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Developmental States and Sustainability Transitions: Prospects of a Just Transition in South Africa

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ABSTRACT *Since the onset of the global economic crisis in 2007/2008 two key trends have made it necessary to reconceptualize the relationship between development and sustainability: the rapid rise of the so-called 'BRICS' and the emergence of the green economy discourse and now since 2015 the adoption of the Sustainable Development Goals. To address this challenge with respect to developing economies in the global South, this paper endeavours to fuse the core conceptual concerns of the developmental state and sustainability transition literatures. It is argued that a just transition would consist of a dual commitment to human well-being (with respect to income, education and health) and sustainability (with respect to decarbonization, resource efficiency and ecosystem restoration). However, to understand these processes we need a better understanding of political dynamics, and for this purpose the notion of a socio-political regime is introduced. A case study of South Africa's dual developmental and environmental trajectories is presented, revealing how different it is to the East Asian experience. Although a just transition in South Africa is currently unlikely, the rapid emergence of the renewable energy niche signals what may be possible if political and environmental shocks are experienced by key actors within the socio-political regime.*

KEY WORDS: Developmental state, sustainability transition, green economy, South Africa

Introduction

Since the onset of the global economic crisis in 2007/2008, two key trends have been discussed in the policy and academic communities: the rise of the so-called 'BRICS-plus' economies as most of the traditional OECD economies plunged into a prolonged depressive malaise (Bogdan, Hurduzeu, Josan, & Vlasceanu, 2011), and the emergence of the 'green economy' discourse that was at one stage (2009) referred to as 'green Keynesianism' (Geels, 2013)—a discourse that has brought the question of a sustainability transition (ST) to the fore of global

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scientific endeavours (as represented in the Future Earth initiative) and generated a major discussion about the next long-wave development cycle (Gore, 2010; Swilling, 2013). This raises the key question this paper sets out to address: How can we understand the complex relationship between development processes and STs in the global South, especially since the onset of the global crisis? And arising from this, what is the global-local politics of these twin dynamics when they arise seemingly in parallel, sometimes in tandem and at times in contradiction to one another within the policy-making space at the nation-state level?

To address this question, the South African case will be discussed using a perspective that draws on, but goes beyond, two bodies of literature: the STs literature and the developmental state (DS) literature. While the DS literature has been widely used to address the development challenges of industrializing economies in the global South (Bagchi, 2000; Chang, 2007; Chibber, 2002; Edigheji, 2010; Evans, 2010; Kohli, 2006; Leftwich, 1995; Mkandawire, 2001; Rodrik, Subramanian, & Trebbi, 2004; Swilling, 2008), this literature has generally neglected to deal with environmental challenges in general and STs in particular. The ST literature has started to be used to address this lacuna, with a significant body of work already done on East Asian economies (Angel & Rock, 2009; Berkhout, Angel, & Wieczorek, 2009; Rock, Murphy, Rasiah, van Seters, & Managi, 2009) and now also starting to be applied in the South African context (Baker, Newell, & Phillips, 2014; Lawhon & Murphy, 2011; Swilling & Annecke, 2012). Although Scoones, Leach, and Newell (2015) do explicitly achieve a synthesis of the development studies and ST/transformation literature with specific reference to the 'politics of green transformations', they do not address the DS literature per se. This paper can be seen as a contribution to the general discussion they have opened up.

The ST literature on East Asian and South African political economies attempts to engage the dynamic relationship between developmental and environmental challenges and argues correctly that in doing so it is necessary to go beyond the overly technocratic bias in the existing ST literature that is partly related to its rootedness in the developmentally mature OECD context. But more work is needed to develop an adequate framework for coming to terms with the specific conditions of the South African context which is developmentally very different to the East Asian cases and environmentally also far more complex. It will be shown that developmentally South Africa has not built a 'relatively autonomous' strong DS apparatus to pursue an employment creation-through-industrialization strategy (a la East Asia) , preferring a non-developmental welfarism to address inequalities using fiscal policy, accommodating the mineral-energy complex (MEC) rather than promoting secondary industrialization and promoting financialization. And yet since 2006 a vast array of environmental and sustainability policies have emerged, fusing into what is referred to as the 'green economy' approach as one way of catalysing low-carbon growth. But for this to materialize into a ST, the self-same state capabilities that are needed to drive the structural transformations to promote 'developmental welfarism' (Khan, 2013, p. 582) are needed to drive a ST.

Indeed, building on previous work (Swilling & Annecke, 2012), it will be argued that a just transition can be understood as a structural transformation that results in the achievement of two linked goals: developmental welfarism and a ST. But for both these goals to be achieved, a socio-political regime committed to the building of relatively autonomous publicly accountable institutions will be needed.

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The argument will be constructed as follows: firstly, a conceptual framework will be provided that will clarify key terms as drawn from the bodies of literature used, in particular what is meant by a DS, ST, just transition, green economy and in particular a new term for understanding the politics of just transitions, namely the notion of a 'socio-political regime' as the arena where strategic coalitions make political decisions (drawing on policy regime theory). A core argument is that the DS and ST literatures share the view that deep-level structural transformation is needed (but obviously with respect to the different sets of goals they are concerned with) that must now be linked with the advent of the UN Sustainable Development Goals (SDGs). However, they have different emphases when it comes to the institutional capacities for managing change. Secondly, a conceptual framework for understanding just transitions will be developed that is influenced by the application of the DS and ST literature to the South African context. Thirdly, the South African case will be reviewed, sketching the emerging patterns of non-developmental welfarism and potential STs (with special reference to the energy sector). Finally, we conclude by suggesting that the adoption of the SDGs by the UN and the launch of the Future Earth programme that emphasizes 'transformation' provides an opportunity for widening the discussion of the challenge of achieving a just transition that can learn some valuable lessons from the South African experience.

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Conceptual Framework

Significantly the DS and ST literatures both agree on the need for deep structural transformation, but with two different ends in mind: for the DS literature, the end is accelerated economic development that substantially raises the average GDP per capita with a focus on industrialization and urbanization, while for the ST literature the end is a socio-technical transition that results in a low-carbon resource-efficient economy.

