energies

Article

Beyond Personal Beliefs: The Impact of the Dominant Social Paradigm on Energy Transition Choices

Johannes Platje [1,*], Katarzyna A. Kurek [2], Petra Berg [3], Johan van Ophem [4], Aniela Styś [1] and Sławomir Jankiewicz [5]

1 Faculty of Finance and Management, WSB Merito University in Wrocław, ul Fabryczna 29-31, 53-609 Wrocław, Poland; aniela.stys@wroclaw.merito.pl
2 Department of Trade and Finance, Czech University of Life Sciences, Kamýcká 129, Praha-Suchdol, 165 00 Prague, Czech Republic; kurek@pef.czu.cz
3 School of Marketing and Communication, University of Vaasa, Wolffintie 34, 65200 Vaasa, Finland; petra.berg@uwasa.fi
4 Urban Economics Group, Wageningen University & Research, Hollandseweg 1, 6706 KN Wageningen, The Netherlands; johan.vanophem@wur.nl
5 Faculty of Finance and Banking, WSB Merito University in Poznań, ul. Ratajczaka 1-3, 61-813 Poznań, Poland; slawomir.jankiewicz@poznan.merito.pl
* Correspondence: johannes.platje@wroclaw.merito.pl

Abstract: Energy transition towards a local resilient energy supply is necessary for energy security. Climate change and the threat of economic collapse are reasons to force society to become less dependent on fossil fuel. Small-scale solutions are expected to be more sustainable, as large-scale integrated networks are featured by complexity and difficult-to-notice vulnerabilities, creating system risks. This paper presents the results of empirical research among a sample of Polish business students (N = 205) on the importance of worldviews for the choice of the energy transition scenario (local solutions vs. large-scale solutions). Worldviews are represented here by the Dominant Social Paradigm (defined for the purpose of this study as the belief that liberal democracy, free markets, and technological development are to solve all type of problems). This study addresses two research questions: (1) Is there a difference in preference for the energy transition scenarios? (2) Does adherence to the Dominant Social Paradigm determine the choice of the scenario for energy transition? The results present a preference for non-cooperative solutions (individual household solutions and large-scale solutions), while no significant relation to the worldviews represented by the Dominant Social Paradigm has been found. The results suggest that preferences for individual and large-scale solutions may be influenced more by institutional factors than by personal worldviews. A policy implication is that a change in the socio-political institutions and strengthening local governance may be a prerequisite for a sustainable energy transition.

Keywords: decision-making under risk and uncertainty; information and knowledge; cognitive factors in decision-making; energy markets; Dominant Social Paradigm

Citation: Platje, J.; Kurek, K.A.; Berg, P.; van Ophem, J.; Styś, A.; Jankiewicz, S. Beyond Personal Beliefs: The Impact of the Dominant Social Paradigm on Energy Transition Choices. *Energies* **2024**, *17*, 1004. https://doi.org/10.3390/en17051004

Academic Editors: Peter V. Schaeffer and Ahmed Abu-Siada

Received: 23 December 2023
Revised: 3 February 2024
Accepted: 15 February 2024
Published: 21 February 2024

1. Introduction

The world economy still remains heavily dependent on fossil fuels [1]. The ongoing energy transition towards renewables is required to deal with physical limitations on their availability and with the threat of climate change [2,3]. For a long period of time, technological development has led to increasing access to fossil fuels, though at increasing marginal energy input per unit of energy obtained (decreasing Energy Return on Investment). While the expected rise as well as the increase in volatility of fossil fuel prices create a threat to global economic growth [4], a climate catastrophe may appear at an earlier stage [5]. For the energy transition to be sustainable, it should be directed toward locally governed, resilient systems based on renewable energy supply [6].

Energy transitions involve a high level of uncertainty. Transitions are extremely slow processes that may take decades [7]. This inertia is due to technological and economic lock-ins in the highly complex energy supply chains [4,8]. These complex integrated global supply chains also entail vulnerabilities [9]. Therefore, autarkic (e.g., decentralized and independent) solutions become attractive [10]. These solutions also make the consumer less dependent on oligopolistic producers [11,12].

Traditionally, centralized, large-scale energy systems have been the backbone of the industrialized societies in the Western sphere. Generally, these societies have been dominated by capitalistic values tied to exponential economic and material growth [13,14]. The past years have presented large-scale challenges to energy security, starting with the Coronavirus pandemic and continuing with supply disturbances due to the war in Ukraine. It is becoming increasingly clear that epidemic and/or political crises can escalate into a sudden economic collapse, whether because of political sanctions due to increasing marginal costs of fossil fuels, or due to producing countries limiting exports in order to sustain their own consumption (see, Refs. [4,15]). As bad as they may seem, such massive global events can also be considered windows of opportunity for creative destruction and innovation of novel solutions and habits [16]. Thus, the ongoing shifts in global power structures, climate change, loss of biodiversity, as well as the energy crisis, and the rapid pace of digitalization may present an opportunity for accelerated adoption of small-scale, renewable energy supply projects. However, due to paradigmatic limitations of individual and collective choices, the current shift might result in reproducing extant institutionalized systems in a slightly different disguise.

The environmental decline has its roots in the institutions that reflect the Dominant Social Paradigm of Western industrialized society [17]. This Dominant Social Paradigm (hereafter DSP) refers to the collection of norms, beliefs, values, and habits that form the most commonly held worldview in Western culture [18]. This DSP, with its inbuilt expectations of material growth, technological solutions, and specialization, has been evolving since the Enlightenment [17,19]. It is being blamed for treating the environment as an unlimited source and sink and for seeing the development of markets and technology as the only solutions to any type of social and environmental problems [20]. Furthermore, the combination of techno-optimism and downplaying system risks [19] can hamper the transition towards renewable energy. The DSP may be the cause behind the technological and institutional lock-ins that favor large-scale energy systems and that hamper gains from a transition towards small-scale, renewable energy. The Dominant Social Paradigm is assumed to be a socially embedded (behavioral) driver of environmental choices [18] and as a source of ignorance of system risk [20]. This study uses a novel approach, testing the Dominant Social Paradigm as a driver of the choice of an energy transition scenario, expanding an existing set of scenarios. In other words, we go beyond individual beliefs and explore the question of how the worldviews of the Dominant Social Paradigm are related to preferences for energy transition scenarios.

Taking the context of Poland, we investigate the preference for local energy supply versus large-scale energy transition solutions. We focus on solar energy because of its wide availability and huge potential for replacing fossil fuels, as well as its environmental benefits [21,22]. Specific research questions (RQ) serving the purpose of this investigation are as follows:

RQ1. Is there a difference in preference for the energy transition scenarios?

RQ2. Does adherence to the Dominant Social Paradigm determine differential preference for scenarios for energy transition?

First, the situation in Poland is described in Section 2 regarding the current developments of different types of renewable energy transitions at different levels of governance —from local to large-scale solutions. The identified preference for large-scale solutions pursued by the current government is the reason to add a large-scale scenario to [6]'s three local scenarios (household, neighborhood, small town) regarding photovoltaics. The theoretical framework and research hypotheses are presented in Section 3. The research questions were answered based on a survey among Polish business students. These students participated in a course on sustainable logistics, including the topic of sustainable energy transition. The student profile was similar to earlier research on the relation between the Dominant Social Paradigm and ignorance of system risk of nuclear energy [20]. After the presentation and discussion of the results of the survey in Section 4, conclusions in Section 5 display differences in preferences compared to the German study [6]. While the results need to be interpreted with care due to the specificity of the respective samples, in the concluding Section 6, implications for further research on preferences for energy transition scenarios in a transboundary context are discussed.

