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Transitions-Based Strategic Environmental Assessment

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Abstract

Strategic environmental assessment (SEA) is emerging as an important tool for sustainability transitions, yet there has been limited research conceptualizing transitions-based SEA. If SEA's primary goal is to facilitate strategic change and guide decision-processes toward sustainability, an assessment framework that accounts for the multi-dimensional factors and relationships influencing transition processes seems highly relevant. This paper advances the transitions-based SEA design – an approach to SEA that is focused on the institutional environment and policy context for the development of strategic initiatives including institutional commitments, supporting policies, and opportunities. We do so within the context of energy transitions, bridging strategic planning theories, decision making, and transition management. Building on existing SEA frameworks that advance strategic thinking, the paper presents the foundational principles and strategic questions to be asked in a transitions-based SEA design. The framework was developed based on a review of sustainability transitions and SEA literature supplemented by expert input. The SEA design focuses on the guiding vision for transitions, the institutional context and governance arrangements, opportunities and risks of proposed sustainability pathways, progress indicators for on-going transition management, and impacts of the exogenous landscape. The framework defines a new functionality for SEA, pushing the boundaries of what SEA can achieve, and should accomplish, as a strategic assessment tool while also challenging conventional thinking and practice beyond its application to policies, plans and programs.

Key words: strategic environmental assessment; transition management; sustainability transitions; energy transition; multi-level perspective

1. Introduction

Value conflicts, disparate objectives, rigid institutions, and politics and power struggles pose challenges to sustainability transitions (Wallington et al., 2007; Butler et al., 2015). Poor articulation of these challenges results in policy that is largely ineffective in enabling transitions toward more sustainable futures (Bale et al., 2015). Sustainability transitions are "long-term, multi-dimensional, and fundamental transformation processes through which established socio-technical systems shift to more sustainable modes of production and consumption" (Markard et al. 2012, p. 956). Research in strategic environmental assessment (SEA) has evolved toward a recognition of the need to understand and assess the strategic nature and complexity of decision-making processes for tackling sustainability challenges. The emergence of "strategic-thinking" in SEA is based on the notion that SEA can be repositioned as a tool to facilitate sustainability transitions by focusing on the decision context of environmental problems, including governance and institutional arrangements (Slunge and Tran, 2014; Monterio and Partidario, 2017; Noble and Nwanekezie, 2017). Assessments of this nature, however, require an understanding of the peculiarities of sustainability transitions, including actors and networks, socio-technical change, institutional and political structures, and the challenges posed by path-dependencies and lock-ins within socio-technical systems (Markard et al., 2012; Geels et al., 2017).

Attempts to address these complex perspectives through SEA requires attention to such key questions as: How can SEA enable fundamental policy shifts within complex socio-technical systems? What are the obstacles to enabling transitions? What capacities exist, or innovations are required, in institutional and policy environments to facilitate transitions? Where are the windows of opportunity to influence strategic decision-making? Answers to these and related questions require assessment frameworks that account for the complex institutional arena and governance conditions of decision processes and the key elements or factors that either constrain or enable significant reform in policy development (Jiliberto, 2011; Monterio and Partidario, 2017). A major challenge, however, is that notwithstanding recommendations on how to improve SEA, there has been limited attention to the possibility of changing its fundamental approach. Improvements have focused largely on analytical methods, legislation, or collaborative stakeholder analysis, resulting in changes to SEA systems that are *incremental* rather than the *radical* changes needed to facilitate sustainability transitions (Therivel et al., 2016). Arguably, SEA practice remains constrained by well-established and resilient institutional arrangements that approach SEA based on the traditional principles and methodologies of project impact assessment (IA) (Noble and Nwanekezie, 2017). Such an approach, though valuable for assessing and mitigating the impacts of a proposed policy or initiative, often neglects the non-linear nature and socio-political contexts of sustainability decision-making (Lobos and Partidario, 2014; Geels et al., 2017).

To address these limitations, the traditional IA-based model of SEA must be complemented with more transitions-based approaches that are better suited to the complexities of the institutional and governance contexts that SEA seeks to influence (World Bank, 2005; Partidario, 2015; Noble et al., 2019). This paper proposes an assessment approach that frames SEA in the context of socio-technical transitions for sustainability. First, the paper provides a synopsis of advancements in SEA and the extent to which they promote transitions. A conceptual framework of key elements and questions to be asked in a transitions-based SEA design is then proposed. The aim is to provide methodological guidance to assess the institutional and governance context surrounding the development and implementation of sustainability initiatives. The paper concludes with a discussion of the implications and limitations of applying transitions-based SEA. This paper adds to the growing body of research suggesting that SEA be re-conceptualized as an instrument of agency to address recurring institutional and governance challenges that impede sustainability transitions.

2. The need for transitions-based SEA

Strategic decision-making refers to a process of intervention in addressing societal problems through planning and policy making (Lyhne, 2011). SEA as a strategic-decision support tool should ideally facilitate effective policy making and guide sustainability decisions. Yet, little seems to have changed since Nitz and Brown (2001) warned that SEA has failed to realize its potential, emphasizing the importance of understanding the policy-making context and re-orienting SEA toward better integration with policy processes. On the other hand, in most jurisdictions where SEA has been institutionalized, decision-makers are concerned that a fully integrated SEA will constrain political choices – perhaps due to limited understanding of SEA's purpose (Turnpenny et al., 2008). There is a sustained debate between scholars on the strategic role of SEA (Bina, 2007; Cherp et al.,2007; Wallington et al., 2007; Partidario, 2015) and how to improve its added-value as an applied governance and environmental sustainability integration tool (Jiliberto, 2011; Slunge and Loayza, 2012; Monterio and Partidario, 2017). Emerging from these debates is recognition that the diverse interpretations and significance of the term 'strategic' has more to do with the purpose of SEA than the level (i.e., projects versus policies) of its application.

Wallington et al. (2007) identifies two interpretations of strategy in the context of SEA. The first, conceptualizes strategy as procedural and focused on the deliberate formulation of policies, plans, and programmes (PPP) and assessing their impacts. The effectiveness of strategy is thus measured by SEA's influence on the PPP or on the decision to adopt or adapt the PPP (Cherp et al., 2007). The second conceptualizes strategy as transformative and transcending the formulation of individual PPPs to focus on assessing and influencing decision-making processes toward sustainability. This latter interpretation of

strategy is especially important, as sustainability transitions require far-reaching and long-term transformations in socio-technical, cultural, and political systems (Geels et al., 2017). When strategy is defined as transformative, SEA can be an agency of long-term change in values, behaviours, and norms of actors and institutions, influencing the setting of PPP agendas (Wallington et al., 2007). Achieving such transformations requires that SEA is a tactical and politically aware process when defining and prioritizing strategic issues (Jiliberto, 2011).

The renewed focus on the role of strategy in SEA is evident in a growing literature. Several authors have adopted a strategic view to address the governance aspects of decision-making (Ahmed and Sanchez-Triana, 2008; Monterio and Partidario, 2017); the role of actors and institutions in strategic decision-making (Vincente and Partidario, 2006; Gauthier et al., 2011; Slunge and Tran, 2014); and the importance of politics and power (Cashmore and Alexsson, 2013). Meuleman (2015), for example, argues that that understanding the conditions in which IA operates is vital to its success, highlighting the opportunities and constraints of governance in shaping decision outcomes. Likewise, Slunge and Loazya (2012) report that sustainability reforms require significant changes and adjustments in institutions, and the effectiveness of SEA depends on adequate institutional capacities. Finally, Cashmore and Alexsson (2013) address the role of power in institutions and explain how power relations can influence the dominant choice of IA approach and, consequently, assessment outcomes.

