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The Temporalities of Energy Transition Processes

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List of abbreviations

EGL	European Gas Limited
FWLK	Friedrich-Wilhelm-Lübke-Koog
GPS	Global Positioning System
HSW	Husum shipyard
IBA	International Bauausstellung (IBA) Fürst Pückler Land
LMBV	Lausitzer und Mitteldeutsche Bergbauverwalttungsgesellschaft mbH

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1 Introduction

The policies of energy transition are driven largely by scenarios of an energy future that result from modelling future technological pathways. This scenario-based approach, and the 'technological potentials' these visions of the future are embedded in, tend to capture normatively the different entities engaged in the processes of energy transition (the 'market', the 'environment', the 'social'). These are presented as 'barriers' to be overcome so as to reach pre-defined amounts of renewable energy production and avoid carbon emissions. From this approach ensues an oversimplified representation of time. Time is represented as a line punctuated by abstract dates (2030, 2050) and used as a collectively shared horizon to engage in strategic debates. While this partitioning provides energy transition debates with shared temporal references for harnessing strategic discussions (about levels of carbon emission, required amounts of investment), the question of whether or not it represents collectively shared horizons remains entirely open.

The aim of this chapter is to provide a critical enquiry in the processes of time-making and of agreeing upon collective horizons of energy transition. These collective horizons, when approached at the level of energy projects, are not given beforehand. Their framing results from a process of change that is confronted with a multiplicity of issues embedded in the development of new energy technologies. To state this more graphically, we do not approach the energy transition as a generic path from 'A' to 'B', but as an experimental process of grasping and assembling 'A' and 'B' altogether. Thus a preliminary but key assertion in this research is that time is not a factor independent and exterior to actors, but a relational factor, configured differently according to emerging sociotechnical assemblages.

Nevertheless, the relationality of time and the importance of a multi-temporal perspective are not self-evident. Decades of academic and disciplinary debates in history, anthropology, geography and sociology have focused on the past through categories (for instance, 'patrimony', 'identity', 'memory') that tend to freeze outcomes and insist on nostalgic evocations of cultures, technical objects and places (for a good analysis of this, see Jackson 1994; Nora 1997; Lowenthal 2015). Another

reason an alternative conception of time is not self-evident is the academic and post-structuralist literature that often introduced 'relational' thinking exclusively focused on the 'event' (for instance in geography: Doel 1999; Thrift 2000; Dewsburry 2000) and neglected its ties to history. Thus the ambition of this chapter is to explore the possibility of a relational approach that allows us to study how the distant and recent past, and the near and the distant future, can be taken up into a process of change in the context of energy transition.

The chapter is structured in four sections. First, proceeding on the assumption that a broad range of academic literature looks at the energy transition solely as a 'matter of timing' (historical drivers, pace of the transition), it engages in a re-problematisation of the question of time. To do so, it takes advantage of two research agendas, respectively focused on the 'future present' and 'nearness'. In the second section, it develops a conceptual framework embedded in pragmatic thinking (John Dewey) that focuses on the ideas of 'experience', 'nearness' and 'duration'. This section aims to displace the way we look at the energy transition from being an interval, a gap to be bridged, to being a process of change in which new assemblages and new durations are performed and become disputed. In the third section, it inquires into three case studies: one in France (Lorraine) and two in Germany (Klettwitz/Schipkau and Northern Friesland). The analysis asks how 'nearness' becomes an issue in energy transition, through which mediations it is connected to entities from different time scales, and the extent to which these scales partake in configuring emerging sociotechnical assemblages. The last section discusses the idea of 'nearness', its ties with material intensities, and the political dimension of 'duration' in the steering of energy transition.

2 Problematizing the Temporal Dimension of the Energy Transition

2.1 Energy Transition: A 'Matter of Timing'?

A first insight into the works about energy transition suggests that the question of time is largely dealt with from two classical perspectives: an

historical approach drawing on past energy transitions, and more theoretical efforts to conceptualize the contemporary dynamics of sociotechnical innovation. Our goal is not to provide the reader with a complete overview of these fields, but to initiate on the basis of its main discussions our questioning about the temporal dimension of energy transition.

Evolutions of energy in human history are analysed on different timescales, sometimes interrelated, ranging from micro-scale evolutions to global changes. The academic literature used to combine them so as to relate a linear history proceeding from one state of civilization to another. This history generally moves from traditional agriculture to the preindustrial stage, then from the Industrial Revolution to the emergence of a globalised fossil-fuelled civilization (Debeir et al. 2013; Smil 1994; Crosby 2006). The global timescale provides a useful perspective for discovering some of the major energy trends and non-energy factors (technical innovation, emergence of mass markets, social practices) that participate in the changes of our relationship to energy. Nevertheless, it also offers a perspective that is open to dispute for various reasons. First, the focus on global tendencies (demography, energy consumption) over centuries tends to universalise occidental energy uses through history, neglecting the role of specific cultures and places in the development of societies, even though more contextualized works exist (for instance, works about national trajectories by Nye 1998, in the case of United-States; by Wrigley 2010, in the case of United-Kingdom). Second, such historical works hardly bear witness to troubled situations, interwoven interests, and emerging actors as they are observed in ongoing processes of energy transition. Historical records provide finely selected data, but time remains external to actors and situations. Time is (re-) constructed a posteriori, but not defined relationally. Third, such global and linear approaches induce a peculiar perspective on what is called a 'transition'. In the light of long-term perspectives, 'transitions' mean key shifts from one energy source to another, as was the case from wood and charcoal to coal and then to hydrocarbons, followed by 'transitions' to a higher share of primary energy consumed in a secondary form as electricity (Smil 2010). This conveys the idea that time is a line that could

be divided between periods of stability and change, and by extension that a transition is the time that elapses between two patterns of energy use. Historical approaches share a common research agenda focused on the characterisation of the factors that drive historical change. Different and numerous assumptions exist to give shape to this question. For instance, Melosi (2006) insists on the idea that evolutionary changes could explain revolutionary ones in the field of energy. Other attempts (Friedrichs 2013) stress the idea that, in the face of imminent civilizational collapses (in the current case, climate change and energy scarcity), a transition could be envisioned more radically as a break with former industrial conditions.

A second field in which the temporal dimension of the energy transition is conceptualized is works about technological change and processes of technological innovation. As summarized by Sovacool (2016), these works share a common inquiry about the timing of energy transition: How long does it take for an energy transition to occur? A series of concepts (phases, path dependency, lock-in) developed by a constellation of authors are enlisted to explain this—most often, in terms of why it takes so much time. For instance, Grubler's work (1996) has stressed factors that highlight how innovation spreads in time and space, and the necessary 'phases' of its scaling-up. Focusing on the development of electrification, Hugues (1983) has distinguished 'phases' (invention, technology transfer, system growth, large expansion, spatial differentiation) that explain why it took decades to build city lightning infrastructures, and the 'path dependency' it generated. More recently, and to counteract the idea that large technological systems can hardly be changed, the multi-level perspective (Geels and Schot 2007) has proposed an encompassing framework that approaches change as the effect of complex alterations at different levels and the interactions between them. These authors suggest a different timing for the development of energy transition (substitution, transformation, reconfiguration, re-alignment).

