

# Renewable energy regulation in South Africa: lessons from the Chinese experience\*

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## **Abstract**

The global community is increasingly aware of the problems associated with climate change and sustainable development. The solution to the problems requires the participation of all countries. However, many developing countries have additional, and often competing, priorities, which include poverty eradication and social sustainability. South Africa, as a developing country, faces these challenges and has acknowledged that environmental sustainability is central to its own development and sustainability, and has also recognised the role that renewable energy can play in achieving these goals. The country's abundant renewable energy sources are valuable assets that require a solid and effective legal regulatory system for their optimal use. Despite the acknowledgement of the role that renewable energy will play in the future of the South African electricity market, the regulation thereof is still in its infancy. The People's Republic of China is facing similar challenges to those faced by South Africa and has emerged as a world leader in renewable energy development. South Africa can learn valuable lessons from China, especially in light of the partnership the two countries share in BRICS. This article will compare renewable-energy policy and law in China with the South African framework, with a view to developing lessons that South Africa can use when formulating its own policy.

## **INTRODUCTION**

South Africa is confronted with multiple socio-economic challenges. Domestically, the country is faced with high rates of poverty and unemployment,<sup>1</sup> while globally, it is challenged by climate change and

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<sup>1</sup> National Planning Commission, 'National Development Plan 2030 Our Future—Make it Work' (2012) <<http://www.poa.gov.za/news/Documents/NPC%20National%20Development%20Plan%20Vision%202030%20-lo-res.>> accessed 27 March 2017 (hereinafter 'NDP') 198.

prioritising sustainable development,<sup>2</sup> each demanding equal and urgent attention.<sup>3</sup> Energy access, being an integral part of most daily activities, is vital for poverty alleviation.<sup>4</sup> In South Africa, the poorest people, mainly living in the rural areas, do not have access to clean energy and resort to using unsustainable sources of energy, such as coal, to the detriment of their health.<sup>5</sup>

The focus of this article, namely electricity, is fundamental to the growth of a country's economy.<sup>6</sup> Recently, South Africa's electricity industry changed from enjoying excess supply of electricity, to experiencing sometimes severe, nationwide shortages.<sup>7</sup> The International Energy Agency (IEA) argues that it is a country's 'specific historical setting and the geopolitical situation'<sup>8</sup> that affects its energy-supply situation.<sup>9</sup> This certainly applies to South Africa, as the majority of the population were historically denied access to basic services, including electricity.<sup>10</sup> After 1994, in an effort to redress the inequality, government embarked on an ambitious programme to provide equal access to electricity for all people in the form of the Free Basic Electricity programme.<sup>11</sup> While the electrification programme has been largely successful,<sup>12</sup> this noble plan may have overlooked certain ancillary aspects and has led to pressure on the existing network.<sup>13</sup> Prior to

<sup>2</sup> Organisation for Economic Co-operation and Development-International Energy Agency (OECD), 'Toward a Sustainable Energy Future' (2001) 17.

<sup>3</sup> Deutsche Gesellschaft Fur Internationale Zusammenarbeit (GIZ) GmbH and Department of Energy, 'Renewable Energy Policy Mapping Study of the Republic of South Africa: Final Report' (October 2013) para 4.1. <<http://www.record.org.za/resources/downloads/item/giz-unlimited-energy-re-policy-mapping-study>> accessed 27 March 2017 (hereinafter 'GIZ') See also Thuli Mdluli and Colleen Vogel, 'Challenges to Achieving a Successful Transition to a Low Carbon Economy in South Africa: Examples from Poor Urban Communities' (2010) 15 *Mitigation and Adaptation Strategies for Global Change* 205 at 206, where they argue that the electricity shortages experienced by the country highlighted the importance of energy in developmental strategies.

<sup>4</sup> OECD (n 2) 75.

<sup>5</sup> Mdluli and Vogel (n 3) 207 and 209.

<sup>6</sup> George Pring, Alexandra Haas and Benton Drinkwine, 'The Impact of Energy on Health, Environment and Sustainable Development: The TANSTAAFL Problem' in Donald Zillman et al (eds), *Beyond the Carbon Economy Energy Law in Transition* (Oxford University Press 2008) 13 at 14 cite the United Nations Development Programme, which states that 'reliable energy services are essential to growth and development'. See also Phillip Lloyd, 'Restructuring South Africa's Electricity Supply Industry' (2012) 64 *FOCUS: The J of the Helen Suzman Foundation* 4.

<sup>7</sup> Lloyd (n 6). See also Joel Krupa and Sarah Burch, 'A New Energy Future for South Africa: The Political Ecology of South African Renewable Energy' (2011) 39 *Energy Policy* 6254.

<sup>8</sup> OECD (n 2) at 76.

<sup>9</sup> *ibid.*

<sup>10</sup> Mdluli and Vogel (n 3) 209. For this reason, people relied on coal as an inexpensive energy source to meet their needs.

<sup>11</sup> Lloyd (n 6) 7–8 states that the Department of Minerals and Energy introduced the Free Basic Electricity programme, which was welcomed, but which came with its own challenges.

<sup>12</sup> *ibid* 7. As of 2012, there were ten million more houses connected to the grid.

<sup>13</sup> *ibid* 8.

the programme, the existing infrastructure met the demand for electricity, but the increase in demand as a result of the programme, soon exceeded supply, resulting in the electricity shortages of 2007, 2008<sup>14</sup> and again in 2015, after a few years of stabilisation.<sup>15</sup>

South Africa's electricity supply is mostly derived from coal,<sup>16</sup> as the country has the ninth largest reserves in the world.<sup>17</sup> This reliance on coal has consequently increased carbon emissions: South Africa is Africa's largest emitter, thus contributing to climate change.<sup>18</sup> This highlights the fact that South Africa's use of fossil fuels is no longer environmentally desirable or sustainable.<sup>19</sup>

To achieve sustainable development, the country must meet 'the needs of the present without compromising the ability of future generations to meet their own needs.'<sup>20</sup> With energy as a common denominator, sustainability involves sustaining the environment, the economy and the 'social framework' of a country.<sup>21</sup> South Africa's current challenge is to address energy sustainability on all three levels, with renewable-energy technologies as the optimal solution.<sup>22</sup> Renewable energy is defined in the White Paper as energy 'that harnesses naturally occurring, non-depletable sources of energy.' These sources include solar, wind, biomass and hydro, which can all be used to generate electricity.<sup>23</sup> Solar technologies convert the energy from the sun to electricity, either directly or through capturing sunlight and producing heat. Naturally occurring wind also produces electricity. Biomass is used both domestically and for industry. In the rural areas, dung and wood are mostly used as sources of fuel. Pulp and paper is used industrially.<sup>24</sup> As a result of migration from rural areas to urban areas, the domestic use of biomass is set to decline.<sup>25</sup> Hydropower uses the

<sup>14</sup> Anna Pegels, 'Renewable Energy in South Africa: Potentials, Barriers and Options for Support' (2010) 38 *Energy Policy* 4945 at 4947. See also Krupa and Burch (n 7) 6254.

<sup>15</sup> Tara Meaney, 'Eskom Ramps up Rolling Blackouts' *Eye Witness News* (5 December 2014) 1 <<http://ewn.co.za/2014/12/05/City-Power-helps-Eskom-in-power-crisis>> accessed 27 March 2017.

<sup>16</sup> White Paper on the Renewable Energy Policy of the Republic of South Africa in GG 26169 (14 May 2004) GN 513 at 3 (hereinafter 'White Paper'). By 1991, ninety-one per cent of electricity supply was derived from coal.

<sup>17</sup> GIZ (n 3) para 2.1.1.

<sup>18</sup> Winkler (ed), (*Energy Policies for Sustainable Development in South Africa: Options for the Future* Energy Resource Centre, UCT 2006) 16 <[www.erc.uct.ac.za](http://www.erc.uct.ac.za)> accessed on 27 March 2017.

<sup>19</sup> *ibid.* See also White Paper (n 16) 3.

<sup>20</sup> OECD (n 2) 13.

<sup>21</sup> *ibid.*

<sup>22</sup> Krupa and Burch (n 7) 6254. Renewable energy, as a solution to the country's challenges is discussed in 'The Challenge of bringing Renewable Energy into the Energy Mix'.

<sup>23</sup> White Paper (n 16) 1.

<sup>24</sup> Andrew Kenney, 'Energy Supply in South Africa' in Winkler (n 18) 45 at 58.

<sup>25</sup> *ibid.*

movement of water together with its gravitational force, to drive turbines, which in turn generate electricity.<sup>26</sup>

Within the Brazil, Russia, India, China and South Africa coalition (BRICS), South Africa's partner, the People's Republic of China, which is currently faced with similar energy-system challenges, has also committed itself to the use of renewable-energy sources as a solution.<sup>27</sup> China's economy has rapidly grown, resulting in an increase in energy demand<sup>28</sup> and resulting energy shortages.<sup>29</sup> Coal forms a substantial part of China's energy mix, which results in a high pollution rate.<sup>30</sup> China's coal reserves, which are of low quality, contribute to China's greenhouse gas (GHG) emissions, with almost fifty-five per cent coming from the electricity industry.<sup>31</sup> China's present economic growth has increased its responsibility to promote sustainable development, a responsibility that is in many ways similar to the one confronting South Africa.<sup>32</sup> Although the two countries are not geographically close, they are connected by trade interests,<sup>33</sup> their status as developing economies and their efforts in the struggle for a cleaner environment.<sup>34</sup> These similarities thus form a relevant basis upon which a comparison can be made between them with respect to renewable energy and its legal and policy framework.

The purpose of this article is to analyse the renewable-energy law-and-policy framework in South Africa's electricity sector. The article will compare the South African legal framework (and the socio-economic challenges that compete with global environmental demands) to that of China, as China begins to emerge as a world leader in renewable-energy development.<sup>35</sup>

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<sup>26</sup> White Paper (n 16) 1.

<sup>27</sup> Judith Cherni and Joanna Kentish, 'Renewable Energy Policy and Electricity Market Reforms in China' (2007) 35 *Energy Policy* 3616.

<sup>28</sup> Yiping Fang and Yong Zeng, 'Balancing Energy and Environment: The Effect and Perspective of Management Instruments in China' (2007) 32 *Energy* 2247.

<sup>29</sup> Cherni and Kentish (n 27) 3617.