2.1 Existing strategy-based SEA models

There are two existing models of strategy-based SEA: “strategic-thinking” and “institution-centered” (**Table 1**). The strategic-thinking model conceptualizes SEA as a decision-oriented instrument focused on assessing the strategic processes of development initiatives rather than individual PPPs per se (Partidario, 2012). The premise is that beyond the assessment of impacts, attention must be paid to the institutional, socio-political, and biophysical contexts of assessment. Strategic-thinking SEA seeks to enhance sustainability integration into decision-making through, among other things: creating enabling decision environments and enhancing capacities to nurture desired development trajectories; assessing the opportunities and risks of alternatives; and promoting institutional coordination and stakeholder dialogue (Partidario, 2012). Ensuring that SEA is focused on the macro-policies and environmental and sustainability issues that are of primary importance are key attributes. This is enabled by the inclusion of a governance framework to engage the network of interrelated institutions, organizations, and stakeholders all of which have the capacity to influence strategic decisions (Partidario, 2012). Focused on assessing the opportunities and risks of strategic options, the intent is that SEA is better positioned to articulate the

impacts, merits and drawbacks of fostering certain development paths (Monterio and Partidario, 2017; Noble and Nwanekezie, 2017).

Table 1: Existing strategy-based SEA frameworks

Model	Strategic Elements	Theoretical Background	Common Elements	Gaps or Limitations
Strategic-thinking[1]	▪ Critical decisions factors ▪ Strategic Reference Framework ▪ Institutional & Governance Framework ▪ Strategic Options ▪ Opportunities and Risks ▪ Decision Windows ▪ Stakeholder Engagement/Dialogue ▪ Follow-up	▪ Complex systems ▪ Good governance ▪ Policy analysis	▪ Institutional and Governance Framework Analysis ▪ Policy Context Analysis ▪ Prioritizing environmental and sustainability issues ▪ Stakeholder Engagement ▪ Opportunities and Risks of Sustainability Pathways ▪ Windows of opportunity ▪ Policy Learning	▪ Assessment process, manner of decision-making, and sources of knowledge are inherently technical-rational. ▪ Limited articulation of actor-stakeholder dynamics with respect to political and power relationships. ▪ Limited attention to assessing implications of broader exogenous landscape. ▪ Limited characterization of factors that enable or constrain policy or plan implementation in the context of transitions to desired futures.
Institution-centered[2]	▪ Policy Formation/Implementation ▪ Windows of Opportunity ▪ Environmental Priority Setting ▪ Institutional Assessment ▪ Stakeholder Representation ▪ Social Accountability	▪ Policy analysis ▪ Political theory ▪ Organizational learning ▪ Institutional analysis		

The strategic-thinking model has been adopted in the development of national strategies and plans to guide sustainability decisions (Partidario, 2010; Gallardo et al., 2016), including the Portuguese Strategy for Integrated Coastal Zone Management (PS-ICZM). SEA was used to prepare a national strategy to address the challenges and opportunities of multiple and conflicting uses of Portugal's coastal ecosystems (Partidario et al., 2009). The PS-ICZM case provides insight to the role of critical decision factors in informing decisions at all stages of policy formulation, implementation, and monitoring (Partidario et al., 2009), and the importance of assessing and comparing the risks and benefits of policy options. The PS-ICZM ultimately informed the development of other strategies and plans, such as the Maritime Spatial Plan, thus demonstrating the role of strategy-based SEA in inducing policy-learning and long-term change. However, the SEA was still largely influenced by well-established institutional structures aligned with the dominant IA-based approach – it was informed by an EU legal framework focused largely on

[1]Partidario, 2010, 2012

[2] World Bank 2005, 2007, 2011; Ahmed and Sanchez-Triana, 2008; Slunge and Loayza, 2012

biophysical impacts, adopted a technical-rational assessment of opportunities and risks, and focused on outcomes rather than also the nature of the decision-making context.

The second model of SEA, institution-centred, was proposed by the World Bank (2005) to integrate environmental concerns in development policy (**Table 1**). Guided by organizational learning and capacity building, institution-centred SEA emphasizes the role of institutions and governance in framing policy and sector reform, particularly in developing countries (Slunge and Loazya, 2012). Attention is focused on strengthening institutional capacities and enhancing social accountability, while ensuring that environmental and related socio-political issues are addressed and prioritized in development policy and plan formulation and implementation (Ahmed and Sánchez-Triana, 2008). Core to institution-centred SEA is that key decision moments or windows of opportunity are targeted, where SEA has a distinct opportunity to inform decision-making and direct policy dialogue toward more sustainable outcomes (Slunge and Tran, 2014).

The institution-centred SEA framework has been adopted in the design and implementation of several national and sectoral policies regarding the use of natural resources. (Slunge and Loazya, 2012). In 2005, for example, Kenya ratified a new Forests Act promoting the sustainable use of forests for national development (World Bank, 2007). SEA was applied to inform policy dialogue and strengthen the implementation process for the new Act and provide guidance on the sustainable management of forest resources. The SEA identified and prioritized environmental, social, institutional, and governance issues underlying the implementation of the Act (Slunge and Loazya, 2012), followed by an analysis of the risks and opportunities to forests and impacts on the livelihood of local communities (World Bank, 2007). A political economy analysis was also conducted to identify obstacles to the reform process. Emerging from the SEA was a Forest Policy Action Matrix (World Bank, 2007; Slunge and Loazya, 2012) to hold government and stakeholders accountable to sector reform and to commitments under the new Forests Act. The SEA effectively raised attention to key environmental and social priorities in the forest sector; however, post-evaluation revealed that limited institutional capacity and the persistence of informal rules created obstacles constraining the Act's effectiveness and thus SEA's influence (Slunge and Tran, 2014).

2.2 Enabling sustainability transitions

The strategy-based SEA paradigm is still evolving and yet to fully integrate the co-evolving institutional and socio-political dynamics of sustainability transitions. Challenged by path-dependencies and lock-in within socio-technical systems (Verbong and Geels, 2007), transitions take place when disruption occurs in technologies, governance, institutions, actors, policies, or practices (Cherp et al., 2016). Enabling

strategic change thus requires a shift in focus toward the broader, non-linear and socio-political processes that influence fundamental change in established development sectors (Geels et al., 2017).

Two prominent ontological frameworks, *the multi-level perspective* (MLP) and *transition management* (TM), guide our understanding of the role of SEA in sustainability transitions. The MLP conceptualizes transitions as a multi-dimensional interplay of three analytical levels – niche, socio-technical regime, and socio-technical landscape – interacting within a nested hierarchy (Verbong and Geels, 2007). Niches are where innovations emerge, such as more sustainable alternatives, that may proliferate given the right enabling conditions (Geels et al., 2017). Established institutions, norms, technologies, and incumbent actors comprise the socio-technical regime and can support or constrain innovation adoption. The socio-technical landscape is the wider exogenous environment of socio-political values and conditions that influence both regime and niche dynamics (Lawhon and Murphy, 2011). In an SEA context, the MLP directs our understanding toward how innovations in PPPs emerge, and what enabling conditions and capacities are required to disrupt existing norms and foster more sustainable trajectories. Insights can be gained about the long-term viability of strategic initiatives within the broader landscape, which may pose obstacles or disruptions to realizing sustainability goals.

The TM framework adopts a deliberative governance approach to transitions, providing an analytical lens to address sustainability issues at different levels of decision-making. Underscored by "long-term thinking for shaping short-term policy-design" (Loorbach, 2010: 168), TM identifies four types of governance activities that influence transitions: strategic, tactical, operational, and reflexive (Loorbach, 2010). Strategic activities establish the vision and objectives for transitions, including strategy formation, and explore the implications of desired outcomes. Tactical activities examine the dominant structures of a socio-technical system, such as rules, institutions, and networks, that pose opportunities or obstacles for PPPs to achieve sustainability visions. Operational activities are short-term actions that introduce innovation (e.g. technological, institutional) to existing structures, routines, or actors. Reflexive activities evaluate ongoing strategies and socio-political change and identify windows of opportunity to adapt or explore new concepts, designs, or development paths, thus preventing socio-technical system lock-in (Loorbach, 2010).