The brief overview of these fields emphasizes the fact that the energy transition used to be approached in the academic literature as what might be called a 'matter of timing': what factors have historically

driven energy transitions? How long does it take for an energy transition to occur? The research agendas these questions belong to present different limits for those who want to investigate ongoing energy transition processes. First, the conception of time at their core is almost linear and abstractly partitioned between past, present and future. These dimensions of time are studied separately (for instance, historical works focus on past transitions, the technical innovation approach on the ambition to influence the steering of contemporary processes), while the issues related to their articulation and political entanglement remain neglected. These approaches still lack a common theoretical basis to investigate temporal processes and issues of energy transition. Second, the conceptualisation of energy transition as a 'matter of timing' can be seen as an expression of a managerial turn, notoriously fleshed out by the multi-level framework. This tends to narrow down the temporal issues of energy transition to few questions, such as the pace of the transition and the means to foster the scaling-up of decarbonized technologies. The narrowing down is accomplished through ideas (levels, barriers, technological potential) that normatively capture the entities engaged in energy transition (for instance, is the landscape a 'barrier' to wind power development?) and underestimate their contribution to stabilizing these temporal issues (does the landscape offer inherited configurations that could help regulate locally the pace of the wind power development?) (Labussière and Nadaï 2014). By extension, this treatment also minimizes the importance of others issues (for instance, the becoming of local heritages, or the life cycles of biodiversity). Third, as discussed in the introduction of the book, the values and ends associated with visions of energy futures are usually not explicit. They remain in the shadow of technological promises. Thus revising the conception of time is both a theoretical and a democratic challenge. Time is put in the hands of innovators, industrialists and policy makers so as to ensure the control over emerging energy futures. This does not sufficiently acknowledge the power relationships at the heart of energy transition and their importance for giving shape to values and means that do not pre-exist the development of new technologies of energy.

2.2 Re-problematizing Time (1): The Future Present

An increasing number of works from the social sciences (Granjou et al. 2017; Poli 2017) develop a research agenda about living towards and governing futures. Compared with mainstream academic literature in the field of energy (see previous section), these works offer new theoretical insights into the interactions between heterogeneous temporalities. Some of these are briefly presented here because their approaches and questions are of interest for our inquiry.

As a starting point, we shall take advantage of the anthropological work of Barbara Adam (2010), with Chris Groves (2007), devoted to the history and the transformations of the future. The idea of the future understood as a predestined fate, a time in the hands of the gods, has been progressively abandoned during the modern era. Faith in science and progress imposed a new framework. The future became a new territory to colonize, plan and steer in specific directions. It has thus progressively shifted from a 'gift of God' to a 'commodity'. 'The future was transmuted into an abstract, empty and quantifiable entity available for free unrestricted use and exploitation' (Adam 2010, p. 365). Mainly interested in the consequences of this revolution, Adam proposes a distinction between processes of 'future-taking', in which the future is envisioned as a free resource for present use, and those of 'future-present', which consist in an ethical and relational questioning of our choices about the future: 'What are we doing to the future?', 'the perspective of future present […] places us in a relation of indebtedness with not-yet existent others'. (Adam 2010, p. 370) A step forward allowed by this questioning is the relational conceptualisation of time, basically summarized here by the alternative between an instrumental or an ethical relationship to the future.

When enquiring into specific processes such big questions have to be contextualized and operationalized through methodological mediations. Other works from the field of 'future studies' develop such mediations by following the multiform presences of the future in our contemporary societies and the politics of anticipation related to it.

The work of Ben Anderson (2010) focuses on regimes of anticipation associated with potentially catastrophic futures, such as climate change, chemical terrorism or pandemic diseases. All these threats turn the question of governing futures into a matter of risk management. To characterize the regimes of anticipation related to futures, Anderson distinguishes 'styles' (statements about the future and its relations to past and present), 'practices' (acts of performing, calculating and imagining to appreciate these eventualities) and 'logics' (programmatic actions that aim to prevent, mitigate, adapt to, prepare for or pre-empt specific futures). The value of this framework is manifold. It provides us with a lens to analyse how the future is performed through a diversity of anticipatory practices (modelling, planning, simulations, games, etc.). Through them the future appears imbricated with a plurality of perspectives and relations of power. This clearly broadens the scope of the inquiry. It is now 'to attend to how futures appear and disappear; to describe how present futures are intensified, blurred, repressed, erased, circulated or dampened; and to understand how the experience of the futures relates to the materiality of the medium through which it is made present' (Anderson 2010, p. 793).

We should like to draw on preliminary observations from our own fieldwork to introduce the question of energy transition and situate its problematisation relative to these works. First, and compared for instance with the politics of anticipation studied by Anderson, the processes of energy transition investigated do not have a positive or negative meaning a priori. Energy futures are not already present as a threat or as a ready-made 'solution'. If energy transition is presented as an answer to climate change, the development of new energy technologies in the field is fundamentally uncertain. The emergence of a technological object is conditioned by the constitution and the stabilization of a network of heterogeneous entities. This work gives rise to new questions, obliges us to define new values and to regulate emerging interests. Thus energy transition potentials that are brought into existence may be major sources of interruption, rupture and breakdown for local territories as well as an opportunity to redistribute wealth, power and impacts on the environment. Their temporal

dimension is entangled in a myriad of experiences, practices and situations. Second, our fieldwork, while dealing with temporalities that are uncertain, disputed, fluctuating because related to emerging technological assemblages, does not connect present situations with very distant futures. The relationship to the future is not a matter of anticipation as it usually is in 'future studies'. More pragmatically, the challenge is to find the means to reengage a situated experience constantly in a continuous but innovative development that avoids major interruptions. This invites us to problematize the energy transition as a situated experience of time, in which the situation, referring to materialities, embodied durations and inherited spatialities, should play a major role in relationally exploring and rearranging past, present and future.

An interesting work by Christopher Groves (2017) about the politics of environmental anticipation carries forth the idea that anticipations are not free-floating cultural representations but are rather embedded in multiple realities (representational, technical, biophysical, emotional). Groves distinguishes different 'styles' of anticipation in tension, called 'abstract', 'empty' and 'lived' futures. The study of a conflictual case of siting an energy infrastructure allows him to elaborate them. The first two styles refer respectively to forecasting energy demand ('a disembodied view') and planning governance. As Groves puts it, this second style deals with (and actively 'empties') the future by 'direct[ing] attention towards a restricted set of system variables' (Groves 2017, p. 34). By contrast, the 'lived future', introduced with reference to the work of Tim Ingold, is defined by the connection and attachment of a community to its everyday environment. These relations enable local people to 'reflect on potential futures in relation to particular pasts, and then […] interpret the past through possible future outcomes' (ibid., p. 35). This interestingly draws attention to the level of experience and its connections to places and heritages. It also suggests that, between the immediate everyday experience and the long-term forecasting, both struggle to get a grip on a sort of particularly strategic and disputed temporal zone—the same one which has been planned and is controversially 'empty' in Groves's study.

We now propose to problematize the temporal challenge of energy transition more frankly with reference to this 'near future', envisioned as a sort of common ground between short and long-term perspectives.

2.3 Re-problematizing Time (2): Near the Now

The relationship to the future and the effect of this relation in the present is a major issue for energy transition, and it has been discussed under the figure of the distant and unpredictable future. Here we should like to make a new start in dealing with the future, and more globally the question of time, by drawing upon a paper that triggered numerous discussions in anthropology a decade ago.

Two years after an address at the annual meeting of the American Ethnological Society, Jane Guyer published a paper 'Prophecy and the near future' (2007) that problematized in a substantially different way the question of our relationship to the future. Basing the discussion on her own experience, the author observed that the temporal frame in which she grew up in post-war Britain was strongly organized by the near past and the near future. Since then, she argues, the near future has thinned out because people are more and more focused on the immediate present and the very distant future. 'The shift in temporal framing has involved a double move, towards both very short and very long sightedness, with a symmetrical evacuation of the near past and the near future' (Guyer 2007, p. 410). Discussions and cross-observations in anthropology from different social and cultural contexts progressively corroborated the assumption of the disappearance of 'nearness' (the recent past and the near future), making it into a full object of inquiry. Questions arose about the temporal bricolage that was specific to this temporal frame, for, until now, it has lacked theoretical elaboration and empirical characterisation.