<sup>30</sup> Fang and Zeng (n 28) 2247.

<sup>31</sup> *ibid* 2256.

<sup>32</sup> *ibid*.

<sup>33</sup> Zhang Chun, 'A Promising Partnership between BRICS and Africa: A Chinese Perspective' (2013) *The China Monitor-Special Edition* 30 at 34 <<http://www.BRICS5.co.za/academic-papers/>> accessed 27 March 2017. Both countries are members of BRICS, which has become Africa's 'largest trading partner' and 'new investor', through which trade investment is set to increase to US\$530 billion in 2015. Such investment will boost developing economies, such as China and South Africa. See also BRICS, 'Opinion Piece: Ms Maite Nkoana-Mashabane, Minister of International Relations and Cooperation South Africa and BRICS: An African Perspective' at 1 <<http://www.brics5.co.za/opinion-piece-ms-maite-nkoana-mashabane-minister-of-international-relations-and-cooperation-south-africa-and-brics-an-african-perspective/>> accessed 2 February 2014 (hereinafter 'Opinion Piece').

<sup>34</sup> China and South Africa are viewed as developing countries in terms of the UNFCCC's Kyoto Protocol. This is discussed further in (n 66).

<sup>35</sup> World Watch Institute, 'China on Pace to Become Global Leader in Renewable Energy' at 1 <<http://www.worldwatch.org/node/5497>> accessed 27 March 2017.

First, the article describes the two countries' relationship within BRICS and the benefits thereof in light of the changing energy industry. A comparison with the other BRICS countries is beyond the scope of this article. Next, the article discusses climate change and makes reference to the United Nations Framework Convention on Climate Change (UNFCCC), the Kyoto Protocol and the more recent Paris Agreement, because of the status of China and South Africa as developing countries. The article then focuses briefly on the socio-economic challenges that affect the entrance of renewable energy into the energy market with reference to some specific barriers to entry. It also discusses renewable energy as the solution to most of the challenges faced by each country in respect of sustainable development. An analysis of China and South Africa's existing legal and policy frameworks follows and lastly, recommendations for South Africa are suggested.

### THE CHINESE AND SOUTH AFRICAN CONTEXTS

China and South Africa's ties are fostered by their membership of BRICS, an acronym referring to a group of countries<sup>36</sup> comprising Brazil, Russia, India, China and South Africa. It was first introduced in 2001 by Goldman Sachs as 'an economic modelling exercise'.<sup>37</sup> BRICS is a collective of the 'leading emerging economies',<sup>38</sup> which meet regularly<sup>39</sup> to discuss common economic goals and business opportunities among other priorities, for the achievement of 'peace, security and co-operation'.<sup>40</sup> Recently, the discussions included relevant subjects, such as climate change, as well as food and energy security.<sup>41</sup>

The fifth BRICS summit was held in South Africa in March 2013.<sup>42</sup> An important development was the establishment of a BRICS Multilateral Cooperative and Co-financing Agreement for Sustainable Development aimed at building cooperative financial relationships among members, with an emphasis on sustainable development encompassing cleaner environmental policies. BRICS has since met annually, and the latest summit took place in October 2016. The group continues to cooperate in favour of

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<sup>36</sup> BRICS5, 'About BRICS' at 1 <<http://www.brics5.co.za/site/about-brics/>> accessed 27 March 2017. BRICS was originally known as BRIC until South Africa joined in 2011. See also Chun (n 33) 30.

<sup>37</sup> BRICS5 (n 36) 1.

<sup>38</sup> BRICS5, 'Fifth BRICS Summit' at 1 <<http://www.brics5.co.za/>> accessed 27 March 2017.

<sup>39</sup> BRICS5 (n 36) 1.

<sup>40</sup> BRICS5 (n 38) 1.

<sup>41</sup> BRICS5 (n 36) 2.

<sup>42</sup> Chun (n 33) 30.

their collective growth and development, and agree on many current world problems. These include the importance of preserving the environment.<sup>43</sup>

Collectively, BRICS countries contain forty-three per cent of the world's population and provide a fifth of the global domestic product.<sup>44</sup> South Africa's involvement thus not only facilitates its own growth, but also addresses the interests of the African continent.<sup>45</sup> South Africa's challenges with unemployment and poverty can be addressed by cooperating with, and learning from, other countries that have overcome similar socio-economic challenges,<sup>46</sup> with one of the most prevalent being clean energy.<sup>47</sup> The benefit of South Africa's membership is evident in the growth of its trading export and import industries.<sup>48</sup>

China's participation is also based on enhancing its economic interests in the global community and sharing its experiences.<sup>49</sup> As part of BRICS, in line with their common goals and challenges and their status as developing countries, both China and South Africa have made progress in introducing and implementing policies and laws to address climate change.<sup>50</sup> This article seeks to understand if, in addition to historical cooperation,<sup>51</sup> the new cooperation under the BRICS partnership could be leveraged to facilitate technology and knowledge transfer in the renewable-energy electricity sector to the benefit of South Africa.<sup>52</sup> This leverage is already evident with the release of the first loans from the new BRICS Development Bank in aid of the development of renewable-energy projects in the BRICS countries.<sup>53</sup> To properly contextualise the importance of renewable energy, it is crucial to understand the link between global environmental problems and energy

<sup>43</sup> BRICS5, 'Fifth BRICS Summit: Background' at 1 <<http://www.brics5.co.za/>> accessed 28 February 2014. See further <<http://brics2016.gov.in/upload/files/document/58038a52e09d4GoaDeclarationAdopted.pdf>> accessed 19 December 2016 at paras 68 and 70. The subject of sustainable development and the achievement of the Paris Agreement goals is highlighted.

<sup>44</sup> Opinion Piece (n 33) 1. See also Chun (n 33) 30.

<sup>45</sup> Opinion Piece (n 33) 1. BRICS has invested substantially in Africa and is also the continent's largest trading partner. See also Chun (n 33) 34 and NDP (n 1) 238–239, which highlight the importance of the relationship between China, India and South Africa, because of their interest in Africa's mineral content, particularly with China as one of the most active foreign investors in Africa.

<sup>46</sup> Opinion Piece (n 33).

<sup>47</sup> NDP (n 1) 198.

<sup>48</sup> BRICS5, 'South Africa in BRICS/Fifth Brics Summit' at 1 <<http://www.brics5.co.za/site/about-brics/south-africa-in-brics/>> accessed 23 January 2013 at 1. See also <<http://www.gov.za/fifth-brics-summit>> accessed 27 March 2017.

<sup>49</sup> Chun (n 33) 30.

<sup>50</sup> See further the discussion of China's and South Africa's Legal Frameworks.

<sup>51</sup> Chun (n 33) 32. China and Africa have enjoyed a 'major strategic partner[ship]' over many years.

<sup>52</sup> *ibid* 35. China is supportive of development and economic growth in Africa and will assist with these means to '[realise Africa's] full economic potential'.

<sup>53</sup> See BRICS5 (n 43) para 4.

production and consumption, which is examined in the next part of this article.

### CLIMATE CHANGE AND GLOBAL RESPONSIBILITY

The environmental impact of the depletion of non-renewable sources highlights that ‘the world is essentially one village’.<sup>54</sup> O’Keefe et al state that environmental concerns, such as ‘global warming, urban air pollution and deforestation—are essentially anthropogenic’ or ‘quite simply ... made by people’.<sup>55</sup> By definition, climate change is an ‘on-going trend of changes in the earth’s general weather condition as a result of an average rise in the temperature of the earth’s surface, often referred to as global warming.’<sup>56</sup>

GHG emissions come from human activities, such as burning fossil fuels, industrial growth and forest clearing.<sup>57</sup> The dependence of many developing countries on coal, oil and natural gas, as well as the increase in energy demand have been the largest contributors to GHG emissions.<sup>58</sup> South Africa, as a developing country, has significant GHG emissions due to its coal-based, energy-intensive economy,<sup>59</sup> and most emissions come from electricity generation.<sup>60</sup> Additionally, the goal of universal access to electricity has increased demand for energy, in turn increasing GHG emissions.<sup>61</sup>

The African continent is susceptible to the effects of climate change, which negatively affects the health of the population.<sup>62</sup> South Africa acknowledges these challenges, as well as its own particular vulnerabilities and its significant GHG emissions.<sup>63</sup> To do its part in combatting climate

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<sup>54</sup> Phil O’Keefe et al, ‘Trying to Develop Energy Policy: The Limits of Intervention’ in Anton Eberhard and Paul Theron (eds), *International Experience in Energy Policy Research and Planning* (Elan Press 1992) 31 at 34.

<sup>55</sup> *ibid.* See also Intergovernmental Panel on Climate Change (IPCC), ‘Summary for Policymakers’ in TF Stocker et al (eds), *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* (Cambridge University Press 2013) 5 and 15, which confirms the link between human activities and climate change with more certainty.

<sup>56</sup> National Climate Change Response White Paper in GG 34695 (19 October 2011) GN 757 at 8 (hereinafter ‘Climate Paper’).

<sup>57</sup> *ibid.*

<sup>58</sup> B Metz et al (eds), ‘Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change: Mitigation of Climate Change’ (Cambridge University Press 2007) paras 4.2–4.2.2 <[www.ipcc.ch/publications\\_and\\_data/ar4/wg3/en/ch4s4-2-2.html](http://www.ipcc.ch/publications_and_data/ar4/wg3/en/ch4s4-2-2.html)> accessed 27 March 2017.

<sup>59</sup> Climate Paper (n 56) 26; White Paper (n 16) 10.

<sup>60</sup> Climate Paper (n 56) 26. See also Pegels (n 14) 4946.

<sup>61</sup> Pegels (n 14) 4946.

<sup>62</sup> *ibid.* See also ML Parry et al (eds), ‘Contribution of Working Group II to the Fourth Assessment Report on the Intergovernmental Panel on Climate Change: Impacts, Adaptation and Vulnerabilities’ (Cambridge University Press 2007) para 9.2.1. <[http://www.ipcc.ch/publications\\_and\\_data/publications\\_and\\_data\\_reports.shtml](http://www.ipcc.ch/publications_and_data/publications_and_data_reports.shtml)> accessed 27 March 2017.

