

# Multilevel integrated planning and greening of public infrastructure in South Africa

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**Titre : Planification intégrée multi-niveaux et verdissement des infrastructures publiques en Afrique du Sud**

## Résumé

Le gouvernement sud-africain a annoncé la croissance verte comme l'une de ses priorités. Il a également mis en place un nouveau système de planification intégrée multi-niveaux, et annoncé un plan massif d'investissement dans les infrastructures publiques. Le point de convergence de ses trois évolutions récentes devrait être l'intégration des principes de « verdissement » des infrastructures dans le nouveau système de planification. En appliquant une grille d'analyse issue des travaux sur l'intégration des politiques environnementales, cet article cherche à évaluer si cette convergence prend réellement forme. Il analyse la capacité du système de planification à intégrer les principes gouvernement le verdissement des infrastructures et propose des options pour leur meilleure prise en compte.

**Mots-clés :** Planification, infrastructures, croissance verte, intégration des politiques environnementales

## Abstract

The South African government has named the transition towards a greener economy one of its priorities. Meanwhile it has developed a new multilevel integrated planning process, and announced a massive public infrastructure investment plan. The converging point of these three dynamics should be the integration of green infrastructure principles into the planning process as the foundation of the green transition. This paper uses a policy integration analytical framework to assess whether this convergence is in fact taking shape. It unravels the ability of the multilevel process to integrate green infrastructure principles and suggests options to move the green infrastructure agenda forward.

**Keywords:** planning, infrastructure, green economy, environmental policy integration.

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# 1 Introduction

Like many emerging and developed countries, South Africa contemplates the transition towards a more sustainable development path as a significant opportunity for future growth. Government declarations and recently released policy documents have highlighted the importance of introducing the green economy in South Africa's long term development plan, with some concrete measures thereof. Green economy definitions oscillate from a progressive development of new economic sectors, to much more ambitious prospects focusing on the relative or absolute decoupling of economic growth from the use of natural resources. South Africa has targeted the former approach, as illustrated by the implementation of renewable energy programs striving to build a local manufacturing industry. However, the opportunity of embracing a much more ambitious green transition path is emerging as a new public infrastructure development plan has recently been released. The South African government has emphasized the importance of strengthening economic and social infrastructure development through a government led investment programme amounting to US\$ 280 billion over the coming years, i.e. about the 2011 GDP estimate of the country (Stat SA, 2012).<sup>1</sup> Could the greening of public infrastructures be seen as the backbone of the green economy? And could the green economy aspirations change the way infrastructures are planned and developed? A positive answer to these questions would lead to a much more profound reorientation of the South African development path than the development of a few hand-picked green sectors. This paper seeks to understand how the green economy agenda and the infrastructure development plan actually converge, and how the multilevel integrated planning process deemed to drive investments in public infrastructure might support or hamper the transition towards a greener economy. The next section aims at clarifying and articulating the different concepts used to conduct this analysis, and sets the theoretical framework. Section 3 describes the South African context within which the new infrastructure development plan has been developed, and explains why the greening of public infrastructure deserves special attention. Section 4 unpacks the three main levels of planning for infrastructure development and analyses how the greening of public infrastructure is actually being taken heed of within each of them. The fifth section discusses the results and provides policy recommendations. The last section concludes.

## 2 Definition and methodology

### 2.1 *Green or greener infrastructure?*

Just like infrastructure is the mainstay of economic growth, green infrastructure should be seen as the mainstay of green growth. This assertion might need to be empirically demonstrated as the measurement of green growth still remains a challenge, but so is the thinking behind developing an infrastructure investment plan to support the green economy (Corfee-Morlot & al., 2012). It acknowledges the transformative power of infrastructure (Neuman, 2009), and stresses the necessity to invest early in innovative technologies for transformation to happen. This approach departs from

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<sup>1</sup> The figure is R3.2 trillion, converted in US\$ using 11.4 as the Dollar/Rand exchange rate.

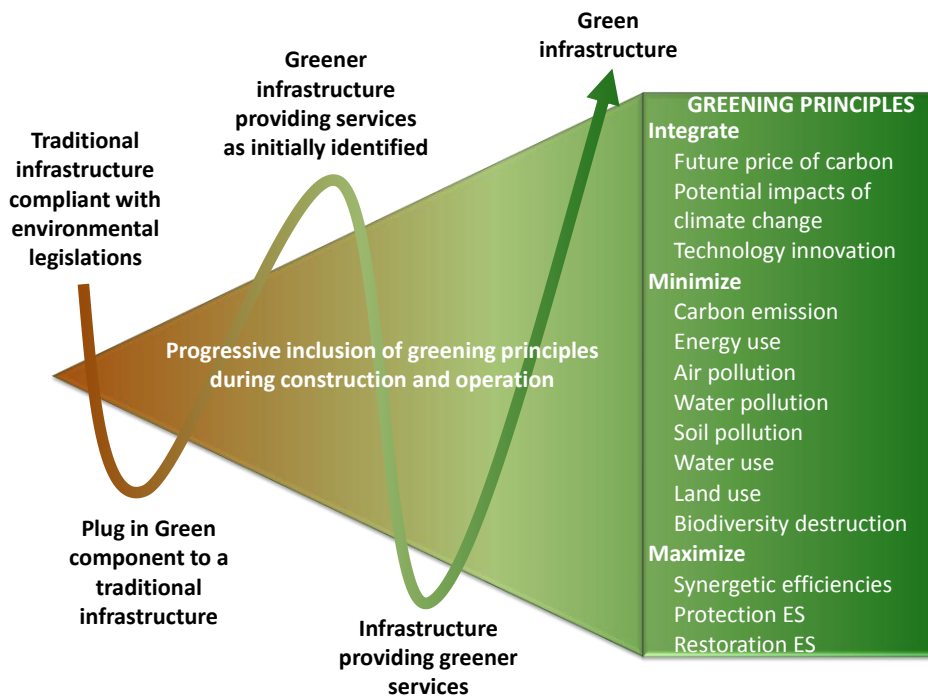
green infrastructure definitions urban planners have been developing, and which have been on the agenda of planning theory and practices for several years, triggering many debates in the planning literature (Benedict & McMahon, 2002; Mell, 2010; Sandström, 2002; Tzoulas & al., 2007; Wright, 2011). These definitions are mainly centred on the importance of green spaces as providers of services, stressing the ecological functions green infrastructure must provide. In this respect, they are very similar to what the South African National Biodiversity Institute calls ecological infrastructure (SANBI, 2011). However, against the backdrop of the green economy, such definitions appear far too restrictive.

Therefore, defining green infrastructure entails looking back on how green growth is defined. According to UNEP (2011b:16), “[i]n a green economy, growth in income and employment is driven by public and private investments that reduce carbon emissions and pollution, enhance energy and resource efficiency, and prevent the loss of biodiversity and ecosystem services.” Drawing green infrastructure features or principles solely from this definition would lead to overlook at least one principle which should be part and parcel of the green infrastructure definition: climate change challenges the way infrastructure must be planned and designed, and climate-related risks – impacts of climate change, future price of carbon, innovative technologies – have to be taken into account for infrastructure to be climate resilient (Fay & al., 2010; Giordano, 2012). Consequently, the following definition can be developed for the purpose of this paper: green infrastructure refers to climate resilient infrastructure systems that, all along their life cycle, minimize carbon emission, pollution, the use of energy and natural resources (soil, land, water, biodiversity) and maximize the provision of services through the protection and restoration of ecosystems. Such a definition is consistent with the view developed by some leading South African institutions (Naidoo & Jarvis, 2011).