Both the MLP and TM framework provide structural models of sustainability transitions. If SEA's primary goal is to facilitate strategic-change and guide decision processes toward sustainability, three contributions of MLP and TM frameworks are particularly relevant: (i) a multi-dimensional and multi-level framing to understand system dynamics, actor behaviour, and overall change processes influencing development trajectories; (ii) a deliberate governance approach and long-term perspective in analyzing

transition pathways, including a focus on the governance activities that influence the outcomes of transitions; and (iii) reforming institutional structures that influence and support long-term regime changes.

3. Toward a transitions-based SEA approach

Transitions-based SEA is about informing and reforming the decision processes required to facilitate fundamental changes in the socio-technical, organizational, institutional, and governance systems of any sector requiring significant sustainability transformations (Cherp et al., 2016). Consider for example a jurisdiction seeking to transition its energy system because of energy insecurities, high energy costs, and external pressures to meet GHG reduction targets. The transition pathway could involve a shift from a fossil fuel-based centralized energy system to a more decentralized and renewables-dominated system; or from a coal-based energy system to other low-carbon energy sources. The transition might involve the gradual introduction of renewable energy to the existing fossil fuel-dominated energy mix, or a wholesale, rapid transition. Each transition pathway triggers different development trajectories and policy options, implications, and constraints, and different opportunities and risks for different actors that need to be identified, evaluated, and managed to facilitate successful transition (Meadowcroft, 2009).

Transitions-based SEA is an agent for change. It secedes from the operational premise of traditional IA-based SEA and focuses instead on assessing the decision environment, including the institutional and policy contexts surrounding the development of strategic initiatives (Noble and Nwanekezie, 2017). Rather than focus on identifying the 'best' alternative (White and Noble, 2012), attention is focused on the constraints, opportunities, and risks of transitioning from one trajectory or state to another. It focuses on institutions or structures that will have to be reshuffled, reformed, destabilized or created to enable transition and the distribution of opportunities and risks for different actors (Markard, 2011). Building on the foundational principles of SEA (e.g. strategically focused, exploratory of alternatives, nested, sensitive to PPP contexts), we present five additional principles that are essential to transitions-based SEA.

3.1. Guiding vision

Guiding visions are central to the effective governance of sustainability transitions and the coordination of long-term change processes (Loorbach and Rotmans, 2010). They often reflect the dominant framing of the aspirations, desired futures, and long-term goals of a given sector, government, or community – for example, a vision for a renewables-dominated energy landscape to reduce GHG emissions and create new

socio-economic opportunity. A vision for transition is crucial to understanding the decision-context and establishing the enabling conditions for strategic change. In a transitions-based approach, SEA focuses on articulating the vision, drivers, and pressures for change, including the preconditions required for coordinating such change. Without a guiding vision, progress toward transitions will be hindered and long-term sustainability objectives will not be fulfilled (Hunt and de Laurentis, 2014). As such, the focus of assessment is not simply on articulating the objectives of individual PPPs, but on evaluating a range of alternative visions for the future, establishing an overarching guiding vision, and identifying the range of opportunities that work towards achieving that vision (Partidario, 2012).

3.2 Dynamic processes and complex interactions

Sustainability transitions are complex, multifaceted, uncertain, long-term change processes (Markard et al., 2012). Changing landscape contexts, changes in preferences regarding sustainability, changes to policy processes, and changes in regimes and regime constituents all influence the impacts and outcomes of transitions (Flanagan et al., 2011). Conflicted and unstable interactions often persist between stakeholders and policy makers stemming from contradictions between existing legislation and practices, political aspirations, and competing objectives (Slunge and Loayza, 2012). Central to transitions-based SEA's influence on decision outcomes is acknowledging the dynamic nature of sustainability decision-making and the interlinkages of actors and domains across multiple scales (Wittmayer et al., 2014). The SEA process must be accommodating of the co-evolving, complex relationships between key elements and characteristics of transitions. This means that SEA must also be flexible to changing decision contexts and sensitive to the socio-political realities of policy making processes, while constantly scanning for new opportunities to inform change. The dynamic nature of sustainability transitions calls for a SEA process that is open and anticipatory of unplanned barriers and obstacles, including institutional resistance to change (Lobos and Partidario, 2014), and always scanning for alternative pathways and emergent and unplanned occurrences.

3.3 Institution-centered

Institutions entail formal governance arrangements, informal rules, organizational structures, behavioural norms, codes of conduct, knowledge types, and belief systems – all of which influence societal interaction (Ostrom, 2005). In SEA terms, the institutional context entails the varied objectives, policies, regulatory obligations, levels of responsibility, and implementation norms relevant to the strategic focus of assessment (Partidario, 2012). Complex policy issues that resurface in environmental policy and planning including implementation difficulties are mostly influenced by the institutional environment and system

of governance (Briassoulis, 2004). The ways in which the capacity of institutions can be enhanced will likely play an important role in the outcomes and pace of sustainability transitions. Significant changes and adjustments in institutional arrangements are thus required to achieve transformations (Cherp et al., 2016). The role of SEA is to identify the institutional variables that directly or indirectly influence the outcomes of policy and plan-making (Noble and Nwanekezie, 2017), and analyzing the capacity of institutions (e.g. regulatory, economic, political) to support a sustainability-oriented regime change.

3.4 Politically-sensitive

Strategic decision-making is intrinsically a political process. Politics underlie the behaviour and activities of both government and non-governmental actors (Meadowcroft, 2011). The decision of governments to explicitly pursue (or not) certain policy or development trajectories over others, the intention to provide regulatory support for certain sustainability initiatives, and whether actor groups encourage or discourage certain development initiatives are driven by political considerations (Meadowcroft 2011). Stakeholders engaged in transition activities often have strong positions and vested interests arising from concerns regarding the future implications of system change. In some cases, intervention by the state is needed to significantly disrupt established entitlements (Aklin and Urpelainen, 2018), which can result in socio-political conflict and struggles (e.g., mandatory implementation of a federal carbon pricing across Canadian provinces), while redistributing authority over decisions, such as for energy production, can have implications for state power and resources.

Transitions-based SEA calls for continuous and deliberative efforts to identify windows of opportunity to influence strategic decision-making and effect positive change in the policy and political arena (Doelle, 2018; Noble et al., 2019) Windows of opportunity exist throughout the policy-making process and across institutional arrangements that can be explored to influence the outcomes of policy and development decisions (Slunge and Tran, 2014). Being able to identify key decision moments is crucial to the overall effectiveness of SEA (Partidario, 2012, 2015). Transitions-based SEA examines the capacity of existing political environments to support transformations; this includes assessing the collective policy sphere (i.e., the portfolio of subsidies, taxes, relevant regulatory frameworks), not just individual PPPs, to identify the approaches that will be most useful in encouraging or discontinuing certain development regimes (Meadowcroft, 2011).