<sup>63</sup> NDP (n 1) 205; Climate Paper (n 56) 8–9.



change, South Africa has developed the National Climate Change Response White Paper, influenced by the provisions on the environment in the Constitution,<sup>64</sup> the National Environmental Management Act (NEMA)<sup>65</sup> and the United Nations Framework Convention on Climate Change, 1992 (UNFCCC),<sup>66</sup> which South Africa ratified in 1997.<sup>67</sup>

China's electricity sector is similarly undergoing changes due to rapid economic growth and increased electricity demand.<sup>68</sup> China must, therefore, consider climate change and the demands of its citizens for better living standards.<sup>69</sup> Environmental protection was recognised in the Chinese Constitution in 1978 and its commitment thereto was apparent in the national Sixth, Seventh, Eighth, Ninth and Tenth Five-Year-Plans, which each placed increasing emphasis on a greener environment.<sup>70</sup> Notably, the policies were implemented soon after their conception.<sup>71</sup>

Efforts have been made to unite the global community in addressing these environmental challenges<sup>72</sup> with the establishment of organisations—such as the Intergovernmental Panel on Climate Change in 1988 by the World Meteorological Organisation (WMO) and the United Nations Environmental Programme (UNEP)—to publish information on the impact of climate change and on possible solutions.<sup>73</sup> At the same time, the world's acknowledgement of the critical problems of rapid climate change resulted in the adoption of the UNFCCC.<sup>74</sup>

The UNFCCC acknowledges that every country may exploit its own natural resources according to its particular needs, but also has the responsibility not to infringe on other countries' environmental rights in doing so.<sup>75</sup> The main objectives are to stabilise GHG emissions and to achieve sustainable development worldwide,<sup>76</sup> by committing to 'common

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<sup>64</sup> S 24 of the Constitution of the Republic of South Africa, 1996. See also Climate Paper (n 56) 5.

<sup>65</sup> Act 107 of 1998.

<sup>66</sup> United Nations Framework Convention on Climate Change (1992) <<https://unfccc.int/2860.php>> accessed 27 March 2017.

<sup>67</sup> White Paper (n 16) 10.

<sup>68</sup> Cherni and Kentish (n 27) 3616.

<sup>69</sup> Runming Yao, Baizhan Li and Koen Steemers, 'Energy Policy and Standard for Built Environment in China' (2005) 30 *Renewable Energy* 1973 at 1974.

<sup>70</sup> *ibid* 1975.

<sup>71</sup> *ibid*.

<sup>72</sup> UNFCCC, 'Background on the UNFCCC: The International Response to Climate Change' <[https://unfccc.int/essential\\_background/items/6031.php](https://unfccc.int/essential_background/items/6031.php)> accessed 27 March 2017.

<sup>73</sup> Catherine Redgwell, 'International Legal Responses to the Challenges of a Lower-carbon Future: Climate Change, Carbon Capture and Storage, and Biofuels' in Zillman (n 6) 87.

<sup>74</sup> *ibid* 88.

<sup>75</sup> UNFCCC (n 66) 1.

<sup>76</sup> *ibid* 4.



but differentiated responsibilities',<sup>77</sup> taking into account the different abilities of each member country.<sup>78</sup>

Following the UNFCCC, the Kyoto Protocol to the United Nations Framework Convention on Climate Change (the Protocol), effected on 16 February 2005, creates legal obligations for developed countries to reduce GHG emissions.<sup>79</sup> Article 2 of the Protocol sets goals for achieving sustainable development, including energy efficiency,<sup>80</sup> research and development on renewable energy sources<sup>81</sup> and decreasing GHG emissions.<sup>82</sup> The Protocol classifies countries who are party to it,<sup>83</sup> with developing countries classified as 'Non-Annex 1' countries, including South Africa and China, which are not obliged to curb GHG emissions.<sup>84</sup>

Thereafter, in 2015, a significant step towards addressing the challenge of climate change came in the form of the Paris Agreement to the United Nations. In addition to efforts towards limiting temperature increases, it also provides support for developing countries, such as South Africa and China, which are most affected by climate change. In terms of the agreement, all parties must provide 'nationally determined contributions' (NDCs), which outline the efforts of each country to combat climate change.<sup>85</sup> South Africa's NDCs provide for an approach that differs from the 'deviation of business as usual' approach of most countries namely that emissions will 'peak, plateau and then decline,'<sup>86</sup> which approach takes into account South Africa's current energy status,<sup>87</sup> together with the priority of addressing socio-economic challenges facing the country, such as high poverty rates and unemployment.<sup>88</sup> South Africa has also recently adopted a policy in the form of the introduction of a carbon tax with the aim of reducing GHG emissions and moving towards the desired low-carbon economy.<sup>89</sup> Subsequently, a

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<sup>77</sup> *ibid.*

<sup>78</sup> *ibid.*

<sup>79</sup> UNFCCC (n 72) 1. See also Hermann Scheer, *Energy Autonomy* (Earthscan 2007) 176.

<sup>80</sup> Art 2(1)(a)(i) of the 'Kyoto Protocol to the United Nations Framework Convention on Climate Change (1998) <[https://unfccc.int/kyoto\\_protocol/items/2830.php](https://unfccc.int/kyoto_protocol/items/2830.php)> accessed 27 March 2017.

<sup>81</sup> *ibid* Art 2(1)(a)(iv).

<sup>82</sup> *ibid* Art 2(1)(a)(vi).

<sup>83</sup> Scheer (n 79) 178.

<sup>84</sup> *ibid.*

<sup>85</sup> UNFCCC, 'Paris Agreement—Essential Elements' at 1 <[http://unfccc.int/paris\\_agreement/items/9485.php](http://unfccc.int/paris_agreement/items/9485.php)> accessed 30 August 2017.

<sup>86</sup> UNFCCC, 'South Africa's Intended Nationally Determined Contributions (INDC)' at 1 <<http://www4.unfccc.int/Submissions/INDC/Published%20Documents/South%20Africa/1/South%20Africa.pdf>> accessed 30 August 2017.

<sup>87</sup> Coal will necessarily form a large part of the energy mix until South Africa's move towards cleaner coal and renewable-energy technologies are achieved in the future.

<sup>88</sup> UNFCCC (n 86) 2.

<sup>89</sup> Department National Treasury, 'Carbon Tax Policy Paper: Executive Summary' (May 2013) at 7 <<http://www.treasury.gov.za/public%20comments/Carbon%20Tax%20Policy%20Paper%202013.pdf>> accessed 30 August 2017.

draft Carbon Tax Bill has been developed as an economic instrument and as one of the measures for adoption towards reducing carbon emissions and in recognition of South Africa's need for sustainable growth.<sup>90</sup> China has also submitted its NDCs, which reflect its contributions towards the reduction of GHG emissions. These are essential considering China's reliance on coal, as well as its particular challenges with air pollution.<sup>91</sup>

People who do not have access to energy—the 'energy poor'<sup>92</sup>—are mostly found in developing countries.<sup>93</sup> Since sustainable development is centred on access to energy,<sup>94</sup> socio-economic issues—such as poverty alleviation—and preserving the environment, are key considerations for a sustainable energy policy<sup>95</sup> where renewable energy and energy efficiency are essential elements.<sup>96</sup>

### THE CHALLENGE OF BRINGING RENEWABLE ENERGY INTO THE ENERGY MIX

Socio-economic challenges, together with other challenges, can constitute barriers to the inclusion of renewable energy in the energy industry, especially where coal is the dominant player in the energy mix. For example, in developing countries, such as China and South Africa, governments are likely to focus on the most basic needs of the country.<sup>97</sup> Socio-economic challenges include access to energy for the poor and poverty.<sup>98</sup> China, as the largest developing country in the world, faces similar challenges to South Africa in developing a sustainable energy system.<sup>99</sup> In China, electricity demand exceeds supply and many people lack access to electricity in

<sup>90</sup> Department National Treasury, 'Draft Carbon Tax Bill: Preamble' (B-2017) at 4 and 5 <<http://www.treasury.gov.za/public%20comments/CarbonTaxBill2015/Carbon%20Tax%20Bill%20final%20for%20release%20for%20comment.pdf>> accessed 30 August 2017.

<sup>91</sup> Center for Climate and Energy Solutions, 'China's Contribution to the Paris Climate Agreement' <<https://www.c2es.org/docUploads/chinas-contributions-paris-climate-agreement.pdf>> accessed 30 August 2017. See also (n 102).

<sup>92</sup> Yinka Omorogbe, 'Promoting Sustainable Development through the Use of Renewable Energy: The Role of the Law' in Zillman (n 6) at 39.

<sup>93</sup> *ibid* 40.

<sup>94</sup> *ibid* 39.

<sup>95</sup> Harald Winkler, 'Renewable Energy Policy in South Africa: Policy Options for Renewable Electricity' (2005) 33 *Energy Policy* 27.

<sup>96</sup> Adrian J Bradbrook, 'The Development of Renewable Energy Technologies and Energy Efficiency Measures through Public International Law' in Zillman et al (eds), (n 6) 109 at 111.

<sup>97</sup> Richard Ottinger, Lily Mathews and Nadia Czachor, 'Renewable Energy in National Legislation: Challenges and Opportunities' in Zillman (n 6) 183 at 184.

<sup>98</sup> Winkler (n 95) 27.

<sup>99</sup> Zhang Peidong et al, 'Opportunities and Challenges for Renewable Energy Policy in China' (2009) 13 *Renewable and Sustainable Energy Reviews* 439 at 440. See also Ni Weidou and Thomas Johansson, 'Energy for Sustainable Development in China' (2004) 32 *Energy Policy* 1225.

rural areas.<sup>100</sup> China also struggles with population and economic growth, poverty and meeting the most basic needs of its people.<sup>101</sup> The effects of air pollution are acutely felt by the inhabitants of large cities, such as Beijing—China’s capital, particular in winter<sup>102</sup>—and cities that are closest to places with the highest levels of coal production.<sup>103</sup>

### Overcoming Social and Energy Challenges

Renewable energy offers a holistic solution to not only security of supply challenges, but also the socio-economic challenges faced by developing countries, because, by its very nature, it is inexhaustible,<sup>104</sup> whereas traditional sources of energy, such as coal, are not.<sup>105</sup> Renewable energy can lead to increased employment opportunities as technologies develop; eliminate health concerns over air pollution from coal burning; and can facilitate access to clean energy.<sup>106</sup> This would be particularly beneficial to South Africa because of its almost exclusive reliance on coal.<sup>107</sup>

South Africa has a great advantage with its abundant potential renewable-energy sources,<sup>108</sup> such as solar and wind energy.<sup>109</sup> Also, abundant land and labour are available and Krupa and Burch argue that the exploitation of South Africa’s substantial mineral resources would generate capital funds.<sup>110</sup>

China also has potential for renewable-energy development, including substantial solar- and wind-energy potential, which is largely untapped.<sup>111</sup> In Western China, where poverty is rampant because of little access to electricity, the potential for renewable-energy generation is also positive.<sup>112</sup> Substantial progress has already been made in addressing these problems, with projects such as the National Township Electrification Programme using renewable energy to electrify towns and villages.<sup>113</sup> Hydropower also has significant potential and has been specifically prioritised, with adequate

<sup>100</sup> Cherni and Kentish (n 27) at 3617. South Africa faced a similar challenge with electricity-supply shortages well into 2015.

