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Path creation for an electricity transition in South African tourism

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ABSTRACT

Transitions to low-carbon energy are central to sustainability transitions, with electricity being a pressing current concern both in South Africa and globally. Economic, social, institutional, and political factors often make transitioning to renewable electricity particularly complex. In this article, we examine electricity transitions in tourism from a global South context, combining evolutionary economic geography (EEG) concepts with the multi-level perspective (MLP). Our findings point to strong exogenous lock-in factors working against an electricity transition in South African tourism. A historic dependence on coal, along with complex place-based factors lock the country into a carbon-intensive electricity path at the national electricity infrastructure level. In turn, these complexities adversely affect an electricity transition in the tourism sector. However, energy policy change along with innovation by tourism actors is emergent stimuli for creating low-carbon electricity paths. More specifically, recent climate change mitigation policies, the increasing unreliability of grid electricity, and legislative reforms are significant factors encouraging the renewal of the electricity system. At the same time, it is becoming more cost-effective for businesses, including tourism establishments, to install renewables. The South African case contributes to the emerging body of literature on sustainability transitions in tourism. It does this by showing that to achieve a just energy transition, proper appraisal of path-dependent structural challenges is needed to understand the nature and levels of change required.

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Introduction

Low-carbon transitions are at the heart of the sustainability transitions agenda focused on fostering structural change, not least in tourism (Defeuilley, 2019; Pan et al., 2018). For a low-carbon transition in the tourism sector, a shift from fossil fuels to clean

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forms of energy is paramount, with the most urgent emphasis being on reducing the carbon intensity of the aviation industry (Gössling et al., 2023). Apart from tourist transportation, tourism has not traditionally been regarded as energy-intensive compared to other economic sectors. However, increasing electricity consumption by tourism establishments in destinations experiencing tourism growth leads to the expansion of the sector's ecological footprint (Khan & Hou, 2021). To date, limited research has been done on electricity transitions in the tourism sector. While there is a wealth of literature on electricity transitions from the energy studies and sustainability science fields, the interrelationships between electricity and tourism remain poorly understood (Amin et al., 2020; Manuel-Navarrete, 2016; Pan et al., 2018).

This article aims to examine electricity transitions in tourism in South Africa where the bulk of electricity (up to 80%) is generated from coal, making the country the world's sixth-largest generator of coal-fired electricity (Pierce & Le Roux, 2023). As analysed in this article, South Africa's transition to less carbon-intensive electricity has been slow. Since 2008, the country has been plagued by insufficient electricity supply to meet the local demand, leading to frequent intermittent blackouts locally known as *load-shedding*. The causes of this electricity crisis are historical and complex, with transitions being 'deeply political' because of 'powerful and deeply entrenched interests' (Baker et al., 2014, p. 814). Notwithstanding power dynamics at play, social justice features prominently in policy debates on a just transition. Concerns about any transition centre on the impact on employment and the need for energy security (The Presidency, 2023).

Tourism is an important economic sector in South Africa. In 2019, the country welcomed over 10 million foreign visitors, and the sector contributed up to 6.4% of the gross domestic product along with 1.5 million jobs (9.3% of total jobs) (SAT, 2021). These figures have contracted significantly because of the COVID-19 pandemic. The losses sustained by tourism businesses during the pandemic (Booyens et al., 2022) combined with the frequent blackouts – which have worsened in 2023 (Holm Energy, 2023), generally for several hours a day – are hampering the financial recovery and viability of tourism businesses in a struggling economy. Additionally, the costs associated with new infrastructure are a barrier to greening the tourism sector, especially for small tourism businesses (Pandy & Rogerson, 2019). However, the removal in August 2021 of the requirement to obtain a licence for energy installations with a capacity of up to 100 MW (megawatts) is a significant development. This energy policy change, combined with the decreasing costs, enhances the feasibility of businesses installing rooftop photovoltaic (PV) (that is solar electricity) systems (Ebhota & Tabakov, 2022; Pandarum et al., 2019). These changes have a positive impact on tourism establishments adopting technologies generating electricity from renewable sources (hereafter referred to as 'renewables').

This article addresses a research gap vis-à-vis sustainability transitions research in tourism, with an emphasis on electricity in South Africa. Extant sustainable tourism research lacks coherent theoretical bases and remains detached from the wider sustainability transitions agenda (Niewiadomski & Brouder, 2022). The tourism sustainability literature routinely highlights the practices of 'sustainable' or 'responsible' tourism enterprises installing renewables (Fennell & Cooper, 2020; Musavengane, 2019). However, Fennell and Cooper (2020) urge tourism firms to demand energy efficiency

throughout their supply chains, highlighting the need for structural change to enable destination sustainability (also see Loehr & Becken, 2023; Weaver et al., 2022). We observe that the literature on tourism greening initiatives in southern African countries tends to be limited to single tourism establishment case examples or localised perspectives. Given this research problem, we discuss tourism innovations with path-creating power for electricity transitions owing to their reach beyond the firm level or local scale.

Our research design involves using evolutionary economic geography (EEG) concepts and the multi-level perspective (MLP) as an analytical framework to scrutinise the factors affecting electricity transitions in the South African tourism sector. The core EEG concepts of path dependence, lock-in (and de-locking), and innovation are accordingly employed in this article. We also examine path-creation factors linked to policy innovation and tourism innovation for low-carbon transitions. This approach is in keeping with suggestions by Niewiadomski and Brouder (2022) who stress the value of using EEG, as a well-established framework, to theoretically enhance sustainability transitions research in tourism. In addition, we incorporate the MLP, from the 'socio-technical transitions' paradigm used in the sustainability transitions research, to unpack regime-level and niche-level factors impacting a tourism electricity transition. The next section elaborates on the theoretical framework used in this article.