Defining the greening of infrastructure in absolute terms would then imply quantifying each and every of these features so as to identify where the greening begins and ends. The same difficulties in defining ‘sustainable’ will thus be encountered in defining ‘green’ (Bond & Morrison-Saunders, 2011). Conversely, a relative rather than absolute definition provides a continuum between brown and green infrastructures as featured in Figure 1. This implies to consider green infrastructure features as greening principles, with no pre-determined priorities in including the different principles or their level of greenness in the planning process. Thereby, moving towards green(er) infrastructure would consist in assessing against these principles the different ways of providing a service, and in selecting its greenest cost-effective way.

Existing infrastructure constitutes the initial benchmark against which new infrastructure can be assessed, whereas international best practices may become the reference to aim at, at the very least, or to outstrip. This initial benchmarking leads to a more or less ambitious stance depending on the type of infrastructure (e.g. water, energy, transport, housing), costs of available technologies, the state of the environment, social, economic and environmental priorities, local contingencies, etc. Consequently, moving from brown to green infrastructure cannot be a linear process. Depending on the perceived urgency of the matter, some principles might be favoured; others put on the back burner. Thereby, there is a wide range of greening levels, from the plug-in of a green component on traditional infrastructure (e.g. filters on industrial equipment, solar water heaters on roof tops), to the provision of traditional services through changes in infrastructure building practices (e.g. insulated housing, green roads), to the greening of these services through a shift in the kind of service delivered (e.g. respond to people mobility requirements by the use of public transport instead of individual vehicles), and, at the end of the spectrum, to what could be featured as ecological infrastructure (e.g. a natural or artificial wetland instead of a sewage plant). Such a greening spectrum ought to be taken into account when analysing the integration of green infrastructure principles into the infrastructure planning process.

Figure 1: From brown to green infrastructure.



Source: Author.

## 2.2 Environmental policy integration as analytical framework

Infrastructure planning happens at several levels depending on the kind of infrastructure, and the remits devolved to the different departments, state-owned agencies and subnational spheres of government, meaning that green infrastructure principles integration ought to happen at every single level or scale of government where planning takes place. Research on policy integration – with its dedicated focuses on environmental policy integration (EPI) (Lafferty & Hovden, 2003; Kivimaa & Mickwitz, 2006; Jordan & Lenschow, 2010), and more recently on climate policy integration (CPI) (Mickwitz & al., 2009; Ahmad, 2009, Reitig, 2012) – might prove particularly valuable in analysing the integration of green infrastructure principles into the planning process.

Policy integration definitions oscillate from weak definitions based on a search for win-win strategies and synergy effects, thereby implying a specific choice and balance of priorities between environmental, social and economic issues, to strong definitions where the environment becomes the overarching or principled priority for policy and decision making (Jordan and Lenschow, 2010). Lafferty and Hovden (2003:9) define EPI as “the incorporation of environmental objectives into all stages of policymaking in non-environmental policy sectors, with a specific recognition of this goal as a guiding principle for the planning and execution of policy; accompanied by an attempt to aggregate presumed environmental consequences into an overall evaluation of policy, and a commitment to minimise contradiction between environmental and sectoral policies by giving principled priority to the former over the latter”. A weak or strong interpretation of this definition can be extrapolated depending on the stance adopted. Because the definition of green infrastructure stresses the relative rather than absolute feature of the greening process, a weaker definition here prevails.

Several tools have been identified to support policy integration, and planning is one of them. As highlighted by Stead & Meijers (2009:317) “[a]s part of planning modernisation agendas, planning systems are being recast as mechanisms to improve policy integration, both horizontally, across policy domains, and vertically, between policy actors and scales of governance”. Therefore,

integrated planning should be a valuable tool to mainstream green infrastructure principles. How efficient this tool could be in supporting policy integration is still to be determined, because measuring the level of integration planning might be responsible for, and isolating it from other factors, is fraught with difficulties (Nadin, 2007).

Kivimaa & Mickwitz (2006) developed an initial analytical framework – later expanded by Mickwitz & al. (2009:46) – to assess the degree of policy integration based on the in-depth discussion of EPI evolving definition. Such a framework and the five criteria it is made of are here adapted to assess the degree of integration of green infrastructure principles into the planning process, as described in Figure 2. The first criterion, “inclusion”, seeks to determine to what extent green aspects are included in the different plans, either through a global approach or by underlying specific green issues. The second criterion, “consistency”, relates to the way each plan addresses the question of consistency between green and other aspects, and tries to minimise contradictions, i.e. the role given to a consistent balance between conflicting issues in the planning process. The third criterion, “weighting” seeks to qualify qualitatively the degree of inclusion of green issues with respect to other priorities mentioned in the plan. The fourth criterion, “reporting”, checks whether evaluation means, tools and/or targets are *ex ante* included in each plan so as to monitor and report on whether green goals set by the plan are met during and after the implementation of the plan. The last criterion identifies the resources available – such as knowledge or skills, time, and funding – to pursue the integration of green infrastructure principles.

**Figure 2: Criteria for assessing inclusion of green infrastructure principles into the planning process.**

Criterion	Key questions
1- Inclusion	To what extent are green aspects or green infrastructure principles covered in the planning process, either in general or by the insertion of one or more specific principles?
2- Consistency	Have the contradiction and synergies related to the use of green aspects or green infrastructure principles been assessed, and efforts undertaken to minimize contradiction and maximize synergies?
3- Weighting	Have the relative priorities of greening the economy or infrastructure over other policy priorities been set?
4- Reporting	Have evaluation methodologies / criteria been identified to assess the degree of inclusion of green infrastructure principles into the different plans?
5- Resources	Do planning institutions have knowledge/know-how, time and financial resources to integrate green aspects or green infrastructure principles into the different plans?

Source: Adapted from Mickwitz & al. (2009).

Before applying this analytical framework to the multilevel planning process and corresponding plans in section four, the next section turns to the presentation of the South African context in which the possible greening of public infrastructure is raised.

### 3 The South African context

The huge social and economic infrastructure backlogs inherited from the Apartheid era have been only partially addressed over the past 15 years, in spite of the provision of most essential services being entrenched in the new Constitution (RSA, 1996). Settling these backlogs remains a daunting task, especially because the demand of services has been evolving with increasing need for integration, sustainability, equity and efficiency. A great deal of investment is still required to ensure

that the country's infrastructure needs are met in a manner that not only redresses the imbalances caused by Apartheid planning but also supports a more sustainable development path.

### ***3.1 Investing in infrastructure as a renewed priority...***

Infrastructure investment has been part of South African governments' strategy since the establishment of the new democracy. In 1996, the National Infrastructure Investment Report identified that investment needs amounted to R170 billion. This analysis prepared the ground towards investments in social and economic infrastructure as a priority of the Growth, Employment and Redistribution (GEAR) macro-economic strategy (NT, 1996:5): "an expansionary public infrastructure investment programme to provide for more adequate and efficient economic infrastructure services in support of industrial and regional development and to address major backlogs in the provision of municipal and rural services". However, GEAR is less about infrastructure investment than about structural adjustment, with cuts in social spending, retrenchment of civil servants, privatization of state-owned companies. Thereby, progress in delivering social and economic infrastructure has been particularly slow (Habib & Padayachee, 2000).