<sup>101</sup> Weidou and Johansson (n 99) 1225.

<sup>102</sup> SAPA, ‘Smog chokes Beijing’ *News24* (17 February 2013) <<http://www.news24.com/Green/News/Smog-chokes-Beijing-20130217>> accessed 27 March 2017.

<sup>103</sup> Fang and Zeng (n 28) 2247.

<sup>104</sup> Winkler (n 95) 27.

<sup>105</sup> *ibid* 28.

<sup>106</sup> White Paper (n 16) ii. These benefits were acknowledged as being part of the solution to the country’s, and indeed the world’s, social challenges. In this regard, see also Cherni and Kentish (n 27) 3620.

<sup>107</sup> Winkler (n 95) 28.

<sup>108</sup> *ibid*.

<sup>109</sup> Krupa and Burch (n 7) 6257.

<sup>110</sup> *ibid*.

<sup>111</sup> Peidong et al (n 99) 440; Cherni and Kentish (n 27) 3618.

<sup>112</sup> Cherni (n 27) 3618.

<sup>113</sup> *ibid* 3620.

mechanisms identifying land together with measures for the provision of access to the grid and the purchase of the power produced.<sup>114</sup> Hydropower generation is already prevalent in many small counties within China.<sup>115</sup> South Africa, in contrast, has few rivers available for these projects, and current water shortages do not allow for the significant development of this technology.<sup>116</sup>

The Chinese electricity industry, similar to that in South Africa, has reformed in recent years and although it is characterised as being a so-called dual system, having state and private ownership, it is the state that controls the industry.<sup>117</sup> China's main fuel source is coal,<sup>118</sup> with seventy-five per cent of energy consumption derived from it.<sup>119</sup> The industry still experiences critical electricity shortages and the biggest consumers are asked to use electricity at alternative times to peak times so that demand can be met.<sup>120</sup> This is similar to Eskom's request to the big industrial users in South Africa.<sup>121</sup> China experienced electricity cuts in 2003 due to high demand and the inefficiencies of its older infrastructure in power generation.<sup>122</sup> Additionally, access to electricity remains a challenge, with most of the rural areas only partially connected to electricity transmission.<sup>123</sup>

China's substantial GHG emissions<sup>124</sup> have resulted in increased global pressure to reduce emissions, with three possible solutions suggested, namely 'slowing economic growth, reducing energy intensity and developing renewable energy.'<sup>125</sup> The only sustainable option is to use renewable energy, which explains China's focus on this.<sup>126</sup>

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<sup>114</sup> UNFCCC, 'First National Communication Report to the UNFCCC from China' at 86 <[http://unfccc.int/national\\_reports/non-annex\\_i\\_natcom/submitted\\_natcom/items/653.php](http://unfccc.int/national_reports/non-annex_i_natcom/submitted_natcom/items/653.php)> accessed 21 December 2016.

<sup>115</sup> *ibid* 91.

<sup>116</sup> UNFCCC, 'Second National Communication Report to the UNFCCC from South Africa' <[http://unfccc.int/national\\_reports/non-annex\\_i\\_natcom/submitted\\_natcom/items/653.php](http://unfccc.int/national_reports/non-annex_i_natcom/submitted_natcom/items/653.php)> accessed 21 December 2016 at 19. See also Kenney (n 24) 50.

<sup>117</sup> Cherni and Kentish (n 27) 3617.

<sup>118</sup> *ibid* 3616.

<sup>119</sup> Feng Wang, Haitao Yin and Shoude Li, 'China's Renewable Energy Policy: Commitments and Challenges' (2010) 38 *Energy Policy* 1872.

<sup>120</sup> Cherni and Kentish (n 27) 3617.

<sup>121</sup> Hilary Joffe, 'Challenges for South Africa's Electricity Supply Industry' (2012) 64 *FOCUS: The Helen Suzman Foundation J* 32 at 34.

<sup>122</sup> Cherni and Kentish (n 27) at 3617.

<sup>123</sup> *ibid*. According to the authors, it is estimated that 23 million people have no access to electricity as of 2007.

<sup>124</sup> Wang, Yin and Li (n 119) 1872. China emits more than the USA, according to the Netherlands Environmental Assessment Agency, as cited by the authors.

<sup>125</sup> *ibid*.

<sup>126</sup> *ibid*.

### Specific Barriers to the Entrance of Renewable Energy

Despite the abundance of renewable energy sources and the potential capital funds in South Africa, the use of renewable energy remains low in the energy mix, mainly due to competing socio-economic challenges and barriers to entry.<sup>127</sup> The barriers can be common to many countries, but are also dependent on a country's specific circumstances.<sup>128</sup> Barriers include historical investment in research and development in the field,<sup>129</sup> the high establishment costs associated with renewable energy<sup>130</sup> and nuclear energy as an alternative, among others.<sup>131</sup> Some specific barriers are discussed below.

### Existing Laws and Policies

If policy and legal frameworks direct the achievement of a society's goals,<sup>132</sup> then South Africa's current legal and policy framework for energy empowers the progression of the coal-dominated industry to the exclusion of renewable energy.<sup>133</sup> The slow development and implementation of policies and regulations on renewable energy is probably the most significant barrier in South Africa.<sup>134</sup> Despite government's acknowledgment of the importance and potential of renewable energy and its undertakings of support in integrated resource planning through legislation, there is a 'lack of movement' in implementation.<sup>135</sup>

China faces a similar barrier in the wind sector in spite of regulations passed by the Ministry of Electric Power in 1994, compelling grid connections to wind farms and the purchase of the electricity generated.<sup>136</sup> Grid companies refused to establish connections to renewable-energy technologies, because of high losses due to increased transmission and distribution costs, weak infrastructure and administrative inefficiency, which were matters not addressed in the legal regulations.<sup>137</sup>

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<sup>127</sup> Krupa and Burch (n 7) 6258. See also Pegels (n 14) 4947. A more detailed discussion of these barriers is beyond the scope of this article.

<sup>128</sup> Ottinger, Matthews and Czachor (n 97) 184.

<sup>129</sup> *ibid* 188. See also Pegels (n 14) 4948.

<sup>130</sup> Cherni and Kentish (n 27) 3620. See also Winkler (n 95) 29.

<sup>131</sup> Donald Zillman, 'The Role of Law in the Future of Nuclear Power' in Zillman et al (n 6) 319. Nuclear energy has been supplying fifteen to twenty per cent of the world's energy supply.

<sup>132</sup> Omorogbe (n 92) 45.

<sup>133</sup> Ottinger (n 97) 189.

<sup>134</sup> AB Sebitosi and P Pillay, 'Renewable Energy and the Environment in South Africa: A Way Forward' (2008) 36 *Energy Policy* 3312 3313.

<sup>135</sup> Krupa and Burch (n 7) 6259.

<sup>136</sup> Cherni and Kentish (n 27) 3622.

<sup>137</sup> *ibid* 3622–3623.

### Cost Factors

High establishment costs are generally associated with renewable-energy technology, especially for bulk electricity generation,<sup>138</sup> in comparison with the arguably inaccurate perception that the established technologies, such as coal-fired generation, are cheaper.<sup>139</sup> Coal-fired generation is very well-established in both China<sup>140</sup> and South Africa, based on the solid foundation of years of investment, abundant reserves and an infrastructure in place that does not require capital contributions.<sup>141</sup> In South Africa particularly, entry into the renewable-energy market is hampered by the artificially low cost of electricity.<sup>142</sup>

While the high costs of coal-fired generation are not quantifiable in monetary terms, its cost lies in its impact on people's health and on climate change.<sup>143</sup> Poverty is connected with the use of coal as a cheap means to meet basic needs, such as cooking and heating.<sup>144</sup> The historically inequitable distribution of electricity contributed to this reliance and exacerbated indoor air pollution.<sup>145</sup> Directing funds towards renewable energy would directly compete with the goals of poverty alleviation and economic growth.<sup>146</sup> However, the investment in renewable energy could arguably also achieve these goals in the long term.<sup>147</sup>

### Nuclear Energy as an Alternative

Nuclear energy is regarded as an alternative to fossil fuels in many countries.<sup>148</sup> Its attraction stems from the greater amount of energy produced from small amounts of enriched uranium, and nuclear energy could thus present a potential barrier to entry for renewable energy.<sup>149</sup> Nevertheless, there are some rather significant shortcomings that render

<sup>138</sup> *ibid.* See also Winkler (n 95) 29.

<sup>139</sup> Ottinger, Mathews and Czachor (n 97) 188.

<sup>140</sup> Cherni and Kentish (n 27) 3617.

<sup>141</sup> Pegels (n 14) at 4948–4949. See also Ottinger, Mathews and Czachor (n 97) 188.

<sup>142</sup> According to the Department of Energy (DOE), South Africa is among those countries that provide the cheapest electricity in the world. See DOE, 'Overview' <[http://www.energy.gov.za/files/electricity\\_overview.html](http://www.energy.gov.za/files/electricity_overview.html)> accessed 27 March 2017. See also GIZ (n 3) para 4.3.1.

<sup>143</sup> Ottinger, Mathews and Czachor (n 97) 188.

<sup>144</sup> Mdluli and Vogel (n 3) 209–210.

<sup>145</sup> *ibid.* 207.

<sup>146</sup> Pegels (n 14) 4949.

