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THE SOCIAL ENERGY OF TRANSITION

A DISCUSSION OF AGATA STASIK'S BOOK *PRZEŁAMAĆ KLINCZ WĘGLOWY. ZBIOROWE EKSPERYMENTOWANIE NA RZECZ ZRÓWNOWAŻONEJ TRANSFORMACJI**

Marta Strumińska-Kutra: Good evening, I'm Marta Strumińska-Kutra and I am very pleased to moderate today's meeting. I think we can expect a really dynamic and interesting exchange of views and experiences, because the format allows us to include the voices of practitioners, as well as theoreticians and researchers. Four guests have been invited to join our panel discussion. I hereby open our meeting and invite Agata to introduce the book.

Agata Stasik: First of all, thank you very much to everyone who accepted the invitation to this meeting. In my recent book, I develop and apply the concept of "collective experimentation for sustainable transition" and use it to analyse three cases. This work is theoretically grounded in two interconnected fields within the social sciences: science and technology studies and sustainable transition studies, and empirically in my research on the social aspects of energy transition, which I have conducted over the past ten years. I analyse three empirical cases: the emergence and growing impact of climate science; the development of prosumption – a model where individuals takes part in energy production; and the development of energy communities, in particular energy clusters, which constitute a specific, Polish proposal for a legal framework to enable local cooperation for energy.

I was prompted to write [the book] by a growing sense of dissonance. When it comes to a sustainable energy transition, on the one hand, we

* The discussion took place online on 5 December 2024.

know quite well where we want to get to, that is, we share the goal of reducing and then zeroing out greenhouse gas emissions from the energy sector. We have various plans, strategies, roadmaps that can give us some solidifying illusion of control. If we stop to read such documents, we get the sense that not only do we know where we want to get to but that we have a great step-by-step plan on how to achieve that. On the other hand, when we go out into the field and look at the details, we see how the implementation of these plans encounters the most mundane obstacles that pile up: technological, legal, or related to the public perception of new solutions. The buildup of obstacles is striking – and, of course, not a coincidence. I see it in my research when, for example, I talk to a practitioner working on energy community development. The gulf between the ambitious visions of the near future and today's paralysis is revealed when I hear first about the solutions we will have in just a moment – which are almost ready, advanced, great, and useful – and immediately after that we talk about ten different specific reasons why local power generation in Poland today hardly works at all. Implementation of well-known, almost-ready solutions seems thus to be an extremely resistant process.

I wonder, then, what and whether there is anything we can do about it as representatives of the social sciences, at this particularly urgent time, when it makes sense to work at using every resource to mitigate further climate change, given the stakes of the endeavour. Can the social sciences contribute something to the understanding of this process that will help guide it? Of course, we should beware of excessive hubris. It's probably difficult for us as sociologists to say that as soon as we join the table, we'll immediately solve all the problems with the enlightened guidance of social theory. But how can we contribute? First, it is worth looking at every moment of "bottleneck" in the change process. This alone requires the use of knowledge from many disciplines and practical areas of action that we cannot assign to one discipline, and forces us to conduct transdisciplinary research. Why, for example, do energy clusters in Poland not work, even though there are persistent efforts to make them work? As part of this approach, we are looking at what kind of mismatch of various factors is paralysing these efforts.

But in addition to this, I have developed a theoretical language that allows us to talk about all similar challenges – not just one at a time, as challenges of collective experimentation for sustainable transition. Following Gregory C. Unruh, I have captured these technical, social, legal, and institutional blockages as symptoms of carbon lock-in [Polish: *klincz*

węglowy]. The carbon lock-in stems from the fact that these individual elements of a stable system formed and shaped each other in a long process of coevolution. In the social sciences we have different ways of talking about similar processes. We can describe them as path dependence. However, the advantage of the notion of carbon lock-in is that it directs our attention less to the meanderings of historical coevolution and more to the currently experienced link to material infrastructure. It's important to observe this looping right now and think about how it can be disrupted to steer the system onto a different path. Here, the inspiration from actor–network theory (ANT) is important to me, as it explains how adding another element to some system affects the whole network, and also requires a whole series of successful translations. A change in one area means that every element of the network will work a little differently; if that broad change doesn't happen, then adding a new element can end in failure.

By analysing in this way the jam we are stuck in, I propose to think about change as a "collective experimentation for sustainable transition." What is important about the notion of experimentation is that the outcome of the process is not fully known. We would probably all prefer to apply known, proven, certain solutions, but there are none, so we are condemned to experimentation, in which we have a great many heterogeneous, hard-to-control elements that influence each other. This is a collective process, which is co-created and influenced by actors from different spheres: it consists not so much in simply finding new solutions as in creating new working configurations. These new configurations, on the one hand, must be compatible enough with the current system to emerge and scale up, because if they are not compatible, they will not become part of the network. It is useful to think of the "network" both as a theoretical category and simply as the electric power grid. But these new configurations must, on the other hand, be incompatible – to introduce disruption and push the system in a new direction consistent with the goal of reducing emissions, and to create new "black boxes," stabilising systems based on a new logic. Realising the tension between alignment and introducing radical change is paramount to understanding how to work to break the carbon lock-in. At such a practical level, this approach reveals and appreciates the work of mediators, facilitators of change, who make it possible for actions carried out, in a siloed way, by actors from different orders to take shape in this working configuration. And here, knowledge from the social sciences, or even the participation of a person with such expertise, could facilitate actions for change, by introducing a better understanding of these processes.