This temporal frame, according to Guyer, was characterized by doctrines and programmes that directly shaped experience and generated durational social process. 'I suggested that […] the "near future" was disappearing, as referring to a manageable range of rational planning and of the postwar, 5-year-plan kind, with its confident expectation

of making life better within a definite time frame' (Guyer 2017, p. 2). Guyer provides illustrations, including from monetary theory, to describe the disappearance of this specific near future. For instance, the regulation by the state of the value of money offered a viable, long-run working horizon for a planned economy following theoretical stages of growth. This has been progressively replaced by the model of a free market based on the combination of rational choice in the very short run and growth in the very long run. According to the author's analysis, the near future has not disappeared, but has been differently articulated and arranged. Mainly it has been compressed and associated with economic functions, almost impossible for the ordinary citizen or the consumer to handle or to relate to. In this way, the near future is 'unhitched' from the present and the distant future, and is made workable for the benefit of more specific people or actions.

Thus 'enduring time' has been progressively replaced by 'punctuated time'. According to Guyer, the latter refers to a new sort of 'near' future. This is a regime of time organized around some predictable dates for some people, but merging into turbulences and unpredictability. Direct action is less easily inserted in the long run; it constantly faces the gap between an instantaneous present and a very different distant future. With this new time regime, the visions of and the attitudes to the future have shifted from prediction—from before, from anticipation—to being prepared for. The author's conception of 'punctuated time' is closely associated with the idea of emergence and event. 'The time frame that used to be "near", as a visible horizon towards which we plan our moves, is now more commonly referred to as "next" and "emergent", in open and indeterminate mode' (Guyer 2017, p. 7). This near future has no visible logical sequence; each date is lived as an event, and its horizon is never definitively shaped.

In its recent developments, Guyer's approach contributes to exploring an 'anthropology of the contemporary' (Faubion 2016) inspired by the works of Paul Rabinow. According to Rabinow, 'the contemporary is a moving ratio of modernity, moving through the recent past and near future in a (nonlinear) space that gauges modernity as an ethos already becoming historical' (Rabinow 2007, p. 2). Drawing on this work,

we want to stress the idea in the current chapter that 'nearness' is a temporal bricolage, a relational framework which questions the combination of the near past and the near future in an era of deep indeterminacy. Nearness has not disappeared, but it has become a disputed field where at least different relational combinations of the recent past and the near future are in competition. Interestingly for the coming analysis, Rabinow's reflection pays attention to the work of John Dewey: the making of the 'contemporary' is approached as problem-driven enterprise that consists in creating new mediations between heterogeneous temporalities. Guyer for her part does not emphasize Dewey's influence. We think that Dewey's theory of the inquiry as a transactive process could offer a promising framework to approach experiences of transitioning-towards emerging futures of energy transition. It could also help us investigate the political dimensions of these processes.

3 From the 'Transition' to 'Transitioning-Towards': A Pragmatic Approach

To support an integrative perspective on time we should like to avail ourselves of pragmatic thought. Pragmatic thought is sometimes said to deal primarily with the future, since it emphasizes human being's ability to shape the emergent. While there are different pragmatic perspectives (Peirce, Royce, James), we have assumed that the one proposed by Dewey allows us to consider a critical distance to the past and, as such, open a genuine relationship to inherited forms that support emancipatory practices. This leads us to conceive of experience as first and foremost an affair of transitions between past, present and future. Transition means not a displacement from one (present) world to another (future one), but rather a transition from one relational state of the reality to another. From this perspective, past, present and future are contemporaneous with each other and interwoven differently according to situated processes of change. This conception enables us to inquire into processes of transition in-the-making from an insider perspective.

3.1 Experience, Transactions and the Continuity of Life

It is of course not possible here to give an extended presentation of John Dewey's thought. Instead, we stress three ideas at the core of Dewey's approach: experience, transactions and the continuity of life. The idea of experience does not refer to Dewey's work to a subjective perspective on the world. It cuts through dualisms of object and subject, person and environment. Experience is first a relational adventure; it begins with the discovery of being constantly associated with and affected by. 'Association in the sense of connection and combination is a "law" of everything known to exist […] the action of everything is along with the action of other things. The "along with" is of such a kind that the behaviour of each is modified by its connection with others' (Dewey 1927, pp. 22–23). Thus the relational dimension of the experience forms what Dewey call a 'situation'. If living in association is a common condition of whatever exists (seeds, trees, humans, etc.), Dewey draws attention to man's capacity to play with associations in a given situation to produce expected consequences that perform an improved situation. This is what makes specifically human associations in contrast with many others—'assemblies of electrons, unions of trees in forests, swarms of insects, herds of sheep, and constellations of stars' (Dewey 1927, pp. 23–24).

From this point of view, experience is not only deploying 'along with' in a situation, but also fully engaged in transforming its relations with others and, thus, transforming the conditions of experience itself. This brings us to another key idea, that of 'transaction'. At the end of his life, Dewey insisted on the idea that experience took place not only through 'interactions' with 'objects' that resulted from stabilized and enduring situations, but also through 'transactions' with 'elements' that were actively questioned, selected and specified within a changing situation (Dewey and Bentley 1949, p. 121). 'The "transaction", as an object among and along with other objects, is to be understood as 'unfractured observation' (i.e. "just as it stands […] with respect to the observer, the observing, and the observed". The transactional activity is the relational mode that supports the inquiry. It is oriented towards

the re-determination and the renaming of objects that present themselves in a subject matter so as to provide them with new potential to keep the experience running on. Through 'transactions', things enter in action, and action is made collectively negotiable through the activity of valuing things.

From the point of view of experience, 'situation' and 'transactions' are not separate from one other. We live in a series of situations and this is what allows our life to be continuously performed and re-invented, in extension and in duration. 'Different situations succeed one another. But because of the principle of continuity something is carried over from the earlier to the later ones. As an individual passes from one situation to another, his world, his environment, expands or contracts. He does not find himself living in another world but in a different part or aspect of one and the same world. What he has learned in the way of knowledge and skill in one situation becomes an instrument of understanding and dealing effectively with the situations which follow' (Dewey 1997, p. 44). This long quotation puts us in possession of the focal point of inquiry, the temporally continuous aspect of experience. Complementary to this perspective, Dewey acknowledges aspects that interfere with experience and hamper its full continuation.

Using this framework, we want to propose the following structuring idea for the study of temporalities of energy transition: first, experience provides us with a perspective on the world as constantly transitioning, engaged in 'qualitative-transformation-towards' (Dewey 1906, p. 254); second, the idea stressed in our introduction that energy transition processes 'interfere' with experiences without providing them with an agency and a political status could be approached using Dewey's idea of treating situations interactionally rather than transactionally.

3.2 The Continuum of Ends-Means

Without leaving the level of experience, we should now like to introduce the reader to the continuum of ends and means, since it provides us with a valuable understanding of the relationships between past, present and future.

As seen before, experience is engaged from one situation to another in a transactional activity that consists in re-engaging existing things in a new world of meaning and action. Things are inquired into and valuated according to a changing situation and according to new ends. This conception was developed by Dewey in his theory of valuation (Dewey 1939). According to this theory, 'ends-in-themselves' do not exist. There are no ends that pre-exist a current situation, beyond what is experienced, but only transitory ends, called by Dewey 'ends-in-view'. An end-in-view arises from and is oriented towards a qualitative change within a situation. For this reason, ends-in-view are not superior to means. They proceed from the same relational realm. The relationship between the two is not mechanistic but rather experimental. An end-in-view is a methodological proposal that aims at testing new relations between things. It allows us to access new experiences and new appreciations about a better way to carry on in a given situation.

The concept of continuum is important, for it stresses the fact that ends-in-view and means are engaged in a process of constant and mutual definition. This is illustrated by Dewey's motto that experience is guided by the attitude of 'taking care of consequences'. Thinking oriented to action from the perspective of consequences is all the most important because (past) consequences constitute the ground in which the current experience is rooted in and (the not yet present) consequences express the hope for improved conditions of life. Thus 'caring for' offers a multi-temporal perspective on experience. '"Care" signifies two quite different things: fret, worry and anxiety, and cherishing attention to that in whose potentialities we are interested. These two meanings represent different poles of reactive behaviour to a present having a future which is ambiguous' (Dewey 1930, p. 215). This invites the thought that caring is oriented towards the exploration of situations that matter and towards the past events that would be at the origin of these situations in the form of renewed attention to things and transformative potentialities.

