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The Phases Model of the Transformation to Sustainability (T2S)—Structuring through the Negotiation Perspective

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Abstract: The complexity of linking sustainability with transformation necessitates a critical re-evaluation of the ways the actors, processes, issues, structures, and outcomes related to the transformation to sustainability (T2S) can be understood. At the same time, achieving T2S is highly dependent on policies based on technical solutions that can prompt needed behavioural change, whereas these technical solutions are not always compatible with both planetary and societal boundaries. Therefore, achieving T2S also calls for evaluating the normative foundations of policies and actions. This paper contends that T2S is significantly defined by the multiplicity of negotiation processes. This justifies a deeper look at T2S from the perspective of negotiation studies. T2S is composed of different phases, each of which has a different set of actors, resources, and audiences. This paper introduces a theoretical model as an analytical meta-framework to structure how T2S unfolds in an orchestrated manner. This model builds on negotiation theories to focus on the actors' perspectives on T2S. It proposes the division of the transformation process into phases—*entry point*, *learning*, *sequencing*, *disrupting*, and *fortifying*. Each of these phases is analysed to determine the “quality” of cooperation that can help fulfil the tasks required to master the so-called “cognitive games” of T2S (*ripeness game*, *power game*, *bargaining game*, *policy game*, *scaling game*). Moreover, insights are presented to explain how the designated milestones can be achieved to indicate the advancement to the next phase and eventually entrench the transformation process. The findings resulting from the analysis of the phases of T2S present potential lessons and opportunities for both theorists and practitioners/policymakers.

Keywords: transformation; sustainability; negotiation; German *Energiewende*; complexity; decisions; phases of processes; cooperation



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1. Introduction—Negotiation Studies as a “Practical” Perspective to the Transformation to Sustainability

The complexity of transformation to sustainability (T2S) can easily overwhelm researchers, policymakers, and society at large when current concepts (e.g., sustainability), methodologies (e.g., models and scenarios), indicators (e.g., GDP) and approaches (e.g., cross-sectoral) are not able to fully capture this complexity [1,2]. Therefore, this complexity necessitates critical reflection, for example on how technological innovation that allows social systems to remain within the planetary and societal boundaries fits into the bigger picture of a sustainable future.

Sustainable development manifests the complexity of multiple transitions and parallel transformations linked not only to the 2030 Agenda for Sustainable Development and the Paris Agreement, but also the individual national development plans of governments, many of which precede these two global visions. Despite achievements in the implementation of these two global visions, more coordination and sequencing of policies, sectors, and technologies are needed to converge norms and align (relational) infrastructures. The success of the COP26 Glasgow Climate Pact, which aims to reduce the gap between the 1.5° Celsius target and existing emission reduction plans, is dependent on additional efforts in other sectors (e.g., biodiversity, rule of law) and policy silos (e.g., market instruments) to

ensure the completion of T2S. For example, the increase of investments into green energy and the dismantling of subsidies for fossil fuels depends on how effectively aligned climate goals are with legislation on energy taxation and carbon pricing [3].

The normativity of sustainability as a concept and transformation as a process is a challenge. Any transformation is driven by predetermined goals that define the back-casting approach of actors. While these goals can be defined in numbers, the decisions on which thresholds will be taken are often outcomes of value judgment. At the same time, the milestones and targets are generally quantified, despite many (socio-political) indicators and qualifiers being qualitative. For example, when referring to decarbonisation, many actors assume that their net-zero targets and actions can help meet the goals set by the Paris Agreement and the 2030 Agenda for Sustainable Development. However, this assumption implies that they already have a predetermined definition of what constitutes a fair contribution, which one has to render vis-à-vis the contribution of others [4]. Moreover, the diversity of worldviews and the contestability of pathways towards sustainability will mostly be reflected in the suitability of technological, economic, and social innovations that are deemed necessary to achieve the “optimisation” of social systems to make them compatible with planetary boundaries [5,6]. Therefore, systemic innovations should be opened up beyond the technological dimension and explain the normative dimension of T2S through more research on “directionality, legitimacy, responsibility, and their interrelation in innovation systems” [5] (p. 1).

The use of analytical frameworks is core to the research on transformations or transitions. The majority of the literature offers insights on how sustainability can be achieved by finding leverage for guiding transitions [7], and what sustainability compels in terms of changes in social systems or actors’ preferences [8]. This paper contributes to an emerging literature on T2S that focusses on developing analytical frameworks that use benchmarks and “what-if” arguments to “explain” the different dynamics behind the patterns and mechanisms driving transformative system change [9,10]. At the moment, there are two highly influential frameworks: the multi-level perspective and the multi-phase concept. These two frameworks represent the transformation management theories and the socio-technical transition theories, respectively. Both frameworks assume that transformation processes can only unfold when the focus goes beyond technical innovations and includes social and institutional innovations [11]. The multi-level perspective looks at long-term and complex socio-technical transitions from the perspective of human agencies, such as institutions [12,13]. Through the three action levels (megatrends, sociotechnical regimes, and niche level), actors can determine the scope of their possible actions [14]. The multi-phase concept depicts the transition dynamics, which are composed of four non-linear, alternating phases (pre-development, take-off, acceleration, and stabilisation) [12,15]. Another group of literature builds on resilience and looks at the dynamics of the build-up and breakdown within transitions [16,17]. For example, the X-curve framework of Aniek Debinck et al. [9] illustrates how transition dynamics of build-up and breakdown necessitate a rule-based model of action (rule-following, using, creation, and alteration).

This paper presents a negotiation framework for T2S that links negotiation studies with transition/transformation studies. The negotiation perspective suggests that transformation is not purely coincidental and that it is possible to manage this transformation process by seeing it as a pathway consisted of various phases. Each of these phases has different rules and “games” to be played to mobilise the resources needed to move to the next phase. Connecting the negotiation perspective to the current debate on T2S is new in the literature on sustainability. This paper goes beyond the discussion on combining insights, methods and approaches from disciplines investigating factors shaping transformations. This paper argues that combining systems (flows and markets, technologies and policies), as Aleh Cherp et al. [18] contend, is not enough, because each system comes with its own framework of interactions. What is further needed is the integration of these systems into a meta-framework that not only shows how these systems and frameworks interact with each other, but also how various negotiation processes are captured. This

meta-level framework explains, for example, the pulling effects each of these systems has on each other that can help other lagging systems to catch up or inhibit the other systems that are excessively advanced.

Section 2 explains the methodological origin of the negotiation framework for T2S by highlighting how negotiation scholars use phases when thinking about analysis of the different steps leading to the desired agreement. This paper argues that the understanding of the dynamics behind negotiation, that is, collective decision-making that requires exchanges and reciprocity, can lower the transaction costs of T2S and therefore lower the caveats or inhibition of recalcitrant actors. Section 3 elaborates on the different phases of T2S and provides insights on how actors can utilise one or many qualities of cooperation (*collaboration, coordination, deliberation, and orchestration*) and master the “cognitive games” (*ripeness game, power game, bargaining game, policy game, and scaling game*) to achieve the relevant milestones (*agenda-setting, rules and procedures, social contract 2.0, and entrenchment*). The ability to understand these qualities of cooperation can be, for example, useful when identifying leverage points to achieve the desired outcomes with the least possible intervention and costs. In addition, understanding the stakes needed to play these cognitive games can help manage expectations and lower frustrations. For example, ambitious emission reduction policies in the transportation sector will most likely fail if there are not yet rules for dialogue in the transportation sector.

Section 4 discusses how the model can offer opportunities for further research as well as for further actions from practitioners and policymakers. The intended recipients of the lessons for theory and practice are both researchers and practitioners or policymakers who are looking for approaches to cope with the complexity of T2S. This section offers some insights as to how this theoretical model can help researchers address some research limitations that they encounter. The last section concludes by presenting the limitations to the research and by building on the contribution of the negotiation framework offers an outlook on further research concerning the applicability of the theoretical model as a “what-if” benchmark for T2S.

2. Background, Methods and Approaches—The Negotiation Framework as a Theoretical Model of the Transformation to Sustainability

For decades, negotiation scholars have been addressing the question of how negotiation is important to achieve individual sustainability goals. Many negotiation scholars have, for example, investigated how agreements on climate change mitigation and adaptation [19,20] as well as on environmental protection [21,22] are achieved through negotiations. Generally, negotiation scholars argue that an excellent understanding of how negotiation occurs in a specific context can help achieve the desired agreements by significantly reducing the transaction costs of collective decision-making.

The T2S is a concert of various negotiation processes that unfold at multiple levels (e.g., global, regional, national, local), scopes (e.g., state/public or non-state/private), issues (e.g., biodiversity, gender), sectors (e.g., energy, industry), and structures/frameworks (e.g., United Nations Framework Convention on Climate Change, the African Union’s Agenda 2063) [2,8,23–25]. Each of these levels involve distinct sets of actors, agencies, and power relations. At the same time, these levels are to a certain extent interlinked through synergies, positive and negative externalities, co-benefits, and trade-offs. For example, China’s decision to reduce emissions might not be solely driven by the goal to protect the climate, but instead by the expected co-benefits, such as curbing air pollution [26]. This might be unproblematic when the measures taken are complementary. However, when priorities are competitive (e.g., climate protection vs. livelihood), prioritising climate protection at the expense of economic development might further increase the hurdles for more ambitious climate policies.

