

Rethinking Economic Policy for South Africa in the Age of Covid-19:
Innovative policy responses for the post-lockdown Phase

Revision of policies and regulations in relation to the opportunity for an eMobility Ecosystem deployment

ACKNOWLEDGEMENTS AND DISCLAIMER:

This work is based on the research supported by the National Institute for the Humanities and Social Science. Any opinions, findings and conclusions or recommendations expressed in this report generated by the NIHSS- supported grant is that of the author(s), and do not reflect the views and opinions of the National Institute for Humanities and Social Sciences.

Revision of policies and regulations in relation to the opportunity for an eMobility Ecosystem deployment

by

Zanele (Nzama) Heinermann

This research aims to address the opportunities for revision of policies and regulations particularly, but not limited to, the Integrated Resource Plan 2019¹ (IRP 2019), in order to guide the build-up of an eMobility² Ecosystem for much needed economic transformation and a just energy transition as special “post” COVID-19 stimulus.³

¹ IRP 2019: Integrated Resource Plan, is South Africa’s plan for the procurement of generation capacity up to 2030. It cogitates the electricity infrastructure development plan grounded on the cost effective electricity supply and demand balance, by putting emphases on the importance of energy security and a clean environment for all. <http://www.energy.gov.za/files/docs/IRP%202019.pdf>

² eMobility: here in brief - electricity as a fuel (Eaaf); Migration away from fossil fuels in transport.

³ In addition to the policies and regulations to be revised and aligned are (no particular order):

White Paper on the Energy Policy of the Republic of South Africa of 1998, National Energy Act 2008, Climate Change Bill 2018 (CCB 2018), National Environmental Act of 1998 (NEMA 1998), Electricity Regulations Act 2006 (ERA 2006), National Development Plan 2030 (NDP 2030), Competition Act of 1998, White Paper on Renewable energy 2003, Energy Security Master Plan 2025 and The Department of Transport Green Transport Strategy (GTS) 2018.

Table of Contents

List of Figures	2
List of Abbreviations and Acronyms.....	2
1. EXECUTIVE SUMMARY	4
2. eMobility Ecosystem Motivation.....	7
3. SOUTH AFRICA NEEDS A PRO-ACTIVE AND COLLECTIVE APPROACH.....	12
4. IDENTIFIED EXISTING POLICIES AND REGULATIONS IN SUPPORT	21
5. eMOBILITY INCLUSION IN THE IRP 2019	27
6. IN CONCLUSION	29

List of Figures:

Figure 1: uYilo eMobility Ecosystem (Page 9)

List of Abbreviations and Acronyms:

AIS	Automotive Investment Scheme
APDP	Automotive Production and Development Programme
AV	Autonomous Vehicles
BFP	Basic fuel price
BRT	Bus Rapid Transit System
CO ₂	Carbon dioxide
CSIR	Council for Scientific and Industrial Research
DEA	Department of Environmental Affairs
DMEA	Department of Mineral and Energy Affairs
DMRE	Department of Mineral Resources and Energy
DoE	Department of Energy
DoT	Department of Transport
DST	Department of Science and Technology
dti	Department of Trade and Industry
dtic	Department of Trade, Industry and Competition
EaaF	Electricity as a Fuel
EMS	Energy Management System
ESS	Energy Storage System
EV	Electric Vehicle
EVIA	Electric Vehicle Industry Association
FDI	Foreign Direct Investment
GDP	Gross Domestic Product

GHG	Greenhouse Gases
GIZ	Gesellschaft für Internationale Zusammenarbeit
GTS	Green Transport Strategy
GWh	Giga Watt hours
ICE	Internal Combustion Engine
IoT	Internet of Things
IPCC	Intergovernmental Panel on Climate Change
IPAP	industrial Policy Action Plan
IRENA	International Renewable Energy Agency
IRP	Integrated Resource Plan
LCOE	Levelised Cost Of Energy
LIB	Lithium ion battery
MIR	Market Intelligence Report
NAAMSA	National Automotive Association of Manufacturers in South Africa
NDC	National Determined Contribution
NDP	National Development Plan
NEA	National Energy Act
NERSA	National Energy Regulator of South Africa
OEM	Original Equipment Manufacturer
PI	Production Incentives
PPPFA	Preferential Procurement Policy Framework Act
R	Rand
SA	South Africa
SANEDI,	South African National Energy Development Institute
SAPVIA	South African Photovoltaic Industry Association
SDG	Sustainable Development Goals
ToU	Time of Use
TIPS	Trade & Industry Policy Strategies
UN	United Nations
UNFCCC	United Nations Framework Convention on Climate Change
V2G	Vehicle to Grid
WEF	World Economic Forum
WPEPRA	White Paper on the Energy Policy of the Republic of South Africa

EXECUTIVE SUMMARY

While organisations around the world are trying to calculate a COVID-19 crisis aftermath, the World Economic Forum sees opportunities in “The Great Reset” and the UN is advocating the Sustainable Development Goals (SDG).⁴ Global leaders have the obligation to seek collaborations to combat the consequences of this devastating pandemic. South Africa launched the Sustainable Infrastructure Development Symposium (SIDSSA 2020)⁵ and is looking into green infrastructure bonds to accelerate growth. Energy sector transitions (with increasing renewable energy mix) and transport sector transitions (with migration to eMobility) are infrastructure developments that have globally gained momentum before COVID-19.