Theoretical framework

EEG is a theoretical framework underscoring 'the processes by which the economic landscape—the spatial organisation of economic production, distribution and consumption—is transformed over time' (Boschma & Martin, 2007, p. 539). EEG theory applies various evolutionary economic concepts to investigate the spatial processes and place-based dynamics of economic systems, landscapes, and economic novelty (Niewiadomski & Brouder, 2022). Relevant concepts, central to EEG theory, are outlined below.

Economic systems, also socio-economic or socio-political systems, are characterised by complexity embedded in multi-actor and multi-dimensional processes. Path dependence is concerned with the inherent legacies of historical factors that pave particular development trajectories within economic systems – these are locally emergent and contingent (as per Martin, 2009). Multiple paths (either complementary or contesting) typically emerge within an area or destination (Brouder, 2014). The concept of lock-in is closely associated with that of path dependence: the cumulative nature of past effects either catalyses the implementation of new technologies (innovation) or adversely leads to lock-ins in the absence of technological change (Ma & Hassink, 2014; Martin, 2009). Irreversible losses are incurred when firms and/or regions are 'locked into' outdated or unsustainable technologies because of failure to (1) respond to change and (2) transition to more sustainable paths (Boschma & Frenken, 2006; Gill & Williams, 2014). Lock-ins range from being 'strong' to 'weak', with political–institutional and economic–structural factors affecting their relative strength (Hassink, 2010). Therefore, lock-ins are evidenced in institutional regimes where the 'weight of inherited investments, practices and skills hampers their ability to adopt new practices' (Niewiadomski & Brouder, 2022, p. 97). While Boschma and Frenken (2006) aver that

once a 'pattern has settled historically, it becomes largely irreversible' (p. 267), they contend that 'firms are not only victims of their history in time and space: routines can be changed by innovation' (p. 292).

While the path dependence literature initially held that new paths are the result of chance events or historical 'accidents', there is growing recognition that the emergence of new paths is linked to actors actively influencing path-creation processes (Niewiadomski & Brouder, 2022). Accordingly, path creation is fostered through 'mindful deviation' from unsustainable paths by actors (firms and organisations) making strategic decisions to catalyse change and implement economic novelty (Gill & Williams, 2014; MacKinnon et al., 2019). Moreover, path creation and path destruction are mechanisms for 'de-locking' (MacKinnon et al., 2019). De-locking processes may be gradual and continuous in development when seen from a path-dependence perspective, but more radical changes attributed to novel innovation resulting from major shocks and criticalities are also observed (Boschma & Martin, 2007). EEG theory holds that innovations (i.e. new and improved products, processes, and technologies) are a catalyst for path creation that displaces older technologies to avoid lock-in over time (Brouder, 2014; Defeuilley, 2019; Gill & Williams, 2014). Therefore, innovation can be regarded as a renewal factor, creating transition paths towards sustainability (Figure 1).

As per the MLP, factors affecting transitions occur on different spatial scales outlining the niche (micro), regime (meso), and landscape (macro) levels (Hecher et al., 2016; Lee et al., 2020). This investigation's niche level concerns the actions – that is, tourism policy innovation and innovative behavior – of tourism actors and firms. The regime level refers to state-run coal-generated electricity (known as Eskom), and national-level policies and structures (as per Baker et al., 2014). Given the complexity and multi-dimensional character of electricity systems, to enable change, regime-level policies must address structural and technological hurdles (Lee et al., 2020). Moreover, policy intervention is vital for sustainability in tourism because the sector is

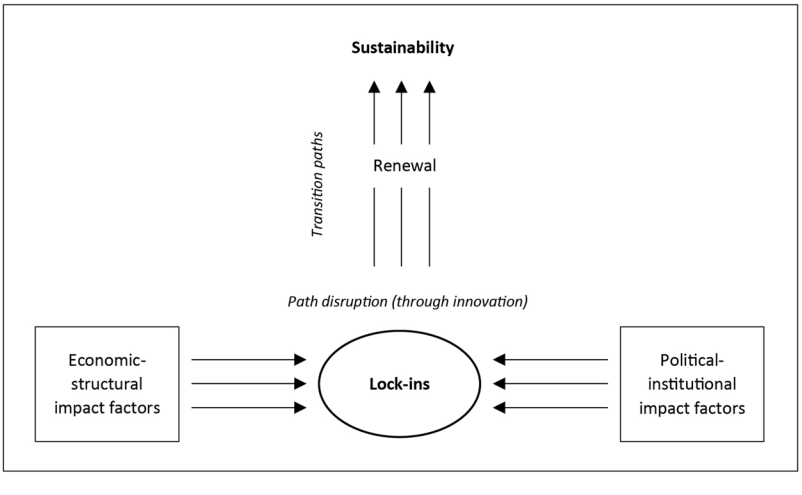

Figure 1. The relationship between lock-in and renewal factors for sustainability transitions (Source: Authors, adapted from Hassink 2010, p. 454).

characterised by a high level of fragmentation and a general lack of collaboration (Loehr & Becken, 2023; Nyanjom et al., 2018). The landscape level, in turn, includes influences from the external environment on energy transitions in a particular context. An example of a landscape factor would be climate finance needed to fund renewable energy transitions in the global South. The grant share of international support packages tends to be small (see the 'electricity policy change' section of the analysis) with the rest being debt. South Africa, like many countries in the global South, faces a heavy debt burden that limits the state's productive investments, including in renewable energy infrastructure. It also restricts the potential for concessional financing facilities for renewable energy uptake in industry, including in tourism.