2. Energy Transition Policy in Poland

The research presented in this paper is based upon a theoretical framework used by [6], whose German sample shows a preference for cooperative solutions—a neighborhood scenario or a small-town scenario for the energy transition. In Poland, the policy regarding renewable energy differs from Germany and is characterized by dualism. The official governmental policies of the year 2023 formally support renewable energy [23,24]. Also, the aim of net-zero greenhouse gas emissions (climate neutrality) by 2050 in the framework of the European Green Deal has been accepted [25]. Furthermore, an agreement with coal miner unions regarding the closure of coal mines by 2049 has been signed [26]. The document Polish Energy Policy until 2040 (*pol.* "Polityka energetyczna Polski do 2040 roku") was accepted on 2 February 2021. This document defines the aim of a minimum share of 50% of zero-emission sources in the energy production capacity installed by 2040. This aim is, in particular, to be achieved by the development of offshore wind energy and nuclear power plants [27]. While the focus seems to be on large-scale solutions, there is no clear policy document that creates a basis for dealing with the complexity of a renewable energy transition [28] (p. 11 ff). The policy focus seems to be directed toward continuing the use of fossil fuels at the expense of the development of renewable energy sources [29] (p. 139). Rather, the current policy landscape appears to create legal barriers to investments in renewable energy sources and (by way of tax reforms and centralization measures) reduce the tax base and decisive power for local governments. These local governments are especially important stakeholders in the creation of local sustainable energy supply [30].

An example of creating obstacles by legal changes concerns wind energy. After a period of rapidly increasing installed capacity, serious restrictions were introduced in 2016. The minimal distance between a wind turbine and an existing residential building (or protected nature) should be 10 times its height [31]. As there was no transitional period (licenses needed for the operation would be refused), existing investments were stopped, and new investments were seriously discouraged.

Another example is photovoltaics installed by individual households (so-called prosumers). Previously, consumers could deliver energy to the grid for "storage" if production exceeded their own needs at a given time. Effectively, the energy distributor was treated as an energy storage. Calculated on a yearly basis, the prosumer could at any time "collect" energy from the grid in the amount of 80% of all energy delivered to the grid if the installation had a capacity of up to 10 kW. If exceeding 10 kW (but less than 50 kW), 70% of all energy delivered to the grid could be "collected". This solution created incentives for the development of small photovoltaic installations because it eliminated the storage problem.

However, because electricity grids are constructed to deliver to households (rather than to receive energy from them) and have a limited capacity, the success of photovoltaic installations would lead to grid instability [32], making the "storage" function of the grid less attractive. As grid development is a long-term process, it was easier to change the law. While prosumers with existing photovoltaic installations received a 15-year transition period, installations connected to the grid from 1 April 2022 would face so-called net billing. The excess production at any time is sold to the electricity company according to monthly established market prices. For the energy purchased, the price is the same as for all customers, including excise taxes and value-added tax, while receiving a discount for the distribution costs [33]. The new law reduced the speed of installation of new photovoltaics from 600 MW to 200 MW per month [34].

Such a legal change should, at the same time, be accompanied by the development of local storage systems, like the development of sand batteries [35], and the installation of storage batteries by households [36]. While current subsidy programs support the purchase of storage batteries as well as heat pumps [37], another step is the development of local cooperative networks, where excessive production could be used by other citizens or companies (the neighborhood and small-town scenarios discussed later on in this article). A challenge to local solutions is that currently, the energy supply in Poland remains dependent on state-guided large-scale solutions.

From the point of view of ownership structure [6], four scenarios for energy transition are the focus of this study: the household scenario, the neighborhood scenario, the small-town scenario, and the large-scale scenario (the last was added by the authors). The situation in Poland looks as follows:

Household scenario: concerns small, individual producers (prosumers), producing up to 50 kW for their own use. Besides households, this can also concern small business entities, local government units, housing associations, and churches.

Neighborhood scenario: consisting of combined sources with low capacity (up to 10 MW of electricity, up to 30 MW of heat, and up to 40 million m^3 of biogas). The energy is used jointly by several households, business entities, or a local government unit. This solution covers a minimum of 70% of their yearly energy needs. All users are located within the same municipality and function on a system of energy cooperatives.

Small-town scenario: with low to medium power production (up to 100 MW), where the energy is used jointly by households, legal entities, scientific units (including research institutes), and/or local government units. In this scenario, entities from at most one powiat (country) cooperate in a so-called energy cluster system.

Large-scale scenario: where producers are able to generate large amounts for the purpose of selling it on the market.

Ad 1. The household scenario has been developing in Poland relatively quickly due to increasing energy prices, subsidies, and the possibility of using the distribution network as energy storage. By the end of 2022, there were almost 1.2 million prosumers, with a total production capacity from photovoltaics of almost 10 GW. The number of prosumers increased 22 times, and the installed capacity 26 times, between the beginning of 2019 and the end of 2022 [35,38]. This increase could have been larger were it not for the legal changes mentioned earlier, reducing the financial attractiveness of photovoltaic installations [33,39].

According to the Central Register of Emissions of Buildings, by 22 July 2022, over 233,000 heat pumps had been reported to be installed. Most of them were air or water heat pumps used for central heating of buildings. According to the data of the Polish Organization for the Development of Heat Pump Technology, in 2021, the number of heat pumps sold for heating buildings in Poland per capita was higher than in Germany [40].

Other renewable sources are less popular. There were only 59 wind micro installations in October 2022, with a capacity of 0.24 MW. For this reason, the state is preparing a change in the law (to come into force by mid-2024), obliging large-scale producers to transfer at least 10% of the shares in wind farms to residents of the commune in which it is located. This will make households virtual prosumers using the generated energy for their own needs [41].

Ad 2. While the concept of energy cooperatives already appeared in 2016 [31], the legal base for the neighborhood scenario in Poland was only created in mid-2019 by the law on the so-called energy cooperatives [42]. Such a cooperative should have at least 10 members in the case of natural persons and 3 in the case of legal entities with a maximum of 1000. Energy cooperatives settle accounts of all its members (producers and consumers) with the energy seller in the prosumer system (based on discounts) at a quantitative ratio of 1 to 0.6 [43]. By mid-2022, three energy cooperatives were registered. The energy cooperative EISALL established in May 2021, has two photovoltaic installations (20 kW in total). As an example, Energy Cooperative Our Energy (*pol.* Spółdzielnia Energetyczna Nasza Energia) was registered in December 2021, possessing four photovoltaic installations with a total capacity of 27 kW. The third one was registered in June 2022 [44]. Currently, legislative measures are prepared to reduce barriers to the creation of energy cooperatives [45–49].

Ad 3. The small-town scenario is related to energy clusters, a concept legally introduced in 2016 [31]. A distinction can be made between micro-clusters when they operate in one commune and macro-clusters in the case of a powiat (county) [50]. Currently, there are 66 energy clusters operating in 12 voivodships (provinces) in Poland [51].