With more emphasis on investment plans to drive “post” COVID-19 economic transformation, the opportunities in these sector transformations have encouraged international governments to launch green stimulus funds for their industries and markets.⁶ COVID-19 pandemic is a crisis that’s affecting all of us, and the immediate response from all policymakers to focus on protecting public health, helping those individuals whose livelihoods are in jeopardy, and whilst stabilising the economy is the appropriate measure. However, its vital that the much needed recovery is sustainable and the glaring approach is to promote a green recovery which will enable our world to be more resilient to such crisis.⁷

In order to guide the process of South Africa’s national energy transitions to be a “Just Energy Transitions”, it is up to South African government and local industry stakeholders to play their respective roles.⁸ IRP 2019 is a central and progressive policy that recognises unequivocally that the cheapest approach to produce reliable new electricity in South Africa is through adding an energy mix of solar PV, wind, nuclear and gas etc. to our declining fleet of coal fire plants. The policy reveals the significant number coal fire plants that shall be replaced with cleaner energy sources until 2030.⁹

The transition to electricity as a fuel (EaaS), however, requires integration and collaboration of the transport and energy sectors. New supply chains in a developing South African electric transportation industry alongside green energy developments promise to create a diverse spectrum of job opportunities and boost economic competitiveness.

⁴ World Economic forum *The Great Reset*, available at, <https://www.weforum.org/great-reset/>, and United Nations news, SDG, ‘Stay the course together to emerge stronger from COVID-19 crisis’ UN chief’s message to major sustainability forum, available at, <https://news.un.org/en/story/2020/07/1067622>.

⁵ Sustainable Infrastructure Development (SIDSSA), available at, <https://sidssa.org.za/>.

⁶ E.g. <https://www.dw.com/en/germanys-angela-merkel-unveils-stimulus-package-to-kickstart-economy/a-53677420> ; <https://www.businessgreen.com/news/4019709/france-germany-ramp-multi-billion-euro-green-stimulus-plans>

⁷ Caroline Kuzemko C Bradshaw M, Bridge G, Goldthau A, Jewel J, Overland L, Scholten Thijs D, Van de Graaf, Westphal K, *Covid-19 and the politics of sustainable energy transitions*, Volume 68, October 2020, 101685: <https://www.sciencedirect.com/science/article/pii/S2214629620302607#!>.

⁸ Glynn, P.J.; Błachowicz, A.; Nicholls, M.: (2020), *Incorporating just transition strategies in developing country Nationally Determined Contributions, Climate Strategies*.

⁹ IRP 2019 at 15-16.

In these processes, it is imperative to attract private investment (foreign and local) and empower local industrialists¹⁰ alongside the development of new infrastructure in the energy and transport sectors as well as it is important to create matching¹¹ job opportunities. To ensure that advantages outweigh potential disadvantages of using electricity as a transportation fuel, this necessitates for policies and regulations to be reviewed in order for them to encourage innovations to combat the effects of the COVID-19 crisis and the continuous decline of our economy.¹²

Investments into modern and sustainable infrastructure like an eMobility Ecosystem entailing charge points (ELECTRIC VEHICLE CHARGERS) as well as digital connectivity (CHARGING NETWORK SERVICES & APPLICATIONS), green energy generation (RENEWABLE ENERGY) and energy security methods (ENERGY STORAGE SYSTEMS) are essential. For the South African government to pro-actively guide these opportunities with strategies for “post” COVID-19 economic stimulus, the benefits of such investments must be guided by policies and regulations that ensure broad-based economic developments.¹³

The IRP 2019 as central resource policy needs to be reviewed and shall further inform other related policies and regulations that have influence on encouraging innovations of the energy and transport transitions. The aforementioned must be cognisant of the important role that electric powered transport and its ecosystem can have by shifting the transport sector’s energy demand towards electricity.

Innovative policies and regulations shall enable South Africa to build modern sustainable infrastructure and increase local manufacturing opportunities by attracting holistic “post” COVID-19 investments. The fundamental aspect is to facilitate urgently needed economic stimulus to have positive impact on broad-based economic recovery, as an eMobility Ecosystem can provide stabilising mechanisms for the “disintegrating” national utility (ESKOM), strengthen municipalities, provide sustainable employment, implement more affordable, secure transport for all and make South Africa more competitive for the export of these green technologies.