The importance of energy justice comes to the fore in the energy transitions and sustainable tourism literature, and justice considerations form part of the practices and politics of sustainable energy transitions (Sareen & Haarstad, 2018; Scheyvens & Biddulph, 2018). Nonetheless, sustainability transitions should be understood as disruptive, contested and non-linear; and typically affected by the vested interests of those in power who want to maintain a certain status quo or seek alternative outcomes (Baker et al., 2014; Ioannides et al., 2014). Therefore, issues of politics, power dynamics, and considerations of who benefits are critical considerations in debates on just transitions and sustainable tourism alike (Bramwell, 2011; Köhler et al., 2019; Manuel-Navarrete, 2016). These are some of the factors influencing energy justice in electricity transitions. The impacts of decarbonisation on livelihoods, workers, and communities are key concerns requiring appropriate attention in debates on energy transitions.

Methods

Critical thematic analysis

For this investigation, we selected critical thematic analysis as an appropriate method fitting with our research design. Thematic analysis is a standard method to analyse qualitative (primary and secondary) data, including media articles, policy documents, research reports or studies, and other texts. Thematic analysis is therefore a form of content analysis (also called conceptual analysis). The Braun and Clarke (2006) process is a classic approach for thematic analysis including the steps of (1) familiarising oneself with the data, (2) generating initial codes, (3) identifying themes, (4) reviewing themes, (5) defining and naming themes, and (6) finally reporting the findings. However, classic approaches to thematic analysis are not necessarily informed by extant theoretical frameworks. Critical research is political in nature, with constructionist approaches to thematic analysis considering latent themes 'imbued with ideologies [political]' to 'theorise the sociocultural contexts and structural conditions' underlying phenomena (Lawless & Chen, 2019, p. 93). Lawless and Chen (2019) propose that thematic analysis is flexible enough to allow critical researchers to apply theoretical frameworks of their choosing to their analyses, with critical thematic analysis drawing specific attention to social issues, power relations, and ideologies.

In our analysis, we reviewed academic literature about the electricity system and the impact of lock-in and renewal factors on tourism firms in South Africa. Our sources

included articles on the political economy of electricity in South Africa, since this work illuminates issues of politics, power, structural barriers, social justice and inequality that are theoretically important for this research (see Baker et al., 2014; Bellos, 2018; Bowman, 2020; Lawrence, 2020; Todd & McCauley, 2021; Woode-Smith, 2019). In addition, relevant statistics, research reports and working papers, media articles, policy documents and parliamentary briefings and other briefing notes on recent developments were also considered. Academic literature, policy documents (particularly DME, 2011, 2019; DoT, 2019, 2021), and organisational reports (particularly CLH, 2022; SANParks, 2021) informed the second section of the analysis focusing on tourism innovation. We also drew on selected data for empirical case examples on tourism innovation vis-à-vis the adoption of renewables.

As per the Braun and Clarke approach, we started with an overview of selected texts about historic considerations regarding electricity production and provision, recent energy policy and regulatory changes, tourism policy development and change, tourism greening initiatives, and the responsible behaviour of tourism firms. We used several initial codes as informed by our theoretical framework (Figure 2). Through an iterative process, we developed themes that we reviewed, defined, and named for use in our analysis. This process required the re-reading of key texts, in addition to identifying gaps and looking for additional information. Note that not all texts reviewed and mentioned in Figure 2 are referenced in this article – only the most important and relevant ones are cited.

Tourism innovation data sources

In addition to the critical thematic analysis, several available data sources on the uptake of renewable electricity by tourism establishments were consulted (key sources included Booyens & Rogerson, 2016; Dube & Nhamo, 2021; Dube & Mearns, 2019; Glocker & Haxton, 2020; Hoogendoorn et al., 2015; Pandy & Rogerson, 2019; Phophe & Masubelele, 2021; Musavengane, 2019; Rogerson, 2020; and Rogerson & Sims, 2012). Note that there is no comprehensive national-level database on renewable electricity use in the tourism sector in South Africa. While there are a few studies on renewable electricity uptake by tourism businesses, these offer a limited picture. Most of these are case studies, limited in scope and geographical reach. To build a broader perspective on tourism innovation vis-à-vis renewable electricity, we selected three data sources. As South African tourism geography, tourism policy, and energy studies researchers, we purposively chose the tourism innovation case examples included, based on our knowledge of tourism policy, new developments and known innovative tourism establishments. We endeavoured to include both small and large tourism firm activity (see sources one and two below), in addition to innovation by the pre-eminent government agency responsible for protected areas management in the country (source three). These innovation case examples were not selected as a representative view of renewable electricity uptake in the sector; our focus was rather on tourism innovation with identifiable scale dimensions.

The first data source identified is a national government programme that co-funds energy efficiency and renewable electricity uptake by tourism establishments. *The Green Tourism Incentive Programme* (GTIP*)* is run by the national DoT and was