Ad 4. The scenario of large-scale energy production is associated with economic entities backed by significant financial resources. Wind turbines/wind farms had an installed capacity of almost 8.3 GW by the end of 2022. This was an increase compared to 2021 by 80 new installations (with a capacity of 935.84 MW). The largest wind farm in Poland (WF Potęgowo), with a capacity of 219 MW, started operating in December 2020 [52,53]. Photovoltaic farms had a total installed power of 2 GW by the end of 2022. The largest is Elektrownia Zwartowo, located on 300 ha of land with 204 MW installed power. This source is most dynamically developing in this scenario, with an increase in installed power by 59% between 2021 and 2022 [54,55]. Other sources such as geothermal energy with a total installed power of 129 MW in 2022 take less of the renewables market share [56].

3. Theoretical Framework

The institutional framework, as well as the technological development of the current economic system in Western industrialized societies, are focused on economic growth [4,14,57]. According to the Dominant Social Paradigm [58,59], the worldview of the salient economic and political stakeholders, growth is good and, together with technological (technofix) development, enables the solution of different social and environmental problems.

The Dominant Social Paradigm has been developed based on a wide range of models trying to identify determinants and sources of environmental attitudes and willingness to change. It has been widely tested in a multi-national context [20,58]. As this paradigm is assumed to be a socially embedded (behavioral) driver of environmental choices, here the question is addressed whether it influences the preferences for a certain energy transition scenario.

The belief in free markets and technological solutions is accompanied by adherence to political liberalism. Such a view is understandable, considering the incredible wealth and welfare created by large-scale production and innovation, leading to economies of scale [60,61]. People are supposed to be the masters of nature, assuming weak sustainability [62], where physical capital and labor can replace environmental sources. Following the above reasoning, it could be argued that the worldview embraced in the Dominant Social Paradigm creates a kind of lock-in, hampering the necessary energy transition towards renewables [63,64].

Research [20] shows that political views may lead to neglect of system risks of large-scale energy supply projects, posing the question of whether the political part of the Dominant Social Paradigm shifts towards authoritarianism [65]. Autarky relates to independence, autonomy, and self-sufficiency, values that might be considered elementary for the choice of energy scenario [6]. Thus, sustainable communities are considered highly self-governed and rely on independent energy provision systems [6,66]. It is argued [6,67,68] that regional autarky is a popular issue in countries like Germany, Switzerland, and Austria. This approach requires cooperation at the local level, as well as developed local self-governance structures. In a study [6] including 168 German participants and using a snowball survey method, the respondents were asked to assess three scenarios (household, neighborhood, and small town) according to the attractiveness for the participants, the attractiveness of the solution for dealing with the negative impact of fossil fuels, the perceived desirability, the impact on the environment, and the stability of the energy supply.

As discussed, there is a politically imposed tendency to develop large-scale solutions in Poland. For this reason, a centralized large-scale scenario, which fits more with the Polish centralized governance, was added to the scenarios in this study [6]. Following this, the scenarios possess a similar level of autarky regarding energy supply (80% of energy supplied by the solution, 20% from outside resources), while differing in the range of autarky when governance and organization are considered. From the governance perspective, the household scenario can be considered to be the most autarkic, and the large-scale scenario least autarkic. The assumed perceptual component of respective energy supply scenarios, i.e., how people are assumed to interpret and understand them, are presented in Table 1.

Table 1. Range of autarky and assumed perceptual components

Energy Supply Scenario	Assumed Perceptual Components
Household	Only a few people involved (family members) High sense of independence Individuals feel autonomous and self-sufficient Easy decision-making process Control of the ongoing process Energy supply is secured
Neighborhood	Increased number of people involved Dependencies on others Individuals feel less autonomous and self-sufficient Need for communication and interpersonal trust Decision-making is complicated Less control of the ongoing process Energy supply is secured
Small town	High number of people involved Dependencies on others Individuals feel less autonomous and self-sufficient Need for advanced communication collaboration Need for organized decision-making process Need for organized control process Energy supply is secured
Large-scale	No local governance involved Dependencies on others No autonomy and no self-sufficiency No need for advanced communication, collaboration and interpersonal trust by the end used No need for organized decision-making procedures at the local level No need for organized control process and control of the ongoing process Energy supply is secured

Source: First three scenarios [6], Large-scale scenario - authors' own elaboration.

The economic, political, and technological dimensions of the Dominant Social Paradigm [58,59] are approached as determinants for the choice of the energy scenario, as well as a source of ignorance of system risks. The technological dimension assumes the possibility of a technofix for any type of problem and a techno-centric approach [19,69]. The free market is supposed to be a system that manages all kinds of social and environmental problems, among other things by providing incentives for innovations leading to technofix solutions. The aim of economic growth is supported by large-scale production, leading to economies of scale, i.e., declining unitary cost of output. In this context, the top-down decision-making approach embedded in the Dominant Social Paradigm does not necessarily embrace the development of small-scale, local solutions [12].

The logic of the free market forces led to the development of large-scale energy provision, dependent on the availability of cheap fossil fuel [3]. This large, complex system creates serious lock-ins (technological, economic, and institutional) for an energy transition towards renewables. The transition trajectory may be strengthened by the democratic process, where legal changes are rather incremental. In the face of the need for a quick sustainable energy transition to achieve climate goals and tackle the challenges to economic growth by an expected long-term increase in marginal costs of the production of fossil fuel [4], the technological dimension of the Dominant Social Paradigm can be expected to be a predictor of preferences for large-scale solutions and ignorance of system risks, which can be interpreted as the risk that a small probability event triggers irreversible damage, or even collapse, of a system (e.g., organization, industry, economy, supply chain) due to the existence of weakest links, bottlenecks, and other types of vulnerabilities. While a similar outcome can be expected for the economic dimension (low-cost output of large-scale projects supports economic growth), for the political dimension, it is expected that, due to the strong individualistic orientation, there will be a preference for small-scale solutions.

4. Methods, Measures, and Materials

In Table 2, two research questions and related hypotheses are presented. In order to find out whether worldviews influence the preference for a specific scenario of energy transition (RQ2), it is useful to assess whether there is a difference in preference for a certain energy transition scenario (RQ1).

Table 2. Research questions and corresponding research hypotheses.

RQ1. Is There a Difference in Preference for the Energy Transition Scenarios?
Hypothesis 1. *The large-scale energy supply scenario is the most attractive energy transition scenario.*
Hypothesis 2. *The large-scale scenario is most attractive for dealing with the impact of fossil fuel use.*
Hypothesis 3. *The preference for the energy supply scenario has an impact on (a) perceived desirability, (b) perceived autarky, (c) perceived feasibility, (d) the assessment of the impact on the environment, and (e) the perceived stability of energy supply to the individual home.*
RQ2. Is adherence to the Dominant Social Paradigm related to the choice of the scenario for energy transition?
Hypothesis 4. *Adherence to techno-optimism (**DSPt**) determines the choice of the energy supply scenario.* *This hypothesis is tested for (a) the attractiveness of the scenario for homeowner, (b) the attractiveness of the scenario for dealing with the impact of fossil fuel use, (c) the perceived desirability, (d) the perceived autarky, (e) the perceived feasibility, (f) the perceived impact on the environment and (g) the perceived impact of stability of energy supply to the owner's home.*
Hypothesis 5. *Belief in free markets (**DSPe**) determines the choice of the energy supply scenario.* *This hypothesis is tested for (a) the attractiveness of the scenario for homeowner, (b) the attractiveness of the scenario for dealing with the impact of fossil fuel use, (c) the perceived desirability, (d) the perceived autarky, (e) the perceived feasibility, (f) the perceived impact on the environment and (g) the perceived impact of stability of energy supply to the owner's home.*
Hypothesis 6. *Adherence to political liberalism (**DSPp**) determined the choice of the energy supply scenario.* *This hypothesis is tested for (a) the attractiveness of the scenario for homeowner, (b) the attractiveness of the scenario for dealing with the impact of fossil fuel use, (c) the perceived desirability, (d) the perceived autarky, (e) the perceived feasibility, (f) the perceived impact on the environment and (g) the perceived impact of stability of energy supply to the owner's home.*

Source: Own elaboration.