Negotiation scholars often use theoretical frameworks to conceptualise the processes for how collective decision-making can lead to agreements. By characterising negotiation as a process that has a temporal start and end, negotiation scholars such as I. William

Zartman [27], Daniel Druckman [28], and William Baber [29] have developed stage and episodic models as analytical frameworks that divide the negotiation process into different phases or segments. The two-stage model of Zartman [27] comprises three initial phases, which aim to find a general procedure of the negotiation, while fourth and fifth stages deal directly with the details on the implementation of the decisions achieved. Druckman [28] suggests a six-stage model, which starts with getting organised and ends with an agreement on implementing details. With knowledge of the distinct requirements of each phase, actors can anticipate the milestones to move from one phase to another. These milestones are also referred to as the “turning points” [29] or “breakpoints” [30]. A full understanding of these milestones allows actors to retrofit their preparations and effectively differentiate their actions, thus, minimising the costs while maximising the benefits.

The negotiation process is, as the introduced theoretical model assumes, a pathway that already starts prior to the bargaining and continues after the signing of an agreement. The likelihood of the achievement of agreement depends not only on bargaining but also on the preparations made to facilitate bargaining by lowering transaction costs as much as possible. Preparations include exploratory talks often conducted by surrogates to test the sincerity of the others. As Daisung Jang et al. [31] recommend, more efforts should be exercised to theorise and measure the preparation for the bargaining and for ensuring the implementation of the achieved agreements. They contend that most recommendations made by specialized experts from various negotiation contexts target the preparation and implementation phases. As I will elaborate in the next section, the theoretical model emphasizes that the pre-negotiation phase is the most challenging phase of the negotiation process (and of the transformation process towards sustainability), because the high level of complexity and uncertainty that actors need to structure.

3. Results: The Phases of T2S—A Negotiation Framework on the Transformation to Sustainability

This negotiation framework (Figure 1) illustrates the different phases of the unfolding—from the entry point to the desired “new sustainable normal”, where sustainability principles, as reflected by the SDGs, are entrenched. This section discusses the five phases that reflect the preparation, bargaining and implementation phases in managing T2S. The first two phases (entry point and learning) are the phases where actors prepare for the bargaining in the sequencing phase. Bargaining requires visions and agenda items. Nevertheless, bargaining is distinct from sequencing as the latter is the purpose while bargaining is the means. Bargaining starts in the sequencing phase and continues in the next disrupting phase. However, the purpose of bargaining in the sequencing phase is about achieving agreements on the rules and procedures. In the disrupting phase, the bargaining is undertaken to achieve agreements on the relevant technical solutions. The T2S is closed in the fortifying phase where additional agreements (post-agreements) might be needed to ensure that the T2S remains on track.

The figure depicts relevant side-tracks that depict the complexity and uncertainty of the T2S. Each phase is influenced by externalities that can either accelerate (e.g., from the learning to disrupting phase) or derail the T2S. At the same time, this distinct T2S can foster or inhibit the success of other T2S. The figure also characterises how each phase can accelerate and skip the next phase or can regress and move back to the previous phase. Finally, the side-tracks show how the whole T2S can collapse or reboot at any phase.

The following Table 1 synthesises the stage or episodic model of negotiation processes, as depicted in the phases of T2S in Figure 1. The phases of T2S reflect the phases of a typical negotiation process, such as pre-negotiations (exploratory talks), agenda-setting, clarification of positions, addressing and connecting interests, coming up with solutions, and ending the process (with or without an agreement) [27].

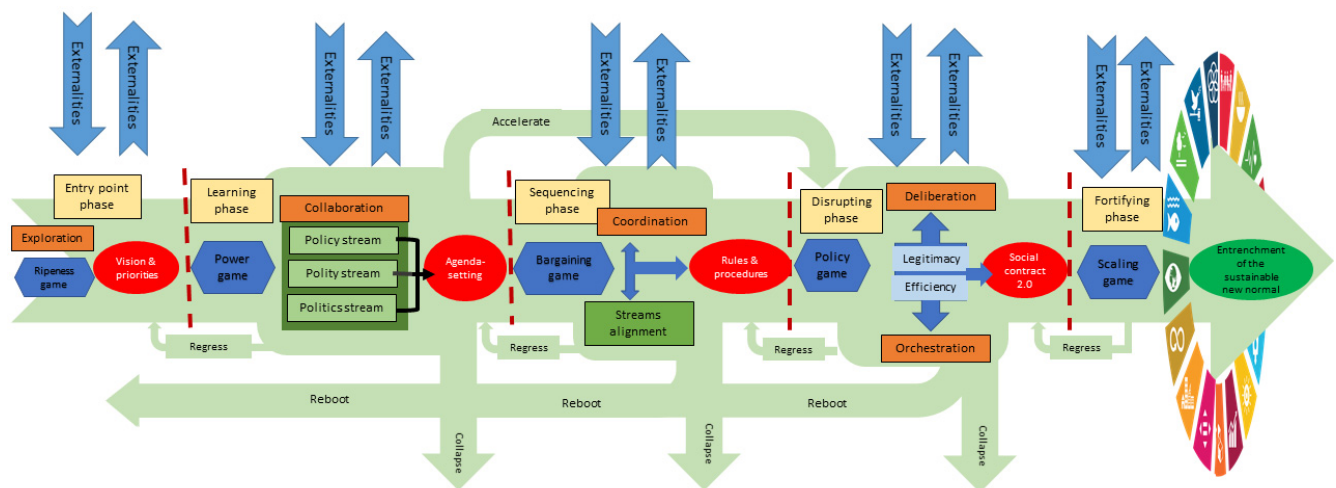


Figure 1. The Phases Model of the Transformation to Sustainability (own representation).

Table 1. The Phases of the Transformation to Sustainability (own representation).

Phases of T2S	Corresponding Phase(s) in the Negotiation Process	Qualities of Cooperation	Cognitive Games	Milestone(s)
Entry point	Pre-negotiation	Exploration (pre-cooperation)	Ripeness game	Definition of vision and priority goals
Learning	Agenda-setting	Collaboration	Power game	Definition of the agenda and timeline Appraisal of social contract (definition of quality indicators and scope of application through contextualisation); rules and procedures of the bargaining
Sequencing	Clarification of positions	Collaboration, coordination	Bargaining game	
Disrupting	Coming up with the solutions	Collaboration, coordination, deliberation, orchestration	Policy game	Appraisal of resilience codified in the social contract 2.0
Fortifying	Ending the process	Collaboration, coordination, deliberation, orchestration	Scaling game	Entrenchment of the sustainable new normal (scaling up, out, and deep)

The table illustrates the integral elements of T2S. The theoretical model introduces the “qualities” of cooperation to differentiate the relevant sensibilities of cooperation, which can be helpful in achieving the corresponding milestone. Another element of the model refers to the cognitive games, which represent the barriers in each phase. If they are overcome, they can help achieve the corresponding milestone. The cognitive games represent the “breaking points” or reference points to define the context of the problems as well as to fully understand the context and explain the actors’ behavioural responses.

3.1. The Entry Point for T2S as Determinant of the “Ripe Moment” for Sustainability Transformation

The theoretical model commences with the entry point, which corresponds to the pre-negotiation stage in negotiation processes. This entry point is the critical juncture where T2S starts if the necessary conditions are present for a specific transformation pathway to be the potentially viable process to achieve sustainability. The following Table 2 enumerates these conditions to determine the “ripeness for T2S”.

Table 2. “Ripeness for T2S”—necessary conditions at the entry point.

Conditions	Description
Condition 1	The conflictual situation defined by common threats and vulnerabilities arising through unsustainability
Condition 2	Mutually hurting situation arising through non-actions, and disadvantages through non-participation and free-loading
Condition 3	Conviction of the possibility of resolving common threats and vulnerabilities through cooperation

The first condition pertains to the occurrence of a conflictual situation that needs to be resolved [32]. The academic debate on sustainability increasingly connects human security to climate change, social inequality, and unsustainable consumption and production [33,34]. As all humans and social systems are constrained by the same planetary boundaries [35], they are directly or indirectly affected by the conflictual limitations that these boundaries present. They are also affected by the chosen instruments to mitigate or adapt to these effects, although in varying degrees, intensities, and temporality. These threats and vulnerabilities are the results of, or exacerbated by, existing structural imbalances while fostering further conflicts and inequalities.

The failure to resolve these conflicts through non-action creates a “mutually hurting stalemate” (MHS) [36]. The concept of MHS is the notion of increasing pain associated with the present (conflictual) course. When parties find themselves locked in a conflict and cannot achieve victory and the deadlock is painful to both of them (although not necessarily to equal degrees or for the same reasons), they are “ripe” or ready to negotiate [37]. In addition, this MHS implies the absence of free riding and indifference. In T2S, through scientific knowledge, actors expect that the ex-ante costs of early warning, prevention, and preparedness are lower than the costs of ex-post remediation, repair, and restoration [38]. At the same time, the current condition of unsustainability poses threats to all actors. The decision not to participate in any effort for solution brings further disadvantages. Actors expect that the payoffs are exclusively for those who contributed or intended non-participation and are free riding, which is generally linked with unacceptable opportunity costs, such as loss of market access, or loss of competitiveness, as well as material damages. In addition, because some actors expect that power asymmetries will change and those “first movers”—who, for example, are able to introduce technological standards and norms—will receive additional competitive advantages, other actors are keen on distributing the efforts more broadly among actors.