The attitude of 'caring for' finds a methodological translation in Dewey's theory of valuation through three different operations: valuing, evaluation and valuation (Bidet et al. 2011). The first is an immediate appreciation of a thing in the present of experience (for example,

liking/disliking what is experienced); the second consists in appreciating the thing relative to former situations of appreciation (for example, providing our judgment with a series of similar experiences); and the last encompasses the first two operations and is oriented towards the production of a transformative point of view (that is, an end-in-view) in a given situation. This in turn lets us see more finely the extent to which Dewey's concept of experience encompasses the past, the present and the future, and engages them in the search for continuity or, as we shall say in the following, a 'duration' adequate to experience. 'Aforetime man employed the results of his prior experience only to form customs that henceforth had to be blindly followed or blindly broken. Now, old experience is used to suggest aims and methods for developing a new and improved experience […]. We use our past experiences to construct new and better ones in the future' (Dewey 1920, p. 94). Clearly, Dewey rejects the idea of time as a passive accumulation of experiences and the blind continuation of customs. Time is not an abstract thing, but a thing that matters for experimenting with new enactments of the world of experience.

3.3 Duration That Matters, Matters That Endure

Drawing on the previous observations, we should now like to propose a few guidelines for the following study of the temporalities of energy transition.

Dewey's thought has often been presented as a philosophy of the future (Lachs 2003; Koopman 2006), that is, a philosophy which cuts off its ties to the past compared with more traditional approaches to time. This characterisation seems to us questionable. Dewey's philosophy is probably better described as a philosophy for the future, in the sense that it does not exclude the past but rather proposes an experimental and organic perspective for approaching the question of time. Let us explain this more precisely.

A concrete illustration can help figure forth such abstract questions. A striking example comes from Dewey's core attention to education. In Dewey's view, the purpose of education is not to train tomorrow's

citizens, since we don't know what 'tomorrow' will bring. It is to provide children with educative experiences that will allow them to deal with situations which might change radically in future. Education is a process of living and not a preparation for future living. 'The process is a slow and arduous one. It is a matter of growth, and there are many obstacles which tend to obstruct growth and to deflect it into wrong lines' (Dewey 1997, p. 30). Thus it is to provide a person with 'educative experiences'—that is, experiences which will enable him to contribute to life as it occurs in association, in society. This draws our attention to the fact that Dewey's approach to time is not split into three distinct phases. Time is not beyond experience but defined relative and according to various situations and issues. Thus, within experience, time is embedded in and problematized through specific processes of 'growth'. Time matters in education because the capacity of an adult to adapt to emerging problems is grounded in 'educative experiences' lived through during childhood. In the same way, time matters especially in a democracy, for the reform of institutions requires new 'publics' able to emerge from previously scattered situations. In sum, Dewey's thought provides us with three important analytical directions.

- First, the continuity of experience is a matter of 'growth'. We would reformulate this idea stressing the issue of engaging experience with human and non-human associations that allow it to endure despite obstacles. Here is a touchstone for the connection between the ideas of time and materiality, that is, for 'duration' in the sense of a continued existence in time, and for 'endurance' in the sense of something that resists over time. Thus the idea of growth offers a stimulating research perspective on duration and materiality, even if it is not fully problematized by Dewey.
- Second, the continuity of experience requires temporal mediations. This refers directly to the transactional activity previously discussed. Experience is constituted not only by 'interactions' with things that reveal usefulness in the present, but also by 'transactions' with things so as to engage them differently than they were or are in the near future. Transactions define a relational mode of inquiring into the experience. Transactions are the practices thanks to which things are

renamed, reframed and entered into action. Dewey does not describe these practices in detail, but we propose to look at them as emerging temporal mediations—that is, mediations which change our attachment to things, and in consequence our relationship to time.

- Third, these temporal mediations impact the way 'nearness' is configured. It seems to us that it is of fundamental importance to introduce the Dewey's philosophy not as a thought of the future (abstract, in general) but of the 'near future', and by looking at the continuum of ends-means of 'nearness'. 'Nearness' is not a temporal metrics, as we might speak of a 'five years plan'. It is an uncertain and plastic zone, where the effects of our actions take place–an aspect that echoes the pragmatist conceptualization of place proposed by Malcom Cutchin (2008). 'Nearness' is a proposal of 'duration' to be articulated. It can be shut down and interrupt an experience, be imperfectly configured and hamper the continuance of an experience, or enact the experience in multiple ways and amplify its potential.

These three points offer a perspective on time that is closely linked to the concept of experience as a process, as emerging mediations of entities from various temporalities (distant or recent past, present, near and distant future), and as the creation of new spatialized and material durations, while seeing these entities within a process of energy transition.

3.4 'Transitioning-Towards': The Strategic Configuration of Nearness

Contrary to the idea that only distant futures (visions, scenarios) and anticipatory attitudes drive energy transition, we assume that 'nearness' is a real battlefield. We make this assumption because energy transition 'potentials' are fundamentally uncertain. Taking control of the future requires intensive practices of selecting, renaming and reassembling things in order to bring values and interests into an enduring process of change.

In the following analysis, we therefore focus on and approach 'nearness' (past and future) as a strategic and disputed zone in the context of energy transition. 'Nearness' is not given beforehand, as if the future were endless. We shall therefore analyse the process of its configuring.

Our research agenda consists of the following questions: how does 'nearness' become an issue and problematized in the processes of energy transition? How are the mediations between emerging issues and entities elaborated from the point of view of various temporalities? How is the near future transformed into duration, and through what material assemblages? How do these assemblages enable or disable the different stakeholders to engage with the energy transition?

4 Exploring the 'Nearness' of the Energy Transition: Entangled Temporalities and the Making of Capacities for Change

4.1 Capturing the Past, Pre-empting an Unconventional Future: Coal Bed Methane Exploration in Lorraine (France)

This case study is located in Lorraine, north-eastern France, at the border with Germany (Labussière 2017). Here is one of the largest coal basins in Europe. The coal industry in this place has a long history running over a century and half. After the Second World War, the French state nationalized the mining industry and created the national company Charbonnages de France. The exploitation of coal went on until 2000. When the mines shut down after 2000, the mining area was opened to newcomers.

At that time, Kimberley Oil, a junior Australian company, was ambitious to become a major player in coal bed methane in Europe. Lorraine is strategically located at the heart of Europe, in a very large coal basin, served by an international gas network and close to places of high energy demand. The activity of a junior company is orientated towards the exploration of underground gas potential. The main challenge is to clear a gas field of its financial risks and geological uncertainty so as to stabilize a manageable near future that will be sold to, capitalized and developed by a gas provider. In what follows, we analyse the practices of assembling different temporalities to generate such an unconventional 'near' future.

As the underground and its resources belong to the French state, Kimberly Oil had to obtain in 2004 a mining permit to start drilling operations. Just arrived from Australia, it knew nothing about the geology of Lorraine. In 2006, it contacted a recently retired director of a mine, who formerly worked for Charbonnages de France, to profit from his knowledge and experience. In practice, the company got much more than expected, since the former director spent six months collecting the archives that belonged to the French National mining company. These cover the knowledge accumulated for a century and half about the geology of Lorraine and its gas. Making copies and scans, the Australian company captured for free thousands of documents (maps of mines, stratigraphic sections, location of six hundred drill holes, etc.). Capturing the past was strategic to fostering the siting of drilling operations and reducing uncertainty about the depth and the geometry of underground coal seams. Inherited knowledge, cut off from the mining experiences it was attached to, was translated into standardized data, positioned in space by GPS coordinates, and compiled into a database with more recent geological results.