To answer these research questions enclosed in Table 2, a qualitative study was carried out among first-year students of a sustainable logistics course at a large, private university in Poland. A reason is that since the survey is dedicated to perception of energy transition, the cost element is not specified, and responders are not asked to evaluate their preferred energy transition choice pricewise. The topic "energy transition" was an element of the course. The questionnaire contained questions regarding the Dominant Social Paradigm (see Table 3) and the choice of energy scenarios (see Table 4 and Appendix A). As presented in Appendix A, first, the four energy transition scenarios were introduced to the respondents in the form of pictures and a description based on the earlier research [6]. The question set on the Dominant Social Paradigm and the related method of analysis of research results was the same as in an earlier study among a similar group of respondents [20]. The questions for the questionnaire were translated from the original source in English into Polish by two specialists and then translated back into English.

Table 3. Test results for the dimensions of the Dominant Social Paradigm.

Dimensions of the Dominant Social Paradigm	Questions	Likert Scale	Descriptive Statistics
D1.Technological dimension	1. Advancing technology provides us with hope for the future. 2. The bad effects of technology outweigh its advantages (recoded). 3. Future resource shortages will be solved by technology. 4. Advancing technology is out of control (recoded).	4 items. Cronbach's α = 0.43	M = 4.26 Sd = 0.76
D2.Political dimension	1. The average person should have more input in dealing with social problems. 2. Business interests have more political power than individuals (recoded). 3. Political equality can be attained only by major changes in election procedures. 4. Political questions are best dealt with through free market economics.	4 items. Cronbach's α = 0.69	M = 4.35 Sd = 0.57
D3.Economic dimension	1. We focus too much on economic measures of well-being. (Left out of analysis in accordance with the original research [57,58]) 2. Individual behavior should be determined by economic self-interest, not politics. 3. The best measure of progress is economic. 4. If the economy continues to grow, everyone benefits.	3 items. Cronbach's α = 0.43 4 items. Cronbach's α = 0.46	M = 4.70 Sd = 0.78 M = 4.42 Sd = 0.64

Source: Own elaboration. Answers were given on a Likert-Item scale from 1 (completely disagree) to 7 (completely agree). For the technological, economic, and political dimensions, the higher the value, the more "pro-DSP" the respondent is.

Table 4. Questions asked regarding the attractiveness of the respective scenarios.

Dependent Variable	Scale	Question
a. Attractiveness for home owner	Rank from 1 (most attractive) to 4 (least attractive)	Suppose, you are the owner of a house. There are 4 options available for an energy transition in order to become independent from fossil fuels. Please rank the attractiveness of these options for yourself personally in order of attractiveness from 1 (most attractive) to 4 (least attractive).
b. Attractiveness for dealing with the impact of fossil fuel use	Rank from 1 (most attractive) to 4 (least attractive)	Please rank the attractiveness of all solutions for dealing with all the negative impacts of the use of fossil fuels in order of attractiveness from 1 (most attractive) to 4 (least attractive).
c. Perceived desirability	Rank from 1 (definitely not desirable) to (6 completely desirable)	"How do you perceive the desirability of the described scenario?"
d. Perceived autarky	Rank from 1 (definitely not autarkic) to 6 (completely autarkic)	"How do you perceive the autarky of the described scenario?"
e. Perceived feasibility	Rank from 1 (definitely not feasible) to 6 (completely feasible)	"How do you perceive the feasibility of the described scenario?"
f. Impact on the environment	Rank from 1 (very negative impact) to 6 (very positive impact)	Impact of the solution on the environment.
g. Impact on stability of energy supply to your home	Rank from 1 (very negative impact) to 6 (very positive impact)	Impact of the solution on the stability of energy supply to your home

Source: [6].

The questionnaire was then distributed online, using MS Forms, before the energy transition topic was dealt with in class; this was done in order to prevent any framing effects. Participation was voluntary, and the questionnaire was anonymous. The results were discussed in class in order to obtain learning effects. All students had the opportunity to fill out the questionnaire. In total, 205 surveys (60.8%) were returned, out of 337 distributed. Demographics of respondents present as 48% female, 52% male, and an average of 24 years old.

As a case, business schools are interesting for carrying out research on the Dominant Social Paradigm [70,71]. Business companies are important stakeholders in energy transition, not only due to their production function but also the transport that is elementary in the functioning of logistics chains. The logistics students surveyed in this study are taught about and trained to address challenges regarding the need for continuous improvement of processes in order to support efficiency, which in turn will lead to improved economic performance.

As the research concerns a specific group, the results have to be interpreted with care. However, as part of the research carried out in Germany some years ago [6], the results provide a perspective for comparison and future research regarding transboundary features of the energy transition. Statistical testing of the questionnaire results was carried out in SPSS version 29. Items of various scales were, when needed, recoded. Three elements in the questionnaire that constructed the technological, economic, and political dimensions of the Dominant Social Paradigm (Table 3) were aggregated to a single score, while the remaining items (Table 4) were analyzed directly.

Statistical analysis was carried out following the methods in the earlier research [6,20]. Cronbach's Alpha coefficient was calculated in order to measure the internal consistency of the measures of the technological, economic, and political dimensions that built the Dominant Social Paradigm. The Cronbach's Alpha value of 0.46 for the economic dimension and 0.43 for the technological dimension (Table 3) suggests that the construction of the adopted Dominant Social Paradigm may be outdated and require redesigning. Nevertheless, Cronbach's Alpha of 0.69 for the political dimension is considered acceptable. Linear regression was carried out to assess Hypotheses 1, 2, 4, 5, and 6. The case of Hypothesis 3 required correlation analysis. Furthermore, to assess this hypothesis, the four energy scenarios were ranked using one-way Anova [6], as well as pairwise T-tests.

5. Results and Discussion

Reliability analysis and descriptive statistics for the different dimensions of the Dominant Social Paradigm show that the technological and economic dimensions have low alpha reliability (Table 3).

Tables 5 and 6 collect the results regarding Research Question 1 (and the related three hypotheses), whether there is a difference in preference for the scenarios, and which determinants are relevant for the choice of the energy transition scenario. Comparing the mean scores (using one-way ANOVA and T-test for control), all three hypotheses (see Table 3) are confirmed. As presented in Table 5, the large-scale scenario is most attractive (Hypothesis 1), and is most attractive for dealing with the impact of fossil fuels (Hypothesis 2). As presented in Table 6, the choice of the scenario has an impact on perceived desirability, autarky, feasibility, environmental impact, and stability of energy supply (Hypothesis 3). Regarding Hypothesis 2, the larger the scale of the energy supply of the solution presented in the scenario, the more attractive the solution is considered for dealing with the impact of fossil fuel use. In other words, small is worse from the point of view of withdrawing from fossil fuels.

Table 5. Attractiveness of energy supply scenario. Mean ranking (and variance); *N* = 205 Note: A Likert Item scale from 1 (most attractive) to 4 (least attractive) was used. The attractiveness is given by the different superscripts in alphabetical order, showing significant differences at $p < 0.05$.