Furthermore, actors need to be convinced that cooperation is necessary to resolve conflicts, notably in cases involving common vulnerabilities where no single actor can effectively resolve the vulnerability. This “community of common fate” [39] depicts the process of identity-building and highlights the relevance of negotiations. When addressing global environmental concerns such as climate change, which no single actor can resolve, cooperation becomes an inevitable approach. In addition, explicitly when addressing complex and uncertain phenomena such as sustainable development and climate change, negotiation serves as an apparatus for adaptive learning and improving social relationships, both on the global and domestic levels [40]. Therefore, a necessary condition to initiate T2S is the conviction that sustainability goals can only be achieved through cooperation that is reflected on the different levels and within the different formats and structures of negotiations.

Timing is a concept that is central to studies on negotiation as well as on transformations and sustainability. Relevant actors—namely those who prefer to resist changes, those who propagate changes, and those who are indifferent or oblivious—will find themselves in a pre-transformation stage to decide whether T2S is what is needed to resolve the MHS. In this stage, those actors for change will point out why inaction is also hurting the others. From the negotiation perspective, initiating T2S is a question of identifying where it hurts,

resolving information asymmetries, and including all actors as part of the solution. In other words, finding entry points to T2S refers to the fostering of the “ripeness” for sustainability.

The idea of the “ripe moment” for T2S, as derived from negotiation theory, concerns the question of the perception of discomfort—the anticipation that what can be achieved through T2S might outweigh the anticipated benefits of non-action or non-participation. The perception of discomfort that is grounded in cost-benefit analysis defines the MHS for all parties, even those who are indifferent to T2S. Applying this ripeness concept to T2S, both status quo and change actors are at an impasse, which hurts all actors in various degrees or for various reasons. For example, actors from the fossil fuel sector can find the uncertainty of climate policymaking tiresome or find the “public shaming” unbearable. As a result, they recognise that it is better for them to adapt, compromise, and engage in finding concrete solutions rather than boycott policy consultations whose outcomes will eventually affect them.

The ripe moment is only a condition, and it is necessary, but not sufficient, for the initiation and success of negotiations. In the same manner, the ripe moment does not always lead to the initiation of T2S, nor can it guarantee that the transformation process will be successful. This is especially true when actors lack the necessary resources to survive the shocks linked to certain disruptions due to T2S. Therefore, the ripe moment needs to be complemented by institutions and governance modes for the actors to fulfil their tasks and achieve the milestones for each phase or stage of the transformation process.

3.2. *The Learning Phase, the Power Game, and the Collaboration between the Three Streams*

The first phase pertains to the “learning phase”, in which the actors from the three streams learn about the first challenge of T2S—the power game. The first process-related challenges are most likely to arise as actors collaborate to set up the agenda items for subsequent deeper discussions. The theoretical model argues that the perception of power dictates the intention or ability to reciprocate concessions. The first indicators of power relations are shown when parties attempt to agree on the agenda. Mastering the power game depends on moving from zero sum to positive sum relationships. When the actors—irrespective of their classification to a stream—are able to adapt to the power game, then power becomes less of a driver of the prisoner’s dilemma and more of a collaboration.

The actors are generally classified into one of the three streams (policy, polity, and politics), which shed light on the sources of power (e.g., convening power, procedural power, inconvenience power). The theoretical model modifies the multiple streams framework of John Kingdon in assessing public policy and governance [41]. These streams in the theoretical model are classifications of actors according to their role in public policy. This implies that the theoretical model also assumes a broader definition of governance [42].

The policy stream refers to actors that are directly involved in designing, evaluating, and implementing policies. Government bodies as well as other actors that are either elected or constitutionally mandated individuals (e.g., president of the central bank) and institutions identify emerging risks and threats, design, and implement policy instruments. They do this to resolve the problems within the socio-political boundaries given to them by their constituents as well as within planetary boundaries [35,43]. At the same time, these boundaries imply the need for some degree of accountability, as the other two streams evaluate and legitimise the policies. These policy instruments include regulation, incentives, or penalties and public investment programmes that aim to prompt certain responses from target groups such as economic actors and private households or trigger transitions in sectors or technologies [8].

Nevertheless, the policy stream is itself heterogeneous, with actors often being motivated by a variety of political ideologies that can determine their preferences to deploy certain policy instruments over others. Hence, competition within the policy stream is expected, if not desired, and effective communication within society at large becomes inevitable for political survival. In addition, to foster both the legitimacy and maturation of policies, the policy stream is in constant exchange with the other streams—including policy

entrepreneurs such as think tanks, scientific communities, NGOs, as well as business and industry groups—to improve policy development and implementation.

The polity stream pertains to formal institutions (e.g., constitutional court) that facilitate various types of verification and compliance in policymaking. In other words, the polity stream serves as a “check and balance” for both the policy and politics stream. The polity stream includes institutions and agents that monitor, evaluate, verify, or sanction government actions and legislation [44]. These institutions are above policies and politics to ensure social cohesion and continuity. For example, a government may initiate new policies to upgrade the country’s energy supply system by expanding the deployment of renewable energy technologies. However, the implementation of these policies will need to adhere, for instance, to existing constitutional limitations as well as depend on the legal culture of precedents. In addition, these institutions can also initiate the impetus for new policies or exercise constraints or provide support to initiatives from both state and non-state actors. For example, the Federal Court in Australia declared that the Minister for the Environment owes a duty of care to Australian children, who would suffer potential “catastrophic harm” from the climate change implications of approving an extension to a coalmine [45].

The politics stream consists of “highly motivated individuals” and non-state actors that advocate the interests of their constituents. The mandate they receive from their constituents includes drawing attention to policy problems, identifying gaps in governance, providing specialised technical knowledge, building coalitions of support or opposition, democratising policymaking processes, delivering scalable solutions, and stimulating further societal and legislative actions [46]. In T2S, the politics stream depends on networks to complement state agencies and institutions. They maintain close and long-term partnership, not only with proximate policymakers but also with other non-state actors to build a network of state and non-state actors (policy silos) [25]. For example, the Fridays for Future movement has been successful in creating policy silos in climate protection by building a broader coalition of supporters, such as the Churches for Future and the Scientists for Future [47]. In addition, the politics stream is a major driver of policy diffusion by creating pulling effects that bring various policy silos together, through which the effectiveness of policies is improved. For example, the policy stream can provide specialised knowledge that can help translate green energy technological innovation into social or cultural innovation.

Corresponding to the agenda-setting of the negotiation process, this learning phase needs to come to terms with the power game and the related existing power structures to lay the groundwork for the constitution of the “rules and procedures” in the next phase. The power game refers to how actors adapt their goals and strategies to address power asymmetry. It explains how power relations can limit the set of potential actions or draw a specific response from counterparts. When weaker actors recognise that the most powerful actors cannot subjugate others without hurting themselves, the probability of them collaborating increases. Power is therefore a variable that allows the assessment—or, to a distinct degree, the predictability—of actions. This predictability of actions allows for adequate preparations and development of strategies to adapt to power realities. In this case, weaker actors can, for instance, maximise the leverage potentials of their resources through strategic placement and timing to achieve the best possible outcome [48]. By mastering the “power game”, actors are able to adapt their strategies and effectively participate in forging the formal agenda in the learning phase, which, once achieved, allows the process to advance to the next phase.

3.3. The Sequencing Phase and the Bargaining Game for Rule-Based Transformation

The sequencing phase of T2S witnesses the alignment of streams, that is, the convergence of norms and values resulting from the bargaining game between actors from the three streams. This stream alignment is important for cooperation, because it allows reciprocity and the building up of a we-identity [49] and allows the completion of policy cycles (development, evaluation, legitimisation, and implementation). In this phase, the

interactions among the policy, polity, and politics streams generate “shared realities” that constitute the new rules of the bargaining game. For example, as these streams align, their understanding of the problem can be standardised. At that point, they will speak the same language, use the same indicators, and even exchange personnel between streams (e.g., environmental activist seeking election). This enhanced understanding facilitates the communication and persuasion efforts between actors, thus mastering the bargaining game, which refers to the persuasion ability of actors.

The sequencing phase commences once the three streams are able to agree on the agenda and timeframe of T2S during the learning phase. The envisaged milestone in this phase is the establishment of the rules and procedures of T2S within a combination of planetary and societal boundaries that define a framework of self-limitations and norms for ecological and human well-being. For example, the German *Energiewende* is oriented towards the principles of a *soziale Marktwirtschaft* (social market economy), which combines liberal economic and welfare policies [50]. Because of these principles, the political framework for the *Energiewende* foresees minimal government intervention while ensuring the consequent stable income of private households. This tolerable window represents the current social contract, “contends a culture of attentiveness, (. . .) a culture of participation, (. . .) and a culture of obligation towards future generations” [51] (p. 2). The window assures reciprocity and the guarantee that potential burdens will remain tolerable through thresholds and compensations. With an overview of the agenda, the policy stream can limit the extent of its coordination efforts, focus on actions that represent the minimum costs but with the maximum effects (leverage points), and equitably distribute the costs and burden of T2S among themselves.

Moreover, setting the agenda paves the way for substantial preparations to make the case in front of other actors. For example, upon agreement on the four agenda items in the framework of Germany’s energy transition, most German federal ministries as well as the 16 German states (*Bundesländer*) developed their own positions and launched their own technical research on certain themes and implementation of goal strategies [52]. In addition, those affected actors from the politics stream, such as actors representing the energy, transport, and industry sectors, mobilised their constituents and networks to seek popular support for their proposals to implement the four major agenda [53].