Initial codes used	Theoretical concepts incorporated	Themes developed	Themes defined and named (for analysis)	Key (most relevant) sources used in analysis	Sources consulted (type and number)
Resources (coal) Technology (current and historical) Politics (current and historical) Economy/economics (current and historical) Social issues (current and historical) Tourism development and policy (new and historical) Legislation (new) Recent changes to electricity policy and regulations Role of institutions (energy and tourism) Tourism firm-level behaviour/barriers Innovations by tourism actors (firms, policy and organisations)	**REGIME LEVEL (RL): THE ELECTRICITY SYSTEM**				**TOTALS**
	Lock-in factors			RL-A. Baker et al., 2014; Bellos, 2018; Bowman, 2020; Davy et al., 2021; Pandarum et al., 2019; Phophe & Masubelele, 2021; Lawrence, 2020; Todd & McCauley, 2021; Woode-Smith, 2019 RL-B. Majavu, 2021; Ngcuka, 2022; Tyler & Steyn, 2021; Van der Poel & Kota, 2021 RL-C. DME, 2011, 2019; South African Government (2021); The Presidency (2023) RL-D. Pierce & Le Roux, 2023; Stats SA, 2022	A. Academic articles (*N*=29) B. Media articles, Parliamentary briefings; other briefing notes (*N*=15) C. Policies, legislation, and initiatives (*N*=13) D. Statistics, research reports/working papers (*N*=22) E. Organisational reports (*N*=8)
	Political-institutional impact factors Economic-structural impact factors	Wider historic economic and political considerations Failing technologies and infrastructure Eskom governance crises: high levels of debt; allegations of corruption; operational challenges Social issues: Resistance; social inequality; just transitions; energy security Barriers: regulatory obstacles; cost of renewables; grid challenges	Resource dependency The role of politics A lack of technological change		
	Renewal factors				
	Energy policy, new developments, and regulatory changes	Energy policy change Legislative reforms	Energy policy innovation		
	NICHE LEVEL (NL): INNOVATION BY TOURISM ACTORS				
	Lock-in factors			NL-A. Booyens et al., 2022; Booyens & Rogerson, 2016; Dube & Nhamo, 2021; Dube & Mearns, 2019; Hoogendoorn et al., 2015; Hoogendoorn & Rogerson, 2015; Pandy & Rogerson, 2019; Musavengane, 2019; Rogerson, 2020; Stoffelen et al., 2020 Rogerson & Sims, 2012 NL-B. Parliament of South Africa, 2022 NL-C. DoT, 2019, 2021 NL-D. Glocker & Haxton, 2020 NL-E. SANParks, 2021; CLH, 2022	
	Tourism electricity transitions as impacted by regime-level factors	Regime level factors leading to lock-in Barriers: cost of renewables; lack of incentives	The electricity dependency Limited historical adoption of renewables		
	Renewal factors				
	Path disruption and creation factors linked to innovation by tourism actors	The tourism policy environment for responsible tourism in South Africa Business responses to the energy crises	Tourism policy innovations Renewable technology adoption by establishments*		

Figure 2. The critical thematic analysis process followed.

introduced by the department in November 2017 to support firms nationwide to become more energy efficient. It is further used to install renewables. The GTIP targets tourism SMEs (micro, small and medium enterprises) with a turnover of up to ZAR 45 million (USD 2.3 million).[1] In response to a data request from the authors, a letter from the DoT was received on 30 June 2022. It provided high-level data on the number of applicants to the GTIP, their approval rate, and the value (estimated cost) of the resource improvement interventions (including the private sector's share of this cost).

The second source of data concerned the integrated annual reports of the three hotel groups listed on the Johannesburg Stock Exchange (JSE): City Lodge Hotels (CLH) Limited, Southern Sun Limited, and Sun International Limited. As listed companies, their annual reports and performance are public, and integrated annual reports for these hotel groups were consulted. Owing to space limitations in this paper, we only included CLH, since of the three hotel groups, it provided the most ideal example of best practice.

To extend the analysis of innovative practices, a third source, South African National Parks (SANParks, the national parks authority) was examined. SANParks is the custodian of the country's 21 national parks and is also the largest provider of accommodation in the country in terms of available beds. Given SANParks' clear environmental mandate, their renewable energy plans were deemed to be of interest to the researchers.

The analysis presented next consists of two main sections. First, we outline lock-in and renewal forces at the regime level. Thereafter, our attention turns to an appraisal of tourism policy developments and innovations (niche-level). While part of the MLP, scrutiny of landscape factors is beyond the aims and scope of this article.

Analysis

Regime level: the electricity system dynamics

Electricity lock-in

Resource dependence on coal. Under apartheid, plentiful coal resources and 'cheap' labour ensured inexpensive electricity for decades. This dependency on coal has a structural economic character embedded in the country's minerals-energy complex (MEC). The MEC resulted in an economy reliant on electricity generated from low-grade coal to support energy-intensive industrial activities and mining. Although recent decades have been marked by industrial decline and a shift to a service-based economy, the MEC is a historical path-dependent factor contributing to a carbon-intensive electricity lock-in. This lock-in is underpinned by a strong symbiotic political and technological relationship, discussed in more detail below.

The role of politics in electricity generation has historical dimensions and continues to manifest in several ways that are hampering the transition to renewables. At the institutional and regime levels, Eskom is central to the electricity crisis, a 'microcosm of tensions in the post-apartheid political economy' (Bowman 2020, p. 427). Earlier investments in renewable electricity were negated by the continued availability of

coal and the relative affordability of coal-fired electricity, coupled with a historic lack of political will to push a renewable electricity agenda.

The National Party came to power in 1948 and used Eskom to preserve the political and corporate interests of Afrikaner nationalism and private mining capital alike. Under apartheid, Eskom was mandated to be solely responsible for all electricity generation and transmission in the country. Apartheid-era policies also led to racialised inequalities and under-development in designated 'non-white' areas, not least concerning electricity access. Since the end of apartheid, as part of the state's redistribution efforts, Eskom has extended the national electricity grid to previously neglected rural areas and townships. As a result, households with access to electricity increased from 34% in 1994 to 89% in 2021 (Stats SA, 2022). Regardless of the more equitable electricity distribution since the end of apartheid, the centrality of Eskom in electricity generation has continued to serve the interests of the new political elite. High levels of debt and corruption linked to so-called 'state capture' by a powerful elite associated with the ruling party, the African National Congress (ANC), have further damaged the utility in recent years. Eskom's interconnected operational, financial, maintenance and governance crisis is compounded by contestations between various interest groups, in turn delaying essential policy reforms. For example, the government under the ANC attempted to introduce private sector investment to the electricity market by prohibiting Eskom from building new power plants in the late 1990s as part of its Black Economic Empowerment agenda. However, the low electricity price meant the construction of new electricity generation capacity was not profitable for private sector investors, and expectations of black entrepreneurs entering the electricity market did not materialise. Eskom was permitted to develop new projects again in 2004, far too late to address the shortfall in supply.