Developmental states. The defining feature of DSs is that they are primarily concerned with the structural transformation of modernizing economies (Evans, 1995; Kohli, 2006). The legitimation of DSs is derived primarily from their ability to promote sustained growth and development via aggressive industrialization (Chibber, 2002). As summarized by Khan (2008), their sustained growth and development is derived from several unique abilities. These include the ability to extract and deploy capital productively, generate and implement national and sectoral plans, and effect dynamic egalitarian and productivity-enhancing development programmes in land, education and training, small enterprise, infrastructure and housing sectors. In addition, DSs must be able to manipulate private access to scarce resources through, among others, financial sector re-engineering, subsidies, taxes, concessions and high levels of lending. The cultivation of close and productive relationships with business, wherein state leadership is more important than its followership, is also required. Interest groups must be able to be managed through state corporatism (often in authoritarian top-down ways to impose the state's agenda versus more consensual social corporatism). The DS is characterized by a capacity to coordinate the efforts of individual businesses by encouraging the emergence and growth of private economic institutions, target-specific industrial projects and sectors, resist political pressure from popular forces and, at times, also brutally suppressing them. It often mediates

and/or insulates domestic economies from (extensive) foreign capital penetration during the early stages and, most importantly, sustains and implements a project of productivity improvement, technological upgrading and increased market share that breaks them out of a path-dependent low-growth economic trajectory.

The institutionalization of the DS has received much attention since the 1990s. Leftwich (1995) summarizes what many regard as the key institutional characteristics of the DS as follows:

- a 'determined developmental elite' committed to the modernization project;
- 'relative autonomy' from major capitalist economic interests who are always keen to capture the state;
- 'a powerful, competent and insulated economic bureaucracy' that enjoys the highest possible political support but operates without too much political interference;
- a 'weak and subordinated civil society' which means there are no rival centres of alternative policy formation;
- the 'effective management of non-state economic interests' via formal structured compacts, incentives and penalties and
- accessible and usable institutions of 'repression, legitimacy and performance'.

Once DSs had consolidated an industrial base via technological capacity building, institutional functionality and human developmental capabilities, their focus shifted from the late 1990s onwards from massive investments in material conditions of modernization to establishing the conditions required by the knowledge economy created by the information revolution (Chang, 2002; Evans, 2006). Three new tasks emerged with major implications for the structures and logics of the socio-political regimes that drove the initial phases of development. Firstly, if institutions are accepted as key to an environment that fosters innovation (following the logic of the new mainstream institutional economics—see Rodrik et al., 2004), networks and new value chains as the driver of growth, the leadership capabilities to build effective institutions—and networks of institutions—across all sectors becomes the main challenge. This will mean striking a very delicate balance between regulation of shared norms/values and self-managed implementation. As will be argued, this will depend on the consolidation of an appropriate socio-political regime.

Secondly, no one disputes that knowledge and innovation matter. However, these are emergent properties that stem from dense networks of people, working together across institutional boundaries, unconstrained by out-dated (usually hierarchically organized) norms or an atmosphere of fear and conformity. The private sector always under-invests in human capital, innovation and networks because the direct returns to the investor are impossible to predict. Without state-led investment in these sectors facilitated by an appropriately configured socio-political regime via universities, NGOs and developmental partnerships/compacts, knowledge-based, innovation-led economic development in the era of the network society may be impossible (Castells & Himanen, 2014).

Thirdly, embeddedness for the twenty-first-century DS might mean building a socio-political regime that broadens out developmental partnering with networks of civil society formations and smaller entrepreneurs rather than focusing only on the needs of large corporates. A weak national bourgeoisie is a good reason for the state to get involved during the early stages of economic development to weld together local business elites. But in situations where the national

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bourgeoisie is fully consolidated, the state has more freedom to integrate a wider set of class alliances. This entails a multiplicity of smallish interventions, rather than a few, massive, physical infrastructure investments that satisfy the need for capital deepening, but do little to redefine the institutional context for the circulation of the benefits.

Sustainability transitions. Although the ST literature is rooted in the broader literature on systems innovation, evolutionary economics and the sociology of technology (Rip & Kemp, 1998), for the purpose of this paper the widely used Multi-Level Perspective (MLP) on STs will be the focus (Geels, 2005; Grin, Rotmans, Schot, Geels, & Loorbach, 2010; for a critique from a political ecology perspective see Lawhon & Murphy, 2011). According to the MLP, socio-technical transitions result in 'deep structural changes' over long time periods in particular socio-technical systems (e.g. transport, energy, water, sanitation, waste communications) that involve fundamental reconfigurations of technologies, markets, institutions, knowledge, consumption practices and cultural norms (Geels, 2011, p. 24). They are explained in terms of complex non-deterministic interrelations between three levels of reality: landscape pressures (macro), regime structures (meso) and niche innovations (micro). This framework is then used to address the challenge of the complex transition(s) to a more sustainable world which is defined as 'human well-being in the face of real bio-physical limits' (Meadowcroft, 2011, p. 71) and 'an open-ended orientation for change' (Grin et al., 2010, p. 2).

Major socio-technical regimes comprise a core set of technologies that co-evolve with social functions, social interests, market dynamics, policy frameworks and institutional regulations. Regimes are shaped by a broad constituency of technologists, engineers, policy-makers, business interests, NGOs, consumers and so on. The interrelationships of these interests through regulations, policy priorities, consumption patterns and investment decisions, among other things, hold together to stabilize socio-technical regimes and their existing trajectories. Regimes set the parameters for what is possible:

> . . . reconfiguration processes do not occur easily, because the elements in a socio-technical configuration are linked and aligned to each other. Radically new technologies have a hard time to break through, because regulations, infrastructure, user practices, maintenance networks are aligned to the existing technology . . . . (Geels, 2002, p. 1258)

The concept of 'landscape' is important in the MLP in seeking to understand the broader 'conditions', 'environment' and 'pressures' for transitions. The landscape operates at the macro level beyond the immediate efficacy of human agency, focusing on issues such as political cultures, economic growth, macro-economic trends, land use, utility infrastructures and so on. The landscape applies pressures on existing socio-technical regimes creating opportunities for responses, for example, climate change and the need for the expansion of renewable energy (RE). Landscapes are characterized as being 'external' pressures that have the potential to impinge upon—but do not determine—the constitution of regimes and niches: they are an external context ' . . . that sustains action and makes some actions easier than others. These external landscape developments do not mechanically impact niches and regimes, but need to be perceived and translated by actors to exert influence . . . ' (Geels & Schot, 2007, p. 404).