In the sequencing phase, the actors from all streams will most likely launch a series of coordination efforts, first within their networks in their stream, and second with network members from the other streams. At this point, some actors from both the policy and politics streams, especially those belonging to the opposition party or affected sectors, will already have sought intervention by the polity stream to clarify constitutional or judicial constraints. At the same time, members from the polity stream can be proactive in arbitrating between actors (both among actors from the same stream or between the streams). In the German *Energiewende*, legal institutions have become heavily involved, as several affected groups launched thousands of legal challenges against the *Energiewende* [54]. Through thousands of legal challenges, new laws and regulations, as well as additional scientific research, can be established to close these gaps in legislation and research. For example, immediately after the German Bundestag approved the legislative framework, additional funding was released for research to understand the effects of the accelerated deployment of renewable energy in Germany [55].

By coordinating, streams align with each other as actors appraise the status quo, evaluate existing rules, assess precedents, and improve their understanding of where they are coming from. The mastering of the bargaining game ensures an effective alignment of interests and resources. For example, government ministries coordinate to combine resources and ensure the coherence of their policies. Ideally, actors from the politics stream are able to review the compatibility of their positions with those of the other network members, because there are already well-established communication and exchange channels within the network. Hence, transnational and national networks facilitate the bargaining game by maintaining relational infrastructures that connect actors and foster

cooperation between them. At the same time, the alignment implies that they have found mutually acceptable procedures on how to elaborate the technical aspects of the measures. At this point, the focus of the interactions will start to shift from the procedure of interactions towards the material content of transformation.

3.4. *The Disrupting Phase and the Policy Game to Connect Solutions with Identities*

The disrupting phase starts after the formal acceptance of the rules and procedures on bargaining that allows for a “rules-based” elaboration of the technical solutions to address the barriers to behavioural change. With this milestone, the policy game becomes the driver of cooperation—that is, of deliberation, in which actors connect their worldviews with the technical aspects of the presented measures—and of orchestration, in which actors link the sum of their worldviews and technical aspects to those of their counterparts from other sectors or scales. In this stage, the actors reflect on the compatibility of technical solutions with their identities, and if new problems or concerns arise, then they are able to communicate this to others. In this stage, some actors might experience a turnaround from their previous positions. For example, German energy utilities eventually gave up their opposition to the *Energiewende* after provisions were reached to adequately compensate for their loss (e.g., EUR 90 billion for the coal sector and affected communities).

The policy game is the most important cognitive barrier in this phase. It refers to the efforts to effectively implement and legitimise the policies and actions. With this, the actors define the scope and normative limitations of the negotiated measures according to the mandate given to them by their constituents. This phase is disruptive, not only from a technological, but also from a behavioural point of view. On one hand, new solutions will disrupt existing carbon lock-ins as new technologies and methods are introduced to break path dependencies. On the other hand, by mastering the bargaining game, actors will know how to persuade others and how to be persuaded with integrity. As such, they can now change their initial reservations without hurting their credibility or backtrack from their initial support of non-sustainable measures, such as subsidies for fossil fuel energy. At the same time, persuasion can disrupt existing coalitions or networks of recalcitrant actors. As actors deliberate and orchestrate, they will most likely find new indicators of efficiency and legitimacy that will provide new elements to the new social contract. The disrupting phase ends with the constitution of a new social contract (2.0), which sums up the deliberated and orchestrated rules and procedures when achieving the sustainable new normal.

In this phase of the transformation, the specificities of the new normal are codified in the new social contract. These specificities are outcomes of discourses in varying scales and dimensions as well as in different knowledge and policy domains. The boycott efforts and spoiling strategies of status quo agents are no longer viable, as the stakes of non-cooperation are already too high to tolerate. Status quo or recalcitrant agents now acknowledge that transformational change is imminent, and that if they want to maintain relevance and certain privileges, they need to influence the design of new institutions and structures. Bargaining and policy games have become interconnected. This means that policies are now direct outcomes of bargaining between streams as opposed to policies reached behind closed doors by individual ministries with little to no public consultation. Bottom-up processes in governance are no longer the exception but the rule. Discourses unfold at the cognitive level, primarily to develop transformative narratives [56]. These narratives are important elements of the rhetorical structure that can help assess the sustainability transformation pathways being taken [57]. In cases of deviations, these narratives can help the process get back on track.

3.5. *The Fortifying Phase and the Scaling Game to Close the T2S Process*

Ending transformations remains a huge challenge for academic research. One reason is that, initially regarded as successful, empirical cases on transformations can still regress, which casts doubt on the usefulness of current methods to measure and evaluate the success of the policies implemented. Another challenge is that systems are constantly evolving,

and completed transitions are still subject to further shifts that can reverse past-entrenched norms and practices. The temporal aspect of transformations can be unclear because of the uncertainty about the length of time a process needs to be completed. For example, Elisabetta de Giorgi [58] sees the “never-ending transformation” of the Italian party system as the consequence of various phases in the history of the Italian party system that are usually started and ended by a major political crisis.

The theoretical model assumes that the fortifying phase can close the transformation through the scaling game. In this model, the scaling game refers to the efforts to replace non-sustainable (carbon) lock-ins and entrench sustainability principles in the way they become self-enforcing and deeply embedded in institutions, cultures, and behaviours that are oriented towards sustainability [59,60]. Carbon lock-ins can frustrate change agents or even destroy political will as well increase the costs of change. Carbon lock-ins can be classified as governance-related, institutional, infrastructural, technological, and behavioural [59] (pp. 8–12). At the same time, replacing carbon lock-ins with sustainable lock-ins assumes that societies need lock-ins in the form of norms, as they provide benchmarks for “appropriate” behaviour. Moreover, entrenchment means that deviations to sustainability are sanctioned, because they are perceived as irrational (in terms of costs vs. benefits) and make one “unfit” for survival.

The previous stage shifts to the fourth and last stage, in which new lock-ins are established that are conducive to sustainability. In this fortifying phase, the sustainability principles and the chosen approaches are entrenched, which means that they are now codified in the new social contract 2.0. This entrenchment is operationalised through the threefold scaling of sustainability principles, which corresponds to the typologies of routes to systemic impact, introduced by Michele-Lee Moore et al. [61]. These are (1) Scaling up (changes in institutions at the level of policy, rules, and laws), (2) Scaling out (replication and dissemination, increasing the number of the extent of impacted people and communities), and (3) Scaling deep (changing relationships, cultural values, belief, and worldviews).

3.5.1. Scaling Up—The Transformation Process as a Mechanism of Rewards and Sanctions

The scaling up of T2S depicts impacting law and policy. Scaling up is based on the recognition that the roots of the problems (threats and risks) can only be properly resolved when innovative approaches to achieve sustainability are codified in laws, policies, and institutions [61]. It can be regarded as the most obvious indicator of the closure of transformation processes. This is because there are quantitative and qualitative indicators that can identify new laws and policies, through which the concrete targets and measures have been or could be achieved. Therefore, both the policy and polity streams in T2S are mainly responsible for the scaling up of sustainability by reflecting on the internal changes that they have experienced following the establishment of new laws and policies.

The scaling up of sustainability principles in the German *Energiewende* is still a work in progress. New laws and policies are regularly introduced as part of the strategic political and legal framework for the *Energiewende*. Examples include the Electricity Market 2.0 to enable an electricity market that is suitable to accommodate growing shares of renewable energy. There are already some indicators that the German legislative and political framework for the *Energiewende* has already been able to mobilise a critical mass of action, not only from the politics stream. This corresponds to the catalytic cooperation model introduced by Thomas Hale [62], in which “catalytic institutions” motivate shifts in the actors’ preferences by encouraging first-movers (change agents) to come forward, punishing spoilers and encouraging small steps, even from recalcitrant actors (status quo agents). For example, high levels of German public funding for research and investment into renewable energy complements the existing political framework for the *Energiewende* and encourages not only technological innovation, but also behavioural change [63]. Another scaling up in the German *Energiewende* pertains to the emergence of policy mixes that couple, for example, the costs of heating and transport with the costs of CO₂ [55]. The country’s

national emissions trading system for fuels scales up the *Energiewende* by creating more incentive for emission reductions from the heating and transport sectors.

3.5.2. Scaling Out—The Transformation Process as a Principle for Other National Policies

The scaling out of the transformation process is manifested by the replication of innovations in different communities with the intention of achieving similar results [61]. In the theoretical model, all streams can serve as the main driver of scaling out. There are some indicators that the sustainable transitions in other sectors have gained momentum, partly due to the achievement of some of the goals of the *Energiewende*. Examples include the *Mobilitäts/Verkehrswende* (mobility/transport transition) [64] and *Agrarwende* (transition in the agricultural sector) [65]. Change actors in sectors other than the energy sector have gained confidence through the positive experiences from the *Energiewende* as they have discovered, for example, new arguments to rebut socio-technical narratives (e.g., loss of jobs, relocation of companies) that are effectively used by recalcitrant or status quo agents to resist changes.

Another indicator of the scaling out of the *Energiewende* is its integration both in Germany's foreign policy and international development policy. Some experts and German politicians suggest that the *Energiewende* can be an "export hit" to other countries [66]. The reform strategy "BMZ 2030", implemented by the German Federal Ministry for Economic Cooperation and Development (BMZ), incorporates some elements and positive experiences from the *Energiewende* [67]. The reform strategy aims at improving how Germany conducts partnerships with developing countries. Because of the inclusion of "green people's energy" as an initiative area, the bilateral development partnerships between Germany and many partner countries have been mandated to focus more on energy transition in the context of climate protection and energy security in partner countries.