Ten years later, in 2006, the Presidency presented a turnaround strategy, the Accelerated and Shared Growth Initiative for South Africa (ASGISA) to support economic and social infrastructure, where infrastructure investment appeared as the top priority (The Presidency, 2006:6): "public-sector investment is planned to rise to around 8% of GDP. As indicated in the Medium Term Budget Policy Statement in October 2005, government and public enterprise investment expenditure for the period April 2005 and March 2008 is planned to be about R370 billion." These figures were boosted by the preparation for the 2010 FIFA World Cup.

In his 2012 State of the Nation Address, President Zuma made infrastructure development the utmost priority of the coming years as an engine for growth, job creation and poverty alleviation. This announcement did not really differ from that of ASGISA except in the extent of the investment. As indicated in the Budget Review (NT, 2012:11), "[b]udgeted and approved public-sector infrastructure projects over the next three years currently total R844.5 billion. The full list of mega-projects under consideration comprises investments worth an estimated R3.2 trillion." The R3.2 trillion targets 43 projects encompassing energy, transport, water, housing, telecommunication, education and health infrastructure. Most of these projects are long-lived infrastructures that will provide services for several decades and support tomorrow's economic and social development. The lumpiness of this capacity installation needs to be acknowledged (Shalizi & Lecocq, 2009), as well as the fact that these investments will be locked in today's spatial and technology choices for decades to come.

### ***3.2 ... while green economy aspirations...***

Concomitantly to these massive investments in infrastructure, the government has committed to embracing the green economy as an important dimension of South Africa's future. Such orientation can be seen as part of the movement that followed the 2008 financial crisis, which highlighted the limits of the world's economic system and, more broadly, our planetary boundaries (Rockström & al., 2009; Barnosky & al., 2012), and pleads for a change of the conception of growth (Jackson, 2009). The United Nations Environmental Programme then called for a global green new deal as a revival engine of growth (UNEP, 2009). Thereby, against the backdrop of the crisis, the influence of "sustainability thinking" has been growing worldwide (UNEP, 2011a:101-102). Green growth has become the motto of recovery, as environmental issues could be translated into economic and social benefits and not simply additional costs (Hallegatte & al., 2012; Jänicke, 2012; OECD, 2011). Thus, the concept seems appealing as it "promises to reconcile low-carbon and sustainable development with other valued outcomes, including job creation, poverty alleviation, and high economic growth"

(Resnick & al., 2012:1). This acted as a catalyst since South Africa has long been aware of the ecological limits of its economic structure, being an energy intensive, resource-rich exporting country (Swilling, 2007). The green economy has rapidly pervaded most of the recently released policy documents.

The first major “green” signal sent by the government was the 2010 Green Economy Summit. Supported by the president, attended by several cabinet ministers – Economic Development (EDD), Science and Technology (DST), Trade and Industry (DTI), and Environmental Affairs (DEA) – and many non-governmental stakeholders, the Summit took stock of the previous efforts and paved the way for future development (DEA, 2010a). As stressed in the Green Economy Summit report, South Africa embraces UNEP definition of the green economy (DEA, 2010a): “a system of economic activities related to the production, distribution and consumption of goods and services that result in improved human well-being over the long run, while not exposing future generations to significant environmental risks or ecological scarcity.” In order to meet this objective, South Africa has to move progressively towards a greener growth (Peter & Swilling, 2011).

Following the Summit, several national departments directly or indirectly highlighted the role the green economy ought to play in the future of the country. In November 2010, EED unveiled its New Growth Path, which seeks to provide orientations for the medium term and sets targets for employment creation: “The New Growth Path targets 300,000 additional direct jobs by 2020 to green the economy, with 80,000 in manufacturing and the rest in construction, operations and maintenance of new environmentally-friendly infrastructure. The potential for job creation rises to well over 400,000 by 2030” (EDD, 2010:12). In February 2011, DTI made an additional contribution by scaling up its programme of action for the green economy compared to its previous plan, thereby contributing to setting up an environment suitable for job creation and green growth (DTI, 2011:17): “The Green Economy is a major new thrust for the South African economy which presents multiple opportunities to create jobs and value-adding industries. IPAP 2 [the second industrial policy action plan] will focus on the manufacturing aspects of the Green Economy; namely Green Industries and Industrial Energy Efficiency.” Shortly after this, the government and social partners signed a “green economy accord” to support the creation of 300,000 jobs by 2020 in the green economy (EDD, 2011). This job creation potential was later reinforced by a comprehensive study developed by two South African Development Banks, thereby building the case for further actions (Maia & al., 2011). In November 2011, the government approved the National Strategy for Sustainable Development which includes transitioning towards a green economy as one of its priority (DEA, 2011:23-27). The ruling party, the African National Congress (ANC), also mentioned the important role the green economy will play in the future of the country in their preparatory policy document for the ANC national policy conference of June 2012 (ANC, 2012). Worth mentioning is the Development Bank of Southern Africa, the state-owned infrastructure bank, which played a major role in supporting DEA’s green economy work. It worked on the definition of what could be green programmes for the country (DBSA, 2011), which led to the creation of the Green Fund in September 2012, a public fund aiming at supporting the development of innovative green projects.<sup>2</sup>

### ***3.3 ... pave the way for green(er) infrastructure***

These recent developments show the willingness of the South African government to move the green agenda forward. They confirm the World Economic Forum analysis on the fact that developing countries “are changing their approach to infrastructure and industrial planning to make their economic growth more sustainable and resilient” (WEF, 2012:3). However, these commitments are now to be translated into concrete actions. In this respect, the new and massive infrastructure investment plan offers a tremendous opportunity to support the green economy: it provides opportunities to “leapfrog technologically and integrate climate consensus at design phase at

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<sup>2</sup> For more details on the Green Fund: <http://www.sagreenfund.org.za/Pages/default.aspx>

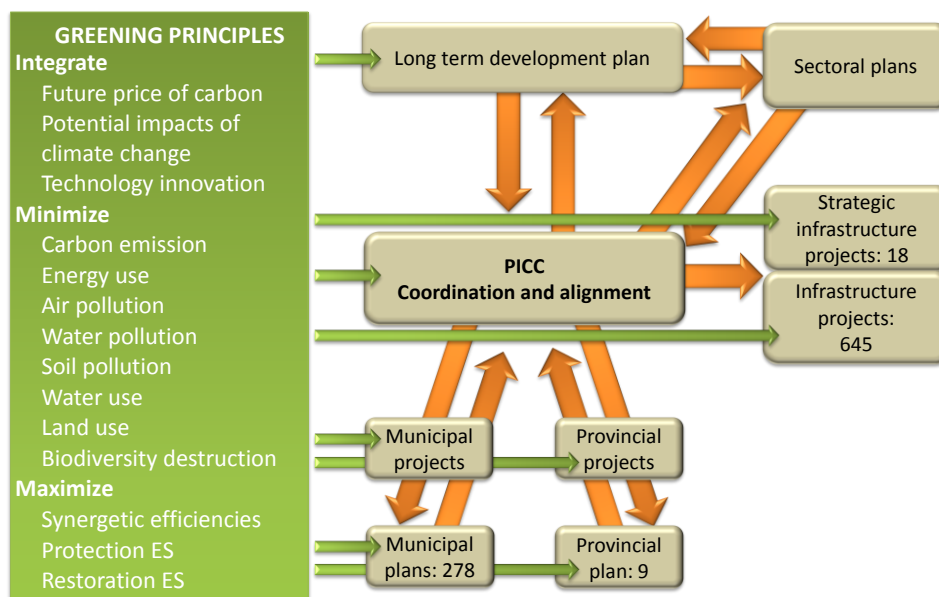


relatively low costs” (Corfee-Morlot & al., 2012). As Peter & Swilling (2011:20) emphasise for South Africa “[r]ather than investing in conventional resource intensive infrastructures and/or the upgrade of legacy infrastructure systems, there are opportunities for designing and building infrastructures that result in far more efficient use of resources and therefore cost saving over the long run”, especially in public transport, energy, waste, water and food production infrastructures. As a consequence, governments should lead since market failures are responsible for the private sector to systematically under-invest in the green economy: “investors rely on the policy makers to define the size, profitability and scope of the market” (Zanghelis, 2011:9). The government has the opportunity to send a clear signal to the market by making sure that the key principles of the green economy become part of the infrastructure investment plan.