<sup>147</sup> Cherni and Kentish (n 27) 3620. A good example is the urgent need for basic housing, which goes hand-in-hand with access to electricity. Although the Constitution does not specifically require access to electricity, it is nevertheless a requirement, together with the requirement for housing, contained in s 26. See *Joseph v City of Johannesburg* [2009] JOL 24365 (CC) para 40. See further the acknowledgement in the White Paper (n 16).

<sup>148</sup> Zillman, (n 131) 319. Nuclear energy has been supplying fifteen to twenty per cent of the world's energy supply.

<sup>149</sup> *ibid.* 321. See also DOE, 'Nuclear Energy: Introduction' <[http://www.energy.gov.za/files/nuclear\\_frame.html](http://www.energy.gov.za/files/nuclear_frame.html)> accessed 27 March 2017, which documents South Africa's abundant uranium reserves and its position as a significant uranium producer.

nuclear energy a less attractive option,<sup>150</sup> such as the start-up costs of US\$2 billion to US\$3.5 billion before energy is even produced.<sup>151</sup> The high costs in monetary terms and health concerns would certainly fuel arguments that, by comparison, renewable-energy costs are not as high.<sup>152</sup> Despite these potential risks, South Africa was initially strongly committed to nuclear-energy development.<sup>153</sup>

### **Business-as-usual Practice**

The efficient management of energy use in South Africa is key to the country's economic aspirations and social development.<sup>154</sup> Universal access to electricity is an ongoing priority and as access increases and the economy grows, so too does demand.<sup>155</sup> This increase in demand accounted for the electricity shortages of 2007 and 2008, and highlighted the importance of energy security to sustainable development.<sup>156</sup> This opportune time to diversify into renewable energy was ignored by the South African government, which instead opted to increase its coal usage,<sup>157</sup> with the construction of two new coal-fired stations, namely Medupi and Kusile.<sup>158</sup> The continued so-called business-as-usual practice has exacerbated the energy shortage, to the extent that rolling blackouts began in November 2014 and became part of everyday life in the first half of 2015.<sup>159</sup> Eskom's monopoly over the industry is one of the most significant barriers to the development of renewable energy. There is a lot of research and development into the fossil-fuel industry by entities such as Eskom and Sasol.<sup>160</sup> The domination of Eskom in providing most of South Africa's electricity

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<sup>150</sup> Zillman (n 131) 322. The production of nuclear electricity from nuclear energy can result in serious health hazards. Explosions at nuclear plants also carry high costs in health and environmental damage. Examples can be seen in the Chernobyl disaster and the more recent Fukushima disaster. For more on the effects of the disaster, see Greenpeace International, 'Fukushima Nuclear Crisis' (February 2013) <<http://www.greenpeace.org/international/en/campaigns/nuclear/safety/accidents/Fukushima-nuclear-disaster/>> accessed 27 March 2017.

<sup>151</sup> Zillman (n 131) 330, as per the International Energy Agency.

<sup>152</sup> *ibid* 327–328.

<sup>153</sup> DOE, 'Background' <[http://www.energy.gov.za/files/esources/nuclear/nuclear\\_back.html](http://www.energy.gov.za/files/esources/nuclear/nuclear_back.html)> accessed 27 March 2017. The stance has subsequently changed, as discussed in the next part of this article.

<sup>154</sup> Winkler (n 95) 27.

<sup>155</sup> Krupa and Burch (n 7) 6254.

<sup>156</sup> *ibid*.

<sup>157</sup> Sebitosi and Pillay (n 134) 3313.

<sup>158</sup> Eskom, 'New Build Program' <[http://www.eskom.co.za/Whatweredoing/NewBuild/Pages/New\\_Build\\_Programme.aspx](http://www.eskom.co.za/Whatweredoing/NewBuild/Pages/New_Build_Programme.aspx)> accessed 27 March 2017.

<sup>159</sup> 'Power Woes May Last Three Years: Eskom' *eNCA* (Johannesburg, 17 February 2015) at 1 <<http://www.enca.com/south-africa/eskom-needs-about-three-years-get-back-track>> accessed 27 March 2017. See also Pegels (n 14) 4945–4946. 'Business as usual' involves continued reliance on coal.

<sup>160</sup> Pegels (n 14) 4948.



is a barrier to the entrance of independent power producers (IPPs).<sup>161</sup> Furthermore, a framework for the purchase of the electricity produced by the IPPs is required in order for the market not to exclude them.<sup>162</sup>

To overcome these and other existing barriers, policy change by government is required. This needs reinforcement through a comprehensive and enabling legal framework, such as the one governing China's renewable-energy industry, which is examined below.<sup>163</sup>

### CHINA'S LEGAL FRAMEWORK

Action is required in China to reduce its significant GHG emissions and preserve the environment.<sup>164</sup> Certain legislative measures were initially implemented over some years.<sup>165</sup> Policies favourable to renewable energy were also provided for in China's Eighth Five-Year-Plan, and the Tenth Five-Year-Plan included goals for producing a development plan and a market share policy.<sup>166</sup>

The most significant effort is apparent in the passing of the Renewable Energy Law of the People's Republic of China (REL), effective as of 1 January 2006<sup>167</sup> and lauded as providing a 'single framework' for the development of renewable energy.<sup>168</sup> Its purpose is to 'promote the development and utilisation of renewable energy',<sup>169</sup> and to provide energy security, protection of the environment and sustainable development.<sup>170</sup> It is a law based on China's particular circumstances and sets targets for the required development in renewable energy.<sup>171</sup> These targets are supported by economic incentives through government funding.<sup>172</sup>

<sup>161</sup> Krupa and Burch (n 7) 6256–6257.

<sup>162</sup> Ottinger, Mathews and Czachor (n 97) 189.

<sup>163</sup> *ibid* 184.

<sup>164</sup> Wang, Yin and Li (n 119) 1872.

<sup>165</sup> Peidong (n 99) 441. These include the Electricity Law of the People's Republic of China of 1995, and administrative regulations, such as the 2000–2015 New Energy and Renewable Energy Development Principles. For a comprehensive list, see Peidong (n 99) 442.

<sup>166</sup> Cherni and Kentish (n 27) 3619.

<sup>167</sup> Sara Schuman and Alvin Lin, 'China's Renewable Energy Law and its Impact on Renewable Power in China: Progress, Challenges and Recommendations for Implementation' (2012) 51 *Energy Policy* 89 at 90. The Renewable Energy Law of the People's Republic of China is based on the document available at <[http://www.china.org.cn/china/LegislationsForm2001-2010/2011-02/14/content\\_21917464.htm](http://www.china.org.cn/china/LegislationsForm2001-2010/2011-02/14/content_21917464.htm)> accessed 28 March 2017.

<sup>168</sup> Cherni and Kentish (n 27) 3616 and 3624.

<sup>169</sup> REL (n 167) art 1.

<sup>170</sup> *ibid*.

<sup>171</sup> FN Mingyuan, 'China's Plight in Moving Towards a Low-carbon Future: Analysis from the Perspective of Energy Law' in Zillman et al (n 6) 395.

<sup>172</sup> REL (n 167), art 24. See also Mingyuan (n 171) 391.

### Analysis of Key Provisions in the REL

Schuman and Lin discuss ‘four key mechanisms’<sup>173</sup> in the REL for renewable-energy development, namely: renewable-energy targets, mandatory connection policy, feed-in-tariffs and cost sharing. These mechanisms are examined in the following paragraphs.<sup>174</sup>

### Renewable Energy Targets and Planning

The REL requires the Energy Department of the State Council<sup>175</sup> to set medium- and long-term targets for the production of renewable energy,<sup>176</sup> and to develop a national renewable-energy development and utilisation plan.<sup>177</sup> The State Council then released the Mid- and Long-term Development Plan for Renewable Energy (‘the Plan’), which set energy-consumption targets as incentives for power generation, grid connection and transmission. The Plan was developed to facilitate the incorporation of various renewable-energy technologies in China’s energy mix.<sup>178</sup> The Plan also requires the grid companies to obtain a Mandatory Market Share (MMS) of power from renewables. This means that grid companies are required to incorporate a minimum percentage of renewable-energy technologies other than hydro power, with increasing targets.<sup>179</sup> Subsequent to the Plan, the Renewable Energy Plan for the Eleventh Five-year Period provided further targets for installed capacity and generation for different types of technologies.<sup>180</sup> At the Copenhagen Climate Conference in 2009, China undertook to reach specific clean-energy goals, reflected in its Eleventh and Twelfth Five-Year Plans respectively, thereby showing its increasing commitment to renewable energy.<sup>181</sup>

The targets were clearly able to steer the energy industry towards renewable energy,<sup>182</sup> but the implementation of the targets was not without its challenges, which were swiftly addressed.<sup>183</sup> As an example, although wind-generation capacity increased, the electricity generated was insignificant.<sup>184</sup> To this end, the National Energy Administration set ‘specific generation-based targets,’ similar to renewable portfolio standards, in draft regulations

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<sup>173</sup> Schuman and Lin (n 167) 91.

<sup>174</sup> *ibid* 91–99.

<sup>175</sup> Cherni and Kentish (n 27) 3616. The State Council is China’s parliament.

<sup>176</sup> REL (n 167), art 7.

<sup>177</sup> *ibid* art 8. See also Schuman and Lin (n 167) 91.

<sup>178</sup> Schuman and Lin (n 167) 92.

<sup>179</sup> *ibid*.

<sup>180</sup> *ibid*.

<sup>181</sup> *ibid*.

<sup>182</sup> *ibid*. See also Winkler (n 95) 30. Setting targets is a crucial step towards promoting renewable-energy development in the electricity industry.

<sup>183</sup> Schuman and Lin (n 167) 91 and 92.