The opening of drilling operations to inherited knowledge, however, was put to a hard test by the materiality of gas in Lorraine. In the near past—that is, in the post-mining era—Charbonnages de France stopped pumping the water table, an operation necessary to accessing and exploiting the coal. The coal seams progressively recovered their natural water content. The temporality of this natural cycle interfered with and complicated the operations of drilling. The first drilling exploration occurred in Folschiviller in a part of a mine that had remained largely untapped. In 2007 another retired French mining engineer, experienced in drilling in the Lorraine basin, was employed by Kimberly Oil to direct the operations. At that time, the drilling concept was to make a horizontal well so as to cross a faulted coal seam and access a large amount of gas. When the well entered the fault, the latter was flooded with water. Geologists progressively realized that the well was connected to the groundwater table and that the amount of water might be endless. ‘We were pumping the ocean’, said an engineer. The ability of the team to direct the drilling was limited by their lack of experience.

Kimberly Oil, now renamed European Gas Limited (EGL), then hired Canadians engineers from Alberta, specialized in coal bed methane production. At the same site, the Canadians used a new drill with the idea of placing three drains in three different seams to extract as much gas as possible. This procedure is technically very complicated. They succeeded in positioning the drains, but as these were shorter than expected, the amount of gas remained restricted. A new testing site was necessary. In 2014, EGL opened a new site at Tritteling. The drilling concept had slightly changed: this time it was a horizontal well with multiple drains, but all the drains were located in the same seam. The hope was to develop longer drains. Six drains were successfully positioned. A pump was placed at the crossroad of the six drains and was expected to suck water and then gas. But new problems arose during the production test. The downward pressure of gas in solution is like a bottle of champagne. When the gas moves upward, it progressively generates bubbles inside the well. The pump, moving water and gas very rapidly, produces a mixture that cannot easily escape. 'We've got a column of water and gas moving up and down! And when the bouncing is hard, it has serious effects on the pump', said one of the Canadian drillers. A row of six broken rigs was displayed on a shelf in his office.

The description of the successive drilling concepts shows different assumptions about ordering general skills, knowledge, cutting head, pump, coal seams, water and gas. Ordering these entities in an operative unit is an experimental process. It consists in stabilizing relationships between these entities and making them participate in the construction of a new common duration. This duration results from a relational but uncertain arrangement that aims at detaching the molecules of methane from the coal seams, allowing them to circulate underground and then bringing them together in a new, stable entity. The idea of duration usefully expresses that this arrangement has both a temporal and a relational nature: the challenge is to stabilize and generate enduring relationships so as to bring a regular flow of concentrated gas free from water to the surface. Thus the construction of a manageable 'near future' oriented towards the production of gas in Lorraine was made up of heterogonous temporalities and materialities.

The case suggests that this emerging 'near future' was also entangled with another temporal frame focused on the relationship between the immediate present and the distant future. While the exploration in the field was progressing by trial and error, EGL launched an advertising campaign in a French national newspaper. The advertising represented typically French jars of jam full of unconventional gas, as if the gas was already a stable commodity. At the same time, EGL was being listed on the stock market. The strategic issue for EGL was to inspire confidence in its private investors and to become part of a renewed gas market, including unconventional gas, which has assumed a larger and larger role in some visions of an energy future (Shell 2013)[1] as a key step towards a decarbonized economy. If the 'near future' is the transformative zone where heterogeneous entities and temporalities are rearranged, this zone is almost inaccessible to emerging 'publics'. What happens underground is not accessible to ordinary experience, and the capture of local knowledge hampered the possibility of a counter-expertise in the long term.

4.2 Repowering and Renaturing: New Renewable Energy Landscapes Embedded in Inherited Browlands and Its Otherness (Lusatia, Germany)

Our second case is located in the former German Democratic Republic, in Lusatia, halfway between Berlin and Dresden (Deshaies 2015). This area is known for the extensive open-cast lignite mining that shaped the landscape from the nineteenth to the end of the twentieth century. Lignite was the prime fuel source for East Germany, but with changed priorities in energy supply after reunification (1989–1990), the majority of mines closed abruptly. High unemployment and outmigration were results of this economic shock. What remained was a devastated countryside, full of huge holes and slag heaps.

Immediately after reunification, there was no comprehensive development strategy to steer rehabilitation of this vast area (Lintz et al. 2012). Two processes were taking place. First, by switching off the mines' drainage pumps, the ground water table began to rise again

over the years, causing the creation of a number of lakes in the holes created by the mines. Second, according to the Unification Treaty, the Federal Republic of Germany was responsible for rehabilitating the devastated areas and boosting their economic future. To this end, it created a state-owned rehabilitation company, the Lausitzer und Mitteldeutsche Bergbauverwaltungsgesellschaft mbH (LMBV). To foster the development of the area, LMBV entered into a partnership in 1999 with the International Bauausstellung Ilse-Park (IBA) to elaborate with the federal states and the districts a new landscape concept. IBA does not execute schemes itself but rather creates networks, attracts investors and coordinates operations. In what follows, focusing on the municipality (Gemeinde) of Klettwitz/Schipkau in the centre of this area, we analyse how renewable energy development, the emerging waterscape and the IBA's landscape concept have been progressively interwoven to transition-towards successive generations of energy landscapes.

At the end of the 1990s, the large available spaces around Klettwitz/Schipkau attracted private wind power developers. These post-mining areas were easy to explore since the dilapidated industrial landscapes and the low level of biodiversity presented no constraints for the siting of wind farms. The best sites were the upper part of the plateau made of detrital material. This induced the development of new technical solutions (implementation of specially developed combined pile-raft foundations) to turn the loose tipping ground of a former open-cast coal mine into manageable ground capable of anchoring wind turbines. From our own analytical perspective, we want to stress the importance of these technical mediations that allow for rearrangement of an inherited and muddled past, providing it with a new endurance and duration.

From 2000 to 2010, the IBA Fürst-Pückler-Land concept was launched. It consisted in opening nine 'landscape islands' (IBA 2010).[2] These were experimental sites intended to test principles of renaturation that could inspire post-mining regions all over the world. The development of renewable energies was in line with this strategy of economic and environmental reconversion. As a guideline, the IBA Director, Rulf Kuhn, envisioned a middle line between a complete reconversion, which would have erased the past and turned the territory into a

recreational area, and just leaving the landscape to its own devices as a wilderness (Mead 2005). 'Island 2', one of the four experimental sites near Klettwitz/Schipkau (in Lauchhammer-Klettwitz), is a good illustration of this middle strategy. The pit of the mine of Bergheider was flooded from 2001 to 2014. New forests and crops were planted on its surroundings. It allowed the flourishing of a new biodiversity, especially thousands of migratory birds (for example, wild geese, storks), beginning in 2007. Industrial relics and landmarks, such as the F60 conveyor bridge that excavated the coal seams, survived to be part of a new tourist destination about the industrial heritage. At the margins of this site, 100 MW of wind power capacities were installed between 1999 and 2006. On a broader scale, the region became one of the most important in Germany for electricity production (wind farms, solar panels, biomass), with 85% of electricity needs met by renewable resources. These developments flesh out the idea that transitioning-towards is not making a future vision come true, but rather engaging actions along with a diversity of physical, biological, economic temporalities, all joined together in a project of repowering (that is the end-in-view). Experimenting at the same time in all these directions is of course rare if not unique, but it lets us see how the 'near future' can be arranged in a 'transformative zone'.

Pursuing the case a step further, we see how, as suggested by Dewey's approach to experience, a transformed situation enacts experience in multiple ways, or, in others words, how a 'transition potential' emerges from successive adaptations to a changing situation. This is visible in the case of Klettwitz/Schipkau when the first wind farm was being repowered from 2012 to 2015. The potential 'interferences' between bigger wind turbines and this new nature became a public issue. The building of new wind towers had to take into consideration the deep onsite renewal of the fauna and the flora. This did not hamper the project, since the studies concluded that the impact on the fauna and the vegetation would be limited. Two wind turbines formerly envisaged have been removed so that birds have a larger migratory corridor to access the Bergheider See. The soil also had to be taken into account to make sure it could accommodate the new and heavier wind towers. The implementation of specially developed combined pile-raft foundations

allowed stabilization of those in water-saturated and rolling dump soils. The new, bigger wind turbines were also sited a little farther from villages to limit co-visibilities with surrounding villages. Working in concert with the population has been easy for the wind farms, which are now widely accepted and considered part of the landscape.