3.5 Relationship(s) between actors

Transitions processes are multi-actor processes, with each actor having vested interests and stakes but all seeking to influence the processes and outcomes of sustainability decisions (Farla et al., 2012). The role of actors and how interactions unfold between actors must be explored in SEA. Interactions between actors in development decisions are often riddled with conflict, with some having the capacity to be influential in the decision process while others are marginalized. Shaping interactions between actors, including their roles and responsibilities, can provide new opportunities to collaboratively address sustainability issues (Wittmayer et al., 2014). SEA thus not only engages different perspectives in a fair and open process, but also explores interactions, needs, and capacities, and seeks opportunities to shift power relations between actors when necessary (Avelino and Rotmans, 2009). Empowering actors who are more sustainability-oriented and proactive in adopting socio-technical innovations can help facilitate strategic-change (Wittmayer et al., 2014). SEA can be an effective process to find consensus solutions even amongst seemingly diverse and conflicting interests (Doelle 2018).

4. Conceptualizing a transitions-based SEA framework

The following sections present the building blocks of a transitions-based SEA framework (**Figure 1**). The framework was conceptualized based on a review of scholarly literature and supplemented by input on framework components from a small sample of leading SEA experts and practitioners. Our review of scholarly literature drew primarily on the foundational principles of sustainability transitions and transitions theory (e.g. Verbong and Geels, 2007; Loorbach 2010; Markard et al., 2012; Cherp et al., 2016), and emerging scholarship on 'strategic thinking' in SEA and advancing SEA purpose and practice beyond the traditional PPP impact assessment model (e.g. Bina, 2007; World Bank, 2005, 2011; Partidario, 2012; Noble and Nwanekezie, 2017). Our review of the literature focused on four main themes that cut across SEA and transitions research, namely analyses of institutional and governance contexts in strategic-level decision making; multi-dimensional and multi-level frameworks for analyses of system interactions, actor behaviour and overall change processes in socio-technical and policy transitions; deliberative governance approaches to analyzing transition pathways; and opportunities, risks, and obstacles to socio-technical and policy transitions. The literature was supplemented by informal discussions with international experts engaged in SEA research and practice. This included in-depth discussions with academic experts and practitioners during the International Association for Impact Assessment 2017 Annual General Meeting held at Montreal, Canada, and a presentation and discussion of framework components with a small group of senior-level government SEA practitioners and managers at Environment at Climate Change Canada. These discussions were not formal interviews per se, but rather

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peer input and guidance to shape the key elements of a transitions-based SEA framework and to determine the types of questions to be asked.

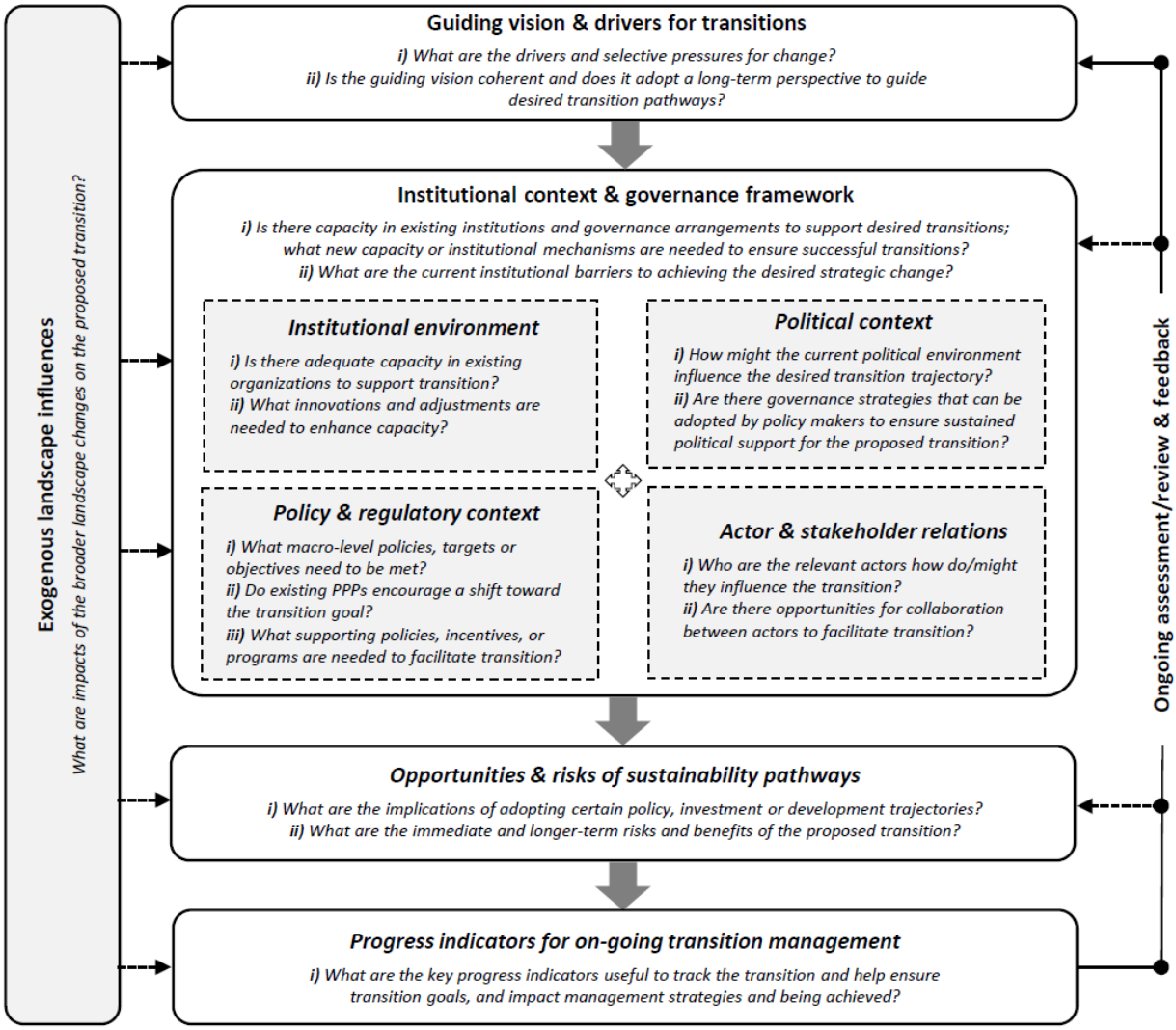

Figure 1: Conceptual framework for transitions-based SEA design

To provide context, and to help illustrate the focus of transitions-based SEA, we situate the framework within the energy resource sector - specifically renewable energy transition. Internationally, the energy sector is at a crossroads. In Canada, for example, national commitments to climate change mitigation, carbon pricing, and a renewed federal interest in renewable energy are setting the foundation for energy transition (Potvin et al., 2017). In the province of Saskatchewan, with the highest per-capita GHG emissions in Canada (ECCC, 2018), about 30% of electricity generation is from coal-fired plants and other fossil-fuel based sources and these sources are expected to continue to play a role in the province's energy future (SaskPower, 2017). The provincial government's current *Climate Change Strategy* sets out a goal of increasing renewable electricity generation capacity from 25% of the current mix up to 50% by 2030 (Government of Saskatchewan, 2017). It should not be assumed, however, that all aspects of renewable energy systems can be plugged-in to current policy and regulatory processes (Hanna et al., 2016). Concerns have been raised about emissions reduction, energy affordability, growing electricity demand, high capital investments, distributional equity for remote communities, and regulatory and policy changes needed to support the changing energy landscape (Dolter and Boucher, 2018).

In Ontario, in contrast, the province appears to have pioneered some progressive energy policies including a phase-out of coal from its electricity mix (Harris et al., 2015). Ontario's transition is occurring in significant part in response to landscape-level pressures to address climate change, to combat the negative effects of coal-fired electricity generation on human health, and the need to build a more resilient electricity system (Martens, 2015). The ability to create supporting policies and legislation at the provincial level, strong political support for transition, key actors and networks championing the coal phase-out campaign, the limited reliance on coal within the electricity generation mix, and the availability and affordability of natural gas as a primary substitute for coal all facilitated transformation of Ontario's electricity sector (Harris et al., 2015; Martens, 2015). The perceived success of energy transition in Ontario may hold important lessons for Saskatchewan. We use this context to illustrate the types of questions that should be asked in a transitions-based SEA framework for energy transition.