¹⁰ Local: in relation to citizen empowerment and development of domestic industry (also referenced to BIS– black industrial scheme).

¹¹ Matching: Developing new energy and transport industry sectors that can (more than) compensate for the job losses in the coal industry. ¹² Electric Power Research Institute (EPRI) is an independent, non-profit organisation that conducts research and development related to the generation, delivery and use of electricity to help address challenges in electricity, including reliability, efficiency, affordability, health, safety and the environment.

¹³ The transition to electricity as a fuel has great impact including: Electricity generation locally vs. import of fossil fuels, Use of renewable vs. pollution-heavy energy generation, Increase of electricity demand vs. high fossil fuel consumption, Cleaner environment vs. harmful pollution, Smart and sustainable cities vs. service delivery issues, etc.

In accordance with the Constitution of the Republic of South Africa, 1996 section 24,¹⁴ it is imperative we uphold our obligations to the signed Paris Agreement¹⁵ and combine efforts towards invigorating the economy for a positive recovery from the COVID-19 crisis. The call from the Presidency¹⁶ that is encouraging private sector investment to support the South African government in getting our country back on track to positive economic transformation and recovery indicates the willingness of the government to provide policies and regulations that create a conducive environment to private investors.

¹⁴ 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.

¹⁵ Amusan, Lere, and Oluwole Olutola. "Addressing Climate Change in Southern Africa: Any Role for South Africa in the Post-Paris Agreement?" *India Quarterly* 72, no. 4 (2016): 395-409. Accessed July 9, 2020. doi:10.2307/48505520.

¹⁶ President Cyril Ramaphosa: Opening the Presidential Job Summit, Gallagher Convention Centre, Johannesburg (and other occasions)

1. eMobility Ecosystem Motivation

President Cyril Ramaphosa said in early May 2020 that *“We South Africans are witnessing the - total destruction of our economy due to the COVID-19 coronavirus, and radical economic transformation must be central to plans to rebuild and repurpose.”*¹⁷

Today, South Africa finds itself cornered by many globally imposed pressures, on top, homemade obstacles occlude the already weak economy. South Africa’s set of economic anguishments are created by a convergence of our lacklustre economic growth in the recent past, a downturn in sectors where we are price takers, a near collapse of economic activities by the restrictions imposed by the COVID-19 lockdown resulting in a plummeting exchange rate.¹⁸ All these factors have contributed, instantaneously, to a harsh reality and an intimidating outlook that requires us to think out of the box.

To weather this storm and to regain a pleasant living reality demands the South African government to reimagine a different norm for economic activity and economic growth, especially in infrastructure sectors (including the review and adaptation of current policy frameworks).¹⁹ With limited monetary resources, South Africa finds itself having to borrow just to get by. Within the current climate and trajectory, the round of borrowing will be followed by further rummage, unless innovative and creative levers of economic growth are deployed in an holistic manner (taking local and international perspectives of sustainable development into account). South Africa is on a downward trajectory that is clearly in conflict with the vision of the NDP²⁰, in respect of its objective to eradicate unemployment, reduce poverty along with inequality.

South Africa’s recent quarterly labour force survey shows the unemployment rate breached the 30% mark for the first time in history and is projected to rise by 1% year on year.²¹ A walk through any of South Africa’s townships pays testament to even higher levels of unemployment, and youth unemployment.²²

On a positive note, the energy and transport sectors have important levers to support the South African economic transformation in a new “post” COVID-19 reality. The critical impact of the aforementioned

¹⁷Statement by Cyril Ramaphosa: (5th May 2020) in Durban while addressing the provincial command council, led by Premier Sihle Zikalala, which is coordinating KwaZulu-Natal’s response to the virus.

¹⁸ Financial Times South Africa’s rand hits record low after debt downgrade: available at, <https://www.ft.com/content/b4a074ca-f664-4fcf-92f9-949413264294> and Pierre Swart and Stephanie Goncalves, Downgrade of South Africa’s credit rating further into junk: available at, <https://www.cliffedekkerhofmeyr.com/en/news/publications/2020/finance/finance-alert-11-may-downgrade-of-south-africas-credit-rating-further-into-junk.html>.

¹⁹ Department of Stats South Africa, Further Data Shows Lagging Infrastructure Investment : available at, <http://www.statssa.gov.za/?p=13662>.

²⁰ NDP: National Development Plan, available at, <https://www.gov.za/issues/national-development-plan-2030>.