MSK: Thank you, Agata. After both reading the book and listening to your introduction, I have the impression that your goal was not only to describe collective experimentation and lock-in. The goal is also to create a useful narrative, that is, one that facilitates dialogue and translation understood in a colloquial rather than theoretical way. It is an attempt to create a way of communication between actors coming from very different worlds. And hence the first question I want to ask is a question of usability. Each of our panellists has a specific and unique knowledge of the energy transition, whether it comes from theory, research, or their own experiences of grappling with the issue. To what extent does the perspective presented in the book resonate with your experience and knowledge? To what extent do the categories of thinking that Agata proposes in the book – collective experimentation, the lock-in, the various constellations of actors who must align with each other in the process – to what extent do these categories that Agata uses allow you to better understand the reality of the energy transformation, and therefore also to better and more effectively work towards making it a reality? In particular, which ideas, research, and conclusions have you found particularly interesting, and which do you perhaps disagree with, or, to put it more diplomatically, find debatable?

Aleksandra Wagner: Starting with this question of how and where I see the usefulness of this book to my own research and also to the research or situation of my team, I will start with a personal remark. First of all, we take on very diverse topics in our work depending on where "the grant carries us." That is, we always focus on the social aspects of the energy transition, but they are very diverse. For example, we currently have a project in which we are working on the construction of energy islands, which are intended to float on the surface of the sea – here we are working closely with technologists. We have a project that deals with the presence of women in the energy sectors, but we are also doing research, for example, on how decarbonisation models are developed and then scenarios based on them to be used locally and globally. So the projects are very diverse, and we sometimes feel that we are jumping from different topics, and into different dimensions. When I started reading Agata's book, I thought to myself: that's good, right? We are in this collective experimentation in absolutely different networks and in different processes. There is a justification for this – "There is method in this madness." On a more serious note, these concepts that are adopted in the book are indeed very close to my own and I find them useful in two main areas. First, the author offers a synthetic, very interesting theoretical discussion at the beginning.

And this is material that is not only very interesting cognitively, but also one that we will use in teaching and working with our students, because it provides insight into the discussions that are currently taking place in the field of transition studies and in the sociology of energy. In the second part, which dives more deeply into the empirical layer, the interestingly selected cases consistently pursue a theoretical approach that I find very valuable for two reasons. First, the very notion of translation and the prospect of going into the network to follow these translations – following the actors to do so – seems to me to be very good and useful when we think about how complicated and how complex energy systems are and look for a key to try to understand them, but also to somehow constrain them. Of course, the ANT framework itself does not demarcate borders; it does not set a system's boundaries. But that's why the author narrows this approach and introduces a framework, declaring that she will use the concept of networks in a narrowed way that allows [one] simultaneously to focus on decarbonisation processes and to open up space for further exploration not only of how these processes are coupled between sectors, but also, for example, how they are coupled with other processes. There are threads of digital reality and materiality in the book, the coupling of which represents a transition to a new reality, or to a new system. Although this does not happen without some tensions. Furthermore, at the level of EU communication, the three dimensions of transformation – decarbonisation, democratisation, digitalisation – also overlap in their outworkings, sometimes leading to contradictory results. That is, in conclusion, I find the idea of framing socio-technological change through the prism of translation particularly interesting in the book – as is the related concept of experimentation, the social co-creation of knowledge and other resources. Such processes are open-ended, and it too can be controversial – controversial in the sense that it opens the field to new and not easy questions, and that is, for example, what happens in the case of failure. What about when these processes of experimentation fail? Because since the process of experimentation is open-ended, it can lead to surprising results – not necessarily intended and not necessarily positive. Experimentation may end in failure; it might not necessarily end in an improvement of a system's activities. Who then bears the responsibility for this? How do actors share these responsibilities? To conclude the theme of what is particularly valuable from my perspective in Agata's book, I would like to address the problem of time.

MSK: Thank you very much. Yes, I think the aspect of time deserves separate attention, and I hope we will come back to that. Radosław, what are your thoughts on the book?