4.1 Situation assessment of the guiding vision and drivers for transitions

The first step in transitions-based SEA is situation assessment of the guiding vision for transition. Guiding visions are central to the formation of robust strategic initiatives, and accordingly effective PPPs. Transition management emphasizes the importance of long-term visions (Loorbach, 2010) and such visions can come in many forms – they can be general or detailed, government-wide or sector-specific, formal or informal, and transformational or incremental. In the example above, for Saskatchewan, the

vision is a future electricity mix that is based on up to 50% renewable sources by 2030. The key SEA questions to be asked include:

- ✓ *What are the drivers and selective pressures for change?*
- ✓ *Is the guiding vision coherent and does it adopt a long-term perspective to guide desired transition pathways?*

Energy transitions are often guided by broader societal goals of improving energy security or achieving a low-carbon future (Cherp et al., 2016). In the Canadian context, at least at national and provincial scales, transition is currently driven largely by global calls to combat climate change, the need to ensure security of supply, and the need to increase energy generation from cleaner sources. The first question in transitions-based SEA thus involves identifying the drivers and policy or landscape pressures influencing transitions. Such assessment is undertaken to understand how such pressures have emerged and perpetuated current regimes, what have been the past barriers to change, what might be the necessary pre-conditions for transitioning, and if desired futures are articulated in a guiding vision (Partidario, 2012; Noble and Nwanekezie, 2017).

The second question is about assessing the coherence and comprehensiveness of the guiding vision. It involves assessing how translatable the vision is to the prevailing political paradigm and whether it conflicts with the goals of other interacting policy domains (Smith et al., 2005). For example, is 50% renewables a realistic target in absence of specific strategies on how to achieve this target, or given current institutional arrangements? Does a vision for clean energy and low-carbon future conflict with other plans to increase provincial investment in the oil and gas sector to support shorter-term economic growth? Part of assessing the guiding vision is also understanding how well the vision represents the diverse needs of the relevant actors, conforms to public sentiment, and provides clear and plausible solutions (Smith et al., 2005; Hunt and de Laurentis, 2014). The aim is to undertake an initial broad-brush assessment of the energy landscape and how a renewables vision fits into broader energy sustainability goals.

4.2 Assess the institutional context and governance framework

Strategic issues often transcend the roles and responsibilities of any single agency, and weak inter-agency engagement and poor cooperation can constrain successful transitions. SEA implementation difficulties are most obvious at the institutional level where the interplay between formal and informal norms occur (Slunge and Tran, 2014). Rigid institutions can pose barriers to transition, and the policy reforms needed to implement change. Meuleman (2015) also notes the importance of the governance context in which an

SEA system is embedded. Governance arrangements determine the conditions in which an SEA process unfolds and, as such, the success or failure of the assessment process.

The overarching questions to be addressed when assessing the institutional and governance context include:

- ✓ *Is there adequate capacity within existing institutions and governance arrangements to support desired energy transitions, and what new capacity or institutional mechanisms (e.g. policies, instruments, regulations, incentives) are needed to ensure successful transitions?*
- ✓ *What are the current institutional barriers to achieving the desired strategic change?*

Facilitating renewable energy transitions, and ensuring long-term viability, requires articulation of the institutional needs and opportunities, including the required supporting policies, financial and human capacity needs, as well as adequately addressing obstacles to implementing renewable energy as a dominant part of energy mix. Institutional and governance context assessment involves identifying the capacities and constraints within the existing assemblage of institutions, administrative cultures, laws and regulations, the assemblage of policy approaches/instruments, and the capacities and constraints among relevant actors and stakeholders (Slunge and Tran, 2014; Meuleman, 2015, Monterio and Partidario, 2017).

4.2.1 Institutional context

An important part of tackling complexity in policy environments is reducing the complexity within institutions and identifying what institutional contexts are favourable to achieving transition goals (Meadowcroft, 2011). Institutions (*in terms of organizational structures*) can be a means for sustainability-oriented governments to disperse power, roles, and responsibilities to achieve sustainability goals. Yet, rigid institutions can create obstacles to change, generating conflict particularly for new entrant institutions seeking to promote strategic innovations. Assessing the institutional context is important for ensuring the support of those agencies whose cooperation, and future PPPs, are important to realizing the strategic vision or goals – or at least for identifying and managing competing mandates within, between, or across government departments and agencies (World Bank, 2005). In assessing organizational capacity, the primary strategic questions are:

- ✓ *Is there adequate capacity within existing organizations to support the proposed energy transition?*
- ✓ *What innovations and adjustments are needed to enhance capacity?*

Addressing these questions involves first assessing the current capacity within existing institutions to manage large-scale transformations. Capacity can be assessed in terms of the human, financial, infrastructural, and socio-political resources within and outside organizational boundaries. In the Saskatchewan case, electricity production and delivery is the sole responsibility of SaskPower - a government-owned utility and Crown corporation. Assessing capacity within the organization to achieve transition goals would mean assessing the informal processes or structures that currently pose a barrier to renewable energy development in the province (e.g. Richards et al., 2012). It would also include assessing the role and capacity of other non-governmental and private institutions for energy development (e.g. Indigenous-owned and operated production and distribution, public-private partnerships). The goal is to identify opportunities to create an enabling environment to get the job done. This could be in the form of creating new organizations that can independently accelerate significant uptake of renewables and pursue technological innovation, or in the form of discontinuing activities that pose barriers within redundant institutions - such as changing current institutional arrangements supporting SaskPower's monopoly of the electricity market that restricts private production and distribution (Meadowcroft, 2011).

4.2.2 Policy and regulatory context

Policy and regulatory contexts determine how energy programs and projects proceed and, in turn, can accelerate or slow the pace of transitions (Slunge and Tran, 2014). In Canada, that energy development obligations remain under provincial jurisdiction further creates key opportunities for provinces to implement tailor-made policies and regulatory arrangements that can foster renewable energy initiatives. For example, Ontario's renewable energy transition, which involved a phase-out of coal-generated electricity, was accelerated in part by capacity at the provincial level to pass legislation to phase-out coal as well as to implement supporting policies for renewables development (Harris et al., 2015). The primary strategic questions about the policy and regulatory context are thus:

- ✓ *What are the macro-level policies, mandates, targets, or regulatory objectives that need to be met?*
- ✓ *Do the existing policies, plans, and programs for energy development encourage a shift toward or away from the transition goal?*
- ✓ *What supporting/complementary policies, incentives, or programs are needed to facilitate the desired energy transition?*

These questions are about assessing the capacity of the existing policy and regulatory framework to support renewables transition. They are also about understanding the level and form of governance activities needed to guide the transition process (Loorbach, 2010). In our illustrative example, this stage

of the SEA process would explore how SaskPower's mandates, targets, and objectives for renewable energy development are currently being met. It would also mean assessing if existing policies and regulations provide the required support (e.g. incentives, instruments, permitting processes) that foster clean energy development. It is equally important to understand how current clean energy policies in the province align with national energy policies. For example, consider the impact of the Federal Climate Change Policy requiring the phase-out of fossil-based generation to reduce GHG emissions and the promotion of clean energy across Canada, which may prove significant in influencing energy decision making at provincial scales. Finally, attention would also focus on the adequacy of other administrative procedures that govern the implementation of clean energy projects (e.g. environmental impact assessment processes), not just those within SaskPower.