3.5.3. Scaling Deep—The Transformation Process as a Driver of Shared Realities in Communities

The scaling deep of the transformation is manifested in the attainment of "big cultural ideas" by using stories or narratives to shift norms and beliefs and by investing in transformative learning and communities of practice [61]. In other words, scaling deep means the mainstreaming of socio-technical narratives about the benefits and urgency of sustainable practices. In addition, scaling deep can be monitored and measured through the quantity and quality of knowledge diplomacy and knowledge networks through which different actors question existing narratives and, if needed, create new ones, exchange perspectives, as well as adjust their preferences, activities, and behaviours in order to obtain benefits, often in the form of increased knowledge [68].

Expanding the idea of scaling deep, this paper argues that T2S requires that the system survive stress tests caused by endogenous and exogenous shocks and disruptions. Scaling deep can also be characterised as the resilience of the system to thwart disruptive backlashes and paradoxes [25,69]. To achieve scaling deep, the social system achieves resilience as T2S unfolds. However, the social system needs to maintain: (1) The same cooperative relationship between populations, (2) the identity markers that connect people, (3) the ability of communities to communicate and negotiate with their environment, (4) the ability to allocate scarce resources efficiently, (5) the desired ecosystem services, (6) the specific relationships between interacting species, and (7) the essential structures of natural capital [25,69,70].

The politics stream is in general the primary driver of the scaling deep of T2S. Scaling deep profits from the increasing volume of public funding for research into green energy and energy efficiency as well as into climate protection is an indication of investment in transformative learning and the mobilisation of communities of practice. The establishment of several new centres of excellence in sustainability, sustainable energy, and climate protection in German universities has supported both change and recalcitrant actors from all streams to rely on reference materials for knowledge to further mobilise efforts to elevate

climate protection and green energy as a political agenda [71]. Knowledge networks such as the German Sustainable Development Solutions Network (SDSN), and the increased inclusion of scientific bodies in constituting sustainability policies in Germany are other indicators of the scaling deep of the *Energiewende*, as they help connect the energy transition to the larger sustainability context in the country [68].

To conclude, the types of scaling represent routes to systematic impacts and insinuate the mainstreaming of exceptional and emergency measures in a way that allows the new sustainability-inclined path dependencies to define future decisions and policies. Nevertheless, the fortifying phase does not mean the permanent closure of T2S, as new information or new events might warrant minor revisions in the social mandate or mobilise new niche groups that challenge the outcomes of T2S. Paradoxically, successfully negotiated outcomes leading to the entrenchment of sustainability, and hence the sustainable new normal, will highly depend on channels to renegotiate some rules and procedures without questioning the legitimacy of the outcome.

4. Discussion of the Negotiation Framework—Lessons and Opportunities for Theory and Lessons for Practice

This section elaborates on a selection of lessons and opportunities from the theoretical model. This paper selected these lessons because although the issues are crucial and critical in advancing the T2S, they still require further research and actions by theorists and practitioners.

Lesson 1. *For actors, the “best possible behaviour” is cooperation, despite existing power asymmetries.*

Power (and its significance to T2S) is a huge challenge for both theorists and practitioners. Yet, the power dimensions in T2S are often taken for granted by the research on climate and sustainability policies. Power is often understood as the means and an end for rationally behaving actors. With power as a means to survive, actors assess their environment and behave strategically while considering the behaviour of other actors. Because of this, actors need to pay attention to the long-term consequences of power distribution between them. This builds on the arguments made by Carsten De Dreu and Jörg Gross [72] (p. 2) that it is easier to motivate cooperation within groups and coordinate collective actions when they see the need of “defending against outside enemies.” As weaker actors see the need to defend their interests, they invest more in defence and seek ways to match the competitiveness of the powerful actors.

The rationality of actors in the context of power dynamics in T2S remains a huge subject of debate. Initially, Mancur Olson [73] suggests that rational actors will free ride and therefore not join a group to pursue common ends when, despite non-participation, they can still benefit from the efforts of others. However, Michael Hechter [74] argues in his rational choice theory of solidarity that rational actors will form groups to obtain goods that they are not able to or cannot produce economically on their own. In this paper, the theoretical model claims that power no longer solely dictates the outcome of the negotiation processes and that a certain source of power may be relevant in one stage, phase, sector or issue but not be that relevant in another. In addition, both powerful and weaker actors can still achieve their desired outcomes because of the condition of common vulnerabilities and common benefits in T2S.

In negotiation studies, there is a huge debate about whether actors are rationally behaving when they seek the best possible outcome even at the expense of others [75,76]. As the theoretical model implied, the negotiation perspective offers ways to allow substantial cooperation between powerful and weak actors despite the prisoner’s dilemma. For theorists, the main challenge is to find a concept of power that does not foster bias towards the more powerful actors, but instead differentiates the functionality of power by contextualizing its meaning and relevance. As Dreu and Jörg Gross [72] observe, actors that challenge the status quo tend to be more likely to succeed if they are less domineering and refrain from using punitive tactics. At the same time, the existence of common vulnerabilities among actors already limits the domineering capability of powerful actors. In addition, theorists

should conceptualise power not only as a co-product of a complex system of regulatory frameworks, but also as a means for substantial cooperation. As the theoretical model shows, the ability to convene and set the agenda in the various negotiation processes is already a powerful instrument. At the same time, practitioners can recognise that powerful actors can achieve their goals without using the power card, which can mobilise grievances and create new structural inequalities. Common vulnerabilities among actors already ensure a revisiting of the concept of power. Theorists can therefore revise the understanding of power in the context of common vulnerabilities. For practitioners and policymakers, the challenge is to capture historical experiences and represent them as evidence for the characteristics of a political context that may be critical for the implementation of sustainability policies.

Another actor-related lesson pertains to what drives them to cooperate. In this theoretical model, the “best possible behaviour” for actors in T2S is to cooperate. As aligned with Dirk Messner’s [49] arguments, while actors involved in T2S will reflect upon the payoffs of engagement or cooperation given the existing power asymmetries, the decision to be part of T2S goes beyond the assumptions of rational choice and narrow self-interest. Non-cooperation becomes the “least possible behaviour”, that is, a behaviour that is not efficient or legitimate. Power asymmetries—and even the recognition that one has a weaker position—do not deter cooperation as long as the “cooperation hexagon” (reciprocity, trust, we-identity, enforcement, communication, reputation, and fairness) defines the interactions between actors. In other words, this cooperation hexagon is recognised as a guarantee that power asymmetries will not make a significant difference. This guarantee is a precondition for the ripeness of T2S.

Lesson 2. *The human dimension of T2S inevitably links human relationships with environmental questions that contextualise issues as a matter of equity and fairness.*

The theoretical model adopts a transformatory approach that connects human relationships with environmental questions. In concrete terms, this approach understands a strong commitment to social equity and environmental integrity, where there is no exploitation of people—for example of women and indigenous communities—or of the environment by a small but powerful minority of people [77,78]. For theorists, one opportunity for further research is to look at the fairness and equity dimensions of targets and milestones. For example, theorists can advance the debate on the fairness of expecting countries in the Global South to reach net zero on the same schedule as countries in the Global North [4]. Moreover, this lesson should motivate researchers from various disciplines to collaborate more closely, for example to close the gaps between quantitative and qualitative research. Modellers and scenario-builders as well as social scientists should look for infrastructures and incentives to improve their collaborations, through which the theoretical understanding of issues and their scientific representation can be advanced.

Practitioners and policymakers involved in any transformation process in a specific sector need to self-reflect and be self-critical about whether and how the advancement of their sustainability goals create opportunities for other sectors as well as new inequities, which especially affect the most vulnerable groups, both in one’s own country and in others. For example, the introduction of policy instruments such as carbon pricing should not be solely assessed through its potential to achieve climate targets, but also through its impacts to vulnerable groups. This also means the need to assess actions and policies through a decolonialised lens. For example, Germany’s *Energiewende* and stringent climate policies can indirectly hinder the country’s efforts to foster the development of least-developed countries (LDCs). The anticipated decrease in German official development assistance (ODA) for non-climate issues in LDCs might “(geo)politicise” international development assistance, which might further marginalise least- or medium-developed countries that are not “emitting enough” to gain the attention of Germany for ODA [79].

Lesson 3. *The T2S is a “nuanced transformation” in which worldviews and scales align with planetary boundaries.*

Planetary boundaries and the increasing usage of these as focal points for milestones and policy targets imply the normativity of T2S [35,43]. Planetary boundaries are often normative because they require choices that favour one worldview or one pathway over others [5]. While this paper makes a case for deep transformation, it also argues that transformation does not need to always be radical and disruptive in all aspects, nor do planetary boundaries always demand a 100% renunciation of the status quo. For theorists, there is a need to scrutinise the suitability of technological, economic, and social changes that are deemed necessary to achieve the “optimisation” of present systems to make them compatible with planetary boundaries. For practitioners, the (political) realities show that not all “unsustainable” practices need to be eliminated for the sake of principle. Instead, some “unsustainable” practices can be tolerated within limits or when they constitute positive aspects of the current system that should be preserved, especially those that help maintain identities and communities. The decision about which of these practices are to be preserved and which abolished should be an outcome of a public debate.