	Attractive for Homeowner	**Attractive for Dealing with the Impact of Fossil Fuel**
Large-scale	2.20 ^{a} (1.64)	1.87 ^{a} (1.41)
Small Town	2.52 ^{b} (.095)	2.47 ^{b} (0.80)
Neighborhood	2.65 ^{b} (0.84)	2.66 ^{c} (0.75)
Household	2.63 ^{b} (1.44)	2.99 ^{d} (1.40)

Table 6. Perceived advantage of energy supply scenario. Mean ranking (and variance); *N* = 205. Note: A Likert Item scale from 1 (most negative) to 6 (most positive) was used. The perceived advantage is given by the different superscripts in alphabetical order, showing significant differences at $p < 0.05$.

	Perceived Desirability	**Perceived Autarky (Self-Sufficiency)**	**Perceived Feasibility**	**Impact on the Environment**	**Impact of Stability of Energy Supply to Your Home**
Large-scale	4.40 (1.26) ^{a}	4.05 (1.62) ^{a}	4.08 (1.37) ^{d}	4.13 (1.89) ^{b}	4.28 (1.32) ^{b}
Small Town	4.26 (0.92) ^{b}	3.73 (0.73) ^{b}	4.15 (0.97) ^{c}	4.22 (1.08) ^{b}	4.23 (0.81) ^{b}
Neighborhood	4.13 (1.04) ^{c}	3.70 (0.75) ^{b}	4.31 (1.10) ^{b}	4.29 (0.96) ^{b}	4.19 (0.80) ^{b}
Household	4.48 (1.30) ^{a}	3.94 (1.33) ^{a}	4.69 (1.34) ^{a}	4.43 (1.20) ^{a}	4.47 (0.97) ^{a}

Other determinants of perceived advantages of a certain energy transition scenario (Hypotheses 3a–3e) show the following outcome. The large-scale and household scenarios are considered to be rather desirable. They are significantly more desirable than the other scenarios (Hypothesis 3a). They also have the highest level of perceived autarky (Hypothesis 3b). The ranking for perceived feasibility is opposite to the ranking for attractiveness for dealing with the impact of fossil fuel use—the smaller the scale of energy supply, the higher the perceived feasibility, ranging between rather feasible for the large-scale scenario and high feasibility for the household scenario. The household scenario is also considered to have the most positive impact on the environment and to be the most stable in energy supply.

Three hypotheses were formulated (see Table 2) in order to deal with Research Question 2 (Does adherence to the Dominant Social Paradigm (independent variable) determine the choice of the scenario for energy transition (dependent variable)?). Regarding the relation between DSP and the choice of the scenario, model fit analysis shows a very low R^2 of 0.0484. Furthermore, as described above, the Cronbach's Alphas are too low to be considered relevant, while for the political element of the Dominant Social Paradigm, an Alpha of 0.69 may be considered acceptable, though low. Model fit testing based in the linear regression shows no significance with any of the scenarios. Thus, the three hypotheses are to be rejected. This may imply that the worldviews, as expressed by the Dominant Social Paradigm, do not influence the preferred choice of the energy scenario. Although the research hypotheses are not corroborated, the results may have important implications for energy transition policies.

First of all, differences in worldviews may not be a factor hampering the development of certain energy scenarios where cooperative solutions are required. The respondents preferred individual, small-scale solutions, or large-scale solutions (see Table 4), independent of their views on the political, economic, and technological fields (as the linear regression shows). This result may imply that support for certain scenarios for renewable energy transition may be obtained independent of political views, an issue for future research.

Secondly, a sample itself represents a particular social group, and therefore the results need to be interpreted with care. A novel approach to measure underlying socially embedded (behavioral) drivers of energy transition choices was tested, and the student sample is a "test group". For this reason, the results cannot be extrapolated to other social groups and should be considered a basis for further research. The respondents' median age is 24 years old. Commonly, at this young age, the adherence to the energy transition is prone to be influenced and ideological, moreover known to the students from mass media sources rather than related to their own market or technology literacy. Moreover, the economic dimension of the Dominant Social Paradigm implies the cost of the energy transition for the respondents. Students may still be relatively free from bearing individual energy costs by, e.g., living in family houses, student houses, or shared accommodation where the energy is provided. Therefore, the stage of the life cycle of the students' sample may not fully reflect the opinion about energy transition scenarios and therefore impact the analysis results. No verified relation between the proposed DSP and given energy transition scenarios was found for the studied group of Polish respondents.

Thirdly, while this research is based on a convenience sample, the following issues appear for research on energy transition scenarios in a transboundary setting. When the Dominant Social Paradigm is not a predictor of the choice of the scenario, there may be other underlying factors with other mediating variables that can explain the results. These may be, for example, institutional differences, alterations in the strength of local political governance, and different levels of public trust in local and central governance. Therefore, the Dominant Social Paradigm itself may require reformulation. Noticeably, a study on the impact of the Dominant Social Paradigm on ignorance of system risks [20], repeatedly demonstrates a low Cronbach's Alpha score for DSP questions, indicating the low reliability of the elements of the Dominant Social Paradigm. Thus, while the question set of the Dominant Social Paradigm has been widely applied, this may either mean that the question set needs to be reformulated because it is outdated (i.e., implying other measures of worldviews need to be applied) or that the Dominant Social Paradigm is culturally specific, and as such, it is better to analyze its meaning in a country's or regional context. Furthermore, the preference for a certain energy supply scenario can depend on the sources of knowledge on the topic or the regions and cultural background of the respondent.

6. Conclusions

This study tried to find out if the Dominant Social Paradigm, for the aim of this study represented by a political, market, and technological set of convictions, determines a preference for an energy scenario. As discussed in Section 2 of this paper, the political preferences in Poland point to the direction of large-scale, centralized energy transformation solutions, simultaneously acknowledging the individual energy sources. The results of the conducted questionnaire on the 205 students' group in Poland display the same preferences for large-scale solutions, together with the household scenario, leaving cooperative scenarios (neighborhood scenario and small-town scenario) behind. This contrasts with the results of [6], whose scenarios for renewable energy transition were the basis for this research. While there was no large-scale scenario in this survey, the household scenario was considered the most autarkic and the small-town scenario the most desirable (with no significant difference between the household and neighborhood scenarios). Regarding perceived feasibility, there was no clear difference in preference for a certain scenario.

Considering the obtained results, the energy autarky is perceived as either a centralized energy provision, or an individual solution of energy supply. Energy transformation is, therefore, best conducted with state support that organizes large-scale energy sources for society or with single initiatives to self-organize energy sources. It resembles the existing energy provision scenarios in Poland, where either a centralized system provides energy or individual households organize various energy sources and infrastructure (historically both of fossil origin). Importantly, the results of the questionnaire observe no indication for the cooperative energy transition forms, where a community is the main beneficiary. As much as these findings are questioning the principles of the EU energy transition where community and cooperative solutions are given special attention [72], the respondents are aligned in energy transition perception with the position of the state authorities communicated in the national energy plans, official documents, and as a general governmental message.

Because of the limitations of this study, to verify if this energy perception is a valid societal attitude in Poland towards energy transition, and whether adherence to the Dominant Social Paradigm is not related to the choice of the energy transition scenario, a consecutive study is requisite with adjustments of the sample. Since the community versus individual energy scenario choice varies among EU societies, as seen in comparing our study result with the survey sample of [6], some interesting differences appear worth further analysis. The transboundary nature of energy transition is one of them, where the inhabitants are of mixed backgrounds, and therefore, the energy autarky character becomes less national but rather regional and cultural. Observation of our study results sheds light on the individual energy transition preferences and their choice determined by the public information and national energy policy.