Radosław Tyrała: First of all, thank you very much for inviting me to this discussion. I am not a sociologist of the energy transition. I have dealt with issues of energy, one might say, somewhat haphazardly – probably the least of all of you here. In my case, the content of Agata Stasik's book resonates primarily with my experience as a participant in the KlastER research project. This was a large project conducted at, among other places, AGH University of Krakow, in which we, as a team of eight sociologists, took an active part in 2020–2021. And from this perspective, this book, if we are talking here about its merits and the novelties it brings, appears to me to be a book that provides encouraging knowledge – a kind of "joyous science," to refer to F. Nietzsche. Perhaps this is the way to write about these issues today. We have a big discussion today about how to write about the climate crisis and the challenges it brings (including energy production and consumption), especially in light of the fact that the world as we know it may be about to end – whether to talk about it in a negative and pessimistic tone, which can further deepen the sense of stagnation, or perhaps precisely in a more optimistic and encouraging tone, which could have a mobilising effect. And I read this book as taking a stand for the second option. The category used in it – in a sense also perhaps a metaphor – of collective experimentation has a positive and motivating overtone for further change. Here I will refer to that research on energy clusters that we once conducted. I was personally responsible for conducting interviews with experts and cluster coordinators, as well as for two case studies conducted in the clusters themselves. And to be honest, the field really worried me. These clusters – and this was just evident both in the case studies and in these interviews – the experts I talked to and the cluster coordinators were really surprisingly and sometimes frighteningly unanimous about how energy clusters don't work. They openly asserted that we are dealing here with blow-up creations, with "apparent activities." They recounted how nothing was really working, both in terms of regulatory and infrastructure issues. In almost no case did the cluster succeed in activating the local community on a wider scale, that is, the social energy that this was, after all, about generating. Some things have succeeded, of course. There are exemplary clusters, but this is a definite minority, just as Agata writes. There are some special cases, extremely positive ones. But the vast majority of these certified clusters, let's say, have died out: they are in

a state of some kind of hibernation, some kind of stagnation. Here I quote my interlocutors: "hibernation," "survival form," "legal structure unfilled with content," "stagnation," and so on and so forth. A good example is our visit to an energy cluster in Tomaszów Mazowiecki. They wanted to show us the cluster, because we had made the request. We were taken to some three or four places, and it was a bit like this: "Well, listen, here, if it goes – well, yes, there will be some geothermal plant somewhere, some photovoltaics will be created under the banner of the cluster." Because for now it is being created, but under a completely different banner. Three years have passed and a lot has changed, but the clusters are still not activated. It's still hard to say whether 2022 will be a trigger, a factor that will perhaps set some processes in motion. We see some swallows of hope, such as last year's surge in RES energy production in Poland. However, the participation of energy clusters in this process is minimal. I say all this from the perspective not only of a researcher but also a citizen with a vested interest in the realisation of these better rather than worse scenarios of the future.

MSK: Thank you. That's an interesting perspective. I hope, too, that we can return to the question of the emotions associated with the energy transition, including hope, which indeed often comes up in this discussion as something we need, as something that can potentially activate and harvest social energy. For now, however, I invite Kamil to offer his thoughts on the book.

Kamil Lipiński: Thank you. The book very interestingly articulates several key issues regarding Polish energy policy. First, Agata accurately recognises that the story and the dominant energy narratives in Poland are, in general, constructed around megaprojects. This setting of the debate results in the reproduction of a certain static system of relations, centred around large actors such as state-owned companies, Transmission System Operators and Distribution System Operators. The interests of these large actors are identified quite well by the author of the book. An interesting thread in this context is the author's analysis of the legal framework of the energy-clusters operations. At great risk – because the legal systems are constantly changing – she shows how existing regulations reproduce relationships in the national energy sector, hindering the energy transition and the development of dispersed generation and distributed energy systems. Exposing the position of dominant actors and assigning them the responsibility that should come from such an important position is a significant feature of the book. The second important topic the author addresses is the concept of a carbon lock-in. From the perspective of an energy-sector analyst, it is not necessarily obvious. If we look at the situation in Poland,