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The idea of socio-technical niches, which operate at a micro level, is one of 'protected' spaces, usually encompassing small networks of actors learning about new and novel technologies and their uses. These networks agitate to get new technologies onto 'the agenda' and promote innovations by trying to keep alive novel technological developments. The constitution of networks and the expectations of a technology they present are important in the creation of niches.

Adrian Smith and colleagues characterize regime change as being predicated on the ways in which shifting pressures impinge on a regime and the extent to which responses to these pressures are coordinated, both from inside and outside the regime (Smith, Stirling, & Berkhout, 2005). In doing this they open up the issue of governance interventions to facilitate regime transformation, but as Meadowcroft argues this is not taken far enough (Meadowcroft, 2011). It is not only the objective reality of these pressures that matters, but more importantly the adaptive capacity, or the relationships, resources and their levels of coordination by the socio-political regime that constitutes a response to these pressures. This can be the outcome of historical processes (e.g. a gradual shift in consumer choices or evolution of new technologies) or purposively informed by a strategic socio-political regime with a shared vision and capacity to implement a coherent set of policies. The ST literature is critical of the neo-liberal assumptions about the virtues of the market, hence the constant insistence on a role for the state. This, Meadowcroft argues, is why it is necessary to address the 'politics' of ST (Meadowcroft, 2011).

Structural transformation, just transitions and socio-political regimes. The purpose of the actually existing DSs was to drive the long-term structural transformation process of economic development (most commonly via industrialization and urbanization) in order to achieve a high level of human well-being with respect income, education and health. Building on the ST literature, a ST can only be envisaged if the state facilitates a long-term structural transformation process that results in socio-technical transitions to more sustainable modes of production and consumption, with special reference to decarbonization, resource efficiency and ecosystem restoration. When these two goals are combined, the result would be a just transition whereby, in the words of the Preamble to the UN's SDGs published in August 2015, the 'lives of all will be profoundly improved and our world will be *transformed* for the better' (emphasis added). For Castells and Himanen, an appropriate definition of development for the information age achieves a similar synthesis but with a much greater emphasis on the Sen-type conception of human capabilities for bringing forth self-constructed futures (Sen, 1999):

> Development . . . is the self-defined social process by which humans enhance their wellbeing and assert their dignity while creating the structural conditions for the sustainability of the process of development itself. (Castells & Himanen, 2014, p. 29)

A DS, however, is not merely defined by the goals it is committed to. The DS literature has paid considerable attention to the *capacity* of the state to make development happen, paying special attention to the emergence of a developmental bureaucracy and policy management. In general, the ST literature has been interested in the capacity of a variety of societal actors to drive (especially niche) innovations, but not of the state per se. The clear exception is the ST literature

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on East Asia which has argued that the considerable capacity of the East Asian DSs to drive development in ways that contradicted the neo-liberal script is very useful for now driving STs in this region in response to environmental landscape pressures, in particular those globalization dynamics that require East Asian economies to be 'greened' (Angel & Rock, 2009; Rock et al., 2009). However, they correctly point out that landscape pressures in general are too diffuse and contradictory to be useful for isolating 'landscape variables in *directing* transition processes' (Rock et al., 2009, p. 242—my emphasis). As a solution they proffer the notion of a 'socio-political landscape' to refer to the 'institutions, values and regulations broadly guiding an economy' (Rock et al., 2009, p. 242). However, given that the defining feature of landscape pressures is that they are long-term and slow moving, this seems like a misnomer—the strategic coalitioning and political actions needed to guide structural transformation (both for development and sustainability) are by no means slow moving and are not nearly as long-term as socio-technical landscape pressures like climate change, demographic change, resource depletion and values change. We therefore prefer the notion of socio-political regime, and draw on the 'policy regime' literature to generate a definition that is appropriate for our notion of a just transition (Wilson, 2000).[1]

Taking as point of departure that a policy regime and a socio-political regime are the same thing,[2] following policy regime theory, a socio-political regime is a specific constellation of actors who have agreed on a set of ground rules for conducting the business of everyday politics within and outside the formal institutions of the political system. These actors (interests) subscribe to certain underlying beliefs about the legitimacy of the system, control institutional resources in various ways, and they get organized into competing factions or alliances to secure advantages in the policy-making space. In other words, a socio-political regime goes beyond the governing elite or even the state-centric institutionalism of the DS literature—it refers in essence to the way the political game is conducted across various arenas (parliament, executive, media, civil society) in order to manage the overall stability of the political system and the direction of policy. A socio-political regime has four dimensions. The first of these is how power relations are arranged and reproduced within the regime, that is, how political power is constituted, distributed and maintained by those who have power, especially—but by no means exclusively—the governing party and its allies within and outside government. Second, there is the underlying policy paradigm, which incorporates beliefs and defines the way policy problems are understood by the different policy actors who engage in the everyday business of politics (who usually share the same underlying paradigm—for example neo-liberalism—but differ on what policy option to adopt). Thirdly, there is the way government and state institutions are organized and operated, which in turn, of course, reflects the power relations and paradigm commitment, but without them being entirely determined by these power relations. Fourthly there are the policies themselves that are debated and adopted by policy actors within a given socio-political regime. The advantage of policy regime theory is that it goes beyond the usual superficial level of policy analysis, which is primarily at dimensions four and to some extent three. However, the evidence suggests that policies reflect underlying power dynamics (dimension 1) and paradigm commitments (dimension 2), and therefore unless these are changed, change in the other dimensions is unlikely. Regime change is instigated by stressors and enablers, normally represented by an external shock to the system. As a consequence of this shock, the policy

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regime will experience paradigm shifts, power shifts, a legitimacy crisis, organizational and policy change.

The notion of a socio-political regime proposed here addresses the challenge faced by the ST literature to conceptualize the role of politics, and it goes beyond the narrow institutionalist perspective that tends to pervade most accounts of the DS in the DS literature.

In short, a just transition is only possible if the overall goal is human well-being (income, education and health) within a sustainable world (decarbonization, resource efficiency and ecosystem restoration). For this to have direction, broader socio-technical landscape pressures should in general be seen by key actors within the socio-political regime as nudging historical processes in a way that reinforces the normative claims of these goal statements. Game changers emerging out of niche innovations should also be coalescing around viable alternatives. However, the structural transformations needed for a just transition will only be achieved when there is a socio-political regime that rests on a strategic coalition of interests that shares this paradigm, uses state institutions to drive a just transition and adopts an appropriate policy and legislative programme that is aligned with the overall goal. The South African case will show that there are political and system shocks forcing a paradigm shift, and some policy reforms, but overall the underlying balance of power remains largely unchanged and unlike the East Asian states, the state is not configured to drive either developmental welfarism or a ST. It will be shown that an underlying unifying paradigm for reconstituting the socio-political regime around developmental welfarism and sustainability has not yet emerged.