Instead of uncontrolled, deep transformation, this paper highlights the possibility of “nuanced transformation” and emphasises the need to focus on leverage points. Hannah Marlen Lübker et al. [80] draw on the leverage point perspective. It states that while a paradigm shift—a socially shared, profound change—is a precondition for any sustainability transformation, relatively minor interventions in the “leverage points” can already lead to relatively major changes in certain outcomes. For practitioners, focussing on leverage points allow for a “nuanced”, deep transformation process that minimises the costs of change and the loss of identities and communities. Although policy research shows that socio-cultural factors as well as market and system failures inhibit the effectiveness of carbon pricing to prompt the necessary behaviour of consumers [81], the bigger question is whether a policy instrument affects the members of one collective (and yet diverse) group in the same manner.

Another important characteristic of nuanced transformation is its scaling diversity. This refers to the different scales of T2S. This paper defines scales as the “space” where projects, products, practices, approaches, technologies, or policy instruments are designed, implemented, legitimised, evaluated, and modified. Each scale is an analytical framework that can refer to geography (global, regional, national, and local levels), sectoral or technological issues (energy, transport), and power relations (e.g., centre vs. periphery), as well as a combination of these three. For example, one scale can look at Indonesia’s energy transition (issue/sector). While these scales can influence each other, each scale has its distinct set of sustainability initiatives that bring together certain actors, issues, institutions, and governance structures. For example, a T2S scale that focusses on social innovations will most likely have different power structures than a T2S scale that focusses on technological transformations. These different scales can complement, reinforce, or compete with each other, reflecting the possible trade-offs, co-benefits, and synergies between sustainability goals. The scales can also be regarded as interactive puzzle parts that require careful sequencing and orchestrating.

Lesson 4. *Trajectories of sustainable development or pathways of sustainability are transformation processes.*

The achievement of sustainability goals requires “pathway thinking” [82]. Important to this pathway thinking is the assumption about the concept of sustainable development. While it might sound evident or even trivial that sustainable development is a transformation process, not all scholars see sustainable development as an outcome of a transformation process. Some academic scholars and civil society groups argue that sustainability can be achieved within the present structures [83,84] and/or that fundamental reform is necessary but without a full rupture with existing arrangements [85,86]. This paper follows the “transformationists” in arguing that “correcting” the roots of unsustainable practices through deep transformation is a precondition to sustainability [80]. For them, the current dominance of several “unsustainable” paradigms (and the related narratives that legitimise

them) is deeply embedded into the social, institutional, political, cultural, and economic fabric of global societies. Against this backdrop, achieving a sustainable future requires the re-thinking of existing concepts such as economic growth and the “repairing” of various human relationships.

For many practitioners and policymakers, deep transformation poses barriers and caveats, because the pace of transformation needs to align with what the existing political or legal frameworks allow. An opportunity for action is assessing projects or policies also, in terms of how they can help defuse barriers and caveats. How can subsidies in renewable energy help overcome reservations not only against renewable energies but also against new technologies? At the same time, policymakers need to be aware of the limitations reflected by the political framework. The political or legal framework has its own merits, as it defines the tolerable window or corridor for change. However, recalcitrant/status quo agents can use the same framework to spoil the transformation process. Therefore, the political or legal framework should formally include provisions for its evolution so that it can respond and adapt to present conditions while respecting predetermined norms such as human rights and the rule of law.

Lesson 5. *Non-linearity and the historicity of transformation processes involving series of acceleration, regress, reboot, and collapse of the process.*

Another subject for further debate is the non-linearity of transformation. The theoretical models implies that T2S is neither monolithic nor automatic. T2S depicts the possibility of acceleration (or leapfrogging) regress, reboot, and collapse of the process. Moreover, the direct and indirect influences of externalities from other transformation processes imply non-linear trajectories. While T2S is a process from one departing point to the envisaged outcome, it is not always continuous and automatic. As Figure 1 illustrates, interruptions of the flow are outcomes of changes in the preferences and behaviour of related actors during several bargaining games. In other cases, the resolution of one issue depends on the proper sequencing of and alignment to other related issues (e.g., electrification as a climate-protection measure sequenced with reforms in the energy-demand sector). As Frank Geels and Johan Schot [12] note, transitions come about when processes link up and reinforce each other, which may lead to interruptions, as one specific process may not yet be aligned to sustainability. The sequencing of T2S policies takes time, and the needed laying of the groundwork for more stringent policies to advance T2S can be delayed [87]. However, successful sequencing and adequate alignment can accelerate the transformation process or even allow the skipping (or leapfrogging) of the next phase.

Interruptions are also reflected in the theoretical model as “backward flow” that can be either a regress or a reboot. A regress refers to the state when actors take one or several steps backwards—or even one whole phase back—to address an issue that was overlooked or that new sequencing measure are needed. For example, a parliamentary committee evaluating the effects of green energy policies may opt to suspend this evaluation when it recognises the need to invite new experts to advise them on food security and other issues. This decision may initially look like a backlash, but later on, the gathered knowledge can facilitate or even accelerate public acceptance of the envisaged policy. A regress is not a transformation failure but instead depicts the trial-and-error characteristic of the learning process. As new knowledge arises or a new understanding between actors is attained, T2S can come back to an earlier restore point.

A reboot pertains to the restarting of the transformation process as the actors shift from one entry point to another. This shift is most likely to lead to alternative pathways. One possible rebooting scenario is the fundamental change about what sustainability means. For example, the current conceptualisation of sustainable development can be replaced by another concept of sustainability. When this new understanding entails a new set of change/niche players or status quo agents or shifts existing power structures, then a reboot is most likely to occur. In addition, exogenous events can disrupt T2S, for example when new technological innovation is able to shift public opinion or a new

legal/political framework enforces a fundamental change in course. For example, the German *Energiewende* can be rebooted following sanctions against the Russian energy sector which in turn might reverse the nuclear or coal phase-out in many European countries.

Moreover, besides the backward flow, a collapse or a rupture of the transformation process is possible, which needs to be distinguished from a regress and a reboot. In this case, T2S ends, because the system that hosts the process collapses for reasons related or not related to the process itself. In other cases, a collapse can also occur when contingencies fail to absorb the shocks of transformation, leading to the cancellation of the transformation process, with no decision being made to choose another entry point nor determine a new timeline for a re-start. This can for example happen after efforts to liberalise the energy market lead to higher energy and food prices, followed by a series of violent demonstrations. When these demonstrations are able to mobilise other groups protesting against grievances, such as income equality or racial injustice, the liberalisation of the energy market connects to a larger conflict context. When the transformation process has collapsed, the social system will most likely have a different set of actors, institutions, structures, and even possibly a new set of political norms. In regresses and reboots, changes to these actors, institutions, structures and norms are minimal.

5. Conclusions

The T2S is uncomfortable, if not disruptive, because the future is unknown. There are many possible routes to this sustainable future, and each route has its own set of merits as well as challenges. Each route needs policies and actions that, on one hand, are effective in addressing the root problems that caused the need for the transformation and, on the other hand, maintain identity markers through which each person can still identify him or herself to the new normal.

At the same time, this paper needs to acknowledge various limitations. As it deals with a (theoretical) model, it cannot fully replicate the realities of transformation. For example, to explain some aspects of the theoretical model, this paper enumerated a few insights from the German *Energiewende*. While this paper is not a case study of the German energy transition, insights that build on the positive experiences of Germany are limited in their usefulness in other contexts. In addition, the model is limited in its replication of the realities confronting many countries in the Global South. However, as a Weberian “ideal type”, this model aims to serve not as a reproduction of reality but instead as a benchmark of T2S or in other words a “what if” experiment. In addition, the theoretical model does not fully capture the variations of governance structures between countries nor the reality that the biggest democracies in the world fail to initiate sustainability transformation due to income inequality. At the same time, the reality shows that some stable authoritarian states, such as Singapore, China, and the UAE, can also be successful, particularly when they are able to offer a minimum degree of political accountability and transparency, for example.

The theoretical model introduced in this paper is a “what if” framework that can help identify the needed leverage points of T2S to address the challenges that deviate the transformation process from the theoretical model. Applying this framework can help explore which interactions are needed to address nexus challenges and well-being priorities of a transformation process. For example, if the Mexican sustainable energy transition follows this theoretical model, it would highlight the lack of participation and inclusion that hampers the achievement of the milestones of the phases of T2S. The next step would be to design additional measures to help improve governance mechanisms and foster public engagement. The analysis of the factors inhibiting participation and inclusion will most likely (1) identify the role of the different forms of inequalities (SDG10) and (2) suggest additional policy measures to strengthen the role of education (SDG4) and strong institutions (SDG16). Linking the negotiation related capacities of actors to these selected SDGs can help mobilize additional resources to reverse or compensate the colonial history of exploitation and the liberalized market economy based on natural resources

extraction that reinforces income inequality, limits the universal access to quality education and undermines institutions.

To conclude, this paper encourages the readers, both researchers and policymakers, to connect the theoretical model with empirical cases of transformations towards sustainability in an innovative way. For example, the author intends to use and apply the theoretical model in mapping out sustainability transformations in the food sector in Brazil and Indonesia as well as in designing a pathway for sustainable urban mobility in selected cities in Germany, Brazil and South Africa.