hard coal mining fell by 41% between 2015 and 2024. The amount of coal-fired electricity produced per month in Poland's electricity mix fell by 38% over the period. As for employment in the coal-mining sector, it fell by 27% over the period. If we look at the Ministry of Family, Labour and Social Policy's monitoring of social conflicts, there were mining protests in 69% of the months between 2014 and 2024, on average there were three protests per month, and some of them were nationwide. So we are experiencing a certain tension and dynamic change in the Polish energy sector. However, this doesn't falsify what Agata writes in the book, because she describes a certain starting point, the sociotechnical imaginary of the Polish energy sector. It's a bit like with Mario Draghi's report. When he was asked if the European Union would face "certain death" if his proposals were not implemented, he replied that it might not be "certain death" but the EU's "slow agony" seemed likely. The lock-in suggests a certain static, doesn't it? We can imagine wrestlers who are in this sort of clinch. For me, this proposed approach corresponds somewhat interestingly with the dominant sociotechnical imaginary (in the sense proposed by Sheila Jasanoff) of the Polish energy industry, the "Let it flow," which the team of Katarzyna Rabiej-Sienicka, Tadeusz Rudek and Aleksandra Wagner identified in their work. Within this imaginary, the energy industry is perceived as a static system that supplies energy to households and undertakings. This centres narratives around security of supply, rather than, for example, energy affordability, the protection of vulnerable consumers, the sustainability of energy generation, and distribution. A third interesting element – quite controversial – is confronting this existing dominant narrative that is based on infrastructure megaprojects and reproduced by the legal system with clusters – with clusters, which, as Agata rightly points out, remain a marginal phenomenon in Poland. Rather, we count the power capacity of clusters in tens of megawatts, despite the fact that we have 1.5 million prosumers, or almost one in ten households in Poland. We had an explosion of prosumption in photovoltaics – 11 GW of power capacity – when the peak demand for power in Poland is 25–26 GW. This is fascinating; it makes you think about such a social-class dimension of the development of clusters in Poland and further deepens the analysis – ask yourself why people might not want to enter such clusters at all? The fourth interesting topic is the non-obvious scope of the analysis of energy clusters. This is always interesting when applying actor–network theory: when to end the narrative? Bruno Latour joked – provocatively, of course – in *Reassembling the Social* that we know that the research process is finished when it runs out

of funding, when the money for the research is gone. In cluster research, this is quite a problem. It's easy to see some asymmetries and some external costs associated with their operation that exist on a global level. The first external cost is the import of cheap, subsidised photovoltaics from China, and China's role in general in driving down the price of goods imported into the EU, which is now a major challenge to Europe's industrial policy. The second area is the issue of power grids and their role in cluster development – a very difficult question that the author raises. To what extent should the interest and involvement of Distribution and Transmission System Operators be taken into account – actually designing transmission and distribution networks top down? To what extent should it really be a bottom-up process? In the book, Agata points out a very important task for sociologists dealing with energy and the climate: to create a space for debate and involve very different actors. The green transition could be an opportunity for the development of a public sociology of the Polish energy sector.

MSK: Yes, so the active engagement of science is a clear theme in this book. Thank you and I now invite Marta [to speak].

Marta Anczewska: Good morning, thank you very much for the invitation. I represent a think tank that is actively working on public policy, so I have a handful of such very practical comments on how the information gathered by Agata in this book can be used to work with this topic. But before I begin, I'd like to make a small *ad vocem* to Kamil, because in my opinion, the carbon lock-in continues. And this can be seen, for example, in the fact that even though coal is going away – its share in the energy mix is declining – cash transfers to the mining industry continue, and the state, unfortunately, is still in the model of supporting the sector. On a symbolic level, society is also not quite ready to part with the important role of mining. For example, yesterday was Barbórka [a Polish mining holiday], and, classically, the media headlines were dominated by the age-old question: is Poland ready to move away from coal, can we afford it, won't the economy collapse, and so on? So it seems to me that we are still in a clinch, despite all those positive elements you mentioned. On the other hand, moving on to the questions asked here in the panel – I, first of all, would like to thank Agata very much for the vision of Poland in 2050 contained in the book's introduction that shows how our lives will function in a climate-neutral economy. Because it's a great operationalisation of what we're aiming for when we try to shape public policies, write strategies, and come up with solutions, for example, for mechanisms to incentivise the implementation of those strategies. There Agata tells us point by point how we are going to

move, how we are going to use energy, how we are going to use heat, how our lifestyles are going to change in such a very tangible way. And this is needed for us practitioners, because we sometimes already have a deficit of such examples, and I have the impression that there is generally a paralysis of imagination among decision-makers, who are focused on surviving, and are also constrained by political tenure. To refer a bit to the terms Agata uses in the book, it is neither backcasting nor forecasting on their part, but survival. We just want to survive until next year, we don't want our programme to collapse, we don't want anyone to start suspecting us of being too ambitious. Just look at the political agendas and the topics of energy and climate, which I think only started to appear there in 2019. And we know that this is an existential threat to all of us; we've known that for years. I'm running out of time, so maybe I'll move on to two things, which is, first, what specific examples I see that can be described in the language created by Agata, and where this language can actually also help solve some crisis moments, where you don't know what to do next, because there are either technological or social obstacles. The first example is the Clean Air [Polish: Czyste Powietrze] Programme, which in theory was a great programme to support prosumers responding to the smog crisis and the fact that the public has gained awareness of how much it threatens their health. At the moment, the Clean Air Programme has been suspended for a week. We don't know yet what the consequences will be. On the other hand, it will most likely lower the public's confidence in state institutions and in the fact that there can be an effective intervention that supports them to take care of their heat sources themselves, as well as energy efficiency in their homes. This programme constitutes an experimentation on a living organism; it is changing dynamically depending on the regulations and the response of households to the proposed support and subsidy mechanisms (e.g., pre-financing has been introduced for poor households that are unable to put up the money for investments upfront). The programme has a ten-year target, and the institutional and regulatory environment will change very dynamically during that time, so that's where the kind of openness to making mistakes that Aleksandra mentioned is also needed. In contrast, among leaders, clearly there is no such margin for error. The system was shut down overnight. I'll give another example, that of electric cars, which as far as I know are very controversial. On the one hand, without electric cars, we will not decarbonise the transportation sector, which is very difficult to decarbonise. And on the other hand, at the social level, it is known that there is a debate as to whether this is a safe mode of