Green economy. Before proceeding, we need to ask whether the new green economy discourse (GED) provides a framework for catalysing/supporting a just transition. Like all global policy discourses emanating from UN institutions, they can relate only at the level of policy options (dimension 4) and to some extent at the level of paradigms (dimension 2), but their influence is entirely dependent within a national context on the configuration of power relations within the socio-political regime and how the state is constituted. What this means is that the socio-political regime acts as a kind of selection environment for translating global discourses into the national context, either meaningfully or to transform them or to suppress them. This means it is not possible to ask whether the GED equals a just transition—the answer to that question is by definition context specific. The ST literature on East Asia makes this very clear—they argue that globalization created the conditions for influencing local elites about the need for environmental change, and that niche innovations were less important than state institutions in driving change (Rock et al., 2009).

Significantly, several mainstream UN documents are arguing that the transition to a green economy will require structural transformation (see United Nations, 2011; United Nations Conference on Trade and Development, 2012; United Nations Environment Programme, 2011). The main issues driving this trend include increased demand for and scarcity of natural resources; rising awareness of threats posed by peak oil, food and water insecurity, and financial crises; global climate change and other forms of pollution; intergenerational justice; and the vulnerability of the economy to these factors (Lorek & Spangenberg, 2014).

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Greening the economy is not a fundamentally new concept, but rather a re-emerging issue that has in recent years gained increasing prominence within international and South African policy debates. Different interpretations of the concept are observed in the literature (Allen & Clough, 2012) and these are deployed by various actors who have differing agendas and priorities (Death, 2014). For some, the concept is linked to specific sectors, policies, principles or topics (European Environment Agency, 2011), which tends to yield a narrow focus. For others, it encompasses all economic opportunities arising from actions to promote sustainability, improve human well-being and social equity, and significantly reduce ecological scarcities and environmental risks (United Nations Environment Programme, 2011).

Death (2014) identifies four GEDs that are theoretically distinct, but which in practice tend to overlap. 'Green revolution' represents a radical reconfiguration of all four dimensions of the socio-political regime in accordance with environmental limits and ethics, as advocated by proponents of radical change such as deep ecologists, eco-socialists and some indigenous peoples. 'Green transformation' involves a realignment of prevailing growth policies according to the principles of sustainable development, including policies supportive of Keynesian fiscal stimulus measures with a green tint, while leaving the underlying power structures and nature of the state essentially intact. The 'green growth' discourse leaves the neo-liberal paradigm assumptions in place and only focuses on policy change, emphasizing new markets and technological opportunities for improved economic efficiency. Finally, the 'green resilience' discourse features reactive responses at the policy level only to threats posed by climate change and resource scarcity and ultimately seeks to shore up the status quo (Death, 2014). Unsurprisingly, the last two responses are most palatable to existing governments with a neo-liberal slant.

On the one hand, we agree with Death (2014) that the characteristics of each of the GEDs are evident in South Africa's green economy drive and that the green growth discourse is by-and-large dominant because it is acceptable to the socio-political regime. This is in particular observed in various government policy documents such as the Green Accord, and to some extent the National Development Plan. We also agree with Death's view that achieving a green economy orientation in South Africa 'will require large-scale structural changes' (Death, 2014, p. 18). On the other hand, we differ with some of Death's arguments. Firstly, while he is quite critical of the growth emphasis in the GED, in a developing country context with high rates of unemployment and inequality, inclusive, job-creating growth is necessary in order for basic material needs to be met. Secondly, Death (2014) seems to have overlooked 'green jobs' as a related but distinct discourse, which is currently motivated by certain governments, labour groups and civil society organizations across the developing world as a way to help meet the twin challenges of environmental protection and the creation of decent work opportunities (UNEP & ILO, 2008).

In sum, depending on which forces within the socio-political regime in any given context manage to influence the underlying paradigm (dimension 2), the GED could create a discursive context supportive of a just transition. But there is nothing inherent in the discourse that makes this inevitable. The emergent outcomes of the contestations over power, paradigm, institutional capacity and policy within the socio-political regime will determine how the regime selects to accept, transform or reject the discourse. In South Africa the GED helped create a discur-

sive framework that reinforced niche innovations, but did little to change the underlying paradigm that remains dominated by neo-liberal economics and a timid approach to the MEC.

The South African Transition

South Africa has a population of 53 million and has been a democracy since 1994. It has a strong democratic constitution, mature institutional infrastructure and a market economy. Between the 1960s and 1980s the South African economy diversified by expanding the manufacturing sector, but following global trends during the mid-1990s it was the growth of the financial sector that became a key driver of growth thus disincentivizing diversification (Black & Gerwel, 2014; Mohamed, 2010). According to the Gini coefficient, South Africa is one of the most unequal societies in the world (National Planning Commission, 2011). Despite moderate growth between 1994 and 2007 and substantial real increases in fiscal expenditure (Swilling, Khan, Van Zyl, & Van Breda, 2008), unemployment and poverty have persisted. The official rate of unemployment, based on the 'narrow' definition, has been around 25% for several years. Using a R524/month poverty line, 53% of the population lived in poverty in 1995, declining marginally to 48% by 2005. This decline was attributed largely to the impact of social grants, which now benefit more people than the number of people in formal employment (National Planning Commission, 2011). Many critical writers blame the failure of the state to initiate employment-creating industrial growth via structural transformation for the persistence of poverty and inequality since 1994 (Bond, 2002; Freund & Witt, 2010; Gelb, 2006; Habib & Padayachee, 2000; Hart, 2008; Khan, 2013; Marais, 2011; Mohamed, 2008, 2010; Netshitenzhe, 2011; Swilling, 2008; Wolpe, 1995).