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References

1. Lam, D.; Martín-López, B.; Wiek, A.; Bennett, E.; Frantzeskaki, N.; Horcea-Milcu, A.; Lang, D. Scaling the impact of sustainability initiatives: A typology of amplification processes. *Urban Transform.* **2020**, *2*, 3. [\[CrossRef\]](#)
2. Hernandez, A. *Taming the Green Elephant. Setting in Motion the Transformation to Sustainability*; Springer: Wiesbaden, Germany, 2021.
3. ECA. *Energy Taxation, Carbon Pricing and Energy Subsidies*; European Court of Auditors: Luxembourg, 2022.
4. Rogelj, J.; Geden, O.; Cowie, A.; Reisinger, A. Three ways to improve net-zero emissions targets. *Nature* **2021**, *591*, 365–368. [\[CrossRef\]](#) [\[PubMed\]](#)
5. Schlaile, M.; Urmetzer, S.; Blok, V.; Dahl Andersen, A.; Timmermans, J.; Mueller, M.; Fagerberg, J.; Pyka, A. Innovation Systems for Transformations towards Sustainability? Taking the Normative Dimension Seriously. *Sustainability* **2017**, *9*, 2253. [\[CrossRef\]](#)
6. Brand, U.; Muraca, B.; Pineault, É.; Sahakian, M.; Schaffartzik, A.; Novy, A.; Streissler, C.; Haberl, H.; Asara, V.; Dietz, K.; et al. From planetary to societal boundaries: An argument for collectively defined self-limitation. *Sustain. Sci. Pract. Policy* **2021**, *17*, 264–291. [\[CrossRef\]](#)
7. Abson, D.J.; Fischer, J.; Leventon, J.; Newig, J.; Schomerus, T.; Vilsmaier, U.; von Wehrden, H.; Abernethy, P.; Ives, C.D.; Jäger, N.W.; et al. Leverage points for sustainability transformation. *Ambio* **2017**, *46*, 30–39. [\[CrossRef\]](#)
8. *System Innovation and the Transition to Sustainability: Theory, Evidence and Policy*; Elzen, B.; Geels, F.W.; Green, K. (Eds.) Edward Elgar: Cheltenham, UK; Northampton, MA, USA, 2004. [\[CrossRef\]](#)
9. Hebinck, A.; Diercks, G.; von Wirth, T.; Beers, P.J.; Barsties, L.; Buchel, S.; Greer, R.; van Steenberghe, F.; Loorbach, D. An actionable understanding of societal transitions: The X-curve framework. *Sustain. Sci.* **2021**, 1–13. [\[CrossRef\]](#)
10. Moore, M.L.; Tjornbo, O.; Enfors, E.; Knapp, C.; Hodbod, J.; Baggio, J.A.; Norstrom, A.; Olsson, P.; Biggs, D. Studying the complexity of change: Toward an analytical framework for understanding deliberate social-ecological transformations. *Ecol. Soc.* **2014**, *19*, 54. [\[CrossRef\]](#)
11. Griefhammer, R.; Brohmann, B.; Bauknecht, D.; David, M.; Heyen, D.A.; Hilbert, I.; Reisch, L. *Wie Transformationen und Gesellschaftliche Innovationen Gelingen Können. Transformationsstrategien und Models of Change für Nachhaltigen Gesellschaftlichen Wande*; Nomos Verlagsgesellschaft: Baden-Baden, Germany, 2015.
12. Geels, F.; Schot, J. The dynamics of socio-technical transitions: A socio-technical perspective. In *Transitions to Sustainable Development—New Directions in the Study of Long Term Transformative Change*; Grin, J., Rotmans, J., Schot, J., Eds.; Routledge: London, UK, 2009; pp. 11–104.
13. Rip, A.; Kemp, R. Technological Change. In *Human Choice and Climate Change*; Rayner, S., Malone, E.L., Eds.; Battele Press: Columbus, OH, USA, 1998.
14. *Coping with Global Environmental Change, Disasters and Security*; Brauch, H.G.; Spring, U.; Mesjasz, C.; Grin, J.; Kameri-Mbote, P.; Chourou, B.; Dunay, P.; Birkmann, J. (Eds.) Hexagon Series; Springer: Berlin/Heidelberg, Germany; New York, NY, USA, 2010.
15. Rotmans, J.; Kemp, R.; van Asselt, H. More evolution than revolution: Transition management in public policy. *Foresight* **2001**, *3*, 15–31. [\[CrossRef\]](#)
16. Wyborn, C. Co-productive governance: A relational framework for adaptive governance. *Glob. Environ. Change-Hum. Policy Dimens.* **2015**, *30*, 56–67. [\[CrossRef\]](#)
17. Holling, C. *Resilience and Stability of Ecological Systems*; International Institute for Applied Systems Analysis: Luxembourg, 1973.

18. Cherp, A.; Vinichenko, V.; Jewell, J.; Brutschin, E.; Sovacool, B. Integrating techno-economic, socio-technical and political perspectives on national energy transitions: A meta-theoretical framework. *Energy Res. Soc. Sci.* **2018**, *37*, 175–190. [[CrossRef](#)]
19. Dasgupta, C. The Climate Change Negotiations. In *Negotiating Climate Change: The Inside Story of the Rio Convention*; Mintzer, I., Leonard, J.A., Eds.; Cambridge University Press: Cambridge, UK, 1994; pp. 129–148.
20. Climate Change Negotiations. *A Guide to Resolving Disputes and Facilitating Multilateral Cooperation*; Sjöstedt, G., Penetrante, A.M., Eds.; Earthscan from Routledge: New York, NY, USA, 2013.
21. Kempel, W. Transboundary Movements of Hazardous Wastes. In *International Environmental Negotiation*; Sjöstedt, G., Ed.; Sage: Newbury Park, CA, USA, 1993; pp. 48–62.
22. Chasek, P. *Earth Negotiations: Analyzing Thirty Years of Environmental Diplomacy*; UNU Press: Tokyo, Japan, 2001.
23. Buzan, B.; Lawson, G. *The Global Transformation: History, Modernity and the Making of International Relations*; Cambridge University Press: Cambridge, UK, 2015.
24. Fücks, R. *The Great (Green) Transformation*; Heinrich Böll Stiftung: Berlin, Germany, 2011.
25. Hernandez, A. SDG-aligned Futures and the Governance of Transformation to Sustainability. Reconsidering Governance Perspectives on the Futures We Aspire to. In *DIE Discussion Paper Series*; Deutsches Institut für Entwicklungspolitik (DIE): Bonn, Germany, 2021. [[CrossRef](#)]
26. Sun, C.W.; Yuan, X.; Yao, X. Social acceptance towards the air pollution in China: Evidence from public's willingness to pay for smog mitigation. *Energy Policy* **2016**, *92*, 313–324. [[CrossRef](#)]
27. Zartman, I.W. Prenegotiation: Phases and Functions. *Int. J.* **1989**, *44*, 237–253. [[CrossRef](#)]
28. *Complexity in International Negotiations*; Druckman, D. (Ed.) Sage: Beverly Hills, CA, USA, 1977.
29. Baber, W. Identifying Macro Phases Across the Negotiation Lifecycle. *Group Decis. Negot.* **2018**, *27*, 885–903. [[CrossRef](#)]
30. Brett, J.; Weingart, L.; Olekalns, M. *Baubles, Bangles, and Beads: Modeling the Evolution of Negotiating Groups over Time*; JAI Press: Stamford, CT, USA, 2003; Volume 6.
31. Jang, D.; Anger Elfenbein, H.; Bottom, W. More than a Phase: Form and Features of a General Theory of Negotiation. *Acad. Manag. Ann.* **2017**, *12*, 318–356. [[CrossRef](#)]
32. Hopmann, P.T. *The Negotiation Process and the Resolution of International Conflicts*; University of South Carolina Press: Columbia, SC, USA, 1996.
33. Balzacq, T. The Three Faces of Securitization: Political Agency, Audience and Context. *Eur. J. Int. Relat.* **2005**, *11*, 171–201. [[CrossRef](#)]
34. Waever, O. Politics, Security, Theory. *Secur. Dialogue* **2011**, *42*, 465–480. [[CrossRef](#)]
35. Rockstrom, J.; Steffen, W.; Noone, K.; Persson, A.; Chapin, F.S.; Lambin, E.; Lenton, T.M.; Scheffer, M.; Folke, C.; Schellnhuber, H.J.; et al. Planetary Boundaries: Exploring the Safe Operating Space for Humanity. *Ecol. Soc.* **2009**, *14*, 32. [[CrossRef](#)]
36. Zartman, I.W. Common Elements in the Analysis of the Negotiation Process. *Negot. J.* **1988**, *4*, 31–43. [[CrossRef](#)]
37. Touval, S. Multilateral Negotiation: An Analytical Approach. *Negot. J.* **1989**, *5*, 159–173. [[CrossRef](#)]
38. OECD. *Costs of Inaction on Key Environmental Challenges*; Organisation for Economic Cooperation and Development (OECD): Paris, France, 2008.
39. Bauer, O. *Die Nationalitätenfrage und Die Sozialdemokratie*; Verlag der Wiener Volksbuchhandlung Ignaz Brand: Vienna, Austria, 1907.
40. Cross, J. Negotiation as Adaptive Learning. *Int. Negot.* **1996**, *1*, 153–178. [[CrossRef](#)]
41. Kingdon, J. *Agendas, Alternatives and Public Policies*; Little, Brown and Company: Boston, MA, USA, 1984.
42. Koorman, J. *Modern Governance: New Government-Society Interactions*; SAGE Publications: Thousand Oaks, CA, USA, 1993.
43. Galaz, V.; Biermann, F.; Folke, C.; Nilsson, M.; Olsson, P. Global environmental governance and planetary boundaries: An introduction. *Ecol. Econ.* **2012**, *81*, 1–3. [[CrossRef](#)]
44. Zengerling, C. *Greening International Jurisprudence. Environmental NGOs before International Courts, Tribunals, and Compliance Committees*; Brill Nijhoff: Leiden, The Netherlands, 2013; Volume 17.
45. Readfearn, G. Australian government must protect young people from climate crisis harm, court declares. *The Guardian*, 8 July 2021.
46. Mintrom, M.; Norman, P. Policy Entrepreneurship and Policy Change. *Policy Stud. J.* **2009**, *37*, 649–667. [[CrossRef](#)]
47. Schröder, T. Die positiven Erfahrungen mitnehmen. In *Süddeutsche Zeitung*; LIT Verlag: Munster, Germany, 2020.
48. Winham, G.; DeBoer-Ashworth, E. Asymmetry in Negotiating the Canada-US Free Trade Agreement, 1985–1987. In *Power and Negotiation*; Zartman, I.W., Rubin, J., Eds.; University of Michigan Press: Ann Arbor, MI, USA, 2000; pp. 35–52.
49. Messner, D.; Guarín, A.; Haun, D. Putting Behavior into International Cooperation. *Chin. J. Glob. Gov.* **2016**, *2*, 129–141. [[CrossRef](#)]
50. Hentschel, V. *Ludwig Erhard, Die "Soziale Marktwirtschaft" und Das Wirtschaftswunder. Historisches Lehrstück Oder Mythos?* Bouvier Verlag: Bonn, Germany, 1998.
51. WBGU. *World in Transition. A Social Contract for Sustainability*; German Advisory Council on Global Change: Berlin, Germany, 2011.
52. Hennicke, P.; Welfens, P.J.J. *Energiewende Nach Fukushima: Deutscher Sonderweg Oder Weltweites Vorbild?* Oekom Verlag: München, Germany, 2012.
53. Pittel, K.; Henning, H.-M. Was uns die Energiewende wirklich kosten wird. *Frankfurter Allgemeine Zeitung*, 12 July 2019.