transportation, whether it can really move us long distances, how much of it is entertainment for the rich, how much of it will ever be available to the less affluent, and there is clearly no confidence in this technology. Well, and the question is what can be done about it, especially since it will change dynamically. And on the other hand, there are electric bicycles, which Polish society has come to love during the course of the past couple of years, that is, they have found a mass of takers, and they solve everyday problems – from people who do extreme sports to couriers who do food delivery. So it's also very interesting how different technologies are narrated, by whom they are narrated, how much of it is based on actual experience, real-world experience, how much of it is simply about the promotion and domination of certain technologies. And my last point, what most caught my attention in this book – well, I am terribly pleased with chapter three. There is a subsection there entitled, "An individual in the energy market in the European Union." And in fact, Agata, you have captured something that I have been sensing for some time now, a tension that I could not name. It's a tension between whether the consumer is supposed to be a so-called active user, that is, to take responsibility for shaping the energy system, to be an energy citizen, to manage his consumption and production – that is, the prosumer, for example, reduces his consumption, makes sure he stores energy, knows how to give it back to the grid, and at the same time earns money from it – versus an interventionist approach like the one prevailing in Poland today, for example, at the household level. That is, we have a right to energy, and it's up to the state to make sure it's supplied at the right price. And in the European Union itself, where the key regulations for the energy market are taking shape, the former approach, the market approach, dominates, where you have to expose the consumer to price incentives and they are supposed to shape his behaviour. On the other hand, there is also a very large group of circles associated more with social justice and the fight against poverty, which says that, well, it can't be such a full exposure, it must also be linked to minimising risks. And there is an even more extreme group that says electricity should be a right, not a commodity. And these tensions are very evident in the debates even when the law is being shaped, because these are such contradictory paradigms that creating regulations here is a huge challenge. Well, and of course, yes, as you rightly point out, this market approach, which has the prosumer invest his own capital and thus also be such a subject of this system, dominates in the regulations, but I see that more and more a reverse approach is emerging. This is where the tension will continue in my opinion.

MSK: Many topics have been raised in the discussion, and you are, of course, free to choose the issues you would like to discuss in greater detail. At the same time, it is worth focusing our discussion on experimentation and its potential or the challenges that this experimentation encounters. Aleksandra, you mentioned failure and responsibility, because this is not just about dealing with failure, but also a very practical question: who bears the real responsibility? Radek, you mentioned stagnation, pessimism, and how certain social initiatives, despite being de facto experimentation, when you look at them closely, they are more like extinguished, once-burning ideals. Kamil spoke about the macro scale, the structure of global economic connections, but also the class structure of society, as aspects that shape the dynamics of these processes, including experimentation. Marta, you also referred to social classes and climate justice. So if we relate these themes to experimentation, what are your thoughts on the potential and limitations? Aleksandra, could I ask you to take a position, or speak on what you feel needs commenting?

AW: This is a difficult question, but at the same time an important one, about these potentials and limitations. It seems to me that you can probably look at it differently from an economic point of view, and still a little differently from a social point of view. Although that's what I also really like about this theoretical proposal – that it proposes to go beyond these oppositions and look at practices, that is, at these skills, meanings, at what people do, how they manage energy. So [it goes] a bit beyond technical, political, and economic divisions. But on the other hand, surely such an opportunity – and also a promise that resounds in the book – is that there is potential for greater inclusivity: here again referring to this year's Nobel laureates in economics – that inclusive institutions nevertheless build wealth and build communities. So this inclusiveness, if you follow the network in such a way – follow the actors in such a way – that they have a chance to be included regardless of, for example, the resources they have, that would be good. On the other hand, however, this market approach that we've turned to limits this inclusivity somewhat. The barriers to entry are increasing, and they too, in my opinion, are not so fair. That's because, on the one hand, people have been encouraged to invest, for example, in photovoltaic panels, and they have invested. But on the other hand, their rate of return is limited, because they, first of all, can't fully recover these funds, and besides, for example, they can't sell them to anyone, right? Or they can't exchange this energy for something else, as they don't have a license. At most, they can donate it to a neighbour to – I don't know – charge his car, right? But