The environmental case for a *ST* was put forward by the Minister in the Presidency and Chairman of the National Planning Commission (NPC), Trevor Manuel, in an address to the National Assembly in June 2011:

> Our economic path, our settlement patterns and our infrastructure all combine to place our country on an unsustainable growth path from a resource utilisation perspective. We are the 27th largest economy in the world but we produce more carbon dioxide emissions than all but eleven countries in the world. We are a water scarce country but we use our water inefficiently. We have to change these patterns of consumption and we have to learn to use our natural resources more efficiently. We must do this with appropriate consideration for jobs, energy and food prices.

What follows is first a brief summary of the explanation for why South Africa did not initiate the kind of developmental structural transformation that occurred in East Asia, despite rhetorical commitments to being (or wanting to be) a DS. Therefore, unlike in East Asia, the developmental phase has not left South Africa with the kind of socio-political regime that can select and drive an ST. However, that said, since 2006 South Africa has adopted a slew of environmental policies, and niche innovations have driven a fast-growing RE sector with an investment portfolio equal to nearly 5% of GDP over just a few years. This raises the interesting prospect of an ST that is *not* state-driven in the same way that it could be driven in East Asia (Baker et al., 2014; Msimanga & Sebitosi, 2014). This then

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raises an interesting challenge when it comes to fusing these developmental and environmental trajectories together to comprehend South Africa's prospective just transition (which is, incidentally, exactly the term used in Chapter 5 of the National Development Plan).

South Africa's Developmental Trajectory

The South African Government formally defines itself as a 'developmental state' committed to the structural transformation of the economy to deal with the legacy of apartheid (Republic of South Africa. National Planning Commission, 2012). The government aims to stimulate economic growth primarily by increasing public investment in national infrastructure to stimulate private sector co-investments. This is complemented by an inflation target of 3–6%, a floating exchange rate, government deficits of 5–10%, extensive fiscal expenditure on education, health and welfare, and incentives to promote raw material exports and expand the manufacturing sector. Despite all this, South Africa's economic growth rate is one of the lowest in Africa. For mainstream neo-classical economists, this is due to labour market rigidities, inflated government expenditures and energy shortages. While these are certainly a factor, the underlying resource drivers are as important, especially the rising cost of minerals, energy, water, waste and mobility (Swilling, Musango, & Wakeford, in press).

Following others writing in the ST tradition (Baker et al., 2014; Swilling & Annecke, 2012) the core structural problem of the South African economy is the dominance of the socio-political regime by the 'mineral-energy complex' (Fine & Rustomjee, 1996; Mohamed, 2010). The MEC refers to a coalition of interests that have a firm grip on energy production and extractive industries and their up- and downstream partners in the manufacturing sector. This explains the politics of socio-technical lock-in that ensures that South Africa continues to be committed to energy- and carbon-intensive pathways and undercommitted to supporting manufacturing that is unrelated to the MEC (Black & Gerwel, 2014). A purposive transition in these sectors will require a substantial shift in the power relations within the socio-political regime to significantly reduce the policy leverage of the powerful mining and energy companies and in so doing respond to global landscape pressures relating to resource prices and competitiveness, as well as domestic labour strife. This would mean establishing a radical new paradigm that Latin Americans refer to as 'post-extractivism' (Economic Commission for Latin America and the Caribbean, 2013).

At the core of South Africa's developmental failure is the fact that the negotiated settlement that took place between 1990 and 1994 after Mandela was released from prison left intact the basic power structures of the apartheid socio-political regime, including black elites in return for handing over political power but protecting economic power structures (Glaser, 2011; Habib & Padayachee, 2000; Hart, 2008). To rapidly stimulate growth and address inequalities, policy choices were made within the socio-political regime that reflected this power deal: neo-liberal ideologies were adopted (Hart, 2008), financialization was promoted as a growth strategy (i.e. essentially debt-funded consumerism to expand the black middle class, ensuring that the financial sector grew faster than any other sector, capital flight for South African corporates) (Mohamed, 2010) and non-developmental welfarism was implemented on a massive scale to quell popular unrest (welfare grants increased from 3 million in 2000/2001 to

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16 million in 2011/2012—from below 1% of GDP to over 3.5% of GDP in a decade!) (Khan, 2013).

This was the context for the relative decomposition of state capacity at the centre of the socio-political regime: instead of focusing on building state institutions to drive a non-MEC employment-creating 'developmental welfarism' (Khan, 2013, p. 582), the focus was on replacing white with black officials as part of a state-driven 'new racial nationalism' agenda (Glaser, 2011). This strategy, coupled to debt-financed consumerism, stabilized the middle class base of the post-apartheid socio-political regime, but at the expense of what Khan calls the 'bioeconomy'—the bodies of the poor and the resources of nature (Khan, 2013). This was the context for the increasingly pervasive rent-seeking and corrupt practices that are steadily hollowing out what state capacity there is to drive development and the related rise in the number and profile of publicly accountable and civil society based accountability watchdogs (e.g. the renowned Public Protector, Thuli Madonsela).

South Africa's Environmental Trajectory

The rationale for a South African ST encapsulated in the quote above from Minister Trevor Manual is a response to a wide range of negative environmental impacts and resource constraints that are generating ad hoc policy responses (often influenced by the South African elite's insertion into global policy dialogues like World Economic Forum etc.), but without deeper shifts within the socio-political regime at the power and paradigm levels (this being the core argument of a forthcoming book, see Swilling et al., in press). Chapter 5 of the National Development Plan (NPC), the Green Economy Accord (Department of Economic Development), National Strategy for Sustainable Development (Department of Environmental Affairs), elements of the New Economic Growth Path and Industrial Action Plan (Departments of Economic Development and Trade and Industry) and various sectoral plans in the energy (Integrated Resource Plan), water (National Water Management Strategy), waste (National Waste Management Strategy), transport (National Public Transport Strategy), urban development (Integrated Urban Development Framework) and biodiversity sectors all reveal a policy-level commitment to structural changes that if implemented would trigger an ST with significant developmental benefits (see Swilling & Annecke, 2012, Ch. 8). However, unlike in East Asia, the point of departure is in reality institutional decomposition not a strong relatively autonomous developmental bureaucracy.