²¹ Department of Stats South Africa: *The South African economy shed 2,2 million jobs in the second quarter of 2020*, according to the latest Quarterly Labour Force Survey Quarter 2: 2020 results, released by Statistics South Africa on 29 September 2020: available at, <http://www.statssa.gov.za/?p=13633>

²² S Schotte, *Chronic Poverty, COVID-19 in South Africa: Temporary shock or lasting poverty trap?* available at, <http://www.chronicpoverty.network.org/blog/2020/4/23/COVID-19-in-south-africa-temporary-shock-or-lasting-poverty-trap>

sectors on every citizen's livelihood with respect to service quality, reliability, accessibility, security and cost are indispensable. Collectively, these two sectors alone foster tremendous opportunities due to disruptive technology migrations as well as socio-economic developments.

In vigorous economies with developed markets, the transitions in the energy and transport sectors are strategically aligned with the mitigation measures against climate change. Several European countries aiming for a CO₂-neutral energy balance by 2050.²³ Worldwide, and more so in the African region, energy generation and - access related issues have taken centre-stage in economic discussions, even before the COVID-19 crisis. While pollution causing climate change could be seen as an environmental or green challenge, it already has profound economic, health and social impacts.²⁴

International research, published in *Cardiovascular Research by the European Society of Cardiology*, established that about 15% of deaths worldwide from COVID-19 could be attributed to long-term exposure to air pollution. In Europe the proportion was about 19%, in North America it was 17%, and in East Asia about 27%.²⁵ The COVID-19 crisis is acute and immediate, whilst climate change is a slow motion version that is equally critical. We argue that these two crises are interdependent due to the notion that the economic recovery envisioned by policymakers will have a significant bearing on the effects of climate change outcome for decades to come. Therefore, the COVID-19 pandemic demands a flexible and urgent approach by policymakers that is cognisant of sustainable development (green economic recovery).²⁶

South Africa has an energy intense economy and as such is a significant contributor to the global emissions.²⁷ The South African parliament has formally ratified the Paris Agreement in November 2016 and endorsed the submission of its National Determined Contribution (NDC). In June 2018, the Department of Environment Affairs (DEA) tabled a Climate Change Bill²⁸, the bill makes provision for the identification and mapping of risks and "vulnerabilities" across areas, ecosystems, industries, communities, and households.

South Africa's critical load shedding scenarios are evidence for the already existing energy deficit as well as other energy security issues.²⁹ Fortunately, renewable energy is conceded to provide a lower

²³ O Ruhnau S Bannik, S Otten, A Praktijnjo, M Robinius, *Direct or indirect electrification? A review of heat generation and road transport decarbonisation scenarios for Germany 2050*: 19/10/2019 pg 989-992.

²⁴ National Climate Change Response White Paper: available at, www.environment.gov.za/sites/default/files/legislations/national_climatechange_response_whitepaper.pdf

²⁵ European Society of Cardiology: available at, <https://www.escardio.org/The-ESC/Press-Office/Press-releases/study-estimates-exposure-to-air-pollution-increases-COVID-19-deaths-by-15-world>, The Actuary Magazine: <https://www.theactuary.com/2020/10/28/study-links-15-COVID-19-deaths-air-pollution>.

²⁶ A Wyns (Climate change researcher, World Health Organization) *The World Economic Forum, How our responses to climate change and the coronavirus are linked*: available at, <https://www.weforum.org/agenda/2020/04/climate-change-coronavirus-linked/>.

²⁷ Global Share CO₂ emissions: available at, <https://www.ucsusa.org/resources/each-countrys-share-co2-emissions>.²⁸

National Climate Change Bill (for comments): available at, www.environment.gov.za/sites/default/files/legislations/climatechangebill2018_gn41689.pdf.

²⁹ E Bellos, *Sustainable energy development: How can the tension between energy security and energy transition be measured and managed in South Africa?* 23/08/2018 and H Trollip, A Butler, A., J Burton, T Caetano, C Godinho, *Energy Security in South Africa. Cape Town (2014)*.

levelised cost of energy (LCOE) than fossil fuel generated energy today.³⁰ Considering further social economic aspects like health (which is of crucial importance with respect to underlying respiratory diseases and the COVID-19 pandemic), quality of life, local economic empowerment as well as the abundance of sun & wind, etc. the development of local renewable energy infrastructure is a must for of South Africa. The energy transition is imperative since South Africa’s predominant CO2 emission is due to the energy production by coal fire plants.³¹

Therefore, positive impacts of the energy and transport transitions have to be guided by innovative policies and regulations. This research policy paper therefore engages with the important role that electric powered transport along with its full ecosystem can have by shifting energy demand in the transport sector from fossil fuels towards electricity, generally referred to as eMobility. The development of an eMobility Ecosystem infrastructure can facilitate urgently needed economic transformation with positive impact on broad-based economic recovery. The localisation of manufacturing of components in the eMobility Ecosystem shall make South Africa competitive in the export of these green technologies too.