A policy implication of the result may be that worldviews are less relevant in the choice of the scenario of energy transition than sometimes assumed. A change in the socio-political institutions and strengthening local governance may be a prerequisite for a sustainable energy transition. The conclusions imply that the choice between individual and large-scale solutions is influenced more by institutional factors rather than personal beliefs. Further examination of the interaction between personal beliefs and institutional elements, as well as the impact of education, awareness campaigns, and different types of incentives, might strengthen this study's findings.

Author Contributions: Conceptualization J.P., S.J. and A.S.; methodology J.P., J.v.O. and K.A.K.; software J.P. and K.A.K.; validation J.v.O.; formal analysis J.P., K.A.K. and J.v.O.; investigation J.P. and A.S.; resources J.P., S.J., A.S., K.A.K. and P.B.; writing—original draft preparation J.P., K.A.K. and P.B.; writing—review and editing J.P., K.A.K., P.B., J.v.O., S.J. and A.S.; visualization J.P.; supervision J.v.O. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Data Availability Statement: Data are available on request from the corresponding author.

Conflicts of Interest: The authors declare no conflicts of interest.

Appendix A The Questionnaire

The questionnaire was introduced as follows:

Fossil fuels are seriously damaging the environment, contributing to climate change, while serious shortages may appear in the future. The war in Ukraine also shows that dependency on one strong supplier, in this case, Russia, may cause a serious political and economic risk. For this reason, an energy transition is required.

Suppose you are the owner of a house. There are 4 options available for an energy transition in order to become independent from fossil fuels. Please assess the attractiveness of these options. The assumption is that in total, the costs of all solutions are the same for you as a house owner. Below you see 4 pictures of the possible scenarios. After viewing the pictures, please continue to the next section to answer the questions."

Then, the participants were shown pictures of all the four scenarios. The respondents had to confirm that they had seen the picture.

Source: The small-town, neighborhood and household scenarios are based in the cited research [6], while the fourth picture [72] was added by the authors.

Besides the questions regarding the Dominant Social Paradigm (see Table 3), the respondents answered the same questions on the attractiveness of respective energy transition scenarios as in [6], the original study (Table 4).

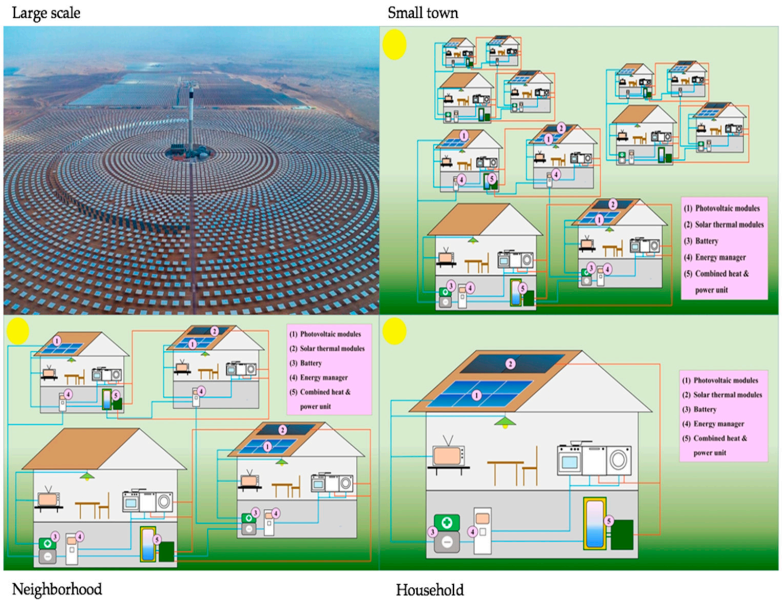

Figure A1. Presentation of all energy scenarios.

References

1. UNFCCC. United Nations Framework Convention On Climate Change. United Nations, FCCC/INFORMAL/84 GE. 05-62220 (E) 200705, Secretariat of the United Nations Framework Convention on Climate Change, Bonn, Germany. 24p, Available online: http://www.unfccc.int/resource/docs/convkp/conveng.pdf (accessed on 2 February 2023).
2. UNFCCC. *Kyoto Protocol to the United Nations Framework Convention on Climate Change*; Dec. 10, 2303 U.N.T.S. 162; UNFCCC: Rio de Janeiro, Brazil, 1997.
3. Smil, V. *How the World Really Works: A Scientist's Guide to Our Past, Present and Future*; Penguin UK: London, UK, 2022.
4. Servigne, P.; Stevens, R. *How Everything Can Collapse*; Polity Press: Cambridge, UK, 2020.
5. McPherson, G.R. *Going Dark*, 2nd ed.; Woodthrush Productions: New York, NY, USA, 2019.
6. Ecker, F.; Hahnel, U.J.J.; Spada, H. Promoting Decentralized Sustainable Energy Systems in Different Supply Scenarios: The Role of Autarky Aspiration. *Front. Energy Res.* **2017**, *5*, 14. [CrossRef]
7. Sovacool, B.K. How Long Will It Take? Conceptualizing the Temporal Dynamics of Energy Transitions. *Energy Res. Soc. Sci.* **2016**, *13*, 202–215. [CrossRef]
8. Andersen, O. *Unintended Consequences of Renewable Energy. Problems to Be Solved*; Springer: London, UK, 2013.
9. Taleb, N.N.; Bar-Yam, Y.; Douady, R.; Norman, J.; Read, R. The Precautionary Principle: Fragility And black Swans from Policy Actions. NYU Extreme Risk Initiative Working Paper. 2014, pp. 1–24. Available online: http://www.fooledbyrandomness.com/pp2.pdf (accessed on 3 April 2016).
10. Culley, M.R.; Carton, A.D.; Weaver, S.R.; Ogley-Oliver, E.; Street, J.C. Sun, Wind, Rock and Metal: Attitudes toward Renewable and Non-renewable Energy Sources in the Context of Climate Change and Current Energy Debates. *Curr. Psychol.* **2011**, *30*, 215–233. [CrossRef]
11. Gattie, D.K. U.S. energy, climate and nuclear power policy in the 21st century: The primacy of national security. *Electr. J.* **2020**, *33*, 106690. [CrossRef]
12. Berg, P.; Narayan, R.; Rajala, A. Ideologies in Energy Transition: Community Discourses on Renewables. *Technol. Innov. Manag. Rev.* **2021**, *11*, 79–91. [CrossRef]
13. Varey, R.J. The Marketing Future beyond the Limits of Growth. *J. Macromark.* **2012**, *32*, 424–433. [CrossRef]
14. Hickel, J. *Less is More: How Degrowth Will Save the World*; Random House: London, UK, 2020.
15. Bardi, U. *Before the Collapse*; Springer International Publishing: Cham, Switzerland, 2020.
16. Geels, F.W. Micro-Foundations of the Multi-Level Perspective on Socio-Technical Transitions: Developing a Multi-Dimensional Model of Agency through Crossovers between Social Constructivism, Evolutionary Economics and Neo-Institutional Theory. *Technol. Forecast. Soc. Chang.* **2020**, *152*, 119894. [CrossRef]
17. Kilbourne, W.; McDonagh, P.; Prothero, A. Sustainable Consumption and the Quality of Life: A Macromarketing Challenge to the Dominant Social Paradigm. *J. Macromark.* **1997**, *17*, 4–24. [CrossRef]
18. Kilbourne, W.E.; Dorsch, M.J.; McDonagh, P.; Urien, B.; Prothero, A.; Grünhagen, M.; Polonsky, M.J.; Marshall, D.; Foley, J.; Bradshaw, A. The Institutional Foundations of Materialism in Western Societies: A Conceptualization and Empirical Test. *J. Macromark.* **2009**, *29*, 259–278. [CrossRef]
19. Humphreys, A.; Thompson, C.J. Branding Disaster: Reestablishing Trust through the Ideological Containment of Systemic Risk Anxieties. *J. Consum. Res.* **2014**, *41*, 877–910. [CrossRef]