4.2.3 Political context

Energy sector reforms are driven in large part by political processes involving negotiations, compromises, or the building of coalitions particularly when landscape pressures encourage threats to incumbent political systems (Geels et al., 2017). To date, addressing political resistance, power struggles, and how to foster political willingness among regime actors remains a major challenge in renewable energy transitions. The key strategic questions include:

- ✓ *How might the current political environment influence the desired energy transition trajectory?*
- ✓ *Are there likely governance strategies that can be adopted by policy makers to ensure sustained political support for the proposed energy transition?*

Assessing the political context involves understanding how the existing political regime will influence (i.e. support or discourage) renewable energy transformations. This requires identifying what is feasible (rather than optimal) in terms of the political conditions under which renewables-based policies are likely to be adopted and thrive in the long-term (Meadowcroft, 2011). In Ontario's electricity system reform case, for example, a somewhat unified political discourse on phasing out coal facilitated buy-in from all political parties regarding renewable energy development. This was crucial in not only accelerating transitions but for ensuring that the renewables agenda remained a priority irrespective of political affiliations (Harris et al., 2015). In Saskatchewan, in contrast, where the political dispensation has in the past always favored the continued exploitation of fossil fuels for economic gain over clean energy development (Prebble et al., 2018), it is important to understand how the political context will impact on proposed renewable energy developments and whether the renewables discourse will remain a priority in the long-term.

4.2.4 Actor and stakeholder relations

A key part of assessing the political context is understanding stakeholder relationships, strategies, and capacity needs to identify and address, to the extent possible, potential conflict, power struggles, diversity of opinions, and inclusion. The key strategic questions include:

- ✓ *Who are the relevant actors in the transition process and how have they influenced the transition?*
- ✓ *Are there opportunities to pursue collaboration between actor groups to facilitate the desired energy transition?*

Intended or not, the politics of energy transitions creates winners and losers, and governments are continually faced with the challenge of attempting to balance values and objectives to accommodate diverging interests (Lawhon and Murphy, 2011). It is thus important to assess how proposed strategic initiatives will impact regime actors, for example: will transition to a renewables-dominated energy sector encourage a reconfiguration of regime actors including their decision-making capacity? It is also important to assess the strategies currently adopted by these stakeholders in pushing for a renewables transition and what opportunities exist to strengthen the role of such actors. Likewise, it is important to consider the role of other actors that have adopted strategies to discourage transitions away from fossil-based energy production, such as the oil and gas industry and ministries with conflicting mandates that promote policy inaction on tighter clean energy regulations (e.g. the Ministry of Economy). Conflicts and power struggles will likely persist between new entrant energy actors and existing regime actors; the intent of SEA is to understand and identify opportunities to address these, or at least mitigate the concerns.

4.3 Opportunities and risks

This stage of the SEA concerns the distribution of opportunities and risks associated with alternative energy sustainability pathways, and potential opportunities and implications in terms of relative costs and benefits (Partidario, 2012). By focusing the assessment on opportunities and risks, versus impacts per se, SEA can help identify directions or pathways toward better outcomes. The key strategic questions are:

- ✓ *What are the implications of adopting certain energy policy, investment or development trajectories?*
- ✓ *What are the immediate and longer-term risks and benefits of the proposed energy transition?*

The choices made about transitions can result in important consequences not just for key stakeholders but for all of society (Meadowcroft, 2009). There are consequences particularly for those individuals or groups that will be directly affected by the outcomes of the different choices about energy futures in varying capacities (ibid.). Transitions-based SEA acknowledges the importance of trade-offs and the assessment of a range of possible alternatives as opposed to solely focusing on unavoidable risks and how to manage mitigable effects (Partidario, 2012). The assessment process also accounts for the impacts of evolving trends and uncertainties (such as changes in energy policy priorities at the federal level, or changes to climate change policies in the international scene) and their implications for the desired energy transition path.

Assessing the distribution of opportunities and risks requires identifying the policy and regulatory risks associated with change in the level and forms of support available for immediate and long-term investment in energy development (Bolton et al., 2016). It also means re-assessing the guiding vision to establish what the current policy priorities are in terms of energy development in the region. In the Saskatchewan case, for example, if energy security is of primary importance in the electricity sector in the short term, then a large-scale shift towards renewables without the appropriate electricity mix may result in immediate reliability issues and have negative cost implications for communities that rely strongly on fossil-based electricity supply sources such as coal and diesel. Likewise, if clean energy and GHG emissions reduction are of utmost importance in the region, then continuing a coal-dominated energy supply path with secondary innovations in carbon capture and storage will result in failure to achieve emissions reduction targets.

4.4 Guidance for on-going transition management

Identification of context-based strategies and progress indicators to guide on-going transition processes is essential. The focus is on developing key indicators to measure progress toward transition targets in the short, mid- and longer-term. The key strategic question is:

- ✓ *What are the key progress indicators useful to track the transition and help ensure transition goals, and impact management strategies and being achieved?*

The inclusion of progress indicators can allow for repeated processes of learning, experimentation, adjustments and adaptation, iterative interaction between stakeholders, and the collaborative re-assessment of guiding visions (Slunge and Loayza, 2012). Thus, SEA must include the identification of key indicators and targets that can be examined in the short, medium, and longer term to track progress toward energy transition goals. Transition processes are dynamic and likely to evolve over time,

presenting new opportunities to facilitate the transition that ought to be maximized. In Saskatchewan's case, for example, the number of renewable energy projects deployed across province could serve as a useful indicator to track the progress of transition. Such progress indicators can also provide input for future policy development that could further accelerate the pace of transitions.

4.5 Exogenous landscape influences

Geels et al. (2017) describe exogenous influences in socio-technical transitions as "activities that comprise both slow-changing trends (e.g., demographics, ideology, spatial structures, geopolitics) and exogenous shocks (e.g., wars, economic crises, major accidents, political upheavals)" (p. 465). These landscape influences can act as driving forces that accelerate or restrain the transition process. The overarching strategic question is thus:

- ✓ *What are impacts of the broader landscape changes on the proposed energy transition?*

Not all issues can be scoped-in to SEA, but it is important to be constantly scanning for significant exogenous influences, or 'game-changers', that may affect the strategic course of SEA. Such circumstances are what Cherp et al. (2007) refer to as emergent issues or events – they cannot be controlled, but they can be instrumental to the nature and shape of the SEA process and influence. Such exogenous influences may include, for example, new agency, national or international policy or institutional commitments or obligations; significant changes in market conditions; technological innovations that may provide new options or solutions; or new discoveries that may require revisiting certain assumptions, objectives, or reassessing the opportunities. Radical changes in the landscape can also open new windows of opportunity to, for example, explore alternative development visions, involve new stakeholders with perspectives that can promote real change; or, on the other hand, bring to halt a transition path if changing landscape conditions suggest that such a trajectory could face insurmountable political obstacles.

Consider, for example, the impact of fluctuations in energy prices (e.g. oil), including the immediate and longer-term impacts of supply shocks on Saskatchewan's economy. A transition goal to "a diversified mix of renewable energy appears well suited to address such vulnerability and increase resilience to energy price shocks" (van de Ven and Fouquet 2017, p. 215). On the other hand, it is important to investigate how an interim rise in oil prices could impact a renewables development trajectory, and whether a vision to 50% renewables still holds in the face of significant changes in market conditions – such as a sudden hike in oil and gas prices.