Please note the illustration of the eMobility Ecosystem by uYilo (South Africa’s eMobility Programme).³²



FIGURE 1: uYilo eMobility Ecosystem

As mentioned, the eMobility Ecosystem is fundamentally appraised by the migration from fossil fuels to electricity (EaaF). The impact eMobility has on the transport sector is often described as the “transport

³⁰ H Kretchmer , (Senior Writer, Formative Content) The World Economic Forum, *Renewables cheaper than coal*: available at, <https://www.weforum.org/agenda/2020/06/renewable-energy-cheaper-coal/>

³¹ SA’s rating: *Brown to Green Report, The G20 transition towards a net-zero emissions economy*, available at, https://www.climate-transparency.org/wp-content/uploads/2019/11/B2G_2019_South_Africa.pdf.

³² uYilo is the national technology agency to enable, facilitate and mobilise electric mobility in South Africa: available at, <https://www.uyilo.org.za/index.php>.

sector transition of the century” and has significant impact on the energy sector transition, which is observable within the following main functionalities:

- Acting as **energy consumer/off-taker** with a principal load-profile characteristic conducive to the national grid (e.g. public transport: depot charging strategies with overnight schedule preference; private market: most charging will be performed at home and overnight).³³
- Acting as **energy generator** with the focus on self-generation via renewable energy, which aligns with the directions provided in the IRP 2019 in terms of energy mix and the migration from a “coal-centric” architecture to a greener (lower CO₂) industry.³⁴ Further, the special determination for bulk-user (e.g. Mining Sector) in respect to self-generation can be applied to the wider eMobility charging infrastructure of a charging service provider.
- Acting as **energy security service provider** by using the continuously growing energy storage capacities (e.g. stationary energy storage to boost charging infrastructure as well as portable/mobile energy storage added with every electric vehicle that is becoming part of the ecosystem). The functionality for holistic integration and management of the vehicle battery capacity into the concepts of energy security is called V2G (vehicle to grid) technology.³⁵
- Acting as **part of the energy management system** with the capability to integrate into the greater smart infrastructure (e.g. smart grid technology, load management, etc.) architecture with intelligent charging (scheduling of charging across fleets, influencing charging behaviour via Time-of-Use (ToU) tariffs, manage peak demands and energy arbitrage).³⁶
- Acting to **increase the localisation factor of energy** used in transport. Electricity used in or via the eMobility Ecosystem does not have to be imported. Even if the electrification in South Africa is still “heavy on CO₂”, the eMobility Ecosystem architecture supports a positive trajectory towards lower CO₂ industry sectors (with reference to energy and transport).

The above functionalities are eventually provided by a growing eMobility Ecosystem that will be developed across the country and further in the (African) region. Greener and more sustainable inner-

³³ EV charging load example: “only” 250,000 Minibus Taxis in SA @ 50kWh/day = 12.5 GWh/day

³⁴ Govender J and Dempster E at Cliffe Dekker Hofmeyr, *The Integrated Resource Plan 2019: A promising future roadmap for generation capacity in South Africa* available at, <https://www.cliffedekkerhofmeyr.com/en/news/publications/2019/Corporate/energy-alert-22-october-The-Integrated-Resource-Plan-2019-A-promising-future-roadmap-for-generation-capacity-in-South-Africa.html>

³⁵ V2G (Vehicle to Grid): <https://www.virta.global/vehicle-to-grid-v2g>

³⁶ Forster W, *Renew Economy Understanding the “arbitrage” value of a large battery in SA*, available at, <https://reneweconomy.com.au/author/warwick-forster/and Us Trade And Development Agency, Parsons, South Africa Energy Storage Technology and Market Assessment> : available at, https://www.crses.sun.ac.za/files/research/publications/technical-reports/USTDA_Public+Version+1.pdf

city transport will have a positive impact, (initially) driven by the public transport migration.³⁷ The more the eMobility Ecosystem develops, the more it can support the energy sector with the discussed capabilities and further improves the quality(standard) of life.

However, to achieve these transitions effectively, we propose a reviewing of the IRP 2019 as central policy for resource planning of South Africa, to make provision for eMobility and the important building blocks, which create its Ecosystem.

To achieve the above we will now engage first, with the need for a pro-active and collective approach by and within the South African government departments, that should facilitate and benefit from their alignment with a reviewed IRP 2019. With emphasis on the leading roles the energy and transport departments have in relation to an eMobility Ecosystem infrastructure development.

Secondly, we look at apparent policies and regulations that are already supportive or could be referred to as facilitating green infrastructure developments like an eMobility Ecosystem.