Recognizing the coal-based carbon-intensive nature of the South African economy, the South African Government has committed itself in global fora to playing its part in mitigating global climate change by limiting its greenhouse gas (GHG) emissions (Trollip & Tyler, 2011). The challenge is massive: ESKOM, the state-owned utility, provides 95% of South Africa's electricity (mostly from coal) and has been struggling to build an additional 17,000 MW of capacity to meet growing unmet demand by 2018. In 2010 a series of year-on-year tariff increases were introduced that will see South African electricity go from the cheapest in the world (R0.25c/KWh) to several times that, possibly as high as R1.10c/KWh by 2020—a trend that brings fossil-fuel costs more or less in line with declining RE costs. But consumption is dominated by large industrial and mining companies: only 36 large users consume 44% all electricity, and they are

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a well-organized group that has effectively dominated the drafting of energy policy in their favour, including pricing and demand forecasts (Trollip & Tyler, 2011).

Related to carbon emissions is air pollution via the production of particulate matter and various hazardous gases (such as carbon monoxide) resulting from the combustion of fossil fuels and wood fuel (Republic of South Africa. Department of Environmental Affairs and Tourism, 2006). The extensive health impacts arising from coal combustion in South Africa are well known. Air pollution from vehicle emissions in urban areas has been estimated to carry health costs amounting to R10 billion per annum.

The contamination and degradation of South Africa's scarce water resources—and their supporting ecosystems—have become a major focus in recent years (Oelofse, 2008a, 2008b). Water pollution includes the massive threat posed by acid mine drainage, as well as eutrophication resulting from the overuse of chemical fertilizers (Turton, 2008). Land pollution comes in various forms, including the highly visible impacts of open cast mining, the more subtle impact of subsurface mining and the dumping of solid waste (Blottnitz, 2006).

These various types of pollution are straining the absorptive capacity of South Africa's natural systems. This in turn risks undermining the integrity of ecosystem services. Biodiversity, of which South Africa has such a generous globally significant endowment, is increasingly under threat not only from the effects of pollution, but also from the destruction of habitats as a result of land use practices including extensive farming, mining and urban sprawl (Maze & Driver, in press; Republic of South Africa. Department of Environmental Affairs and Tourism, 2007).

Although challenges such as climate change and biodiversity loss are reasonably well known and understood in South Africa (Tyler & Winkler, 2009) the matter of resource scarcity has to date received relatively little attention. Resource scarcity arises from the intersection between increasing demand for material resources to fuel economic growth, and the depletion of non-renewable or exhaustible natural resources such as fossil fuels, minerals and metals, soils and forests. Beyers (2014) provides an overview of the resource flows through the South African economy through the lens of Material Flow Analysis. Her data show that consumption of key materials such as fossil fuels, non-metallic minerals and biomass has grown over the past few decades in absolute terms, and the extraction of metal ores has declined. More significantly, there is evidence that South Africa's economic growth rate has tended to rise faster than the rate of resource use which suggests that there is a degree of dematerialization underway, which reinforces those calls in official policy documents for a transition to a less resource-intensive and decarbonized economy.

For over a century, South Africa's economic growth has largely been fuelled by coal and it is commonly assumed that the country has sufficient coal reserves to last at least 200 years. However, the extent of South Africa's remaining coal reserves is a matter of considerable dispute among government officials, industry players and independent researchers. The official figure for coal reserves is approximately 30 gigatonnes (Gt) (BP, 2013). However, both Rutledge (2011) and Mohr and Evans using variants of the 'Hubbert curve' technique estimate that remaining recoverable coal reserves in South Africa may be as low as 10 Gt. Hartnady (2010) estimates there could be 15 Gt of remaining coal reserves and forecasts a peak in domestic coal production by 2020, while Mohr and Evans (2009) 'best

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guess' is for a peak in 2036. Thus at some point in the not too distant future—possibly soon after 2020—rising demand (e.g. to feed Eskom's two—and possibly three—new coal-fired power plants and to meet export growth targets) could intersect with stagnant or falling production of coal and result in substantial increases in coal prices. Confirming this, in August 2015, an ESKOM spokesperson admitted for the first time they are looking to secure coal supplies from outside South Africa's boarders.

The second most important energy source for the South African economy is oil. The country has miniscule proven oil reserves, estimated at 15 million barrels (about a month's worth of national oil consumption) in 2011 (Department of Mineral Resources, 2013), and these are rapidly depleting. Oil production from state oil company PetroSA's Oribi and Oryx oilfields off the country's southern coast declined by an average of 24% per annum between 2002 and 2011, and amounted to less than 600 barrels per day (bpd) in 2011 (Department of Mineral Resources, 2013). While Sasol produces around 150,000 bpd of synthetic petroleum products from coal, South Africa nevertheless depends on imports of crude oil and refined petroleum fuels to meet around 70% of its liquid fuel requirements (Wakeford, 2012). The affordability of these imports is threatened by a combination of rising demand in developing countries and a possible near-term peak in global oil supply. In fact, data from the US Energy Information Administration show that world oil exports have been stagnant since 2005.

Currently South Africa has very meagre natural gas reserves, estimated at 318 billion cubic feet (Department of Mineral Resources, 2013). Located offshore south of the country, these reserves are rapidly depleting and consequently production has been steadily declining over the past decade. This situation has forced PetroSA to investigate alternative sources of feedstock for its gas-to-liquids refinery at Mossel Bay, such as imported liquefied natural gas. The government and certain industry players are however very optimistic about the potential development of shale gas in the Karoo basin. However, shale gas extraction might be constrained by water scarcity, if not concerns over contamination of water supplies as in several other countries.

Like fossil fuels, minerals and metals are also finite, non-renewable resources subject to depletion. South Africa's gold production history is a poster child for the so-called 'Hubbert peak' model of non-renewable resource depletion (Hartnady, 2009). Having dominated the global gold industry for a century, South Africa's production reached a peak in 1970 and has been on an inexorable decline ever since. The country's ranking has fallen to fifth largest producer in the world and Hartnady (2009) estimates that 90% of the mineable gold reserves have been extracted. South Africa has an abundant endowment of other minerals such as platinum group metals, manganese and chromium ore, and production of these resources is not in any immediate danger of declining from resource scarcity. Nevertheless, the extraction and beneficiation of these minerals are highly energy and water intensive and therefore place great strain on the country's resources and also on the environment (Glaister & Mudd, 2010).