they can't resell it anymore under today's regulations. So this inclusivity is probably an opportunity, but I think it's being limited at the moment, though. Vision. This vision of the world after transition is also, in my opinion, really valuable. And it is also new, because a great deal of research, studies, and papers focus precisely on this transformational path, that is, on what needs to be done now. And here, perhaps, that category I mentioned earlier appears, that is, time, because time is treated in the book as the pace of transition. And this is an important variable, that this pace of transition depends on various factors and also on how these actors come together, how they cooperate, whether they just block each other, whether they create opportunities for each other to act. But it seems to me that time can also be a resource. On the one hand, we think that we don't have time – we need to make a transition, because there is no time, because there is a disaster around the corner, right? That is, the pressure is on to recognise the urgency of change and to give the actors an impetus to act. And, on the other hand, they are of very different orders, because time is treated differently by businesses and investments, differently by politicians who think in terms of tenure, differently by people who, since they have invested, would probably already like to have benefits from it immediately, and I don't know if for them it is so promising that in ten or fifteen years they will see a return, right? So here what puzzles me is how it happens that these different time orders nevertheless come together. Are they also subject to some kind of translation? How does this actually happen?

MSK: Thank you. Radosław?

RT: Then let me just start briefly and give you an anecdote about the coal lock-in. I wanted to point out that as of 2021, there is no longer a Faculty of Mining or a Faculty of Mining and Geoengineering at the AGH University of Krakow. Instead, we now have a Faculty of Civil Engineering and Resource Management. This is a significant change.

AW: But there is still a miner's monument in front of the academy.

RT: Yes, there are even two of them left. But speaking of time – nothing is eternal, so you never know. But let's get back to the discussion regarding collective experimentation. As I said, this metaphor seems to me to be very well tailored for today's times, and it somehow makes me optimistic. And this openness of the process of building all sorts of new connections and translations has positive connotations sewn into it. That's how I read it. Perhaps, as I say, my view is a bit skewed here. But I wanted to draw attention to two issues that need to be added here. They do appear in the book, but they're tucked away somewhere on single pages, and

it ultimately doesn't break out of this optimistic and "joyous" vision of openly building new energy communities of various types. First, it seems to me that what needs special attention is a matter of the conflict factor. These things were mentioned here and also appear in the book, but, as I said, they are somewhere in the background. Our AGH sociological team, and also more recently with Maria Nawojczyk and Łukasz Afeltowicz, with whom we have published various articles on this subject, used Neil Fligstein's concept of the field, and strategic action field theory, where such themes seem to me to stand out quite well, because the theory itself is tailored in such a way that it accentuates well the tension between incumbents and challengers in the energy field and in niches within it. While the ANT theory used by Agata operates with a flat ontology, it should be noted that in this ontology there are, shall we say, larger protrusions – there are various elements of this network, various actors, who mean more. This is the role of grid operators, the big energy players, who impose the rules of the game. These moments must not be missed. The second issue is that the role of apparent activities is underestimated or sometimes not taken into account. Apparent activities, that is, according to Jan Lutyński, are activities that are designed to not be able to fulfil the purposes for which they were declaratively created. It is precisely using such categories that we once interpreted the institution of the energy cluster – as apparent actions aimed at solving problems of energy production, distribution, and local energy balancing. The third issue that has emerged here and that is worth remembering in the context of time is the issue of institutional discontinuity. In particular, the role of ministries – their constant transformations, changing competencies, changing leadership, the emergence of some on the ruins of others, the dependence of strategy on ad hoc political considerations and interests. We in Poland in general have a problem with discontinuity in the historical and institutional dimensions, and our various modernisation woes probably stem from the fact that we had such strong caesuras in the history of the twentieth century. Moreover, in the case of distributed and grassroots energy, it seems to me that what is happening – especially at the level of the ministries, the structure of the ministries, and how this process from that level has been managed – is a major factor in the disorganisation of the country's energy transition. This is something that we need to pay attention to, and unfortunately it is repeated over and over again in Polish history, and somehow we don't learn any lessons from it.

MSK: Thank you. Kamil, it's your turn.

KL: That was a very interesting point raised by Radek as to some limitations of ANT when it comes to describing relations of power. Limiting yourself to this conceptual framework, it is quite difficult to formulate a critique of asymmetric relations that contain elements of oppression and exploitation. From the perspective of the Polish public sector, it is very interesting to pay attention to stranded costs, which are relevant in Polish public policies in general, but especially in the energy sector. A symbol is the unfinished Żarnowiec Nuclear Power Plant; there have been three approaches to the Baltic Pipe project, and at least five approaches to a nuclear power plant in the last thirty years. However, I would like to address the issue of collective experimentation in the Polish energy sector. Noting the potential for a "long march" through social lifestyles as a tool for developing public acceptance of the Polish energy transition is a great feature of the book – pointing to sociologists as social emancipators and as people who give voice to actors who are not heard. That being said, I somewhat missed in the book the voice of the energy-sector actors themselves. It kind of lacked, for example, excerpts from interviews; this would have been very interesting, especially in the context of the study of leadership, whose relevance for clusters Agata describes – which is another plus of the book. Excerpts from the interviews would help better capture the leadership patterns in energy clusters, which are interestingly described in the book. The dominant leadership patterns seem to be important – they make some clusters last and reproduce themselves, while some clusters are completely passive, façade-like, and ultimately disappear. It would be worth highlighting a more macro-structural constraint on cluster development. For thirty years, Polish sociologists complained that the level of social capital in Poland was low. Nowadays, they can complain that there are not enough energy clusters and energy communities. That remains apparent not just in Poland, by the way, but in general. If clusters exist, they usually have the face – as in the case of Germany – of an upper-middle-class or upper-class white male. We had a similar problem in our report *The Four Faces of Energy Poverty* in Poland, for the Polish Economic Institute, when we described household energy practices. There are households that belong to the "transformational Poland" and ones stuck in "emissions-intensive Poland." The differences lie not so much in distribution of economic capital, but more in cultural and social capital. The question is to what extent public policies should seek to structurally change existing divisions and inequalities, and to what extent they should accept it and optimise efficient spending on the energy transition.