In conclusion, we then suggest how the IRP shall be reviewed, due to its importance as a central resource policy that underpins the road map of the country's resources management, deployment and successful (sustainable) implementation. With strong prospects of attracting much needed FDI using SDG into green infrastructure, which will bolster transitions in energy and transport in the wake of the COVID-19 crisis.

³⁷ Public transport first, due to the demand for broad-based transitions (15.000.000 MiniBus Trips daily) , South African National Development Institues can SANEDI, *Support ecomobility during Transport Month(October)*, available at, <https://www.sanedi.org.za/img/Events/Releases%20for%20website/Releases%20for%20website/Support%20ecomobility%20during%20Transport%20Month%20-%20FINAL.pdf>

2. SOUTH AFRICA NEEDS A PRO-ACTIVE AND COLLECTIVE APPROACH

Strong international markets are ahead with their implementation of SDG and direct their attention to the energy consumption in transport. In their view, the migration to EVs as a socio-economic prerogative.³⁸ Sector experts regard the transport sector transition as the most disruptive and important industry shift in hundred years.³⁹ Carmakers are racing against each other to take advantage of the enormous growth opportunities in producing EVs.⁴⁰

With European countries committed to terminate their new production of internal combustion engine (ICE) vehicles by 2030 (UK in 2035) and migrating to EV and fuel cell (hydrogen) based transport⁴¹, South Africa cannot wait for these predictable decisions to be driven or even dictated by international forces.⁴² It is important for South Africa to manage the adoption of EaaS⁴³ by all forms of transport in a pro-active and sovereign manner. Challenges and opportunities of the transport transition are on our doorsteps. Failing to create a local eMobility Ecosystem infrastructure in South Africa, will destine our automotive manufacturing⁴⁴ facilities to be obsolete within a decade.⁴⁵

An eMobility migration to EaaS requires integration and collaboration of the energy and transport sectors as well as alignment by other sector departments. New supply chains in a developing South African electric transportation industry alongside green energy developments shall create a wide spectrum of job opportunities and boost economic competitiveness.⁴⁶ The University of Massachusetts in a study stated that Oxford University's Smith School of Enterprise (SSEE) found that every \$1 Million in public investment generates 7.49 full-time jobs in renewables infrastructure, 7.72 in energy efficiency, and just 2.65 in fossil fuels.⁴⁷

Today, South Africa's transport, energy, trade and fiscal policies remain largely centred around the private automobile powered by the internal combustion engine (ICE). The South African industrial policy primarily, if not solely, focuses on incentives for the assembly of ICEs locally through the AIS.. Therefore fuel taxes remain an integral revenue stream amounting to over R60-billion in 2017/18. In

³⁸ Socio-economic prerogative: Reduction of tailpipe emission is imperative to reduce climate change. Globally, countries have widely committed to terminate the manufacturing of *Internal Combustion Engine (ICE)* vehicles by 2030.

³⁹ J Monios & G Wilmsmeier, *Deep adaptation to climate change in the maritime transport sector – a new paradigm for maritime economics?*, *Maritime Policy & Management*, 47:7, 853-872, DOI: 10.1080/03088839.2020.1752947

⁴⁰ *Who will rule the Teslaverse* The Economist: available at, <https://www.economist.com/business/2020/09/17/who-will-rule-the-teslaverse>, T Jeff. "Charging up the future: a new generation of lithium-ion batteries, coupled with rising oil prices and the need to address climate change, has sparked a global race to electrify transportation." *Nature*, vol. 456, no. 7221, 2008, p. 436+.

⁴¹ I Burch, and J Gilchrist, *Survey of Global Activity to Phase Out Internal Combustion Engine Vehicles*: <https://theclimatecenter.org/wp-content/uploads/2020/03/Survey-on-Global-Activities-to-Phase-Out-ICE-Vehicles-update-3.18.20-1.pdf>

⁴² EVIA, *The future of Mobility is here* : <https://www.evia.org.za/2018EVIACONFERENCEPUBLICATION.PDF>

⁴³ eMobility: available at, [https://www.gartner.com/en/information-technology/glossary/electro-mobility-emobility#:~:text=Electro%20mobility%20\(or%20e%2DMobility,propulsion%20of%20vehicles%20and%20fleets.](https://www.gartner.com/en/information-technology/glossary/electro-mobility-emobility#:~:text=Electro%20mobility%20(or%20e%2DMobility,propulsion%20of%20vehicles%20and%20fleets.)

⁴⁴ Automotive Manufacturing: representing 30% of South Africa's total manufacturing output and 7% of GDP (source NAAMSA 2018)

⁴⁵ Green Cape, *Market Intelligent Report 2020 for EVs*: available at, https://www.greencape.co.za/assets/Uploads/ELECTRIC_VEHICLES_MARKET_INTELLIGENCE_REPORT_25_3_20_WEB.pdf

⁴⁶ Ibid at 11-27.