Soil is an under-appreciated and under-researched natural resource that provides the foundation for agriculture and arguably for society as a whole (Mills & Fey, 2004). South Africa's soil fertility is being depleted as a result of a fossil-fuel-intensive type of agriculture, with up to a third of its 14 Mha of arable land suffering from degradation. South Africa was not endowed with an abundance of good soils to begin with, and cannot afford indefinitely to have

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this fragile resource further eroded through excessive tilling, acidified as a consequence of the application of large and increasing quantities of chemical fertilizers and pesticides, and salinized through over-irrigation. The intensive use of fossil fuels and synthetic chemicals in agriculture also contributes to water pollution, degradation of ecosystems and climate-altering GHG emissions. Furthermore, the heavy dependence of industrial agriculture on depleting fossil fuels such as oil and coal (via thermal power plants) presents considerable risks to future food security (Wakeford, 2012).

Phosphate is another critical resource for South African agriculture. Although South Africa is very fortunate to be endowed with the world's fourth largest deposits of rock phosphate, this is nevertheless a finite resource. At present, the rock phosphate is being mined for export and domestic consumption, and ultimately dissipated into the environment in an unsustainable linear production and consumption process. Should this practice be continued indefinitely, South Africa will eventually encounter 'peak phosphate' production and phosphate pollution.

The vast majority of South Africa's transport infrastructure relies directly on petroleum fuels, the majority of which are imported. The spatial configuration of human settlements and the built environment also determines certain resource flows. Therefore, in order to tackle the economy's reliance on depleting natural resources and to curb environmental impacts, there is an urgent need to invest in a new generation of resource-efficient, less-polluting infrastructures. By way of example, there is enormous potential for developing a new electricity infrastructure that harnesses clean available RE sources such as solar and wind energy (although constraints on the availability of finance and scarce inputs for infrastructure such as rare earth metals are acknowledged). As shown below, despite investments in coal, South Africa's procurement of RE has increased rapidly.

The long-term implication of resource depletion is increasing material scarcity and increasing costs of extraction to produce the same level of output (Mudd, 2007), leading to higher and increasingly volatile resource prices (Grantham, 2011; Kellard & Wohar, 2006). This, in turn, raises costs of production and ultimately the prices of many basic goods and services such as energy and food. These problems are intimately related to environmental issues in at least two ways.

Firstly, resource depletion and pollution often pose disproportionately high threats to poor people; they are the most affected by rising costs of living and often by health impacts of pollution, and have the least resources available to cope with socioeconomic shocks and environmental changes. Furthermore, resource depletion and increasing unemployment sometimes go hand in hand. For example, the decline in agricultural productivity has contributed to the loss of hundreds of thousands of jobs in this sector. In the mining sector, the steady decline in gold mining output since 1970 has contributed to the shedding of tens of thousands of jobs.

Secondly, if negative environmental impacts, increasing resource scarcity and the erosion of ecosystem services are not addressed, they will hamstring South Africa's development because of direct threats to water and energy supplies and soils, and indirectly with respect to tourism revenues. Thus efforts to preserve the environment do not imply sacrificing inclusive economic growth; rather, socioeconomic upliftment requires good environmental stewardship. This linkage

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between these environmental dynamics and the National Infrastructure Programme which is South Africa's largest public investment programme is not understood, despite the wide range of sustainability-oriented inter-sectoral and sectoral policy frameworks (Rivett-Carnac, Swilling, & Giordano, in press). However, there are positive signs that this linkage is being recognized at city level where a number of Local Municipalities are introducing sustainability-oriented alternatives, largely because local socio-political regimes are not that tightly controlled by the national level, especially if the local level is controlled by the opposition party.

Towards a Just Transition in South Africa?

It has been argued thus far that a just transition would entail structural transformation to achieve the twin goals of human well-being and sustainability. However, contrary to the normative orientation of most policy-relevant writing, we have argued that a just transition is only possible if the politics comes right, that is, a socio-political regime emerges that aligns the underlying power configuration of interests located within and outside the formal political systems with an appropriate sustainability paradigm (possibly influenced by the GED and SDGs), with a clear set of policies that could be implemented by a state with the necessary institutional and strategic capacity. In the South African case, the political settlement made it difficult to craft a socio-political regime with similar developmental capabilities to those that emerged in East Asia. Instead of constraining financialization and limiting the power of the MEC in order to promote industrial diversification, post-1994 economic policies did the opposite and addressed inequalities via welfare policies. At the same time a wide range of environmental and resource pressures emerged at the landscape level with major implications for the various socio-technical regimes. Policy responses did emerge from the socio-political regime, but without the underlying capacity to implement them precisely because of the absence of a coherent institutionally strong DS to start off with—a problem exacerbated by rent-seeking and corrupt practices. However, unlike East Asia where sustainability-oriented innovation was driven centrally by state-linked development institutions (Angel & Rock, 2009), in South Africa (following Baker et al., 2014) the growth of the RE sector seems to demonstrate that niche innovations supported by global investors coupled to realignments within the socio-political regime in response to supply shocks could possibly herald the early beginnings of a just transition.

By 2015, a total of R155.16 billion had been invested in 92 RE projects, which is equivalent to 4.67% of GDP (Baker, 2015). This was achieved from virtually a zero base in 2009 which is when President Zuma made his famous 'pledge' to reduce South Africa's emissions at the 2009 Climate Conference in Copenhagen. Initially, the National Energy Regulator of South Africa, following study tours to other countries, favoured the introduction of a Renewable Energy Feed-in Tariff (REFIT)—the mechanism that led to the growth of the RE sector in Europe and elsewhere. However, after realizing how price fixing (which is what a REFIT is) could stimulate rent-seeking and cronyism, the National Treasury (NT) allied with the Department of Energy, replaced the REFIT with the Renewable Energy Independent Power Producers Procurement Programme (REIPPPP) which entailed calling on Independent Power Producers (IPPs) to bid without first disclosing a price. Criteria for approval were price, plus a minimum of 40%

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South African entity participation and a minimum black ownership of the project company of 12% with a target of 20%. Local communities must also have a minimum 2.5% shareholding, though in some cases this is much higher. With each call, the local content requirements also went up. This resulted in a remarkable coalition of local public and private banks, the World Bank, consultants, international IPPs, local researchers, local communities and NGOs, creating South Africa's most vibrant niche innovation. Proposals were professionally, quickly and in a non-corrupt way assessed and approved, resulting in the rapid construction of RE plants around the country providing over 5000 MW of extra capacity connected into the national grid.