Furthermore, social and political resistance influences the transition away from coal. Continued destabilising episodes of labour strikes at mines – accompanied by extreme violence in some cases – form part of the political economy of mining and energy transitions in South Africa. Because of the associated job losses in a country with an unemployment rate above 35%, politically powerful labour unions in the fossil fuels and energy sectors have actively opposed the closure of coal mines and coal-fired power stations (see Majavu, 2021). As stressed by The Presidency, the livelihoods of vulnerable workers and communities, i.e. women, youth, and mining communities, need to be protected in a move away from coal.

A lack of technological change. There has been a shortage in electricity supply since the mid-2000s and this has continued to worsen. While the national grid has been extended, generation capacity has yet to be maintained and sufficiently increased in capacity to meet the electricity demand. This shortfall is compounded by the ageing – and accordingly failing – electricity generation infrastructure at crumbling coal-fired plants. Consequently, the electricity system is locked into outdated technologies and electricity infrastructure, pinning the country on a carbon-intensive electricity path. There has been systemic under-investment in new and renewable electricity technology by the state that, for economic, institutional and political reasons, has also blocked competitive private sector participation in electricity provision (during and after apartheid).

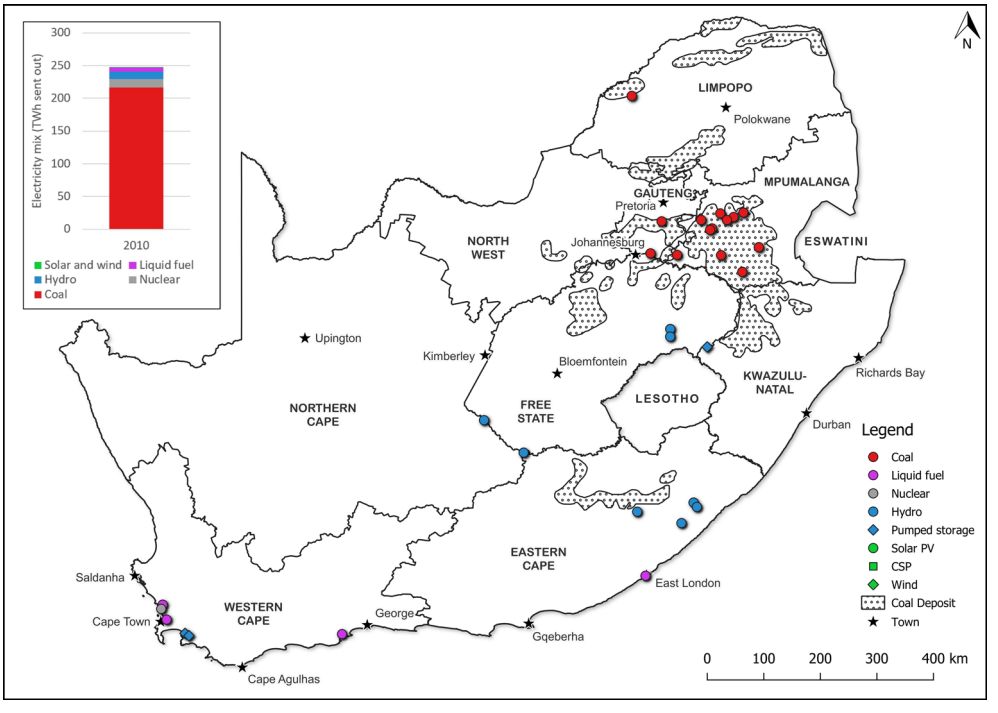

Figure 3. The electricity mix in South Africa in 2010 (Source: Authors).