Another limit to collective experimentation, in addition to the structural conditions, is, as Aleksandra pointed out, the issue of how the Polish energy sector operates within the EU energy market. In addition to vertically integrated undertakings, natural monopolies, and large state-owned market players, there is a second group of institutions, so to speak, that do not fully support the development of dispersed generation and distributed energy systems. The market assumes the greatest possible turnover and leads to a concentration of capital. Certain mechanisms related to the functioning of the transmission and energy market – such as, for example, the mechanism of market coupling, which encourages the greatest possible exchange between market areas, or the ruling of the EU Court of Justice in Case C-239/07–Julius Sabatauskas, which shifts the costs of connection to small generators, or the role of state-aid in Germany, Italy, and France – all this creates a tension between the development of local energy markets based on very limited local prosumption and the development of an EU-wide competitive energy market. It comes down to a choice between co-operativism and capitalism. These great structural tensions and constraints will limit the development of clusters in Poland, even with the involvement of sociologists and public institutions.

MA: The limitation that I see in the system in general is a lack of knowledge, that is, the basics of climate change are not part of the curriculum in schools, and this unfortunately has consequences. We also have little knowledge of the various technologies, their limitations, where electricity even comes from in the socket. This is not valued knowledge in our society, and I don't think there is a belief that everyone should have this information. I very much support the idea about institutional discontinuity. This is a powerful constraint. If an infrastructure project is going to succeed, it has to run for a decade, and otherwise it's burning through money. There is the risk of widening inequality, which was mentioned earlier – that the middle class with capital will be winners and the lower classes will not. But from what I observe, citizens are nevertheless beginning to see the mismanagement of at least state-owned companies or certain government decisions, and this raises a certain frustration that could be creative, and that could encourage them to this collective experimentation – not just in the form of prosumers who invest, but as participants in the debate. Thank you.

MSK: Thank you, Marta, especially since you did some moderation work for me and summarised the common themes. Well, many topics here deserve to be developed, of course. Unfortunately, time does not allow us to do so. We would like to give the other participants of the meeting

a chance to actively participate, whether by asking a question or sharing their thoughts on the book. We will then ask the author of the book to summarise the discussion.

Jakub Motrenko: Let me start with a quick question. This experimentation indeed sounds like something very pleasant, because we like to experiment. The comment about those experiments going wrong was interesting. And I associate experimentation in general with such a response to what some people call a crisis of expertise, of expert knowledge, in that we don't trust experts. One answer, then, would be to include participants in various processes. Well, but the history of such participations often just ends in failure, that is, it is very difficult to reach any conclusions. The process is prolonged; new interests emerge all the time and so on. And on the other hand – and Kamil mentioned this – what particularly seduces us are these big infrastructure projects. Well, and I wonder – maybe the answer is not experimentation, but atomic energy and top-down management of the whole process? So, a little provocatively, but experimentation appeals to me a lot.

AW: Yes, I'm sorry to interject – just for a moment – I just wanted to say that, like most of you here, most of us, I didn't get the impression that experimentation is described as being so nice and pleasant. The book makes it clear that experimentation causes discomfort, that it is very difficult, that it involves commitment, supplementing knowledge, that it can be a very painful process. I have a question about this failure, starting from this point: exactly what happens then and who takes responsibility for it? For the effort, for the commitment, for the costs of various kinds, which, although incurred, did not lead to the intended results.