5. Conclusion

Advancing strategic thinking in SEA has become increasingly important in response to efforts to enhance SEA's effectiveness as a strategic decision-making tool. An emerging consensus holds that SEA needs more robust frameworks to address sustainability transition challenges than what is currently in place. The interest in conceptualizing transitions-based SEA stems from the need to address this crucial gap. The framework defines a new functionality for SEA, pushing the boundaries of what SEA can achieve, and should accomplish as a strategic assessment tool while also challenging conventional thinking and established practice beyond its application to PPPs. Efforts have been made to advance more strategic forms of SEA but missing has been a conceptual framework and underlying principles that reshapes SEA for enabling sustainability transitions - where the focus is on institutional and governance issues, challenges, and possibilities rather than the impacts of individual PPPs. The intent is not to replace SEA for PPPs, but rather to complement and strengthen such applications. Repeated reforms to IA seeking to address big picture sustainability issues have largely resulted in project-based systems that are over-burdened with issues and expectations they are not sufficiently designed to address (Noble et al., 2019). There is an urgent need to shift attention towards reforming higher-order assessment approaches that are better suited to address complex sustainability problems, as proposed with the transitions-based SEA framework. By showcasing a novel conceptual SEA approach that can guide sustainability transitions decisions, the study aims to increase the visibility of *transitions thinking* in the impact assessment field.

There are, however, implications for advancing transitions-based SEA. First, methodologically, the framework draws largely on theoretical conceptualizations about the strategic elements that should be included in SEA design that are yet to be applied in practice. The framework also draws on insights from a limited number of existing SEA models that advance strategic thinking. As such, there is a need for research on empirical application of the transitions-based model to understand how the framework might be optimized in practice, and to identify limitations or deficiencies. Practical application will likely bring forth other important questions and opportunities to advance transitions-based SEA.

Second, effective implementation of transitions-based SEA may require adjustments to existing institutions and governance arrangements. This can pose significant challenges given that SEA practice continues to be constrained by well-established and resilient institutional arrangements, including ideologies that are strongly consolidated with conventional project-like SEA approaches (Noble et al., 2019). In Canada, for example, SEA remains largely limited to assessing the implications of PPPs in the context of subsequent project-focused regulatory impact assessments, failing to address broader questions about the sustainability of strategic initiatives (Doelle, 2018). The policy-based system for SEA federally

in Canada, under the Cabinet Directive, has thrived for decades with only modest changes to SEA and with limited opportunities for reform (Noble et al., 2019). At the provincial level, the absence of any formal requirements for SEA may likely pose an additional barrier to adopting the framework. Yet, within these contexts, and in absence of rigid legislative requirements for SEA, key opportunities do exist to explore more flexible and innovative approaches to SEA.

In conclusion, the transition-based SEA framework conceptualized in this paper provides for a more holistic assessment of the decision-making environment, bringing to light complex yet significantly relevant dimensions that would otherwise be overlooked under traditional SEA approaches. The aim is to widen the capability of SEA to foster sustainability transformations - a much touted benefit of SEA (Partidario, 2015), but a result that is rarely seen in practice (Noble et al., 2019). A new set of pressures, particularly those stemming from climate change and low-carbon transitions, require a radical re-consideration of approaches, methodologies, and tools designed to address sustainability concerns about future development trajectories. SEA should not just be about technological solutions to sustainability transitions and mitigating the impacts of PPP choices, but rather enable and influence shifts in socio-political interests, institutions, and actors who shape the decision context.

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7. References

Ahmed, K., Sanchez-Triana, E., 2008. Strategic environmental assessment for policies: An instrument for good governance. Washington: World Bank.

Aklin, M., Urpelainen, J. 2018., *Renewables: the politics of a global energy transition*. MIT Press.

Avelino, F., Rotmans, J., 2009. Power in transition: An interdisciplinary framework to study power in relation to structural change. European Journal of Social Theory 12, 543–569.

Bale, C.S.E., Varga, L., Foxon, T.J., 2015. Energy and complexity: New ways forward. Applied Energy, 138, 150–159. https://doi.org/10.1016/j.apenergy.2014.10.057

Bina, O., 2007. A critical review of the dominant lines of argumentation on the need for strategic environmental assessment. Environmental Impact Assessment Review 27(7), 585–606.

Bolton, R., Foxon, T.J., Hall, S., 2016. Energy transitions and uncertainty: Creating low carbon investment opportunities in the UK electricity sector. Environment and Planning C: Government and Policy, 34(8), 1387–1403. https://doi.org/10.1177/0263774X15619628

Briassoulis, H., 2004. The institutional complexity of environmental policy and planning problems: the example of Mediterranean desertification. Journal of Environmental Planning and Management 47(February), 115-135. https://doi.org/10.1080/0964056042000189835

Butler, C., Demski, C., Parkhill, K., Pidgeon, N., Spence, A., 2015. Public values for energy futures: Framing, indeterminacy and policy making. Energy Policy, 87, 665–672. https://doi.org/10.1016/j.enpol.2015.01.035

Cashmore, M., Axelsson, A., 2013. The mediation of environmental assessment's influence: What role for power? Environmental Impact Assessment Review 39, 5–12.

Cherp, A., Vinichenko, V., Jewell, J., Suzuki, M., Antal, M., 2016. Comparing electricity transitions: A historical analysis of nuclear, wind and solar power in Germany and Japan. Energy Policy, 101(November 2015), 612–628. https://doi.org/10.1016/j.enpol.2016.10.044

Cherp, A., Watt, A., Vinichenko, V., 2007. SEA and strategy formation theories: From three Ps to five Ps. Environmental Impact Assessment Review 27(7), 624–644. https://doi.org/10.1016/j.eiar.2007.05.008

Doelle, M., 2018. Regional and strategic assessments in the proposed federal impact assessment act. [accessed 2021 February 23]: https://blogs.dal.ca/melaw/2018/02/25/regional-strategic-assessments-in-the-proposed-canadian-impact-assessment-act-ciaa/

Dolter, B.D., Boucher, M., 2018. Solar energy justice: A case-study analysis of Saskatchewan, Canada. Applied Energy, 225(April), 221–232. https://doi.org/10.1016/j.apenergy.2018.04.088

Farla, J., Markard, J., Raven, R., Coenen, L., 2012. Sustainability transitions in the making: a closer look at actors, strategies and resources. Technological Forecasting and Social Change. 79, 991–998.

Flanagan, K., Uyarra, E., Laranja, M., 2011. Reconceptualizing the policy mix for innovation. Resource Policy. 40, 702–713

Gallardo, A. L, Duarte, C. G., Dibo, A.P., 2016. Strategic environmental assessment for planning sugarcane expansion: A framework proposal. Ambiente & Sociedade, 19(2), 67–92. https://doi.org/10.1590/1809-4422asoc127007v1922016

Gauthier, M., Simard, L., Waaub, J.-P, 2011. Public participation in strategic environmental assessment: Critical review and the Quebec (Canada) approach. Environmental Impact Assessment Review 31(1), 48-60. https://doi.org/10.1016/j.eiar.2010.01.006

Geels, F.W., Sovacool, B.K., Schwanen, T., Sorrell, S., 2017. The socio-technical dynamics of low-carbon transitions. Joule, 1(3), 463–479. https://doi.org/10.1016/j.joule.2017.09.018

Government of Saskatchewan (2017). Prairie Resilience: A Made-in-Saskatchewan Climate Change Strategy. (#104890). Available at: www.saskatchewan.ca

Hanna, K., McGuigan, E., Noble, B.F., Parkins, J., 2019. An analysis of the state of impact assessment research for low carbon power production: what do we really know? Energy Research and Social Science 50, 116-128.

Harris, M., Beck, M., Gerasimchuk, I., 2015. The end of cCoal: Ontario's coal phase-out. IISD REPORT. International Institute for Sustainable Development.

Hunt, M., de Laurentis, C., 2015. Sustainable regeneration: a guiding vision towards low-carbon transition? Local Environment, 20(9), 1081–1102. https://doi.org/10.1080/13549839.2014.894964

Jiliberto, R., 2011. Recognizing the institutional dimension of strategic environmental assessment. Impact Assessment and Project Appraisal 29(2), 133–140. https://doi.org/10.3152/146155111X12959673795921

Lawhon, M., Murphy, J.T. 2011. Socio-technical regimes and sustainability transitions: Insights from political ecology. Progress in Human Geography, 36(3), 354–378.