#### 4 Unravelling the South African infrastructure planning process

Integrated planning has not been formally organized in South Africa even if in practice different levels of planning have been co-existing. Over the last presidential term, the planning system has been further institutionalized with the creation, first, of the National Planning Commission (NPC) in May 2010, responsible for the long term, national development plan (NDP), and, second, of the Presidential Infrastructure Coordinating Commission (PICC) in July 2011, responsible for infrastructure development through several strategic infrastructure projects (SIPs). These two plans add up to the integrated planning processes which were mostly institutionalized at provincial and municipal levels (Figure 3). Whereas NDP provides the long term vision for the country, SIPs are supposed to align both national and local development plans in an integrated and coordinated manner. Note that the many sectoral plans designed by the different national or local departments are not analysed here, for they should have been included at all integrated planning levels. Not doing so would reveal gaps in the various plans.

Figure 3: Mainstreaming green infrastructure principles into the South African integrated planning process.



Source: Author.

This section seeks to understand the extent to which green aspects or green infrastructure principles, depending on the nature of the plan, have been incorporated into the South African integrated planning system. To this end, the institutional arrangements and practices for planning are described

for each planning process, and the three major plans critically reviewed using EPI analytical framework described in section 2.2.

#### ***4.1 Long term vision and integrated planning***

The shift to a green economy implies many structural changes with tremendous economic and social consequences – some positive, others negative – which are difficult to anticipate and therefore manage. Indeed, there are still lots of unknowns about how economies will evolve due to, among others, the depletion of natural resources including oil, the impacts of climate change, or the long term consequences of the current financial crisis. These unknowns and their potential environmental consequences have to be rooted in the decision-making process, especially because societies might fail or succeed, depending on the way they behave (Jared, 2005, 2011). This is probably why long term planning is back on the agenda of many governments – including some deemed liberal – as a strategic element to elaborate a long term vision for the future of their countries (Giddens, 2011:94-102). South Africa is one of them.

When elected in 2010, President Jacob Zuma instituted the National Planning Commission (NPC) chaired by the Minister in the Presidency for National Planning and former Finance Minister, Trevor Manuel, while Cyril Ramaphosa, businessman, then member of the National Executive Council of ANC, was appointed deputy chairperson.<sup>3</sup> NPC comprises 24 commissioners selected according to their skills and expertise: academics, representatives of the business community and of the civil society. NPC was tasked to develop a long term vision for the country, i.e. a strategic plan for the next 20 years. The quality of its chairs and members provided sufficient credits for its work to be highly acknowledged and considered.

In June 2011, NPC published a diagnostic report which identified challenges South Africa had to address. An overly and unsustainably resource intensive economy was one of them. In November 2011, NPC released its draft National Development Plan Vision 2030 (NDP), and the final report was published in August 2012, after an intense consultation process and genuine endeavour to integrate the many comments received on the first draft. Considering the government's recent position on the green agenda, some would have expected NDP to adopt an ambitious stance on the matter. Let's now consider the extent to which NPC has been able to integrate green concerns in NDP by using our EPI analytical framework.

*Inclusion:* Environmental concerns are highly acknowledged all along the plan. NDP mentions the growing pressure on food, energy and water supply caused by demographic trends (NPC, 2011:98), and the extreme pressure on natural resources, especially water, as one of the weaknesses of the South African economy (NPC, 2011:111-114). It points to the environment as a major driver of change, stresses the necessity to manage it sustainably, and lists all the major environmental challenges the country is facing (NPC, 2011:91-92), e.g. water shortage, soil degradation, biodiversity losses, fish stock depletion, pollution, carbon emissions. Entitled "environmental sustainability – an equitable transition to a low carbon economy", the fifth chapter attempts to synthesize what the environmental pressures are, with a priority emphasis on carbon emission reduction (NPC, 2011:197-216).

*Consistency:* The green economy has not cornered NDP underlying thought despite acknowledgments made to environmental challenges. NPC is very cautious about the inclusion of the green economy in its long term vision. One explanation might be the commission inability to move away from the traditional growth pattern and reconcile growth, employment and green economy objectives. One of the three main priorities of the country as stated by the plan is job creation, and according to the plan, faster growth and job creation can only be achieved through increased exports and improved competitiveness, with an energy-mineral complex playing a central role (NDP,

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<sup>3</sup> Since then, at the ANC policy conference of December 2012, Cyril Ramaphosa was elected ANC Deputy President. At the same conference, ANC endorsed the National development Plan.

2011:119-123). Improving competitiveness for job creation becomes the backbone of the vision. Unfortunately, none of the three scenarios developed in NDP to meet the national employment creation target – 11 million jobs by 2030 – integrates these environmental opportunities and constraints (NPC, 2011:121-123). This is a double-edged sword as, on the one hand, synergies are merely mentioned, like the possibility of fostering green job creation as emphasized in the Green Accord for the medium term (EDD, 2011) or estimated in the South Africa Green Job Report (Maia & al., 2011); on the other, obvious contradictions are dangerously concealed: no scenario takes into account the mounting environmental threats caused by the massive environmental impacts of economic activities as binding constraints to growth. Nor are these binding constraints mentioned in the economic chapter. The green economy is only seen as one of the sectors “with substantial potential for growth stimulation or employment, or both” (NPC, 2011:144 & 150), just like mining, manufacturing, or infrastructure development and construction. The development challenge thereof, as stated by the Commission, has nothing to do with a progressive decoupling of the economy from the use of natural resources; it is all about boosting early development, manufacturing and deployment of new technologies for growth and job creation.

*Weighting:* NDP is silent on the possibility for the green economy to enhance long term competitiveness, with the exception of the renewable energy sector. One has to acknowledge that theoretical impacts of the green economy on growth rates are highly debated. Some believe the green economy might support growth (Hallegatte & al., 2012; Stern & al., 2012; Baietti, 2012; Zinghelis, 2011). Some argue that it might generate much moderated growth rates in the short term, but longer lasting than the brown economy; the later might carry on growing for a while before declining sharply in the long term due to environmental degradation and continued erosion of natural capital (Helm, 2011; Jänicke, 2012). Others claim that growth and ecological goals are simply not compatible and call for new ecological macro-economics (Jackson, 2009). Repositioning the green economy into the global competitiveness challenge of the country would have required deep investigation and articulation of the economic output, labour intensity and productivity, and subsequent environmental impacts of the different development paths.

*Reporting:* Because of the uneven inclusion of environmental aspects in the NDP, reporting is not mentioned except in the case of energy. The report takes up the integrated resource plan for electricity (IRP 2010-2030) released in 2011, using its 3725 MW renewable energy target as a reference for 2020. One would have expected targets regarding water use or savings, public transport development or solid waste management – an issue totally absent from the report whereas landfill management remains a major challenge.