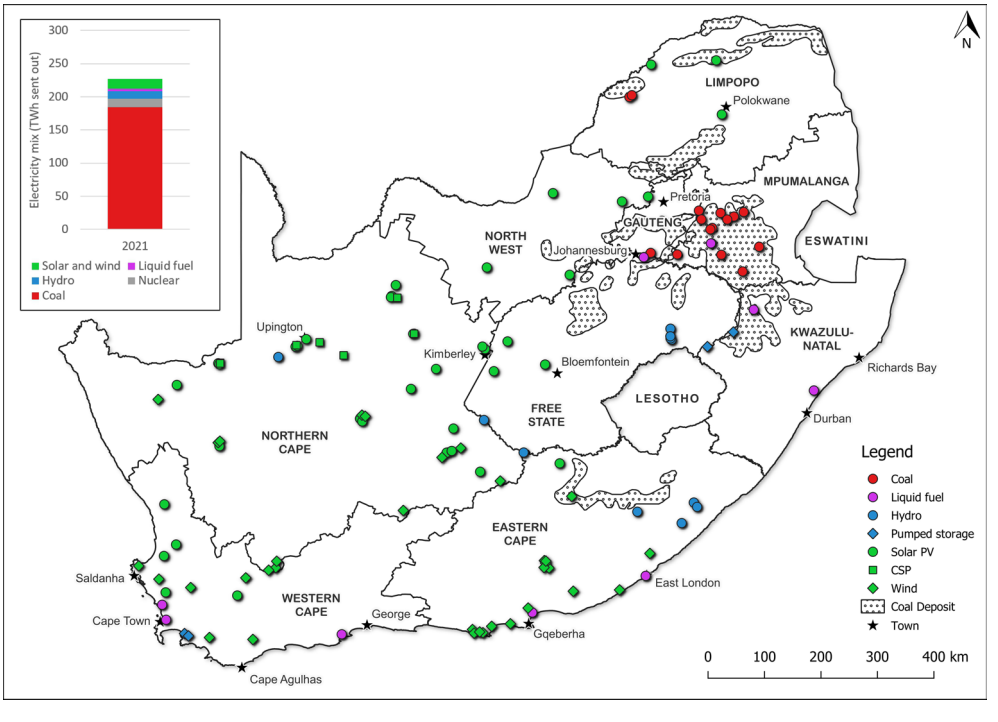

Figure 4. The electricity mix in South Africa, 2011–2021 (Source: Authors).

The new major coal-powered electricity plants, Medupi and Kusile, have been considerably delayed, become extraordinarily costly, and are still not producing at full capacity. The recent construction of these costly assets has clear lock-in implications for coal-intensive electricity in the coming decades. Because of the late adoption of renewables, the country is starting from a very low renewable base. The total amount generated by renewables (wind and solar) constituted only 7% of the country's electricity supply generated at the utility scale in 2022 (Pierce & Le Roux, 2023).

Electricity policy change

There is an emergent policy urgency for South Africa to move away from its dependence on coal for electricity generation. While South Africa had already ratified the United Nations Framework Convention on Climate Change in 1997 and published the *Renewable Energy Policy* in 2004, a noteworthy turning point first occurred in 2010. The first renewable energy initiative in South Africa, the renewable energy-feed-in tariff (REFIT), supported by the national energy regulator (NERSA) led to the approval of the restructured Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) linked to the 2010 *Integrated Resource Plan (IRP)*. The REIPPPP allowed renewable generators to supply to the national grid through a competitive bidding process and was the first step towards greater participation by smaller private producers in electricity production.

Figure 3 shows the energy mix in 2010 before the REIPPPP was implemented. The dominance of coal-fired power stations, concentrated in the north-western part of the country, is evident. Figure 4 reveals that the renewable portion of the energy mix has slowly been increasing over the last decade, resulting in a decentralised pattern of electricity production across the country. However, the allocations made for renewable generation in the 2010 IRP and then more recently in the 2019 IRP remain inadequate, with restrictions placed on the annual building of new solar and wind capacity.

In August 2021, a significant legislative change occurred when a new measure was introduced in Schedule 2 of the *Electricity Regulation Act* allowing smaller generation facilities with a capacity of up to 100 MW to sell power without a licence. Then in September 2021, as per the Paris Agreement, the country renewed its commitment to reducing national greenhouse gas emissions. At the same time, a *Climate Change Bill* was passed to transition the country to a low-carbon economy and society.

Following the Conference of the Parties (COP26) held in Glasgow in November 2021, South Africa partnered with the governments of France, Germany, the United Kingdom, the United States, and the European Union to negotiate a climate finance package through a Just Energy Transition Partnership. In November 2022, the *Just Energy Transition Investment Plan* (JET IP) was announced to outline how the USD 8.5 billion packages will be used to decommission coal-fired plants, expand the transmission grid and distribution infrastructure, and deploy renewables. While the funding package is insufficient to address all the local energy challenges, it could unlock further opportunities for change at the electricity system level. However, the grant share of total JET IP financing to be provided by the international partners is very little, around 3%. The rest is debt, and while some of it is at preferential rates it will still need to be serviced.

Responses by tourism establishments

We identified strong regime-level lock-in factors adversely affecting an electricity transition in the tourism sector and locking the sector into a carbon-intensive energy path. Historically, tourism establishments relied on Eskom for electricity because of its monopoly and restrictions placed on private electricity producers in the past. This dependency, along with the high costs of renewables, hampers the widespread adoption of renewables by tourism establishments. This said energy policy reform at the national level is a substantial factor disrupting the country's carbon-intensive electricity. Equally, the electricity crisis has driven micro-level adaptation by businesses, including tourism establishments, installing their own, often renewable, electricity supply. Several tourism studies point to the use of PV panels and geysers, heat pumps, small wind turbines, energy-saving measures, and green building in the sector.

Niche level: innovation by tourism actors

Tourism policy for responsible tourism

The first significant policy instrument for responsible tourism was the 1996 *White Paper on the Development and Promotion of Tourism in South Africa*, followed by the 2002 *National Guidelines for Responsible Tourism* published by the then Department of Environmental Affairs and Tourism. Responsible tourism principles were also embraced at the local level, with municipalities including these in their local economic development and/or tourism sector plans. In 2011, the South Africa Bureau of Standards National Minimum Standard for Responsible Tourism (SANS 1162) was introduced to offer responsible tourism criteria for tourism establishments. In terms of energy, the standard includes criteria for firms to take steps to reduce electricity use.

In 2021, the DoT published the *Tourism Environmental Implementation Plan*, a requirement of the *National Environmental Management Act*, to facilitate greater participation by tourism establishments in renewable electricity generation and saving. This plan includes actions relating to the introduction of electricity efficiency programmes, electricity use assessments, and an electricity retrofit programme. Resource mobilisation to support the plan's implementation is channelled through the GTIP aimed at encouraging private sector adoption of renewables towards a longer-term sector-wide transformation as its broad objective. The fund provides grants of between 30% and 90% of the cost of proposed interventions, capped at ZAR 1 million (USD 52 thousand) per applicant.

Renewable electricity innovation by tourism establishments

GTIP uptake by tourism SMEs. Even though the uptake and resources allocated are

Table 1. Projects supported by the GTIP (Nov 2017–Mar 2022).