The case shows how brownlands that might have supported an almost opportunistic and quantitative energy transition have progressively been endowed with a political dimension supported by environmental concerns. A first generation of wind power projects participated in a process of redesigning the land and strengthened local capacities for developing new environmental requirements. The second generation of wind power (repowering) opened a window for actively negotiating post-mining nature and managing its new multiplicity (birds, landscapes, visual qualities) with respect to energy transition. From this point of view, the short life cycle of wind power farms (twenty years of production) contributed to fostering the interweaving of different entities (lakes, forests, migratory birds) and joining their respective life cycles into a common 'near future'.

4.3 Amplifying Collective Experiences to Up-Scale Wind Power: The Continuous Growth of Citizen Assemblies and Wind Power Parks in Northern Friesland (Germany)

Our last case is located in Northern Friesland, an administrative district in Germany, on the border with Denmark, on the shores of the Wadden Sea. Its landscape consists of islands, outlands, wetlands and polders. In 2016, it had 162,000 inhabitants and more than 800 wind turbines (with a total capacity of about 1800 MW) installed on 90 wind farms, 77% of which belong to 'citizen wind park' inhabitants. Prior to wind power, agriculture had been the dominant economic activity, including mainly sheep breeding and cow and wheat farming, and despite some tourist attractions, the population was declining.

Compared with the two others case studies, which were about one to two decades long, this one covers four decades of wind power

development, between 1976 and 2014 (Chezel and Labussière 2017). It aims at exploring how 'nearness', understood as a 'transformative zone' where past and future are rearranged, can be configured to connect to manifold experiences and support successive generations of increasing wind power capacities. Thus, in contrast to standardized technological pathways, the case allows us to observe how citizens problematized the up-scaling of wind power as 'growth' that both included and questioned their experiences.

As a starting point of this long wind power history, we can usefully consider the German federal pilot project GROWIAN, implemented in the neighbouring district of Dithmarschen in 1980. The Federal Research Ministry handed it over to the Jülich Institute for Nuclear Research. A 3 MW turbine with a hub height of about 100 m had been designed, and the project was intended to test the feasibility of a large-scale wind turbine that would provide Germany with the technical foundation to develop an ambitious wind power policy. This oversized device, with an excessively heavy rotor, never reached its full run. The pioneering megaproject was supposed to provide Germany with a large-scale alternative to nuclear power. This vision came up short, since 'present' experience, not related to former wind power experiments at smaller scales, could not reach such a 'distant future' in the abstract. Reducing wind power development to small-scale projects could be interpreted as a political way of putting wind energy to one side, but this interpretation would fail to take into consideration the "Danish way".

The spatial diffusion around the border has certainly played a role in the advent of small wind turbines in Northern Friesland. It inspired not only individuals but also private firms. A well-known company from Schleswig-Holstein, the Husum shipyard (HSW), whose nautical activity was in decline, shifted to the construction of wind turbines in 1987. It first began producing a prototype, the HSW-200 (200 kW), by using its traditional know-how in the shipyard, the same employees and with financial support from the district and the federal state of Schleswig-Holstein. The turbine had been tested onsite, right behind the company's workshop. Promising results led HSW to envision the production of a range of bigger (HSW-250, 750) and smaller wind turbines (HSW 30)

to be exported to isolated regions or developing countries. In 1989, HSW decided to build the biggest park in Europe (13 MW) in the polder of Friedrich-Wilhelm-Lübke-Koog (FWLK) with mixed financial support from the community, the district, the state of Schleswig-Holstein and investors from Munich. Lack of internal skills led the company to revise the project and to settle for smaller turbines.

This first line of wind turbines nevertheless inspired the polder's farmers. Looking at the foundations, the erecting of the turbines, the material and its management, some of them realized in situ that wind energy could be produced on their lands with local wind and local technologies. Three different farmers asked the mayor of FWLK whether they could build a wind turbine on their diked land. He asked them to come up with a common wind farm in order to avoid a dispersion of wind turbines in the polder. More than a piece of land free from any infrastructure, the polder has strong collective land management—dewatering, dike construction and conservation—historically anchored in inherited practices of collective management. The polder offered a spatial pattern that could match a collective wind power perspective and optimize the occupation of the land when siting the turbines along the dike. The three farmers decided to invite people from the whole polder to join the project. In 1991, they organized a meeting every week of the year. In the end, 44 inhabitants (one-third of the polder) participated in the project and, following a request from the bank, also mortgaged their land to hedge against the risk of a project failure. In 1992, they received authorisation to build 22 wind turbines (6.6 MW) along the dike. There were similar stories in Bredstedt-Land in 1991, and Bohmstedt in 1993, and many other citizen wind parks. The first law promoting and financing the selling of electricity produced from wind energy was adopted in 1991 and fostered these developments.

At the end of the 1990s, wind power development became contested at the national level, especially owing to landscape changes perceived as the result of uncontrolled growth. Because of its early wind power history, Northern Friesland was a crucial district for devising and testing innovative planning solutions. In 1993, its administration started to standardize approval of the new wind power projects. It also produced the first maps of the wind power development and established wind

power development zones. The administration worked closely with municipalities, associations and citizen wind parks. The emerging landscape policy was therefore informed by the inhabitants and their political experience of sharing the land. In contrast to an abstract vision, this wind power plan represented a political compromise able to steer wind power development towards the 'near future'—that is, without cutting off the ongoing dynamic from its grass roots and its transformative potential. In practice, this consisted in agreeing upon the creation of wind power basins with high densities of wind turbines and breathing spaces where the Frisian landscape could be preserved.

Another emergent issue was that the development of citizen wind farms quickly became dependent on expanding the grid. This is ordinarily not manageable at the scale of a single wind farm. In 2009, wind farmers decided to network and create a new assembly based in Breklum (Northern Friesland), ARGE NETZ (that is, 220 windfarms and 9000 partners) around emerging concerns on the regional level. ARGE NETZ created a financial pool with contributions from the wind parks to mutualize investments in the electrical grid and develop the existing transformer stations—two sensitive issues in achieving large-scale wind power development. It also created a firm, the Breitbandnetzgesellschaft, whose goal is to turn Northern Friesland into a 'broadband country', that is, a region equipped with fibre-optic cables to support the remote management of wind farms and optimize the production of electricity. This development has created facilities that also benefit villages without wind turbines. It became obvious that the ways the landscape was turned into a political and negotiable entity through wind power development could in turn offer possibilities of regional development to everyone in the region. ARGE NETZ is also eyeing the possibility of political lobbying, mainly focused on the role of citizen projects in the 'Energiewende' (German energy transition policy), and opened an office in Berlin in 2014. A striking aspect of this case study is that the making of enduring citizen assemblies, continuously adjusted and enlarged to support new wind power end-in-views, allowed the scaling-up of wind power parks in a way that did not ignore the lessons learned from previous wind power development at a smaller scale nor the challenging effects induced by the proliferation of biggest

wind turbines. This points out the idea that the scaling-up of new technologies of energy is not a matter of moving from 'niches' to 'regimes', but a matter of producing a duration that allows the different entities to endure in the process, and have a say on its steering.

5 From 'Nearness' to Enduring Processes of the Energy Transition: Coping with Heritages and Material Intensities

To begin the discussion, we go back to the assumption proposed by Guyer (2007): 'nearness', understood as the temporal frame in which experience is embedded, has thinned out in the last sixty years. The temporal frame inherited from the post-war period, strongly concatenated to the recent past and the near future, has progressively been replaced by a new one, focused on the immediate present and the very distant future. According to Guyer, 'nearness' has not totally disappeared—a position that differs from more radical perspectives (Jameson 2002)—but its management has become more and more an individual affair, without any reference to a defined collective future.