*Resources:* These green elements might have been overlooked either by choice, as they might be of little concern to the Commission – NDP is a collective work where the strongest views prevail and the minority opinions are overlooked –, or by default because of the lack of adequate data to address them – this is particularly true for water as the last comprehensive dataset on water use dates back to 2000 – or of uncertainties surrounding the ability of the green economy to stimulate growth. Furthermore, as the report acknowledges, there is a worrying lack of spatial consideration in the planning process today, whereas spatial planning and land use are considered as major issues in decoupling the economy from the use of natural resources. Despite the publication of the white paper on Spatial Planning and Land Use Management in 2001 (DALA, 2001), delays in developing land use management Act led to neglecting land use management, “one of the least transformed and least developed areas of post-apartheid planning” (Harrison & al., 2008:65). And yet, spatial planning is increasingly seen as a critical tool for policy integration both horizontally and vertically (Counsell & al., 2006; Nadin, 2007; Stead & Meijers, 2009).

Interestingly enough, an important statement made in the first draft of the report, which has been deleted in the final version, stated that “[m]oney invested in the current economic structure runs the risk of being a sunken cost if spending is not aligned with the country’s future goals. There is the additional risk that South Africa is locked into an economic pathway that could undermine its competitiveness and flexibility in taking up future opportunities” (NPC, 2011:185). The risk still exists, but NDP does not tackle it. This vision turns out to be too restrictive to really address the transition

not only to a low carbon economy but to a green economy. The efficient use of natural resources could have been part of the development strategy or at least better addressed. Trade-offs have to be made between sectors: natural resources have to be shared and consistently allocated for each economic sector to play its designated role in the development process. NDP could have set further strategic goals beyond the renewable energy production targets. It could also have given more room to linchpin development – institutions, regulations, policies and infrastructures – for the green economy transition to flourish. As a result, the green economy and infrastructure development are merely articulated in NDP.

Nevertheless, the process is not over and some room for manoeuvre might emerge. Indeed, during September 2012 Cabinet Lekgotla, the government endorsed the 18 objectives identified in NDP, and acknowledged NDP as a strategic framework. It also mentioned that the next step would be the translation of these objectives into sustainable targets and into an integrated implementation plan by a dedicated cabinet committee to be set up (GCIS, 2012).

## ***4.2 National integrated infrastructure planning***

NDP defines the trajectory to follow, identifies some goals and targets to be met, acknowledges the assets to rely on, and points out the gaps to be filled. Of course, the vision is not enough; its reliable translation into appropriate actions is just as important as its accuracy for the country to strive (or trudge) along what should be a well-trodden development path. Because adequate infrastructure remains the mainstay of the economy, infrastructure gaps are the hurdles to overcome: planning for infrastructure development in response to the vision becomes the prerequisite to meeting long term development goals.

Initiatives have been launched. The President first announced the creation of the Infrastructure Cluster in October 2009, chaired by the Minister of Transport, to ensure coordination of the different departments in their infrastructure project developments. The aim of the cluster was to improve planning coordination and delivery. An Infrastructure Forum of South African Directors-General (FoSAD), established under the Intergovernmental Relations Framework Act (IGRA) No. 13 of 2005, was created to support the infrastructure cluster work.

Then, in 2010, the Department of Performance Monitoring and Evaluation (DPME) announced a series of cross-department outcomes to strengthen the vertical coordination among national departments, and ministries signed a delivery agreement for each of them for the period 2011-2016 (DPME, 2010). Outcome 6, entitled “an efficient, competitive, and responsive economic infrastructure network” was designed. The Infrastructure Cluster was then renamed the Infrastructure Development Cluster (IDC) and tasked to deliver on the outcome. It comprised the following departments: Communications, Cooperative Governance and Traditional Affairs, Economic Development, Energy, Finance, Human Settlements, Public Enterprises, Public Works, National Planning Commission, Transport, and Water and Environmental Affairs (DPME, 2010b).

Finally, in July 2011, a Presidential Infrastructure Coordinating Committee (PICC) was created to “ensure systematic selection, planning and monitoring of large projects. This intervention will systematically improve the capacity of state agencies to deliver infrastructure and help connect the work of all spheres of government” (Ndebele, 2011). PICC brings together Ministers, Premiers and Metro Mayors, and is chaired by the President. Its mandate is to “ensure systematic selection, planning and monitoring of large projects and its terms of reference [...] to identify 5-year priorities and develop a 20-year project pipeline” (PICC, 2012b:9). In February 2012, the PICC produced a report identifying 17 strategic infrastructure projects (SIPs) including 645 infrastructure projects at various stage of readiness (PICC, 2012a).<sup>4</sup> In September 2012, Cabinet Lekgotla reviewed the PICC

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<sup>4</sup> Such projects hark back in some way to the Special Presidential Lead Projects announced by President Mandela in his State of the Nation address in 1994 as part of the Reconstruction and Development Programme

progress report and added an 18<sup>th</sup> SIP on water and sanitation to what is now dubbed the National Infrastructure Plan (NIP) (GCIS, 2012; PICC, 2012b).

Before turning to the content of the SIPS, two dimensions need to be addressed. The first one relates to the institutional search for setting up the appropriate coordination structure herein described: it reveals the difficulty to coordinate different national and local authorities – including parastatals – in the definition and prioritization of critical infrastructure, i.e. the difficulty to build a coherent integrated infrastructure plan which surpasses the simple aggregation of ministers' individual demands. As stressed by Russel and Jordan (2007), "there is no guarantee that departments will join-up in a manner consistent with cross-government best practice, especially if departmental resistance is strong and/or if departmental capacity is lacking due to a paucity of appropriate diffuse processes". Whether PICC, chaired by the president, will do better than the infrastructure development cluster in overcoming political fights and minister's clout is questionable: the latter is also committed to delivering directly to the president.

The second dimension concerns the coordination between NPC and PICC. A clear articulation of the SIPs within NDP was expected: NDP was supposed to provide the rationale for prioritized SIPs to meet long term targets, and to offer guidance on infrastructure development in relation to long term objectives. However, the initial NDP draft released in November 2011 lacked substantial references to the SIPs – despite the PICC process having been launched long before the release of the vision – thereby underscoring the lack of coordination between the two institutions. This loophole was closed in NDP final version which mentions each SIP several times, aligning thus the infrastructure investment plan with the vision. Nevertheless, the process seems rather flawed as NDP is supposed to show the way, and NIP to respond. Of course, it might not be as sequential, and some overlaps must exist; but the outcome is that NIP does not pay much attention to the green economy either.

Figure 4 briefly describes the 18 SIPs contained in NIP. Because of the nature of the SIPs – each being the result of the collapse of many projects into one programme – and the scanty content of the NIP, it is very difficult to establish clearly the integration level of green aspects or green infrastructure principles. Green principles might be included at project implementation level, and not mentioned at SIP level. This introduces a bias in our analysis that we acknowledge but cannot overcome.<sup>5</sup>

*Inclusion:* Except SIP 6 which seeks to promote renewable energy projects, the green dimension of the plan remains clearly understated, not to say anecdotal. The report only states that urban development in Waterberg under SIP 1 will be the "first major post-apartheid new urban centre [to] be a "green" development project" (PICC, 2012b:8). Any other reference to green projects is simply absent in spite of the report emphasizing in conclusion that one of NIP goals is to promote the greening of the economy. Other SIPs might have green dimensions especially when public transport or bulk and water treatment are included. However, none are genuinely designed to respond to green concerns or opportunities, but rather are meant as an answer to service provision backlogs and economic development weaknesses.