<sup>184</sup> *ibid* 91.

in May 2012.<sup>185</sup> This adaptation is evidence of a structured and proactive policy that addresses obstacles as they arise.<sup>186</sup>

### **Mandatory Connection and Purchase Policy**

Article 14 of the REL, which requires grid companies to buy the renewable power generated in the same geographical area and to connect the power to the main grid, is based on a model used in Germany. The model uses feed-in-tariffs and obliges grid companies to connect renewable energy to the grid and also to purchase all of the power generated in specified areas. This ensures a market for all the electricity that is generated and makes it worthwhile for companies to produce the electricity.<sup>187</sup> It promotes competition for the most cost-effective and highest quality technology and also fosters cooperation between the grid companies and the IPPs.<sup>188</sup>

### **Feed-in-tariffs**

Article 19 of the REL provides that Parliament must set the prices for renewable energy, entailing the use of a feed-in-tariff system (FIT'), which encourages innovation to ensure economic viability and allowing for progress through experience. The FIT system entails the establishment of a price for each unit of electricity generated. The producers of electricity are then encouraged to continue to develop cheaper ways of producing electricity so that the price can be reduced.<sup>189</sup> The mix of the three supportive economic instruments, namely the FIT, the MMS and a competitive bidding system, promotes competition in the industry as each player tries to find cheaper ways of producing electricity.<sup>190</sup>

### **Cost Sharing**

Funding for renewables has been raised by a national surcharge carried by consumers. Thus the burden of the increased costs associated with renewable energy is ultimately borne by the consumer. The surcharge, however, would not cover all the costs and the government was faced with challenges that included underfunding and excess of electricity generation in low-usage areas. The national surcharge regulations were therefore amended to streamline the funding process and to address the challenges encountered initially.<sup>191</sup>

The provisions in the REL are connective and mostly successful, with a good example in the increase in wind-generation capacity, which exceeded

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<sup>185</sup> *ibid* 92. These are the Regulations for Management of Renewable Power Quotas.

<sup>186</sup> *ibid*.

<sup>187</sup> *ibid* 95.

<sup>188</sup> Cherni and Kentish (n 27) 3625–3626.

<sup>189</sup> *ibid* 3625.

<sup>190</sup> *ibid* 3625–3626.

<sup>191</sup> Schuman and Lin (n 167) 96 and 97.

that of the US shortly after its enactment.<sup>192</sup> Although certain challenges were experienced initially,<sup>193</sup> they were rapidly addressed in amendments to the REL—effective as of April 2010—and have cemented the position of renewable energy in China’s development goals.<sup>194</sup> China’s strong commitment to renewable energy is evidenced through its adaptation and implementation of the REL.<sup>195</sup> China has the most cohesive and top-down approach, ensuring that it emerges as the leader in comparison to large renewable-energy markets, such as Europe and the US.<sup>196</sup>

## **SOUTH AFRICAN ENERGY LEGAL AND POLICY FRAMEWORK**

### **Introduction**

Historically, South Africa’s electricity market was regulated by the Electricity Act 42 of 1922, which established Eskom as the main electricity supplier.<sup>197</sup> Electricity was generated regionally and was distributed by the municipalities, leaving remote rural areas without access until the national grid was formed.<sup>198</sup> The power stations were fuelled by coal, an industry that grew exponentially and enjoyed an excess supply until 2007.<sup>199</sup>

### **South African Energy Law and Policy**

The Constitution of South Africa, 1996 provides that:

Everyone has the right—

- (a) to an environment that is not harmful to their health or well-being; and
- (b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that—
  - (i) prevent pollution and ecological degradation;
  - (ii) promote conservation; and
  - (iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.<sup>200</sup>

<sup>192</sup> Schuman and Lin (n 167) 91.

<sup>193</sup> *ibid.* See also (n 184).

<sup>194</sup> Schuman and Lin (n 167) 91. See also ‘Second National Communication to UNFCCC from China’ 112–115 <[http://unfccc.int/national\\_reports/non-annex\\_i\\_natcom/submitted\\_natcom/items/653.php](http://unfccc.int/national_reports/non-annex_i_natcom/submitted_natcom/items/653.php)> accessed 21 December 2016

<sup>195</sup> Mingyuan (n 171) 379.

<sup>196</sup> Schuman and Lin (n 167) 99.

<sup>197</sup> Lloyd (n 6) 5.

<sup>198</sup> *ibid.*

<sup>199</sup> *ibid.* 5–6. The excess was distributed to neighbouring countries under the South African Power Pool agreement. See also Krupa and Burch (n 7) 6254.

<sup>200</sup> S 24.

At the time of drafting the Constitution, government was also mindful of the contribution of renewable energy to these goals.<sup>201</sup> This laid a foundation for the legislative and policy measures that followed, such as the National Environmental Management Act 107 of 1998 (NEMA).<sup>202</sup> NEMA introduced certain key principles aligning South Africa's approach to sustainable development with international standards,<sup>203</sup> and specifically mentions that renewable energy sources must be used to ensure long-term availability.<sup>204</sup>

The commencement of the electrification programme after 1994 exposed weaknesses in the distribution system.<sup>205</sup> At the same time, a regulatory body, the National Electricity Regulator (NER), was formed to regulate the electricity industry.<sup>206</sup> This subsequently became the National Energy Regulator of South Africa (NERSA).<sup>207</sup> As universal electrification continued, its success presented a number of unforeseen challenges as the oversupply of electricity soon shifted to an undersupply<sup>208</sup> that eventually resulted in the continuation of rolling blackouts.<sup>209</sup>

Government introduced the Energy Paper in 1998<sup>210</sup> to provide access to inexpensive,<sup>211</sup> quality energy, to facilitate economic growth, to introduce competition<sup>212</sup> and to ensure security of supply by diversifying the energy mix.<sup>213</sup> The Energy Paper, together with other key principles, facilitates the entrance of private participants.<sup>214</sup> It gave fair warning that security of supply would be severely compromised by 2007.<sup>215</sup> This warning was ignored, resulting in the electricity shortages experienced in 2007 and 2008.<sup>216</sup>

In reaction to the electricity shortages, the National Response to South Africa's Electricity Shortage was released in 2008.<sup>217</sup> A number of solutions were explored, including increasing capacity with two new coal-fired

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<sup>201</sup> Sebitosi and Pillay (n 134) 3313.

<sup>202</sup> *ibid.* See also NEMA (n 65).

<sup>203</sup> S 2(4)(n). See also Michael Kidd, *Environmental Law* (Juta 2008) 34.

<sup>204</sup> S 2(4)(a)(vi). See also Kidd (n 203) 33.

<sup>205</sup> Lloyd (n 6) 7.

<sup>206</sup> *ibid.* In terms of the Electricity Amendment Act 60 of 1995.

<sup>207</sup> S 3 of the National Energy Regulator Act 40 of 2004.

<sup>208</sup> Lloyd (n 6) 8.

<sup>209</sup> See (n 159).

<sup>210</sup> Lloyd (n 6) 8. The electricity industry was dealt with in detail.

<sup>211</sup> White Paper on Energy Policy 7 in 1998 GG 19606 (17 December 1998) GN 3007 para 3.2.2.1 (hereinafter 'Energy Paper').

<sup>212</sup> *ibid.* paras 3.2.2.3 and 7.1.1. See also Lloyd (n 6) 8.

<sup>213</sup> Energy Paper (n 211) para 3.2.2.5. See also Winkler (n 95) 28.

<sup>214</sup> Lloyd (n 6) 8. See also Energy Paper (n 211) para 7.1.1.

<sup>215</sup> Energy Paper (n 211) para 7.1.5.5; Lloyd (n 6) 9.

<sup>216</sup> Lloyd (n 6) 10.

<sup>217</sup> DME, (January 2008) <[http://www.gov.za/sites/www.gov.za/files/resp\\_elec.pdf](http://www.gov.za/sites/www.gov.za/files/resp_elec.pdf)> accessed 27 March 2017 (hereinafter 'National Response'). See also Krupa and Burch (n 7) 6254.

power stations, the return to service of older stations,<sup>218</sup> as well as the use of renewable energy.<sup>219</sup> As indicated above, in opting to increase the use of coal, an opportunity to diversify the energy mix with renewable energy sources was missed.<sup>220</sup> This reaction contrasts with China's systematic development of legislation aimed at increasing the use of renewable energy, as seen in its Five-Year-Plans<sup>221</sup> and decisive legal reforms.<sup>222</sup>

At the time of the 2007 electricity shortages, the Department of Minerals and Energy published the Energy Security Master Plan—Electricity (hereinafter 'Master Plan'),<sup>223</sup> specifically aimed at the electricity industry, which recognised the worldwide interest in renewable energy<sup>224</sup> and set out to achieve security of supply, diversification of electricity sources and meeting the targets of the Energy Paper.<sup>225</sup> Coincidentally, while the country was experiencing power outages at home, the Paper highlighted the importance of learning from other countries' experiences of energy shortages, such as those experienced in Ontario in 2001 and in Europe in 2004.<sup>226</sup> The importance of the role of renewable energy in South Africa's future is apparent and thus it is crucial to discuss the existing policy and laws pertaining thereto.

Spurred on by the World Summit on Sustainable Development held in South Africa in 2002, the White Paper on Renewable Energy<sup>227</sup> was published with apparent enthusiasm to 'give much needed thrust to renewable energy'.<sup>228</sup> The renewable-energy target set was a 10 000GWh.<sup>229</sup> Despite the existence of a plethora of policies geared towards the use of renewable energy,<sup>230</sup> there is no cohesive blueprint, such as China's REL.<sup>231</sup> By 2008, six years after the White Paper, very little progress had been made to establish a practical plan to implement its goals.<sup>232</sup>

However, the National Energy Act 34 of 2008 (NEA) did implement some of the measures in the White Paper, which included establishing

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<sup>218</sup> National Response (n 217) 7, referring to the construction of Medupi and Kusile, with Kusile being completed in 2018. See <[http://www.eskom.co.za/Whatweredoing/NewBuild/Pages/Kusile\\_Power\\_Station.aspx](http://www.eskom.co.za/Whatweredoing/NewBuild/Pages/Kusile_Power_Station.aspx)> accessed 27 March 2017.

<sup>219</sup> National Response (n 217) 9. See also Pegels (n 14) 4947.

<sup>220</sup> Sebitosi and Pillay (n 134) 3313.

<sup>221</sup> See (n 163).

<sup>222</sup> These efforts culminated in the REL—see (n 167).

<sup>223</sup> Department of Minerals and Energy, 'Energy Security Master Plan: Electricity 2007–2025'.

<sup>224</sup> *ibid* para 10.1.4.

<sup>225</sup> *ibid* para 4.

<sup>226</sup> *ibid* para 3.

<sup>227</sup> White Paper (n 16).

<sup>228</sup> *ibid* i.

<sup>229</sup> *ibid* 25. See also Lloyd (n 6) 11.

<sup>230</sup> See especially Lloyd (n 6), for a discussion of some of the policies and legislation in respect of the development of renewable energy.

<sup>231</sup> See (n 197).