Energy transition is an especially stimulating field of inquiry for questioning this proposal. At first sight, Guyer's observation seems very well established if we consider that many energy policies are driven by long-term scenarios of energy futures (by 2030, 2050), which exhort us to act urgently. Delayed investments in policies of attenuation and adaptation make us enter a more uncertain and risky world, and confront us with unbearable costs to manage the consequences of an untamed planet. While not denying the pertinence of this economic reasoning to foster collective concern for ambitious climate and energy policies, its logic of time is questionable. For instance, its opening to democratic issues is limited. As was asserted during the recent scientific conference that preceded the CoP 21 in Paris, anthropogenic climate change is now well established and we are entering the 'time of solutions'. This means that the 'technological solutions' are known; many are common to different scenarios and it is felt they have to be imposed

urgently even if implementation neglects the regular democratic interplay. Such assertions urge us to reopen the temporal dimension of the energy transition and to analyse the political issues that ensue upon its elaboration.

The temporal frame depicted by Guyer usefully develops some of the tensions at work in the contemporary energy transition. Nevertheless, 'nearness' in the sense proposed in this chapter should also be considered with attention to the level of energy projects. Through this lens, 'nearness' does not entirely disappear but is invested and rearranged differently according to emerging technologies and issues of energy transition. In this direction, our assumption is that 'nearness' constitutes a strategic and disputed zone for taking control of emerging energy futures. Drawing on our case studies, we propose several points of discussion to test this idea.

Our first point pertains to the different media through which past, present and future entities come into 'nearness'. Existing analyses—for instance that of Anderson (2010) of the future present—have always usefully suggested that these mediations could take different shapes such as calculative practices, narratives or embodied performances. Our pragmatic framework invites us to look at these mediations as 'transactions'—understood, following Dewey, as relations that rename, reframe and specify things to endow them with a new agency in a process of change. What are these mediations? How do they take completely different times in a process? And how do they configure 'nearness'?

- The case of Lorraine covers over fifteen years: the distant past was captured—that is, a century and a half of archives was cut off from former mining experiences, standardized into data and compiled into a database to reduce uncertainty about where to site drilling operations and inspire confidence in private investors about the amount of recoverable gas; the recent past was enlisted—that is, former mining engineers were hired by the private company to direct the operations of drilling in the field; 'nearness' was configured as a restricted zone to develop interactions with a declining coal mining activity (and benefit from past experiences), but avoiding any relationships of reciprocity with miners, their memory or post-mining environmental

concerns; and in the 'nearness' drilling experiments remained hidden and interferences between the exploration of coal and the water table failed to become a subject for investigation. Thus, transitioning-towards was the process through which 'nearness' was configured to exclude the public from the issues and foster (from exploration to market) an unconventional medium-term future.

- The case Klettwitz/Schipkau covers over 25 years: the distant past (man-made topography, huge holes, slag heaps) and the recent past (water table recovering its natural level) were approached abruptly after German reunification without any comprehensive plan, and 'nearness' was configured as a field of experiment (the 'islands' introduced by the landscape concept) to develop transactions with the past that did not erase their own dynamics. In the 'nearness', soils made of detrital materials were consolidated to support wind turbines and processes of renaturation were engaged to enable plants and animals to colonize the 'islands'. Thus, transitioning-towards was the process through which 'nearness' was opened and connected to various (physical, biological, economical) cycles to intensify transformative effects and crossed influences inside, between and outside the 'islands'. On the basis of this 'transition potential', local concerns for sustainable energy landscape emerged and participated in repowering wind turbines.
- The case of Northern Friesland covers over 40 years: the distant past (polder, strong collective land management of the dikes) continue to influence current activities in the land—even if romantic nationalism of the nineteenth century and national socialism from 1933 to 1945 can be seen as a rupture in Frisian solidarities; the recent past (the Danish adventures of small wind power) was easy to visit and a natural source of inspiration, since it took place in a neighbouring area, sharing strong geographical and cultural patterns also due to porous frontiers until 1920; and 'nearness' was configured as a zone of experiencing and sharing know-how among inhabitants (that is, an 'assembly'). In the 'nearness' inhabitants took advantage of the polder pattern and their custom of land management to engage with and gather around wind power. In the 'nearness' a wind power plan was elaborated to cope with the proliferation of wind turbines and design

principles of growth for the 'near future' inspired by grass roots collective experiences. In the nearness, a network of wind power assemblies arose to tackle problems issuing from increasing wind power capacities (that is, the reinforcement of the electric grid) and support more widely regional development. Thus transitioning-towards was the process through which (wind power) assemblies were successively brought to higher level of commonisation to up-scale wind power without cutting-off its grass roots and its transformative potential.

Our second point originates in the observation that these experiences are embedded in more multiple and various temporal scales (distant past, recent past, present, near-future, medium-term future) than has been noticed in the literature about 'futurity' and 'nearness'. This clearly shows that 'nearness' in the context of energy transition is not reducible to the influences of the 'immediate present' and the 'distant future'. It also suggests that energy transition processes induce spatial re-compositions as well as underestimated temporal re-orderings. 'Transitioning-towards' is an operation that takes both materiality and time in a process of change. It makes time matter, it endows time with a renewed materiality. This echoes what the Brazilian geographer Milton Santos (1997) called the 'empiricisation' of time. According to Santos, a sociotechnical system produces historically dated types of human organizations and settlements because it reconfigures human activities (work, cooperation, financial flows). Over the course of history, the juxtaposition of sociotechnical systems from different ages in a place generates a complex interplay of materialized temporalities. While this formulation places technology at the core, it also suggests a layered approach of time that limits our ability to understand more dynamic processes of change. On its own, the idea of 'nearness' draws attention to how heterogeneous elements are taken up in an enduring assemblage that engages people and things in a new relationship to time, a new duration. Thus 'enduring', giving consistency and robustness to a sociotechnical assemblage, is a condition for, and the 'duration' an outcome of, transitioning-towards. This offers a perspective different from the one introduced by Guyer's work (2007, 2017). According to Guyer, we have shifted from an 'enduring time' to a 'punctuated time', or to put it more

simply, from plan to event. The plan is supposed to be endowed with a duration defined by advance, while the event focuses on the continual adaptation of a person to a changing world. Both bypass the question of how things participate directly in making a specific duration when taken up in a process of change.

This leads to our third point of discussion, the political dimension of time-making in energy transition. If transitioning-towards is different from a 'matter of timing', this is because all the dimensions of time, as embedded in a multiplicity of experiences and material processes, are not present in a process of change with the same intensity. In others words, some are intentionally selected and defined along with the ongoing experience, while others constitute a 'surplus', a 'margin' of the experience (Dewey 1906), but can 'interfere' with it. Thus the question of time in energy transition is both relational and intensive. Our case studies have specifically brought the attention on the role of heritages and environmental processes in the configuring of the nearness. But it is clear that the temporal mediations are multiple and manifold. Thus, 'transitioning-towards' can be defined as the political work that consists in defining and specifying the relevance/irrelevance of temporal associations in performing an 'enduring' sociotechnical assemblage. This consists in including/excluding experiences or material processes according to their capacity to foster or to slow down a process of change. For instance, it can be seen in the processes of configuring 'nearness' along with heritages and environmental intensities.

'Nearness' emerges from the case studies as being configured in three ways: a 'restricted zone' (Lorraine), a 'field of experiments' (Klettwitz/Schipkau), a 'zone of experiencing in common' (Northern Friesland). In the three case studies, emerging sociotechnical systems are clearly and intentionally embedded in heritages. These heritages provide each process studied with different relational and intensive contributions. In Lorraine, the appropriation of local knowledge and skills aimed at accelerating the drilling operations by taming geological uncertainty. It severed ties to heritages with the former mining activity and engaged the exploration of the subterranean in a different direction, changing from coal mining to coal bed methane. In Klettwitz/Schipkau, heritages (post-mine landscape) did not propose a clear direction of

change but provided the stakeholders with an enormous potential to experiment in very different directions. In Northern Friesland, heritages (spatial configurations, customs/habits of collective land management) differed from the precedent cases since they were embedded in a vivid custom of landscape management. This made visible that 'nearness' does not cope with the same problematisation of change in both cases, Klettwitz/Schipkau (managing discontinuity) and Northern Friesland (managing continuity).