Although the story is far more complex (and debatable) than the above summary (for a detailed discussion see Baker et al., 2014), the fact remains that South Africa now has an RE sector and this was made possible by realignments within the socio-political regime (especially by the actions of the powerful NT which is often regarded as a 'state-within-a-state' and by powerful business interests worried about security of supply and South Africa's image as high carbon user), pressure from the World Bank which funded a large coal-fired power station (Medupi) on condition an additional grant to fund RE was accepted, SA's positioning within the climate change negotiation space, the build-up of expertise within private and civil society niches, the growth of University-based research knowledge networks, and, of course, the rapidly declining global price of RE technologies vis-à-vis coal and nuclear energy. The state's capacity to link RE investments to protection of South African interests and local communities demonstrates the fusion of developmental and environmental objectives. Without the supply shocks of the late 2000s and global consensus on climate threats and green economy, shifts in the socio-political regime might not have happened. In short, this is in microcosm what would be possible if there was a deeper paradigm shift within the socio-political regime, which could broaden out the coalition of power interests in support of a wider set of just transitions in the water, waste, transport, communications and other sectors. There is evidence this is happening, especially in transport, but not on the scale of what has happened in the energy sector. That said, RE is still only a marginal niche. The majority position within the socio-political regime remains committed to proceeding with more coal and nuclear energy which effectively crowds out investments in renewables, thus forcing it to remain only a niche. The driver here is not only about socio-technical 'lock-in' at regime level, but it is also about the politics of rent-seeking which is central to the way South African politics is conducted—put simply, large infrastructure projects benefit the networks of the ruling elite. By contrast, REIPPP has been well managed, so far seemingly insulated from corruption. Ultimately, the combination of socio-technical 'lock-in' around the coal/nuclear regime plus the politics of rent-seeking would thwart the structural transformation needed for a just transition to be fully realized beyond the niche-level RE sector.

Conclusion

We set out in this paper to address the question of how best to understand the relationship between developmental processes and STs in the global South, with special reference to the political dynamics of this relationship. This has become an especially important challenge in light of the rise of the 'BRICS-plus' countries,

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shorthand for quite a large number of rapidly industrializing economies many of which are resource-based (not only Brazil, Russia, China and India, but also Indonesia, Vietnam, Kenya, Ghana, Ethiopia, Venezuela, Mexico, Turkey, Botswana, Mauritius, and of course South Africa, etc.). These countries want to implement a c. 20th conception of accelerated development inspired by the East Asian industrializers, but now in a climate and resource constrained world. Most important of all, after the publication of the UN SDGs in August 2015, the global discourse is going to shift from the old 'MDGs-plus-green economy' framework, to the globally approved SDG framework that firmly and irrevocably inserts the 'people-planet-prosperity-peace-partnership' paradigm into official definitions of sustainable development at global and national levels. The Future Earth partnership between the natural and social sciences will reinforce this. In essence, the SDG and Future Earth frameworks marry human well-being and sustainability goals in a way that reinforces what we have referred to in this paper as a just transition. This is what justifies the need to reconcile the core concerns of the DS and ST literatures.

We have argued that both the DS and ST literatures acknowledge that structural transformation is needed, but each with respect to the hitherto separated goals of human well-being (and more narrowly economic development) and sustainability (and more narrowly environmental improvements). Building on the emerging literatures on East Asia and (to a more limited extent) South Africa that attempts to fuse these separate research trajectories, we argued that an integrated conception of structural transformation will be needed that is driven by a commitment to both the goals of human well-being and sustainability. However, the expected just transition this could give rise to will not happen simply because there is a shared normative commitment, as is now reflected in the adoption of the SDGs and before that in the GED. Nor will much progress be made by formulating bland managerialist policy prescriptions that ignore underlying power dynamics and paradigm differences. We have therefore argued that an adequate fusion of the core body of concepts in the DS and ST literatures will need to make space for an understanding of political dynamics. For this purpose we proposed the notion of a socio-political regime: a space of policy-related action and engagement by a wide range of actors within and outside the formal political system that operates in four dimensions: power dynamics, paradigm commitments, state organization and policy programmes. The sustainability-oriented effects (and their counter-vailing tendencies) at landscape, regime and niche levels are played out within the socio-political regime, resulting in changes over time in power dynamics, paradigms shifts, state organization adaptations and the adoption of new policies. This regime change process can be initiated within one or multiple dimensions, either synchronistically or not.

To illustrate our argument we integrated several strands of research on democratic South Africa, showing how different the South African case is to the East Asian context with special reference to how the political settlement protected the core power structures of the socio-political regime thus preventing the implementation of a more radical developmental welfarist programme. Poverty was addressed via welfarism. The emergent outcome is an institutionally weak state that has not broken the power of the MEC within the socio-political regime, not promoted employment-creating industrialization and has facilitated accelerated financialization. At the same time a myriad of environmental and resource challenges have emerged, without an adequate paradigmatic framework

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to ensure full understanding of what is going on within the socio-political regime. The result is a wide range of seemingly disconnected ad hoc responses to these environmental challenges, but without what the East Asian economies emerged with after the turn of the millennium—a strong state to drive an ST in the same way that it drove developmental modernization. We are, therefore, quite pessimistic about the prospects for a just transition in South Africa at the moment. However, this is counter-acted by the remarkable story of the rapid growth of the RE niche in response to landscape pressures and supply crises within the energy socio-technical regime. The result was shocks and paradigms shifts within the socio-political regime that made possible a new alliance of forces that explains the emergence of this niche. There are, however, threats that socio-technical lock-in around coal and nuclear—plus the rent-seeking that large infrastructure projects make possible—will prevent this niche coalescing into an alternative socio-technical regime.

In light of the adoption of the SDGs and the launch of Future Earth, it will be necessary to conduct many more case studies of developing economies in the global South where developmental and sustainability goals need to be reconciled in order to achieve the just transition envisaged by these initiatives. This paper has contributed an approach that could guide this kind of future research.

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Notes

1. Although the notion of a 'policy regime' has been used in the systems innovation literature, it is never defined and its intent is mangerialist rather than a way of understanding political dynamics (see Foxon & Pearson, 2008). This is good reason not to use the same term.
2. The notion of a 'policy regime' originates in the US context where there is a very broad highly institutionalized political system that can be inclusive of a wide range of interests. This is not true in most developing countries where governing coalitions are often tied to formations located outside formal party-political and legislative systems, for example, trade unions and civil society movements. We therefore prefer the notion of a socio-political regime to denote this broader sense of alliance building, coalitioning and strategic leadership.

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