Lobos, V., Partidario, M., 2014. Theory versus practice in strategic environmental assessment. Environmental Impact Assessment Review 48. https://doi.org/10.1016/j.eiar.2014.04.004

Loorbach, D.A., 2010. Transition management for sustainable development: A prescriptive, complexity-based governance framework. Governance, An International Journal of Policy, Administration, and Institutions., 23(1), 161–183. https://doi.org/10.1111/j.1468-0491.2009.01471.x

Loorbach, D., Rotmans, J., 2010. The practice of transition management: Examples and lessons from four distinct cases. Futures. https://doi.org/10.1016/j.futures.2009.11.009

Lyhne, I., 2011. Between policy-making and planning: SEA and strategic decision-making in the Danish energy sector. Journal of Environmental Assessment Policy and Management 13(3), 319–341. https://doi.org/10.1142/S1464333211003912

Markard, J., 2011. Transformation of infrastructures: sector characteristics and implications for fundamental change. Journal of Infrastructure Systems (ASCE) 17, 107–117.

Markard, J., Raven, R., Truffer, B., 2012. Sustainability transitions: An emerging field of research and its prospects. Research Policy, 41(6), 955–967. https://doi.org/10.1016/j.respol.2012.02.013

Martens, L., 2015. Power shifts: The politics of sustainability transitions in electricity systems and the possibilities for First Nations participation. [Doctoral dissertation, University of Saskatchewan]. https://harvest.usask.ca/handle/10388/ETD-2015-03-1979

Meadowcroft, J., 2011. Engaging with the politics of sustainability transitions. Environmental Innovation and Societal Transitions, 1(1), 70–75. https://doi.org/10.1016/j.eist.2011.02.003

Meadowcroft, J., 2009. What about the politics? Sustainable development, transition management, and long-term energy transitions. Policy Sciences, 42(4), 323–340. https://doi.org/10.1007/s11077-009-9097-z

Meuleman, L., 2015. Owl meets beehive: how impact assessment and governance relate. Impact Assessment and Project Appraisal, 30: 4-15

Monteiro, M.B., Partidario, M., 2017. Governance in strategic environmental assessment: Lessons from the Portuguese practice. Environmental Impact Assessment Review 65(1), 125–138. https://doi.org/10.1016/j.eiar.2017.04.007

Nitz, T., Brown, A.L., 2001. SEA must learn how policy-making works. Journal of Environmental Assessment Policy and Management 3(3), 329-342.

Noble, B.F., Nwanekezie, K., 2017. Conceptualizing strategic environmental assessment: Principles, approaches and research directions. Environmental Impact Assessment Review 62, 165-73

Noble, B., Gibson, R., White, L., Blakley, J., Croal, P., Nwanekezie, K., Doelle, M., 2019. Effectiveness of strategic environmental assessment in Canada under directive-based and informal practice, Impact Assessment and Project Appraisal 37(3-4), 344-355

Ostrom, E., 2005. Understanding Institutional Diversity. New Jersey: Princeton University Press

Partidário, M.R., 2010. Including ecosystem services in coastal management by using Strategic Environmental Assessment, Portugal. The Economics of Ecosystems and Biodiversity: Ecological and Economic Foundations.

Partidário, M.R., 2012. Strategic Environmental Assessment Better Practice Guide: Methodological Guidance for Strategic Thinking in SEA. Portuguese Environment Agency and Redas Energeticas Nacionais, Lisbon.

Partidario, M.R., 2015. A strategic advocacy role in SEA for sustainability. Journal of Environmental Assessment Policy and Management, 17(01), 1550015. https://doi.org/10.1142/S1464333215500155

Partidário, M.R., Vicente G., Lobos, V.L., 2009. Strategic environmental assessment of the national strategy for integrated coastal zone management in Portugal. Journal of Coastal Research, (SPEC. ISSUE 56), 1271–1275.

Potvin, C., Burch, S., Layzell, D., Meadowcroft, J., Mousseau, N., Dale, A., Henriques, I., Margolis, L., Matthews, D., Paquin, D., Ramos, H., Sharma, D., Sheppard, S., Slawinski, N., 2017. Re-energizing Canada: Pathways to a Low Carbon Future. Sustainable Canada Dialogues. http://sustainablecanadadialogues.ca/

Prebble, P., Asmuss, M., Coxworth, A., Halliday, B., 2018. *Prairie Resilience Is Not Enough*. Saskatchewan Environmental Society: Saskatoon, SK.

Richards, G., Noble, B., Belcher, K., 2012. Barriers to renewable energy development: A case study of large-scale wind energy in Saskatchewan, Canada. Energy Policy, *42*, 691–698. https://doi.org/10.1016/j.enpol.2011.12.049

SaskPower, 2017. The path to 2030: SaskPower updates progress on renewable electricity. http://www.saskpower.com

Slunge, D., Loayza, F., 2012. Greening growth through strategic environmental assessment of sector reforms. Public Administration and Development, 32(3), 245–261. https://doi.org/10.1002/pad.1623

Slunge, D., Tran, T., 2014. Challenges to institutionalizing strategic environmental assessment: The case of Vietnam. Environmental Impact Assessment Review 48, 53–61. https://doi.org/10.1016/j.eiar.2014.05.005

Smith, A., Stirling, A., Berkhout, F., 2005. The governance of sustainable socio-technical transitions. Resource Policy 34 (10), 1491–1510. http://dx.doi.org/10.1016/ j.res pol.2005.07.005.

Therivel, R., Jones, M., Jenkins, B., 2016. Beyond current SEA Practice. In: Sadler, B., Dusik, J. (Eds.), European and International Experiences of Strategic Environmental Assessment: Recent progress and future prospects. Routledge: UK.

Turnpenny, J., Nilsson, M., Russel, D., Jordan, A., Hertin, J., Nykvist, B., 2008. Why is integrating policy assessment so hard? A comparative analysis of the institutional capacities and constraints. Journal of Environmental Planning and Management 51(6), 759–775. https://doi.org/10.1080/09640560802423541

Verbong, G., Geels, F., 2007. The ongoing energy transition: Lessons from a socio-technical, multi-level analysis of the Dutch electricity system (1960-2004). Energy Policy, 35(2), 1025–1037. https://doi.org/10.1016/j.enpol.2006.02.010

Vicente, G., Partidário, M.R., 2006. SEA – Enhancing communication for better environmental decisions. Environmental Impact Assessment Review 26, 696–706. https://doi.org/10.1016/j.eiar.2006.06.005

Wallington, T., Bina, O., Thissen, W., 2007. Theorising strategic environmental assessment: Fresh perspectives and future challenges. Environmental Impact Assessment Review 27, 569–584. https://doi.org/10.1016/j.eiar.2007.05.007

White, L., Noble, B., 2012. Strategic environmental assessment in the electricity sector: an application to electricity supply planning, Saskatchewan, Canada. Impact Assessment and Project Appraisal 30(4), 284–295. https://doi.org/10.1080/14615517.2012.746836

Wittmayer, J., Roorda, C., Van Steenbergen, F., 2014. Governing urban sustainability transitions – Inspiring examples. https://doi.org/10.13140/RG.2.1.2367.7606

World Bank, 2005. Integrating environmental considerations in policy formulation: Lessons from policy based SEA experience. Report 32783, Washington, DC.

World Bank, 2007. Strategic environmental assessment toolkit. Washington: World Bank.

World Bank, 2011. Strategic environmental assessment in policy and sector reform: Conceptual model and operational guidance. Washington: World Bank