⁴⁷ H Garrett-Peltier, 2017. "Green versus brown: Comparing the employment impacts of energy efficiency, renewable energy, and fossil fuels using an input-output model," *Economic Modelling*, Elsevier, vol. 61(C),

addition it constitutes well over 40% of the final consumer fuel price.⁴⁸ Hence the uptake and introduction of electric vehicles in some instances are seen as a peril rather than an exciting opportunity.

The importance of the automotive sector for the South African economy is undeniable, even if, as to be expected, the aggregate domestic new vehicle sales numbers declined at the back of the recent COVID-19 pandemic and challenging economic conditions in the country. The sector reported a total revenue of more than R500 billion (\$35.6 billion) in 2017. Additionally, the industry employs over ~900 000 workers.⁴⁹ The new vehicle sales statistics for March 2020 reflects a substantial decline. There is a total of around 12 Million motor vehicles registered on South African roads. In 2018 the sector produced more than 600.000 ICE in which the majority was for export trade.⁵⁰ The APDP notes that the continuous success of the automotive sector is attributed largely to the enduring policy certainty and government incentives, which in return provide investor confidence.

At the present moment the opposite can be said for the eMobility transition. The existing policy frameworks are geared around the ICE exclusively and these policy and regulations have not been reviewed, updated to facilitate an enabling environment for the sustainable development of the eMobility Ecosystem. In the wake of COVID-19 crisis such a new adaptation of policy directives is essential for much needed private investment into the South African economy.

It is acknowledged that with the continuing decline in battery storage prices, the eMobility Ecosystem will naturally grow in South Africa at some point, however this uncertainty in South Africa cannot be appreciated due to the need for recovery from the COVID-19 pandemic. South Africa simply cannot wait to become a price taker and miss the local manufacturing migration opportunities.

Moreover, it is imperative for the automotive sector as strong manufacturing hub (considered as a second-tier market) to sustain its competitive advantage given the decline in demand of the ICE vehicles globally by facilitating enabling environments through robust policies and regulation for the eMobility Ecosystem infrastructure development utilising SDG.

Policy uncertainties for eMobility Ecosystem developments remain a robust barrier amongst others like the high taxes and import duty of 25% of any EV imported from abroad including an additional 17% for ad valorem (luxury tax duty) due to the battery price pushing the overall cost of the vehicle into a luxury threshold.⁵¹ However, viewed from the dtic the 25% import duty is seen as a driver for

⁴⁸ Green Cape, *Market Intelligent Report 2020 for EVs*: available at, https://www.greencape.co.za/assets/Uploads/ELECTRIC_VEHICLES_MARKET_INTELLIGENCE_REPORT_25_3_20_WEB.pdf

⁴⁹ Ibid at 11-25.

⁵⁰ Ibid at 11-29.

⁵¹ Ibid (2019) at 22, <https://www.greencape.co.za/assets/Uploads/ELECTRIC-VEHICLES-MARKET-INTELLIGENCE-REPORT-WEB4.pdf>

localisation, since it safeguards the local automotive manufacturing sector from imports that benefit from government incentives.⁵² Another barrier is that several products are not (and will not be) suitable for the South Africa market, predominantly due to difference in infrastructure and lagging skill-set development.⁵³

The impactful drivers on a Macroeconomics and Microeconomics level are the South Africa's commitment to mitigation of climate change (coupled with the climate-conscious consumers), the cost of importing fuels, the foreseeable loss of the automotive trademarks (OEM manufacturing in SA) and decrease in customer hesitation (e.g. range anxiety, with the proposed infrastructure development that becomes more visible and increasing openly available information about the benefits of eMobility).⁵⁴

The eMobility opportunities for South Africa are clear. The threat for the country's industry lies in failing to grasp the significance of the global eMobility revolution. If South Africa's automotive and industrial policy does not start adapting to the eMobility Ecosystem transitions, the country could find itself producing ICE cars for which there is less and less global demand. Policymakers should, hence, embrace an integrated approach that cuts across the energy, trade, industrial, transport, and fiscal policy spectrum.⁵⁵

The approach necessitates that respective government departments shouldn't work in silos in achieving green SDG, they must work collectively in the complete process from reviewing policy, implementation and continuous adaptation in the fast changing technology sectors. The relevant government department identified to facilitate a conducive environment for the eMobility Ecosystem are (but not limited too):

- Firstly, Department of Transport (DoT) and Department Mineral Resources and Energy (DMRE) to play strong cooperative roles in the proposed development.
- Secondly, Department of Environmental Affairs (DEA), Department of Trade, Industry and Competition (dtic), National Treasury, Department of Communication and Digital Technologies (DCDT), Department of Education – basic & higher (DoBE & DoHE), Department of Health (DoH), Department of Agriculture Forestry and Fisheries (DAFF), Department of Water and Sanitation (DWS) as well as others.