<sup>232</sup> GIZ (n 3) 74. The timeline of renewable energy reflects the stagnation. See also Sebitosi and Pillay (n 134) 3313.

a framework for integrated resource planning.<sup>233</sup> Its purpose includes achieving security of supply,<sup>234</sup> the diversification of the energy mix,<sup>235</sup> access to energy<sup>236</sup> and sustainable development.<sup>237</sup> In 2011, almost a decade after the World Summit on Sustainable Development and in line with the NEA, the Integrated Resource Plan, 2010–2030 ('IRP 2010') laid out the first phase of the Renewable Energy Power Purchase Programme under Renewable Energy Feed in Tariffs (REFIT), and also introduced a renewable-energy programme to begin in 2020 to increase renewable-energy generation.<sup>238</sup> The plan was generally well received, except for the inclusion of nuclear energy in the mix.<sup>239</sup>

The IRP 2010 is seen as a long-term plan,<sup>240</sup> in terms of which measures and targets were set, such as those for emission constraints<sup>241</sup> and for an 'accelerated roll-out of renewable energy options'.<sup>242</sup> The IRP 2010 effectively focuses on reducing coal use and on increasing renewable energy sources, coupled with a target of thirty per cent in private participation for new capacity.<sup>243</sup> To facilitate private participation in terms of the IRP 2010, the Electricity Regulations on New Generation Capacity (hereinafter 'the regulations') were published in 2011 in terms of section 35(4) of the Electricity Regulation Act 4 of 2006. These regulations applied to new

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<sup>233</sup> S 6 of Act 34 of 2008, which states that the Integrated Energy Plan must provide for sustainable development, efficient use of the country's natural resources and consider the environment, the health and socio-economic impact on the population, at s 4(a), (b) and (e) respectively. See also Lloyd (n 6) 12. Under ch 4 of the NEA, the South African National Energy Development Institute (SANEDI) is established to promote energy efficiency (s 7(2)(a)), and to 'direct, monitor, conduct and implement energy research and technology development in all fields of energy other than nuclear energy' at s 7(2)(b)(i), along with other functions outlined in s 7. For a detailed description of the projects, as well as 'energy innovation' undertaken by SANEDI especially with regard to renewable energy, see <[www.sanedi.org.za](http://www.sanedi.org.za)> accessed 27 March 2017.

<sup>234</sup> S 2(a).

<sup>235</sup> S 2(b).

<sup>236</sup> S 2(i).

<sup>237</sup> S 2(l). A notable provision is that of s 17, which allows the Minister to prescribe 'any state-owned entity to acquire, maintain, monitor and manage national strategic energy feedstocks and carriers.' In terms of this section, the government has expressed its intention to proclaim coal as a national asset and thereby to apply export quotas on coal, cementing its 'business-as-usual' approach and sidelining renewable-energy development. See David McKay, 'Quotas May be Fatal Misstep for SA Coal' *miningmx.com* (15 June 2012) <<http://www.miningmx.com/opinion/columnists/15479-quotas-may-be-fatal-misstep-for-sa-coal/>> accessed 27 March 2017.

<sup>238</sup> Integrated Resource Plan for Electricity, 2010–2030, Final Report (25 March 2011). See also Lloyd (n 6) 12.

<sup>239</sup> Lloyd (n 6) 12.

<sup>240</sup> IRP 2010 (n 238) 60.

<sup>241</sup> *ibid* 11.

<sup>242</sup> *ibid* 22. See also Lloyd (n 6) 13.

<sup>243</sup> Joffe (n 121) 34.



generation capacity,<sup>244</sup> including renewable energy sources,<sup>245</sup> and guided the entrance of IPPs.<sup>246</sup> They also provide for the development of an integrated resource plan for new generation capacity,<sup>247</sup> regulate the conclusion of Power Purchase Agreements (PPAs)<sup>248</sup> and guide the implementation of an IPP procurement programme.<sup>249</sup>

The IRP 2010 balances the goals of reducing GHG emissions, economic growth and security of supply.<sup>250</sup> It also highlights the fact that, as a long-term plan, it falls short of addressing the current electricity shortages.<sup>251</sup> To address this gap, the Medium-Term Risk Mitigation Project was formulated, outlining measures to avoid further electricity cuts until 2016, including emphasising the use of renewable energy.<sup>252</sup> A renewed undertaking to use renewable energy has emerged as a result of the rolling blackouts that began at the end of 2014, once again evidencing a reactive approach.<sup>253</sup> At this stage it is necessary to point out the inconsistencies regarding the renewable-energy goals set by policy documents, such as the White Paper, which set a target of 10 000GW,<sup>254</sup> the IRP 2010 with a target of 11 400 GW,<sup>255</sup> and the recently updated IRP with a target of 17 800GW.<sup>256</sup> Such inconsistencies lead to confusion and a lack of clarity, which could delay the implementation of these documents because of the shifting targets.<sup>257</sup> Further inconsistency emerged with the IRP 2010 considering nuclear power as a viable alternative energy source,<sup>258</sup> and the 2012 NDP subsequently

<sup>244</sup> GG 34262 (4 May 2011) GN 399. S 1 defines new generation capacity as electricity derived from means other than through 'existing generation facilities'.

<sup>245</sup> S 2(1)(a).

<sup>246</sup> S 1 defined IPPs as any persons in which the 'government does not have a controlling ownership interest'.

<sup>247</sup> S 4.

<sup>248</sup> S 3(b).

<sup>249</sup> S 7.

<sup>250</sup> Joffe (n 121) 34.

<sup>251</sup> IRP 2010 (n 238) 60.

<sup>252</sup> *ibid.* See also Shaun Nel, 'Transforming the Energy Supply Industry' (2012) 64 FOCUS: The Helen Suzman Foundation J 15–16.

<sup>253</sup> Robert Brand, 'South Africa Plans to Raise Renewable Energy to Curb Blackouts' *Bloomberg Business* (Johannesburg, 11 December 2014) <<http://www.bloomberg.com/news/articles/2014-12-11/south-africa-plans-to-raise-renewable-energy-to-curb-blackouts?hootPostID=b267e90d16005d29c906353d1916ad24>> accessed 27 March 2017.

<sup>254</sup> White Paper (n 16) 25.

<sup>255</sup> IRP 2010 (n 238) 6.

<sup>256</sup> Integrated Resource Plan for Electricity 2010–2030, (hereinafter 'IRP update') Updated Report 2013 <<http://www.doe-irp.co.za/>> accessed 27 March 2017. The updated IRP was released on 25 November 2013 at 12 Table 1. See also GIZ (n 3) 75.

<sup>257</sup> Krupa and Burch (n 7) 6258.

<sup>258</sup> IRP 2010 (n 238) 11. Regardless of the associated high costs and risks to health and safety, the Department of Energy decided to procure 9600MW of nuclear capacity, even though it acknowledged that security of supply can be achieved without it.

providing that nuclear may no longer be a favoured source.<sup>259</sup> Despite this, the position currently seems to indicate that nuclear power is very much in the running.<sup>260</sup>

The NDP reflects a vision of what South Africa should be as a nation by 2030,<sup>261</sup> and has recognised the need for balance between South Africa's goals of economic growth and the prevalent environmental concerns in which the IRP 2010 is a key role player.<sup>262</sup> The updated IRP, which was recently released, also proposes a delay in nuclear development.<sup>263</sup> The continuous change in focus creates further uncertainty that filters into the industry, possibly explaining the minimal review in policy and legal formulation.<sup>264</sup>

Although the IRP 2010 could be considered a practical plan to formulate a blueprint and to ensure cooperation between the industry role players,<sup>265</sup> its implementation does not appear to be a priority—since the completion of Kusile, there has been no planned new capacity in terms of the IRP 2010.<sup>266</sup> Despite the apparent enthusiasm for renewable energy in policy, there is more commitment to the old faithful coal industry, as emphasised in the recent announcement of the construction of a third coal-powered station,<sup>267</sup> and the NDP's assertion that 'coal will [still] continue to be the dominant fuel in South Africa for the next 20 years.'<sup>268</sup> A 'greater climate of certainty' in South Africa is thus required for an effective industry.<sup>269</sup> This is where China's single-minded focus on renewable energy and resultant reputation as a leader in renewable-energy development serves as a valuable lesson to South Africa.<sup>270</sup>

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<sup>259</sup> NDP (n 1) 172. This is because of these high establishment costs, which could be better channelled elsewhere.

<sup>260</sup> Harald Winkler, 'Fears Mount over South Africa's Nuclear Deal' *Mail & Guardian* (Johannesburg, 27 September 2016) <<https://mg.co.za/article/2016-09-27-questions-mount-over-south-africas-planned-nuclear-power-deal>> accessed 15 March 2017.

<sup>261</sup> NDP (n 1) 198–199. It prioritises education, employment and poverty alleviation.

<sup>262</sup> *ibid* 212.

<sup>263</sup> IRP update (n 256) 51.

<sup>264</sup> Renewable Energy and Energy Efficiency Partnership (REEEP), 'Relevant Policy and Regulatory Overviews: South Africa (2012)' at 10 and 14 <<http://www.reegle.info/policy-and-regulatory-overviews/ZA>> accessed 27 March 2017. See also Krupa and Burch (n 7) 6258.

<sup>265</sup> Thomas Garner and Stephanie Kock, 'Energy Intensive Users: South Africa's Energy Needs' (2012) 64 *FOCUS: The Helen Suzman Foundation J* 59 at 62.

<sup>266</sup> *ibid*. See also Joffe (n 121) 34.

<sup>267</sup> Paul Vacchiatto and Sikonathi Mantshantsha, 'Third New Coal Power Station "to Help Remove Energy Constraints"' *BDLIVE* (23 August 2013) <<http://www.bdlive.co.za/business/energy/2013/08/23/third-new-coal-power-station-to-help-remove-energy-constraints>> accessed 2 February 2014. See also full details available at <<http://www.pressreader.com/south-africa/business-day/20130823/281573763349042>> accessed 27 March 2017.

<sup>268</sup> NDP (n 1) 165.

<sup>269</sup> *ibid* 162.

<sup>270</sup> See (n 34).