Total applications received	No. of resource efficiency audits	No. of approved projects	Value of grant funding for approved projects	Value of private sector contribution to approved projects
699	212	111	ZAR 68.6 million (USD 3.6 million)	ZAR 34.2 million (USD 1.8 million)

Source: Authors' table based on data provided by DoT.

Table 2. Renewable electricity adoption by CLH.

Size of operations (hotels and hotel rooms)	Renewable electricity generation	Brands and locations
7534 rooms across 59 hotels in Southern Africa (95% are in South Africa)	4,250 solar PV panels have been installed at 2 hotels (about 40% of their properties). There are plans for solar panels at a further 10–15 hotels to add another one million kWh/year to its generation capacity.	The 24 (City Lodge, Road Lodge, and Town Lodge) properties are located in Johannesburg, Pretoria, Bloemfontein, Kimberley, Mbombela, Potchefstroom, Rustenburg, Umhlanga, and Windhoek (Namibia). The highest concentration is within the Johannesburg urban area where 14 of the 25 properties are located.

Source: Authors' table based on CLH information.

modest as shown below, this is an important example of innovation on the niche level supported by tourism policy at the national level. By March 2022, 111 approved projects received grant funding to the value of ZAR 69 million (Table 1). According to the DoT, many applications were declined or withdrawn owing to non-compliance with eligibility criteria or non-submission of the requested information. The total value of these 111 projects is estimated at ZAR 102.8 million (USD 5.3 million), of which the GTIP pays approximately two-thirds, and the firms finance the remaining third.

While interest in the GTIP has been growing, for the period 2020–2022, installations and contracting slowed because of the COVID-19 pandemic. Small tourism firms have reportedly been struggling to meet the application requirements because their financial accounting practices fail to meet the minimum requirements. A further challenge to the programme is the limited number of experienced and qualified resource efficiency auditors, particularly in remote parts of the country. Despite some progress, the GTIP's budget allocation and targets suggest that the programme's roll-out is unlikely to continue at the desired scale. The overall funding allocation to the Tourism Incentive sub-programme of the DoT (which includes the GTIP and other incentives) was set to decrease by 16% in 2022/23. Furthermore, the ten beneficiaries a year target for the GTIP for 2022/23–2024/25 (DoT, 2021) is negligible, given the estimated 50,000 small tourism businesses that were operating in 2018 and the 699 applications already received.

City Lodge Hotels (CLH). Of the three listed hotel groups on the JSE, only CLH has rolled out renewable energy installations (Table 2). Sun International and Southern Sun indicate their intention to consider renewable energy in the future, but their current focus is on energy efficiency and demand-side management. In contrast, CLH represents an innovative example of what a hotel group can achieve by installing renewables at a number of their properties across the country. In 2020, new PV panels generated 1.8 GWh (Gigawatt hours), just over 10% of their electricity requirements.

SANParks. [2] PV panels have been installed at 19 SANParks nationwide.[3] Between 2015 and 2018, 2,577 kWh of their electricity was solar generated, avoiding 5,475 tCO2e through its renewable base. In 2020, more panels were installed across their parks at accommodation facilities, ranger posts, a new science leadership centre and water pumps at the Addo National Park. Compared to the United States National Park Service benchmarks, 13 SANParks are below the 935 tCO2e permitted yearly for a park to be considered environmentally friendly in terms

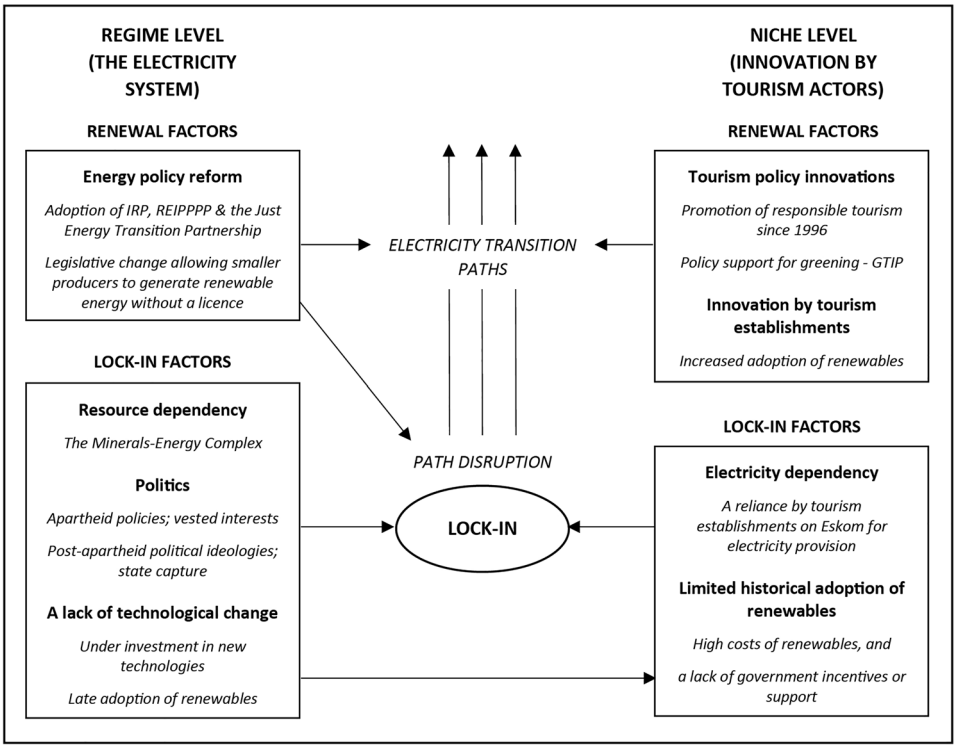

Figure 5. An MLP perspective on an electricity transition in South Africa (Source: Authors).

of its emissions. SANParks' recent draft, *Green Energy Strategy and Implementation Plan* and the *Carbon Footprint and Future Emissions Reduction Report* outline mechanisms to track and manage their emissions and carbon footprint.