54. Focus. Verwaltungsgericht droht Klagewelle wegen Energiewende. *Online Focus*. 2013. Available online: https://www.focus.de/immobilien/energiesparen/tausende-kilometer-stromstrassen-verwaltungsgericht-droht-klagewelle-wegen-energiewende_aid_918944.html (accessed on 14 December 2019).
55. IEA. *Germany 2020. Energy Policy Review*; International Energy Agency: Paris, France, 2020.
56. Ingram, M.; Ingram, H.; Lejano, R. Environmental Action in the Anthropocene: The Power of Narrative Networks. *J. Environ. Policy Plan.* **2019**, *21*, 492–503. [\[CrossRef\]](#)
57. Fricko, O.; Havlik, P.; Rogelj, J.; Klimont, Z.; Gusti, M.; Johnson, N.; Kolp, P.; Strubegger, M.; Valin, H.; Amann, M.; et al. The marker quantification of the Shared Socioeconomic Pathway 2: A middle-of-the-road scenario for the 21st century. *Glob. Environ. Chang.* **2017**, *42*, 251–267. [\[CrossRef\]](#)
58. De Giorgi, E. The never-ending transformation of the Italian party system. In *Party System Change, the European Crisis and the State of Democracy*; Lisi, M., Ed.; Routledge: London, UK, 2018; pp. 155–170.
59. Hernandez, A.M.; Pacheco Rojas, D.A.; Barrón Villaverde, D. Carbon Lock-In and Contradictions—Applied Guide to Academic Teaching of Mexico’s Energy Transition. *Appl. Sci.* **2021**, *11*, 8289. [\[CrossRef\]](#)
60. Unruh, G. Understanding carbon lock-in. *Energy Policy* **2000**, *28*, 817–830. [\[CrossRef\]](#)
61. Moore, M.-L.; Riddell, D.; Vicisano, D. Scaling Out, Scaling Up, Scaling Deep: Strategies of Non-profits in Advancing Systemic Social Innovation. *J. Corp. Citizsh.* **2015**, *58*, 67–84. [\[CrossRef\]](#)
62. Hale, T. Catalytic Cooperation. *Glob. Environ. Politics* **2020**, *20*, 73–98. [\[CrossRef\]](#)
63. BMWI. *Gesamtausgabe der Energiedaten*; Bundesministerium für Wirtschaft und Energie: Berlin, Germany, 2020.
64. Frey, K.; Burger, A.; Dziekan, K.; Bunge, C.; Lünenbürger, B. *Verkehrswende für Alle*; Umweltbundesamt: Dessau, Germany, 2020.
65. AgrarBündnis. *Der Kritische Agrarbericht*; AgrarBündnis: Konstanz, Germany, 2022.
66. Steinbacher, K. *Exporting the Energiewende*; Springer: Wiesbaden, Germany, 2019.
67. BMZ. *BMZ 2030 Reform Strategy*; Federal Ministry for Economic Cooperation and Development (BMZ): Berlin, Germany, 2020.
68. Hernandez, A. Knowledge Diplomacy and the Future(s) of Global Cooperation. *E-Int. Relat.* **2021**, *132*. Available online: <https://www.e-ir.info/2021/04/05/knowledge-diplomacy-and-the-futures-of-global-cooperation/> (accessed on 26 November 2020).
69. Folke, C.; Carpenter, S.R.; Walker, B.; Scheffer, M.; Chapin, T.; Rockström, J. Resilience Thinking: Integrating Resilience, Adaptability and Transformability. *Ecol. Soc.* **2010**, *15*, 20. [\[CrossRef\]](#)
70. Thorén, H. Resilience as a Unifying Concept. *Int. Stud. Philos. Sci.* **2014**, *28*, 303–324. [\[CrossRef\]](#)
71. Rizzi, F.; van Eck, N.J.; Frey, M. The production of scientific knowledge on renewable energies: Worldwide trends, dynamics and challenges and implications for management. *Renew. Energy* **2014**, *62*, 657–671. [\[CrossRef\]](#)
72. De Dreu, C.; Gross, J. Revisiting the form and function of conflict: Neurobiological, psychological, and cultural mechanisms for attack and defense within and between groups. *Behav. Brain Sci.* **2019**, *42*, e116. [\[CrossRef\]](#) [\[PubMed\]](#)
73. Olson, M. *The Logic of Collective Action*; Harvard University Press: Cambridge, MA, USA, 1965.
74. Hechter, M. *Principles of Group Solidarity*; University of California Press: Berkeley, CA, USA, 1988.
75. Tversky, A.; Kahnemann, D. Rational Choice and the Framing of Decisions. *J. Bus.* **1986**, *59*, S251–S278. [\[CrossRef\]](#)
76. Goldsmith, J.; Posner, E. International Agreements: A Rational Choice Approach. In *International Institutions*; Goldstein, J., Steinberg, R.H., Eds.; Sage: Los Angeles, CA, USA; London, UK.; New Delhi, India; Singapore; Washington, DC, USA, 2010; pp. 365–390.
77. Velasco-Herrejon, P.; Bauwens, T. Energy justice from the bottom up: A capability approach to community acceptance of wind energy in Mexico. *Energy Res. Soc. Sci.* **2020**, *70*, 101711. [\[CrossRef\]](#)
78. Sarkar, S. *Eco-Socialism or Eco-Capitalism?* Zed: London, UK, 1999.
79. Öhm, M. *Towards Geopolitical German Development Cooperation? Recent History, Current Trends and Future Prospects*; The French Institute of International Relations (IFRI): Paris, France, 2021.
80. Lübker, H.M.; Abson, D.; Riechers, M. Discourses for deep transformation: Perceptions of economic growth in two rural communities in Lower Saxony, Germany. *Sustain. Sci.* **2021**, *16*, 1827–1840. [\[CrossRef\]](#)
81. Rosenbloom, D. Pathways: An emerging concept for the theory and governance of low-carbon transitions. *Glob. Environ. Change-Hum. Policy Dimens.* **2017**, *43*, 37–50. [\[CrossRef\]](#)
82. Riahi, K.; van Vuuren, D.P.; Kriegler, E.; Edmonds, J.; O’Neill, B.C.; Fujimori, S.; Bauer, N.; Calvin, K.; Dellink, R.; Ficko, O.; et al. The Shared Socioeconomic Pathways and their energy, land use, and greenhouse gas emissions implications: An overview. *Glob. Environ. Change* **2017**, *42*, 153–168. [\[CrossRef\]](#)
83. Elkington, J.; Burke, T. *The Green Capitalists*; Gollancz: London, UK, 1987.
84. Lomborg, B. *The Sceptical Environmentalists: Measuring the Real State of the World*; Cambridge University Press: Cambridge, UK, 2001.
85. Beck, U. *The Risk Society*; Sage: London, UK, 1992.
86. Jacobs, M. *Environmental Modernisation: The New Labour Agenda*; Fabian Society: London, UK, 1999.
87. Meckling, J.; Sterner, T.; Wagner, G. Policy sequencing toward decarbonization. *Nat. Energy* **2017**, *2*, 918–922. [\[CrossRef\]](#)