20. Platje, J.; Will, M.; Paradowska, M.; van Dam, Y.K. Socioeconomic Paradigms and the Perception of System Risks: A Study of Attitudes towards Nuclear Power among Polish Business Students. *Energies* **2022**, *15*, 7313. [CrossRef]
21. Shayan, M.E.; Ghasemzadeh, F.; Hossein Rouhani, S. Energy Storage Concentrates on Solar Air Heaters with Artificial S-shaped Irregularity on the Absorber Plate. *J. Energy Storage* **2023**, *74*, 109289. [CrossRef]
22. Shayan, M.E.; Najafi, G.; Ghobadian, B.; Gorjian, S.; Mamat, R.; Ghazali, M.F. Multi-microgrid Optimization and Energy Management under Boost Voltage Converter with Markov Prediction Chain and Dynamic Decision Algorithm. *Renew. Energy* **2022**, *201*, 179–189. [CrossRef]
23. Program Zdrowie Rodzina Praca, Prawo i Sprawiedliwość, Warszawa. 2014. Available online: https://www.gramwzielone.pl/trendy/16998/co-pis-zrobi-z-oze-po-przejeciu-wladzy (accessed on 2 February 2023).
24. Program PIS. Available online: https://pis.org.pl/files/Program_PIS_2019.pdf (accessed on 2 February 2023).
25. Dyrekcja Generalna ds. Działań w Dziedzinie Klimatu Komisja Europejska. *Neutralność Klimatyczna do 2050. Strategiczna Długoterminowa Wizja Zamożnej, Nowoczesnej, Konkurencyjnej i Neutralnej dla Klimatu Gospodarki*; Urząd Publikacji Unii Europejskiej: Luxembourg, 2019.
26. Przedstawiciele Rządu i Związków Zawodowych Podpisali Umowę Społeczną dla Górnictwa. Available online: https://www.cire.pl/artykuly/serwis-informacyjny-cire-24/185426-przedstawiciele-rzadu-i-zwiazkow-zawodowych-podpisali-umowe-spoleczna-dla-gornictwa (accessed on 10 February 2023).
27. Hebda, W. *Polityka Energetyczna Polski do 2040r. (Energy Policy of Poland until 2040)*; Ministry of Climate and Environment: Warsaw, Poland, 2021.
28. NIK (Najwyższa Izba Kontroli). *Rozwój Sektora Odnawialnych Źródeł Energii*; NIK: Warsaw, Poland, 2018. Available online: https://www.nik.gov.pl/kontrole/P/17/020/ (accessed on 11 February 2023).
29. Michałowska, G. *UNESCO Sukcesy Porażki Wyzwania*; Wydawnictwo Naukowe Scholar: Warsaw, Poland, 2020.
30. De Laurentis, C. Mediating the form and direction of regional sustainable development: The role of the state in renewable energy deployment in selected regions. *Eur. Urban Reg. Stud.* **2020**, *27*, 303–317. [CrossRef]
31. USTAWA, Act of 22 June 2016 on Investments in Wind Farms, Journal of Laws 2016 Item 961 (Ustawa z Dnia 22 Czerwca 2016 r. o Zmianie Ustawy o Odnawialnych Źródłach Energii Oraz Niektórych Innych Ustaw, Dz. U. 2016 poz. 925), Prezes Rady Ministrów, Warsaw. Available online: https://isap.sejm.gov.pl/isap.nsf/DocDetails.xsp?id=wdu20160000925 (accessed on 2 February 2023).
32. Tavakoli, A.; Saha, S.; Arif, M.T.; Haque, M.E.; Mendis, N.; Oo, A.M. Impacts of grid integration of solar PV and electric vehicle on grid stability, power quality and energy economics: A review. *IET Energy Syst. Integr.* **2020**, *2*, 243–260. [CrossRef]
33. USTAWA, Act of 29 October 2021 Amending the Act on Renewable Energy Sources and Certain Other Acts, Journal of Laws 2021 Item 2376. (Ustawa z Dnia 29 Października 2021 r. o Zmianie Ustawy o Odnawialnych Źródłach Energii Oraz Niektórych Innych Ustaw, Dz. U. 2021 poz. 2376), Prezes rady Ministrów, Warsaw. Available online: https://isap.sejm.gov.pl/isap.nsf/DocDetails.xsp?id=WDU20210002376 (accessed on 2 February 2023).
34. Raport Rynek Fotowoltaiki w Polsce za Poszczególne Lata. Instytut Energetyki Odnawialnej. 2020. Available online: https://ieo.pl/en/aktualnosci/1475-rola-regionalnych-programow-operacyjnych-w-stymulowaniu-rozwoju-rynku-fotowoltaiki-w-polsce (accessed on 10 January 2023).
35. Aouf, R.S. Finnish "Sand Battery" Offers Solution for Renewable Energy Storage. 2022. Available online: https://www.dezeen.com/2022/07/14/finnish-sand-battery-solution-renewable-energy-storage-technology-news/ (accessed on 1 April 2023).
36. Chen, T.; Jin, Y.; Lv, H.; Yang, A.; Liu, M.; Chen, B.; Xie, Y.; Chen, Q. Applications of Lithium-Ion Batteries in Grid-Scale Energy Storage Systems. *Trans. Tianjin Univ.* **2020**, *26*, 208–217. [CrossRef]
37. Mój Prąd. Available online: https://mojprad.gov.pl/ (accessed on 1 April 2023).
38. Archiwa Fotowoltaika. Available online: https://globenergia.pl/kategoria/fotowoltaika (accessed on 10 January 2023).
39. USTAWA, Act of 20 February 2015 on Renewable Energy Sources, Journal of Laws of 2021, Item 610, 1093, 1873 and 2376 and the Act of 29 October 2021 Amending the Act on Renewable Energy Sources and Certain Other Acts, Journal of Laws 2021 Item 2376. [Ustawa z Dnia 20 Lutego 2015 r. o Odnawialnych Źródłach Energii, Dz. U. z 2021 r. poz. 610, 1093, 1873 i 2376 Oraz USTAWA z Dnia 29 Października 2021 r. o Zmianie Ustawy o Odnawialnych Źródłach Energii Oraz Niektórych Innych Ustaw, Dz. U. 2021 poz. 2376], Prezes Rady Ministrów, Warsaw. Available online: https://isap.sejm.gov.pl/isap.nsf/DocDetails.xsp?id=wdu20150000478 (accessed on 2 February 2023).
40. Główny Urząd Nadzoru Budowlanego, Centralna Ewidencja Emisyjności Budynków. Available online: https://www.gunb.gov.pl/strona/centralna-ewidencja-emisyjnosci-budynkow (accessed on 12 February 2023).
41. PSEW. Wind Energy in Poland 4.0, Report 2022, TPA Poland/Baker Tilly TPA. Available online: http://psew.pl/wp-content/uploads/2022/06/skompresowany-raport-22Polska-energetyka-wIatrowa-4.022-2022-.pdf (accessed on 8 November 2023).
42. USTAWA, Act of 19 July 2019 Amending the Act on Renewable Energy Sources and Certain Other Acts, Journal of Laws of 2019, Item 1524. [Ustawa z Dnia 19 Lipca 2019 r. o Zmianie Ustawy o Odnawialnych Źródłach Energii Oraz Niektórych Innych Ustaw, DZ. U. z 2019 r. poz. 1524], Prezes Rady Ministrów, Warsaw. Available online: https://isap.sejm.gov.pl/isap.nsf/DocDetails.xsp?id=WDU20190001524 (accessed on 2 February 2023).
43. KOWR. Available online: https://www.kowr.gov.pl/odnawialne-zrodla-energii/spoldzielnie-energetyczne (accessed on 12 February 2023).