Achieving energy sustainability through renewable energy requires a commitment by policy makers and regulators.<sup>271</sup> This, however, cannot be solely government's responsibility, and thus a crucial component of the renewable-energy vision is participation by private investors to ensure its success.<sup>272</sup>

### Private Participation

The importance of private participation in the energy industry is reflected in documents, such as the IRP and the MTRM Project, which facilitate the participation of IPPs, as it is these industry players that will develop the infrastructure for renewable-energy generation to meet the demand for electricity.<sup>273</sup> To this end, the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) was established to ensure this development.<sup>274</sup> The REFIT system was initially used, but because FITs were not in accordance with the public procurement laws, government implemented a competitive bidding system instead.<sup>275</sup> This caused further delays and uncertainty, most especially since potential participants had taken steps towards development.<sup>276</sup> However, despite the delays, there was great interest in the projects, as over 1 000 participants attended a compulsory bidders' conference.<sup>277</sup> True to form, however, momentum in respect of IPPs was achieved only after the 2008 energy shortage,<sup>278</sup> which saw concentrated efforts to introduce private-sector participation where the economy and industry requires competition in electricity generation.<sup>279</sup>

Eskom will assist in providing connectivity to the national electricity grid, and by signing PPAs with the IPPs to purchase all their electricity.<sup>280</sup> The rates agreed to for the purchase of the power will ultimately be paid by consumers through increases in electricity tariffs, which Eskom will most likely request.<sup>281</sup> The unfortunate consequence is that the costs will further

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<sup>271</sup> C Mitchell and B Woodman, 'Regulation and Sustainable Energy Systems' in Robert Baldwin, Martin Cave and Martin Lodge (eds), *The Oxford Handbook of Regulation* (Oxford University Press 2012) 572 at 573. See also NDP (n 1) 200, which requires behavioural change towards renewable energy on the public's part as well.

<sup>272</sup> Nel (n 252) 15.

<sup>273</sup> *ibid.*

<sup>274</sup> Garner and Kock (n 265) 62.

<sup>275</sup> Anton Eberhard, 'Feed-in-Tariffs or Auctions?' (2013) Viewpoint at 1 and 2 <<https://www.gsb.uct.ac.za/files/FeedintariffisorAuctions.pdf>> accessed 27 March 2017

<sup>276</sup> *ibid.*

<sup>277</sup> *ibid.*

<sup>278</sup> Joffe (n 121) 35.

<sup>279</sup> NDP (n 1) 164. It is further recognised in terms of the plan that better regulation of supply and quality as well as the pricing of electricity are also required.

<sup>280</sup> Joffe (n 121) 35.

<sup>281</sup> Jonas Mosia, 'Should Energy Intensive Users Have Such a Large Say in Energy Discourse?' (2012) 64 FOCUS: The Helen Suzman Foundation J 64 at 68.

burden the poor.<sup>282</sup> The monopoly currently enjoyed by Eskom could deter investors.<sup>283</sup> However, government initially acted positively by drafting the Independent System and Market Operator Bill (ISMO),<sup>284</sup> which aimed to form a new state-owned entity to oversee the System Operator and the purchasing of the power.<sup>285</sup> Stimulation of competition and entrance to any market requires ‘effective economic regulation’ to assist the entry of private investors.<sup>286</sup> The increases in electricity tariffs approved by NERSA in 2008 to bring the cost of electricity to international levels are part of this required regulation.<sup>287</sup> However, efforts to pass the ISMO Bill appear to have been abandoned, as the deliberations and due diligence required by the National Assembly have not yet been finalised.<sup>288</sup>

The REFIT system has been successfully used in many countries,<sup>289</sup> including in China.<sup>290</sup> South Africa’s use of the bidding system instead brought an excess of bidders in the first window, to the credit of the Department of Energy.<sup>291</sup> The various bidding windows saw a succession of bids accepted—even though there were some delays in the process—and PPAs were signed, with investments reaching US\$6 billion.<sup>292</sup> Regardless of the shaky start, some projects have already supplied power to the grid<sup>293</sup> and the programme has been hailed a success, possibly providing lessons from which other developing countries could learn.<sup>294</sup>

The initial enthusiasm for the development of renewable-energy technology has not progressed beyond the vision reflected in the White Paper and other policies and Acts.<sup>295</sup> Opportunities to diversify have not been taken up, despite undertakings to focus on development.<sup>296</sup> Additionally, in spite of the ample opportunities to develop the renewable-energy industry in terms of the post-1994 restructuring, and the subsequent publication of the

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<sup>282</sup> *ibid* 66.

<sup>283</sup> Joffe (n 121) 35.

<sup>284</sup> BB 9B-2012.

<sup>285</sup> Joffe (n 121) 36.

<sup>286</sup> NDP (n 1) 162.

<sup>287</sup> Lloyd (n 6) 12.

<sup>288</sup> Editorial Staff, ‘Bill to Open up Energy Market Stalls’ *Mail & Guardian* (Johannesburg, 5 July 2013) at 1 <<http://mg.co.za/article/2013-07-05-00-bill-to-open-up-energy-market-stalls>> accessed 15 March 2017.

<sup>289</sup> Philippe Menanteau, Dominique Finon and Marie-Laure Lamy, ‘Price Versus Quantities: Choosing Policies for Promoting the Development of Renewable Energy’ (2003) 31 *Energy Policy* 799 at 802. Examples are Germany and Spain. See also Winkler (n 95) 31.

<sup>290</sup> See (n 82).

<sup>291</sup> Eberhard (n 275) 3.

<sup>292</sup> *ibid*. Twenty-eight bids were accepted.

<sup>293</sup> Leandi Kolver, ‘De Aar Solar Project Starts Supplying Power into Grid’ *Engineering News* (10 December 2013) <<http://www.engineeringnews.co.za/article/de-aar-solar-project-starts-supplying-power-into-grid-2013-12-10>> accessed 27 March 2017.

<sup>294</sup> Eberhard (n 275) 7.

<sup>295</sup> Sebitosi and Pillay (n 134) 3313.

<sup>296</sup> REEEP (n 264) 10.

White Paper, there has been little progress.<sup>297</sup> Further missed opportunities arose during the electricity shortages. The fossil-fuel industry, however, has continued to dominate, with the construction of the two new coal-fired power stations—actions contrary to the drive for developing renewable energy.<sup>298</sup> The business-as-usual approach has, once again, resulted in the current electricity shortage, which Eskom did not see as a crisis, despite the continuous rolling blackouts during November and December 2014.<sup>299</sup> It can thus be concluded that South Africa’s approach lacks the conviction and drive of the Chinese approach.<sup>300</sup>

### CONCLUSION AND RECOMMENDATIONS

Energy drives the economic growth and development of any country,<sup>301</sup> and the consideration of the environment is fundamental in planning for the future.<sup>302</sup> In this context, both China and South Africa find themselves faced with the task of balancing their priorities.<sup>303</sup> Concerns about climate change are very relevant in light of the two countries’ respective coal-dominated energy industries.<sup>304</sup> Although both realise the importance of sustainable growth and the role of renewable energy, each has differing approaches to the development thereof, with China taking the lead.<sup>305</sup> China’s success provides valuable lessons that could benefit South Africa in its endeavours.

The primary lesson for South Africa is China’s development of a ‘single coherent framework’,<sup>306</sup> which is the blueprint against which the renewable-energy industry is developing, as embodied in the REL.<sup>307</sup> South Africa, unlike China, has no single frame of reference on which to base its renewable energy industry. The current framework is fragmented and contained in a variety of policy papers and regulations, and although promises have been made, no clear strategy has been developed.<sup>308</sup>

Another key lesson is China’s drive towards cleaner energy, which is focused and proactive, as seen from the momentum gained in the various Five-Year-Plans catering for environmental concerns,<sup>309</sup> to the enactment of the REL and the subsequent amendments to improve its provisions in

<sup>297</sup> Krupa and Burch (n 7) 6258.

<sup>298</sup> Sebitosi and Pillay (n 134) 3313.

<sup>299</sup> Chris Barron, ‘A Crisis for SA, but Not for Eskom, Says Matona’ *Business Times BDLive* (14 December 2014) at 3–4 <<http://www.bdlive.co.za/business-times/2014/12/14/a-crisis-for-sa-but-not-for-eskom-says-matona>> accessed 9 February 2015.

<sup>300</sup> See (n 196).

<sup>301</sup> OECD (n 2) 25.

<sup>302</sup> Pring, Haas and Drinkwine (n 6) 13–14.

<sup>303</sup> Cherni and Kentish (n 27) 3616; Krupa and Burch (n 7) 6254.

<sup>304</sup> See (n 16) and (n 118).

<sup>305</sup> See (n 35).

<sup>306</sup> Cherni and Kentish (n 27) 3616.

<sup>307</sup> *ibid.*

<sup>308</sup> Sebitosi and Pillay (n 134) 3313. See also (n 135).

<sup>309</sup> Yao, Li and Steemers (n 69) 1975.

2010.<sup>310</sup> South Africa, on the other hand, is reactive only once confronted by a crisis, despite being forewarned of problems.<sup>311</sup> In order to successfully apply the lessons from China, South Africa needs to adopt an approach of ‘policy consistency and continuity’,<sup>312</sup> and therefore avoid shifting policies as seen in the change in stance with regards to nuclear development<sup>313</sup> and the shift in renewable-energy targets.<sup>314</sup>

South Africa could further learn from China’s focused approach, by abandoning the business-as-usual approach.<sup>315</sup> However, a positive development is evident in the success of the REIPPP, which has ensured investment and some progression of the renewable-energy industry, and which could serve as a guide to other developing countries, including China, in their strategies.<sup>316</sup>

Ultimately, what South Africa needs is a ‘complete structural change’,<sup>317</sup> and to constructively use the relationship fostered with China in BRICS to learn from the Chinese experience, to transfer knowledge and even to provide an avenue for investment in terms of the partnership.<sup>318</sup> Unfortunately, it appears that this ideal opportunity will be ignored to the detriment of the country.

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<sup>310</sup> Schuman and Lin (n 167) 91.

<sup>311</sup> Lloyd (n 6) 9–10. See also (n 199).

<sup>312</sup> Sebitosi and Pillay (n 134) 3312.

<sup>313</sup> See (n 258) and (n 259).

<sup>314</sup> See (n 254) and (n 255).

<sup>315</sup> Krupa and Burch (n 7) 6255.

<sup>316</sup> Eberhard (n 275) 7.

<sup>317</sup> Krupa and Burch (n 7) 6255.

<sup>318</sup> Chun (n 33) 35.