisure and recreation. Hence, it is possible for a harmonious cultural landscape comprising invaluable vernacular infrastructure to co-exist with elements of a disharmonious landscape.

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