*Consistency:* Without a detailed description of the SIPs, this dimension is hard to evaluate. Some sectoral SIPs are clearly supporting greener infrastructure, like SIP 7 on public transport, SIP 8 on renewable energy, while not always using this rationale as such to justify their relevance. Other SIPs drop hints that in some instances consistency has not been fully thought through, especially when integrated infrastructure becomes the most important challenge. For example, SIP 1 on the development of Waterberg area in Limpopo Province seems very ambitious, with the development of mining, tourism, agriculture, industry and human settlement, thereby questioning the potential competition over natural resources, especially water. Whereas this SIP is backed by a Spatial Development Framework (Waterberg District Municipality, 2009) and a Waterberg District

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(The Presidency, 1994), or the Urban Renewal Programme and Integrated Sustainable Rural Development Strategy launched by President Mbeki in 2001.

<sup>5</sup> A 900-page document gathering all the projects clustered under the 18 SIPs was compiled according to several public officials, but is not publicly available. This raises concerns about the transparency of the infrastructure planning process.

Environmental Management Framework (DEA, 2010b)<sup>6</sup> – which balance the spatial development of the different economic sectors, the corresponding needs for infrastructure, with the integration of environmental challenges and opportunities, namely water –, the competition for water seems highly overlooked. Waterberg area is already a water stressed area and, according to the Centre for Sustainability in Mining and Industry, the implementation of the planned mining and energy projects would lead to a worse-case scenario of an additional water consumption of 73 million m<sup>3</sup> per year, compared to the current base of 13 million (CSMI, 2010). Despite this huge increase, there is no clear answer to the following question: where will the water come from?

Figure 4: Brief description of the 18 SIPs.

Strategic infrastructure projects	Main infrastructures	Implicit green principles
1 Unlocking the Northern Mineral Belt with Waterberg as the Catalyst	Rail, water pipelines, energy generation and transmission infrastructure, <b>green urban development</b> , industries (mining)	Minimize energy use, carbon emission
2 Durban - Free State - Gauteng Logistics and Industrial Corridor	Logistics and transport	
3 South Eastern node & corridor development	Dam, irrigation, rail, port, industries (sinter and smelter)	
4 Unlocking the economic opportunities in North West Province	Roads, rail, bulk water and water treatment, transmission infrastructure, industries (mining, agriculture, tourism, and beneficiation)	
5 Saldanha-Northern Cape Development Corridor	Rail and port, Industrial development zone, mining	Minimize energy use, carbon emission for the rail project
6 Integrated Municipal Infrastructure Project	Roads, water, electricity and sanitation	Minimize energy use, carbon emission for the rail project
7 Integrated Urban Space and Public Transport Programme	Public transport, human settlement, economic and social infrastructure	
8 Green Energy in support of the South African economy	<b>Green energy, biofuel</b>	
9 Electricity Generation to support socio-economic development	Electricity generation capacity	
10 Electricity Transmission and Distribution for all	Transmission and distribution network	
11 Agri-logistics and rural infrastructure	Storage, transport (roads, branch train-line, ports), irrigation, processing facilities (abattoirs, dairy infrastructure), aquaculture, tourism	
12 Revitalisation of public hospitals and other health facilities	Hospitals, other public health facilities, nursing colleges	
13 National school build programme	Schools	
14 Higher Education Infrastructure	Lecture rooms, student accommodation, libraries and laboratories, ICT connectivity	
15 Expanding access to communication technology	Fibre networks, broadband coverage, analogue broadcasting (TV)	
16 SKA & Meerkat	Radio-telescope	
17 Regional Integration for African cooperation and development	Transport, water and energy	
18 Water and sanitation infrastructure	Water and sanitation access at household level	

Source: Adapted from PICC (2012a and 2012b).  
Notes: Green principles are bolded in the second column.

<sup>6</sup> The ability of these frameworks to influence the decision making process will be further discussed in the next section.

*Weighting:* Just like in NDP, economic and social development is the first priority of NIP. Greening infrastructure is seen as an option in very specific cases – like urban development in SIP 1 – but certainly not as a cross-cutting issue where each greening opportunity must be weighed against more traditional practices. More disturbing is the mention of a recurring debate in South Africa about the role environmental impact assessments might play in slowing infrastructure investment. A major risk is for this debate to lead to what some call reverse integration – “environmental policy taking on board the demands of the social and economic sectors” (Jordan & Lenschow, 2010) – whereas EPI aims at the opposite.

*Reporting:* The reporting system is based on the definition of a development impact plan for each SIP, which includes the greening of the economy as one of the impacts, together with jobs, localisation, skill development, empowerment, and research and development (PICC, 2012:47). How these impacts will be measured is not explained, but NIP underscores that in order to improve the performance of infrastructure projects, these will be planned and built to promote low life-cycle costs (PICC, 2012:30). If implemented despite the many difficulties surrounding life-cycle assessments, it will be a major breakthrough in the way infrastructure is designed and built in South Africa.

*Resources:* There is a clear lack of resources, both technical and financial, to develop and implement such infrastructure plans. The need to leverage private finance to implement NIP goes hand in hand with the need to attract and build capacities. This is a major limitation to the infrastructure building programme, but it can also be seen as an opportunity to build non-traditional engineering and technical capacities able to integrate environmental opportunities and constraints.

The greening level will now depend on the nature of the investments, i.e. the detailed design of the various projects. They will have tremendous economic, social and environmental local impacts, especially when the SIPs concern the development of an entire region – such as the first five SIPs. Provinces and municipalities will either have to plan their own infrastructure development accordingly, or to be able to influence SIPs. It is unclear how this articulation will take place and may thus represent a major drawback, especially as municipalities and provinces have planning processes of their own.

### ***4.3 Provincial and municipal infrastructure planning***

Decentralization is a core principle of the 1996 Constitution. Planning has then been introduced at subnational levels as a tool for the provision of devolved services, with planning tools for provinces, districts and municipalities. The five-year integrated development plan (IDP) is one of them, and surely the most important coordinating mechanism for planning at municipal and district levels. Limited to the medium term, it requires the presentation of a long term strategic vision. The Municipal Systems Act (RSA, 2000:44) defines IDP as “the principal strategic planning instrument which guides and informs all planning and development, and all decisions with regard to planning, management and development, in the municipality”. It is the only statutory planning requirement directing local government’s activities and budgeting based on an integrated (economic, social and environmental considerations), cross-sectoral and bottom-up approach (Todes, 2004).

To support coordination between national and local planning systems, the provincial planning department monitors IDP process, and facilitates coordination and alignment with IDPs of other municipalities and plans, and strategies and programmes of national and provincial departments (RSA, 2000:42). Since 2005, to strengthen alignment between plans, provinces have been required to prepare a Provincial Growth and Development Strategy (PGDS) which “should help in achieving alignment and laying the basis for sustainable development: ensuring that plans are economically productive and efficient, meet social needs and address equity issues; whilst building on, and taking advantage of opportunities in the context of the constraints of the province’s natural resource base” (The presidency & DPLG, 2005:2). The PGDS is not a plan, but a long term strategy (10 to 20 years) and is supposed to include:

- sustainability by giving attention to “the (sometimes) competing components of the sustainable development paradigm – balancing the social, economic and environmental drivers and needs (and various sector targets) along with defining the strategic choices and trade-offs that need to be made in the long-term” (The presidency & DPLG, 2005:8);
- spatial planning by “the development of a spatial perspective on economic potential, social need and resource potential” (The Presidency & DPLG, 2005:8).

However, PGDS is not a legal requirement and it has generated much less interest than IDP; its coordination and alignment role is therefore very weak, and it has not been able to play a significant role in guiding decision-making for improved service delivery (Harrison & Todes, 2001). Furthermore, in practice, the existing PGDSs tend to focus mainly on economic and social development and infrastructure, thereby overlooking environmental challenges, and highlighting the divide between planning and environment management.