On the other hand, it's also a very interesting observation about centralisation and just thinking about energy through the prism of large projects, including nuclear power. It seems that it is at the other pole of just such open social experimentation […] although maybe not, because the production of knowledge and thinking about this energy in a local context can also have different forms and involve different actors. The author starts with a certain imaginary – at the very beginning of the book there is a statement that points us to such a basic deep conviction: that energy is to be on demand, always available, and – the author does not say this directly, but I will add it myself after numerous interviews with actors from the energy system – not too expensive. It is supposed to be available. And that puts us in a certain position. But the vision presented at the beginning also provokes a different view. It causes a person to think: "Could it be different?" It makes one realise

that we have the kind of energy system we have created for ourselves – not as individuals, but one that we have nevertheless collectively worked out over the years. And the author makes it clear: such thinking about energy is neither natural nor even globally dominant, nor does it have a very long history. So it's possible to think about it differently. Such an opening of the book, leaning it into a potentially possible and quite optimistic future, opens the space for a serious conversation about experimentation in the here and now. I wanted to point out that, for me, this experimentation is also a painful process, though one that perhaps offers hope.

MSK: Yes, that once again brings us to *time* […] time and the imaginary remain important categories. Łukasz Dąbrowiecki would like to ask a question.

Łukasz Dąbrowiecki: I'm a doctoral student at the AGH Department of Sociology and Technology Studies and I have a couple of comments. The issue just raised on the topic of experimentation and innovation in the nuclear power sector is very interesting, because it seemed to be an abandoned area. Sociologists are very often just interested in micro projects, such as clusters, and perhaps the solution is to socialise the construction of a nuclear power plant. The five projects that have been tried didn't come to fruition precisely because of institutional discontinuity. Perhaps they should get support, so to speak, from grassroots organisations, so that this process goes faster. As we know, those countries in Europe that have decarbonised the electroenergetic system effectively – those that have made the transition, such as France, Sweden, and, not in Europe, but Ontario in Canada, for example – have systems based largely on nuclear power. I have another point. Miners are not just mining coal. Miners will be badly needed for the energy transition, and they will have to dig for various other minerals that will also be needed to build RES. The electric bicycles that we have seen – it was Marta Anczewska who mentioned their growing popularity in the Polish transportation system – increase emissions, not decrease them. Because potentially whoever switches to an electric bicycle was previously riding a regular bicycle, and if they are getting electricity from the Polish grid, they are burning coal mainly.

MSK: Thank you. I now invite Marta Anczewska and then Kamil Lipiński [to speak].

MA: I wanted to support this notion about the importance of time, because based on the collective experimentation happening now […]; I mean the process of spending the Just Transition Fund in coal regions. That is, in principle, a very good idea – funds that have been set aside, dedicated from

EU funds for the regions themselves to plan investments and towards economic diversification and social mitigation. On the other hand, it turns out that two years after these funds were made available, there are not enough resources there to submit good, substantive projects. And this shows that sometimes time is the resource that is most lacking, and it really needs to be taken into account in transition planning – possibly supplemented with other resources to compensate for the lack of that time.

MSK: Thank you. Kamil?

KL: I would like to ask Agata a question about turning points. When did the coal lock-in start? My hypothesis is [that it began with] the decision of the Polish Government in 1990 to cancel the construction of the Żarnowiec Nuclear Power Plant. Since then, for decades there have really been no clear strategic decisions on energy policy in Poland. And the second question is whether the coal lock-in has already died, or do we have some kind of peak moment, a high-water mark, so to speak, and the beginning of a period of decline? In my opinion, the outcome of a discussion on updating the Energy Policy of Poland in 2022 between the ruling coalition members proved that the possibility of reproducing a certain static narrative during the 2022 energy crisis is slowly running out. You've written about the 1970s, the energy crisis, which encouraged many countries, such as France, to revise their energy policies and broke the existing consensus. Is the recent crisis a turning point for Poland? Have there been such turning points in the Polish energy industry in the past?

MSK: Thank you. Agata, how do you feel after this discussion? Have any of your assumptions been shaken? Are you planning to write another book?

AS: To fairly address the issues raised in the discussion, we need more books. I think that especially issues of leadership and accountability in the process of experimentation deserve more attention to allow us to better understand problems such as the paralysing effects of institutional discontinuity and the problem of apparent actions. An important issue is also how and for whom we should write the next books. As an author, I struggle with the question of how to write to do justice to the complexity of the processes: on the one hand, when we try to grasp them theoretically and when we think about this incredibly complex empirical layer; at the same time, we would like our writing to be interesting, inspiring, and also inviting to those involved in the energy transition who do not have long training in the social sciences. That, I believe, should also encourage experimentation – that impacts the very shape and soul of sociology.

MSK: Yes, I think this is an important conclusion. Starting the book with a vision of the future also attracted my attention, because of a topic that emerged here as one of many very interesting ones, that is, the crisis of imagination. I think that using a certain vision, a metaphor, in order to explain intentions, practices, and bring us to a common denominator […] has a very high value and your book is a carrier of this often-underestimated value – although I would be happy to test this hypothesis in a non-sociological group, because as we know this community of sociological view makes it easier for us to discuss certain things together. I would like to hereby conclude our meeting in the hope of continuing the discussion at another time, in other configurations, but also, I hope, with the people who had the opportunity to meet here today. Agata, congratulations again, [it's a] great book and I think many people will use it soon and for a long time.

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