'Nearness' is also politically configured in the way it copes with material intensities, often unexpected and untamed, which question the best way to challenge the means of steering change and open a collective discussion about its consequences in the near future. In our three cases, these materials intensities erupt into experience in the following statements: 'too much water', 'too many birds', 'too many wind turbines'. These things are issuing, but do not become collective concerns in the same way. In Lorraine, when the horizontal drilling interfered with the water table, pumping became endless. This confronted the operation with such a huge environmental intensity—the circulation of water underground—that the drilling concept had to be revised. No 'duration' could be performed from this assemblage. 'Nearness' dissolved in the earth's own temporality. As the interferences between drilling operations and water remained hidden underground, no one 'public' emerged from this adventurous management of water and gas. In Klettwitz/Schipkau, on the contrary, physical, biological and economic cycles were revitalized by switching off the pumping of the table water, planting forests and crops, settling wind turbines and developing tourist activities. These processes progressively interfered with each other, strengthening new environmental concerns such as those for the cohabitation between wind turbines and migratory birds. Here local inhabitants constituted themselves as 'publics' (that is, groups affected by the issues resulting from this post-mine nature), participated in open 'nearness' as formerly embedded in a 'network' (that is, a scientific and technical assemblage of heterogeneous pieces) of new environmental processes (here migratory birds, since flooded pits offered them new resting places). Renaturing offered unexpected lines (birds' migrations) to repower the turbines, and repowering advanced this new nature a step further with a more

enduring assemblage. Thus the 'publics' helped turn random 'interferences' into well-specified 'transactions' among the entities (local inhabitants, mines, turbines, lakes, migratory birds) of an emerging sustainable energy landscape. Finally, in Northern Friesland, the increasing number of wind turbines in the countryside interfered with the landscape and generated political concerns about its becoming. These 'interferences' nevertheless issued from a wind power development strongly embedded in an inherited transactive pattern (collective management of the polder, wind power assembly). The challenge was to move these transactions from the scale of local wind power assemblies to the scale of a region, so as to agree on the pace and the extension of the wind power development in the near future. Wind power raised the question whether or not the wind power landscape could be directed as a regional commons. The devising of an innovative wind power plan opened to grass roots experiences helped in reaching agreement about new landscape intensities ('breathing spaces' and 'wind power basins') on a new scale.

These examples stress the fact that 'nearness' is a strategic and disputed zone for two chief reasons. First, 'nearness' was systematically connected to all or some of the heritages that were selected and reconfigured according to emerging issues of energy transition. Second, 'nearness' was continually challenged by emerging 'interferences' and became (or did not become) the object of new investigations aimed at translating their quantitative effects ('too much water, too many birds or wind turbines') into a qualitative 'duration'. Each 'duration'—that is, the way successive generations of experiences were taken up into a process—specified the identity of an energy transition 'potential'.

It is worth noting that here an 'interference', contrary to what may seem to be the main assumption of this book, need not as such be negative. The elements with which the processes of energy transition interfere are called into a process of change and may contribute to its configuring according to their own temporality (circulation of water underground, cycles of bird migrations, expansion of wind power). Thus 'nearness' develops in the tension between temporalities that are intentionally captured, enlisted, observed or celebrated, and the others that erupt into experience but can be harnessed, defined along with experience. This tension illustrates how 'transitioning-towards' is a

political process. It goes from manifold experiences of time (that issue and interfere) to the formulation of new ends-in-view which include or exclude entities attached to these experiences.

6 Conclusion

The aim of this chapter is to provide a critical inquiry into the processes of time-making and of agreeing upon collective horizons of energy transition. Contrary to the idea that energy transition is driven only by distant futures (visions, scenarios) and anticipatory attitudes, we have argued that 'nearness' (recent past and near future) has a major influence on steering processes of energy transition. This is so because energy transition 'potentials' are fundamentally uncertain. Taking control of the future requires intensive practices of selecting, renaming and reassembling things to bring values and interests into an enduring process of change. In this way, our pragmatist framework has insisted on the idea that we are 'transitioning-towards'. This displaces the way we look at energy 'transition' from being an interval, a gap to be bridged, to being a process of change in which new assemblages and new durations are performed.

We now sum up the main outcomes of our study as follows.

First, drawing on the pragmatic heritage of John Dewey, we have proposed a relational approach to time, defined along the lines of 'experience', 'transaction' and 'duration'. Experience is constituted not only by 'interactions' with things that reveal themselves to be useful in the present but also by 'transactions' with things that engage them differently from how they were or will be in the near future. Transactions define a relational mode of inquiring into the experience. 'Nearness' is defined relative to this transactive pattern. It is the operation of selecting, renaming and reframing entities from different times (past, present and future) to make them intervene in the ongoing experience. 'Nearness' offers a new perspective on 'duration', which is thus approached as the processes of engaging experience in associations that allow it to endure despite obstacles.

Second, this problematisation of 'nearness' allows us to analyse the entanglement of past and future temporalities and to reassess them as at the heart of the processes of energy transition. Our case studies have shown that these processes appear to be more embedded in multiple and various temporal scales (distant past, recent past, present, near-future, medium-term future) than has been noticed in the literature about 'futurity' and 'nearness' (immediate present/distant future). This has drawn attention to how heterogeneous elements are taken up in an enduring sociotechnical assemblage that engages people and things in a new relationship to time, a new 'duration'. This in turn allows us to define the idea of 'duration' more precisely from a relational and material perspective. 'Enduring', giving consistency and robustness to a sociotechnical assemblage, is a condition for, and 'duration' an outcome of, transitioning-towards-a-qualitative-change. Hence this suggests that the way in which 'nearness' is configured, and by extension the way in which a 'duration' is performed, is both a material and a political enterprise.

Third, our work has defined the political effects that ensue from the configuration of 'nearness'. The pragmatic approach allows us to understand that all the dimensions of time—as embedded in a multiplicity of experiences and material processes—are not present in a process of change with the same intensity. Some are intentionally selected and defined along with the ongoing experience, while others constitute a 'surplus', a 'margin' of the experience, yet can 'interfere' with it. This points to a difference between energy transition approached as 'matter of timing', in which time is treated within a unified but abstract framework, and energy transition as a 'matter of experiencing new durations' ('transitioning-towards'), in which time is multiple and intervenes in mainly two empirical ways, as heritages and as material intensities. 'Nearness' appears most often intentionally associated with heritages (knowledge, skills, spatial patterns) according to their capacity to foster or to slow down a process of change. At the same time, 'nearness' is continually challenged by material temporalities (circulation of water underground, cycles of bird migrations, expansion of wind power). These untamed intensities question the coherence of an assemblage and

give rise to new objects of investigations and new 'publics', translating quantitative effects into a qualitative 'duration'. Thus the 'duration'—that is, the way successive generations of experiences are taken up in a process—specifies the political dimension of an energy transition 'potential'.

From this perspective, 'nearness' is a strategic and disputed zone for steering the processes of energy transition. It is a zone in which the definition and the specification of relevant associations between material intensities and temporalities become a political issue. It is the plastic zone where an energy future becomes a proposition of 'duration', which has to be articulated in relation with the things located where it takes place.

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Notes

1. Shell, *New lens on the Future. A Shift in Perspective for a World in Transition*, 2013.
2. IBA, *Bergbau Folge Landschaft (Post-Mining-Landscape)*. Berlin, Jovis, 2010. See also: http://www.iba-see2010.de/en/verstehen/projekte/neun-inseln.html.

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