IDP remains the most important local planning tool for infrastructure development as it presents the priority projects for each financial year.<sup>7</sup> It is supposed to integrate all the strategic documents developed by the municipality, thus ensuring horizontal coordination within the municipality, and to take heed of strategic documents and plans developed by other spheres of government, thereby contributing to vertical coordination. IDP is also important to benefit from fiscal transfers from the National Treasury, such as the municipal infrastructure grant (MIG), the largest infrastructure transfer, which can only fund projects included in IDPs that target basic services, roads and social infrastructure to poor communities.<sup>8</sup> How do IDPs support the greening of infrastructure?

*Inclusion:* IDPs are designed to clear up the link between sustainability and integrated planning within a very specific post-apartheid context, where the Municipal System Act refers to development as “sustainable development, and includes integrated social, economic, environmental, spatial, infrastructural, institutional, organisational and human resources upliftment of a community” (RSA, 2000: 14). Therefore, sustainability is a key planning principle and tends to be increasingly present in the rationale of most IDPs (Todes, 2004; Todes et al, 2009).

*Consistency:* In practice, the environmental dimension is very often overlooked in favour of economic and social considerations, and thereby poorly incorporated into strategic planning and its resulting budget allocation (Todes et al, 2009). This might be due to the fact that “[e]nvironmental management has emerged as a parallel legal and institutional system to planning” (Todes, 2011). However, such an approach limits the infrastructure greening potential to comply with environmental laws at project level. Endeavours have been made to strengthen the inclusion process. In 2000, the spatial development framework (SDF) was introduced into the IDP as a tool for spatial coordination of investment. While SDFs are legally required to be reviewed through a strategic environmental assessment, few have actually been following this process (Todes & al., 2009), thereby undermining the potential impact of SDF on the greening of infrastructure.

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<sup>7</sup> It must be noted that because of the size of municipalities, both in terms of area and population, it can be viewed as a version of regional planning (Todes, 2004).

<sup>8</sup> Conditional grants represent about half of the total fiscal transfer from national government to municipalities, the other half being the local government equitable share. MIG is the largest conditional grant, especially for poor municipalities where it can represent far more than half of the conditional grants they receive.



The main loophole relates to the lack of formal mechanism to link planning and infrastructure development, with many municipal infrastructure departments often acting as autonomous entities following their own agendas. Todes (2012) describes how the City of Johannesburg has developed with some level of success a growth management strategy to ensure the alignment of infrastructure development and strategic planning.

*Weighting:* Environmental or sustainability issues are often discounted during the planning process (even if legally required) especially in the context of the infrastructure and service delivery backlogs and financial constraints. Despite the production of guidelines aiming at integrating sustainability (DEAT, 2003), environmental concerns have been poorly taken into account or addressed for several reasons (Todes, 2004): the poor implementation of IDPs, except by large municipalities, makes environmental concerns useless, even when included in the initial plan; IDP medium-term horizon precludes addressing long term concerns, such as natural resource depletion or climate change; an insufficient focus on the role of natural resources within the development context due to the IDP environmental and sustainability section is viewed as an add-on to the planning process; a focus has been placed on IDP finance and budget elements as opposed to integrated sustainability; there has been a lack of focus on land management. Only a few large municipalities endeavour to value better green principles, especially climate related ones (Roberts, 2008), despite the many advantages they could provide in responding to urban challenges (Swilling, 2006; Schäffler & Swilling, 2012).

*Reporting:* There is no dedicated monitoring and reporting of the integration of green infrastructure principles into the IDP process; but structures are in place to monitor and report on municipal infrastructure investment. For instance, MIG allocation is conditional to the completion of an IDP and MIG is subjected to a reporting, monitoring and performance evaluation procedure (COGTA, 2012), thereby confirming that at stake is the upstream inclusion of green principles into the planning process.

*Resources:* Firstly, IDPs across the country have been of very uneven quality and efficiency, for designing an IDP is a very demanding process requiring time, skills and local participation (Todes, 2004). Therefore, developing an even basic IDP has been a tremendous challenge for many poor municipalities despite efforts made to provide guidance and training to municipal officials, and it has been seen as a real burden diverting scarce resources from more urgent matters. Meanwhile, IDP appears too limited for more capacitated municipalities (Harrison & al, 2008:87). Secondly, the inclusion of environmental issues has been uneven, due to a general lack of environmental capacity throughout municipalities, including among planners who most of the time have a limited understanding of the green agenda (Todes et al., 2009), and more specifically, a lack of knowledge and practice on the socio-economic opportunity of investing in ecological infrastructure (Schäffler & Swilling, 2012) – and despite recent attempts (de Wit & al, 2012). Furthermore, financial concerns – as featured by the lack of finance, coupled with the difficulty of many municipalities to spend their budget and to spend it properly (AGSA, 2012) – must also be addressed. SIP 6 seeks to deal with the lack of capacity and skills in defining and implementing IDPs, a daunting task as previous endeavours to support local governments have come across tremendous difficulties. SIP 6 design and implementation will have to be highly innovative to avoid the same pitfalls. It is hard to say whether green principles will be part of the support turnaround strategy.

## **5 Discussion and policy implications**

Green concerns or green infrastructure principles are unequally included in the different planning levels. Crucial in this integration process is the coordination among the different spheres of government, i.e. how the different planning levels actually speak to each other. Figure 5 shows the five evaluation criteria used in EPI framework across the three integrated planning levels, from which several conclusions could be drawn.

**Figure 5: Diagnosis of the integration of green principles into the multilevel planning system.**

Criterion	National development plan	National infrastructure plan	Integrated development plan
<b>Inclusion</b>	Environmental challenges highly acknowledged, Specific issues stressed +++	Green dimensions as overarching principle, greener sectoral SIPs, but hints of no inclusion in others ++ / --	Sustainability as IDP core principle +++
<b>Consistency</b>	Environmental challenges and opportunities poorly addressed as part of the development agenda --	To be determined, but hints of lack of consistency (-)	Remain superficial despite additional efforts + / -
<b>Weighting</b>	Potential contribution of the green economy to SA future largely ignored ---	To be determined, but risks of undermining environmental challenges and opportunities (+ / -)	Environmental issues often discounted, except for a few large municipalities + / -
<b>Reporting</b>	No targets, except for renewable energy development --	Low life cycle costs as a promising evaluation criteria if implemented (+ +)	Existing evaluation tools but not designed to deal with green matters + / -
<b>Resources</b>	Adequate expertise and knowledge, but lack of data + / -	Lack of skills and capacity to develop the plans, lack of financial resources, opportunity for external (green) support + / -	General lack of planning skills, poor knowledge of the green agenda, poor data ---

Source: Author.

Note: when the evaluation needs to be confirmed by further analysis, symbols are in brackets.

First, inclusion is not an issue; green projects are already underway or planned. Over the past two years, the relevance of the green agenda has gained political support, leading to its inclusion in two national planning documents (NDP and NIP). Whereas the diagnosis drawn by NDP widens the scope for action (as shown in its Chapter 5), its operational conclusions, together with the nature of SIPs identified in NIP, remain sectoral (e.g. renewable energy, transport or housing), with some sectors left aside despite their genuine green potential (e.g. water and sanitation, or solid waste management). In this context, and at least in the short term, most experimental changes might come from the local level rather than from the national vision. Local authorities are at the coalface of the natural resource degradation, the main witnesses and the first actors. Where capacity and willingness exist, i.e. mostly in large municipalities, changes are underway. Attempts are made to design innovative projects, to reshape existing or newly developed infrastructures. At some point, local green experiments and national plans have to converge in an integrated way and spread to smaller municipalities. The other side of the coin is that the huge majority of municipalities, especially the poor and disadvantaged ones, do not have the greening of infrastructure in their plan, whereas tremendous benefits – e.g. cost savings, labour intensity – could be generated from their development. For now, the greening of infrastructure remains stealth, mainly driven by the climate change agenda (mitigation and adaptation) and tremendous endeavours are needed for concrete changes to emerge.