44. Powstaje Trzecia Spółdzielnia Energetyczna w Polsce. Available online: https://www.gramwzielone.pl/trendy/108211/powstaje-trzecia-spoldzielnia-energetyczna-w-polsce (accessed on 12 February 2023).
45. Yildiz, O.; Rommel, J.; Debor, S.; Holstenkamp, L.; Mey, F.; Muller, J.R.; Radtke, J.; Rognli, J. Renewable energy cooperatives as gatekeepers or facilitators? Recent developments in Germany and a multidisciplinary research agenda. *Energy Res. Soc. Sci.* **2015**, *6*, 59–73. [CrossRef]
46. Heras-Saizarbitoria, I.; Saez, L.; Allur, E.; Morandeira, J. The emergence of renewable energy cooperatives in Spain: A review. *Renew. Sustain. Energy Rev.* **2018**, *94*, 1036–1043. [CrossRef]
47. Wierling, A.; Schwanitz, V.J.; Zeiß, J.P.; Bout, C.; Candelise, C.; Gilcrease, W.; Gregg, J.S. Statistical evidence on the role of energy cooperatives for the energy transition in European countries. *Sustainability* **2018**, *10*, 3339. [CrossRef]
48. Ozgul, S.; Kocar, G.; Eryasar, A. The progress, challenges, and opportunities of renewable energy cooperatives in Turkey. *Energy Sustain. Dev.* **2020**, *59*, 107–119. [CrossRef]
49. Proka, A.; Loorbach, D.; Hisschemöller, M. Leading from the Niche: Insights from a Strategic Dialogue of Renewable Energy Cooperatives in The Netherlands. *Sustainability* **2018**, *10*, 4106. [CrossRef]
50. Fraś, B.; Ivashchuk, O. Rola Klastrów w Zrównoważonym Rozwoju Energetyki w Polsce. *Polityka Energ.-Energy Policy J.* **2017**, *20*, 33–38.
51. Cluster Map, PARP. Available online: https://mapaklastrow.parp.gov.pl/Klastry2/index_en.html (accessed on 12 February 2023).
52. Polskie Sieci Elektroenergetyczne. Available online: https://www.pse.pl/dane-systemowe/funkcjonowanie-kse/raporty-dobowe-z-pracy-kse (accessed on 12 February 2023).
53. Mikołajuk, H.; Zatorska, M.; Stępniak, E.; Wrońska, I. Informacja statystyczna o energii elektrycznej. *Biul. Miesięczny Agencji Rynk. Energii* **2021**, *3*, 327.
54. Największe Elektrownie Fotowoltaiczne w Polsce RANKING. Available online: https://www.rynekelektryczny.pl/najwieksze-farmy-fotowoltaiczne-w-polsce/ (accessed on 10 February 2022).
55. Moc Zainstalowana Farm Wiatrowych AKTUALIZACJA. Available online: https://www.rynekelektryczny.pl/moc-zainstalowana-farm-wiatrowych-w-polsce/ (accessed on 10 February 2022).
56. Kępińska, B.; Hajto, M. Przegląd wykorzystania energii geotermalnej w polsce w latach 2022–2023. 2023. Available online: https://kongresgeotermalny.pl/viii-ogolnopolski-kongres-geotermalny/przeglad-wykorzystania-energii-geotermalnej-w-polsce-w-latach-2022-2023/ (accessed on 9 December 2023).
57. Schmelzer, M.; Vetter, A.; Vansintjan, A. *The Future Is Degrowth: A Guide to a World Beyond Capitalism*; Verso Books: London, UK, 2022.
58. Kilbourne, W.E.; Beckmann, S.C.; Thelen, E. The role of the dominant social paradigm in environmental attitudes: A multinational examination. *J. Bus. Res.* **2002**, *55*, 193–204. [CrossRef]
59. Kilbourne, W.E.; Beckmann, S.C.; Lewis, A.; van Dam, Y. A Multinational Examination of the Role of the Dominant Social Paradigm in Environmental Attitudes of University Students. *Environ. Behav.* **2001**, *33*, 209–228. [CrossRef]
60. Schumpeter, J.A. *Socialism, Capitalism and Democracy*; Harper and Brothers: New York, NY, USA, 1942.
61. Nasar, S. *Grand Pursuit: The Story of Economic Genius*; Simon & Schuster: New York, NY, USA, 2011.
62. Rao, P.K. *Sustainable Development–Economics and Policy*; Blackwell Publishers: Oxford, UK, 2000.
63. Platje, J. *Institutional Capital–Creating Capacity and Capabilities for Sustainable Development*; Wydawnictwo Universytetu Opolskiego: Opole, Poland, 2011.
64. Williamson, O.E. *The Economic Institutions of Capitalism*; Free Press: New York, NY, USA, 1985.
65. Applebaum, A. *Twilight of Democracy: The Seductive Lure of Authoritarianism*; Doubleday: New York, NY, USA, 2020.
66. Rae, C.; Bradley, F. Energy autonomy in sustainable communities–A review of key issues. *Renew. Sustain. Energ. Rev.* **2012**, *16*, 6497–6506. [CrossRef]
67. Müller, M.O.; Stämpfli, A.; Dold, U.; Hammer, T. Energy autarky: A conceptual framework for sustainable regional development. *Energy Policy* **2011**, *39*, 5800–5810. [CrossRef]
68. Schmidt, J.; Schönhart, M.; Biberacher, M.; Guggenberger, T.; Hausl, S.; Kalt, G.; Leduc, S.; Schardinger, I.; Schmid, E. Regional energy autarky: Potentials, costs and consequences for an Austrian region. *Energy Policy* **2012**, *47*, 211–221. [CrossRef]
69. Gladwin, T.N.; Kennelly, J.J.; Krause, T.-S. Shifting paradigms for sustainable development: Implications for management theory and research. *Acad. Manag. Rev.* **1995**, *20*, 874–907. [CrossRef]
70. Ehrensal, K.N. Critical Management Studies and American Business School Culture: Or, How Not to Get Tenure in One Easy Publication. Presented at the International Critical Management Studies Conference, Manchester, UK, 14–16 July 1999.
71. Ehrensal, K.N. Training capitalism's foot soldiers. In *The Hidden Curriculum in Higher Education*; Margolis, E., Ed.; Routledge: New York, NY, USA; London, UK, 2001; pp. 97–113.
72. European Commission. *The European Green Deal*; COM/2019/640 Final; European Commission: Brussels, Belgium, 11 December 2019.