The innovations presented above, both on policy and establishment levels, are important renewal factors stimulating path creation for an electricity transition in the tourism sector. The innovations outlined have scale dimensions reaching several establishments within a group and beyond the local level. The GTIP is a national-level initiative, CLH have adopted renewables at 24 properties in eight cities in South Africa, and SANParks have PV installations at most parks nationwide, typically in rural locations.

Discussion

Based on our analysis, we stress that multi-level changes are required for electricity transitions, i.e. regime-level change accompanied by micro-level innovation (Lee et al., 2020). This investigation has demonstrated that regime-level lock-in factors affect lock-in at the niche level (Figure 5). Accordingly, tourism firms are constrained by a reliance on Eskom, the high cost of renewables, and a (historical and general) lack of government incentives. However, this picture is changing because of policy innovations on the regime and niche levels alike. This article details long overdue national policy and legislative reforms necessary for path disruption and renewal in the electricity system, which also creates an enabling environment for tourism establishments

adopting renewables to a greater degree than before. In addition, tourism policy support for participation by tourism establishments in renewable electricity generation is underscored by the enduring promotion of responsible tourism acting as a path creator that has enabled the spread of responsible tourism practices. However, there remains the need for structural innovation to extend renewable electricity roll-out in the tourism sector and wider collaboration to enable it.

Key contributions of this research to the emerging sustainable transitions literature in tourism follow. Firstly, a significant implication of our findings is tourism firm-level innovation would be insufficient to bring about electricity transitions given the strong lock-in factors identified. Indeed, firm-level resilience and self-sufficiency (i.e. tourism establishments adopting renewables as necessitated by the increasingly unreliable electricity supply) mean little for small tourism firms unable to afford or fund the 'own contribution' required by the GTIP. Thus, public policy has an essential role to play in addressing structural and technological hurdles hampering transitions in both the electricity and tourism contexts (see Bramwell, 2011; Lee et al., 2020; Loehr & Becken, 2023). This presents a departure from conventional neoliberal understandings of innovation foregrounded by technological innovation and market perspectives (Booyens & Brouder, 2022; Köhler et al., 2019).

The second contribution concerns the nature of innovation in relation to tourism establishments introducing renewables. The emphasis on innovation from a techno-scientific perspective is typically on novelty, with tourism establishments regarded as 'defective' when it comes to innovation (see Hjalager, 2002). However, innovation from a sustainability perspective does not need to be novel to achieve environmental and social outcomes in tourism (Booyens & Brouder, 2022). The tourism innovations discussed in this article should be understood as incremental, since tourism establishments typically do not develop new technologies themselves, but rather exhibit innovative behaviour when adopting renewables (Booyens & Rogerson, 2016). Incremental innovation, and micro-level adaptation, can through continuous improvement, cumulatively lead to more radical and long-term change (Köhler et al., 2019; Weaver et al., 2022). However, a shift in path dependence is only achieved when a technology or practice has become established (Martin, 2009) which is not yet the case in South Africa.

Our third contribution comes from our reflection on just electricity transitions and the connection with tourism. Our analysis shows that there is a tension between electricity security and renewable electricity transition in South Africa. While progress has been made in bringing electricity to previously neglected areas and communities to redress racialised spatial inequalities, over 10% of households remain un-electrified. Poor communities are also most affected by *load-shedding*. Local distribution networks in low-income communities frequently get overloaded and trip since the restoration of connections is not prioritised by local municipalities. Furthermore, poor households are typically unable to afford electricity from private suppliers or install self-help solutions that are available on the market. As a further complication, a transition to clean electricity evokes protests from unions and workers in the mining sector because of the threat of additional job losses in a country with an extremely high level of unemployment. We would, therefore, question the extent to which the tourism establishments can in fact contribute to a just electricity transition. For poor communities, the impact of tourism establishments installing renewables is arguably negligible. For

this reason, neoliberal self-help solutions are insufficient for ensuring sustainability and just transitions as stressed above.

Conclusions

The South African case shows that modest gains have been made in renewable electricity deployment at the national level and tourism innovations are creating paths for electricity transitions. However, we conclude that the tourism sector has been unable to de-lock itself, to date, from the unsustainable energy path deeply embedded in complex local dynamics working against an electricity transition. A shift in path dependence resulting from the cumulative effects of tourism innovation is not yet evidenced in the tourism sector. We emphasise the indispensable role of public policy to foster transformative change and create an enabling environment for sustainability transitions. It is unlikely, and perhaps unreasonable to expect, that structural issues and equality can be addressed by tourism firm-level practices. The state, and its institutions, must therefore be called to greater responsibility, commitment, and accountability to advance the social sustainability of a country's energy policies. In terms of future research, the impact of landscape factors and structural constraints on sustainability transitions in tourism both need to be understood better. Concerning the sustainable tourism research agenda, there remains a need for more research considering the scope and scale of tourism innovation at the firm and destination levels alike.

Notes

1. ZAR 1 = USD 0.052 on October 8, 2023. The conversions included in the paper are based on this exchange rate.
2. While SANParks is a public entity, the accommodation providers in the parks operate as businesses to generate income and profits.
3. Owing to space limitations in the article, we have not mentioned all the locations.

Disclosure statement

No potential conflict of interest was reported by the authors.

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