Secondly, the greening of infrastructure is far from being a principled priority in spite of infrastructure being the mainstay of the economy. Planners, be they commissioners of NPC, PICC members or local government officials, find it difficult to articulate consistently environmental challenges and actions. The (in)consistencies of various long term policy choices and of regional development plans have not been fully assessed. Spatial planning, which has been an ever-recurring issue over the past years, is crucially lacking, although it could openly demonstrate some of these hidden flaws.

Thirdly, planners still favour traditional development modes, without balancing the consequences of natural resource depletion and environmental impacts. Social and economic development remains the principled priority without seeing opportunities in considering green options. To turn the

situation around, planners will have to be much more inventive and audacious for infrastructure to really play a profound transformative role and support the greening of the economy: green infrastructures still need to be discovered and the viable alternatives they can offer to be explained. This is not an easy task especially because many resources are lacking, e.g. data in providing evidence about the benefits of greening infrastructures, skills in the design and implementation of greener plans, or finance models in balancing today's economic and social costs with tomorrow's benefits.

Fourthly, planning reporting and evaluation is still much easier at local than at national level, at least on paper, since IDPs have been partly linked to national budget allocations to municipalities. However, IDPs are not evaluated according to their green content. At national level, green targets are scarce: a few have been set in the context of the green economy (e.g. renewable energy production, air quality); some in response to social or economic stakes (e.g. development of the public transport system, waste management); others are desperately lacking (e.g. water use and saving). Defining benchmarks against which future infrastructure development could be assessed should constitute the first step towards a better definition of the way services could be delivered within the ecological limits of the country. Encouraging is the mention of low life-cycle costs in the development of new infrastructure projects in the NIP. While it is too soon to infer how this concept could be applied or what its outcomes might be, it could become a real catalyst for the identification of the greenest cost-effective ways to achieve many service delivery objectives.

Fifthly, difficulties in integrating green infrastructure principles into the planning process at all levels echo those encountered in mainstreaming environmental policies in South Africa. Despite several legislative clarifications, intergovernmental relations are still a great challenge for many issues including planning (Harrison & al., 2008:84), environment (Du Plessis, 2011), or climate change (Giordano & al., 2011). Furthermore, legal and institutional planning and environmental management have never been integrated neither at national level nor at local level (Todes & al., 2009:412). "The consequence of this divide has been a weak incorporation of sustainability concerns into planning, considerable duplication and a cumbersome system of planning and environmental assessment, placing severe pressure on limited capacity" (Harrison & al, 2008:163). Consequently, integrating planning and environment management, while an absolute necessity for the greening of public infrastructure, is still a daunting task (Todes & al., 2009:426).

Planning is often seen as an important policy integration tool. South Africa has engaged in an ambitious coordination process with the creation of NPC and PICC, where it is genuinely foreseeable that the integration of green concerns could definitely trickle down to every new infrastructure project. It commands to engage in a thorough review of SIPs, where planners could take into account ecological limits over the long term, define innovative solutions offering promising alternatives to traditional plans.

Policy integration is not the only tool to go green. Additional measures are needed to support the integration of green infrastructure principles into new building programmes. The first one is to clarify what green infrastructure concretely means beyond the herein proposed definition so as to agree on a possible – and over time evolving – set of criteria or indicators to be used. Ugwu & Haupt (2007) have attempted to identify some indicators for sustainable infrastructure in South Africa. The Australian Green Infrastructure Council has recently developed its own methodology for infrastructure rating (AGIC, 2012), just like the American-based Institute for sustainable Infrastructure (ISI, 2012). The creation of a South African green infrastructure council is in discussion and should take shape in the coming months, and its first mission might be to tackle this clarification task.

A second measure should be the development and sharing of adequate information about how natural resources actually contribute to the development path of the country. At national level, Statistic South Africa has compiled a first set of environmental satellite accounts which should be used all along the planning process to make sure the resulting plan falls within the limits of national resource availability. At subnational levels, expanding strategic environmental assessment could be a valuable asset. SEA is about delimiting and understanding the context; engaging different, not only environmental, perspectives in clearing the problems through dialogues and communication; and

always searching for options that will create environmental and sustainable contexts within which proposals are sought (Partidário, 2007). Such approaches would constitute a crucial step towards the improvement of the long term planning process.

Another very powerful measure would be for the National Treasury to move towards green budgeting, or the inclusion of green criteria into the public funding allocation process. Such a change could be easily done for some subnational public transfers, like the Municipal Infrastructure Grant. It would then constitute a real incentive for planners to develop greener IDPs. A similar approach could be transposed to the annual budget requests of national departments or public agencies. Such a change would tremendously foster EPI. The discussions launched by the National Treasury about the introduction of a carbon tax could have a significant impact once effected (NT, 2010).

Finally, the role of the private sector should not be underestimated. Private investments are essential to meet the level of requirements. Private investors are more and more aware of environmental risks borne by investments in long-lived infrastructure. As partners of the government in the new infrastructure investment plan, they have their role to play in influencing the decision, and their financial clout, coupled with their skills, could play a major role in supporting the greening process.

## **6 Conclusion**

For an emerging country like South Africa, with high levels of poverty and inequality, embracing the green economy only makes sense if short term growth and job creation can thrive from it. The current growth model is based on a resource-intensive model, with mounting evidence that the environment has become an insuperable constraint. Such a situation is acknowledged at all planning levels. Planning a development path that fits in the ecological capacity of the country, but still generates growth and jobs, implies to reconcile these objectives, too often perceived as dual, as each should no longer be scarified on the altar of the other.

Investing in long-lived infrastructure as a prerequisite to future economic and social development may lay the foundation for this change. The transformative role of infrastructure must be acknowledged; the increasing pressure on natural resources too. Infrastructure planning has then to integrate these dimensions to truly lay the groundwork for future growth. The EPI analytical framework applied to the South Africa multilevel planning process clarifies the state of integration of green principles and underlines what could be done at each level to strengthen it. The new planning initiatives launched by the government to define its vision for the country on the one hand, and to coordinate the massive public infrastructure investments on the other, acknowledge green challenges but has not yet converted them into concrete actions: locked into a conservative view of its future development path which fits with the social and economic challenge the country at the expense of the environment, planners need to be much more innovative to move beyond marginal greening of specific sectors. Critical steps are taking shape that could offer opportunities to curb the dominant view: the design of an implementation plan for NDP, the review of regional SIPs, or the implementation of SIP 6 which relates to supporting municipalities, could trigger major changes if EPI two criteria (consistency and resources), which score low in our analysis, are addressed.

Planning is an important tool for EPI, but not the only one. Together with endeavours to influence the planning process, a raft of measures needs to be pursued to send the right signal to the multiple actors involved in the planning and development of public infrastructure. More research is needed to go beyond the diagnosis made here and unravel the ins and outs of the greening process, and to understand the political economy of the planning process and identify the levers which could allow South Africa to transition towards a more sustainable development path.

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## Documents de Travail Art-Dev :

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