⁵² Green Cape : *Market Intelligent Report 2020* pg 25, BMW submitted an application to the International Trade Administration Commission (ITAC) for the reduction of import duties to stimulate vehicles sales. The application for the reduction in duties on imported electric vehicles to 0% for a period of three years, with a subsequent increase to 10%. The outcome of this application was unsuccessful. available at, https://www.greencape.co.za/assets/Uploads/ELECTRIC_VEHICLES_MARKET_INTELLIGENCE_REPORT_25_3_20_WEB.pdf

⁵³ Ibid at 22-15.

⁵⁴ TIPS Research Report for dtic and NAAMSA 2020 pg 48,79,106,138.

⁵⁵ The Green Fund, available at, <https://www.sagreenfund.org.za/wordpress/> Positioning

South Africa for a green recovery, *Alexander Forbes*, available at,

<https://www.fanews.co.za/article/investments/8/economy/1021/positioning-south-africa-for-a-green-recovery/30455>

For the purposes of this research paper, we shall highlight the respective roles of some of the departments in creating an enabling environment to foster the development of an eMobility Ecosystem infrastructure.

Renewable Energy (Self) Generation

DOE

As a holistic eMobility Ecosystem aims to provide green energy (mainly provided by Solar PV Farms) to meet the increasing charging network demand driven by the adaptation of EVs (initial focus on government fleets and public transport), there is a need for the DoE (in cooperation with NERSA) to consider special power generation licensing structures.

The Electricity Regulation Act (2006) (ERA) establishes a national regulatory framework for the electricity supply industry, makes NERSA the custodian and enforcer of the national electricity regulatory framework, provides for licenses and registration of electricity and regulates reticulation of electricity by municipalities. One of the objectives of the Act is to promote the use of diverse energy sources and energy efficiency.⁵⁶ ERA in this regard supports renewable energy as a diverse energy source. No person may operate any generation, transmission or distribution facility without a license.⁵⁷

South Africa's mining industry requested the Minister of Mineral Resources to urgently allow mines to build their own power plants to generate 869 MW of solar power and other additional power needed. Minerals Council CEO Roger Baxter addressed the government 'to take decisive steps not only to fix Eskom, but also to enable the private sector to bring on stream substantial self-generation capacity. These new self-generation plants would be at no cost to government'.⁵⁸ The DMRE released a short statement saying that it would be introducing 'immediate measures' to increase access to energy supply. These measures can be carried out under s 34 of the Electricity Regulation Act. Moreover, IRP is used to roll out electricity infrastructure development in line with Ministerial Determinations that are issued under s 34 of the Act.

In 2019, the Minerals Council further called for the amendment of schedule 2 of the Electricity Regulation Act (REA) which would lift the license requirement for self-generation regardless of plant size. The Minister of Mineral Resources and Energy published a Licensing Exemption and Registration Notice in which Schedule 2 of the ERA was substituted for an amended Schedule 2. Schedule 2 of ERA provides for the exemption from the obligation of specified parties to apply for and hold a license from the NERSA.⁵⁹

⁵⁶ ERA s2(e).

⁵⁷ ERA s 8.

⁵⁸ BUSINESS MAVERICK *The mining industry wants to produce its own power*, available at, <https://www.dailymaverick.co.za/article/2019-12-13-the-mining-industry-wants-to-produce-its-own-power/>

⁵⁹ DoE, licensing and Exemption and Registration Notice under Electricity Regulation available at, https://cer.org.za/wp-content/uploads/2020/03/ERA-Licensing-Exemption-gg43151-2020-GOV_nn402.pdf

In addition, the President has given the government the permission to thrash out legislation that will allow companies and households to generate their own electricity in a bid to alleviate the burden on the national grid.⁶⁰ The President said that the government was starting to appreciate that self-generation, especially renewable energy, was part of the future that needed to be embraced.

We can therefore recognise positive traction in the energy generation license regime towards self-generation, including the newly gazetted amendments under S.34 of the Electricity Amendment Act for SA's Electricity Regulation on new generation capacity. This enables even the way for Municipalities in good financial standing to apply for procurement of new generation capacities in accordance with the IRP 2019 and Integrated Development Plans IDPs.⁶¹

A similar self-generation license structure could be followed in relation to the increasing energy demand of the charging infrastructure and matching generation capacity to ensure the usage of green energy in the eMobility Ecosystem environment. Hence, the inclusion of eMobility in the IRP 2019 is key.

Energy Storage Systems:

(DoE)

As stabilising building block to the (intermittent)⁶² green energy generation infrastructure as well as for levelling the typically peaky nature of self-consumption via the charging network infrastructure, the eMobility Ecosystem architecture shall include energy security services (in form of ESS⁶³) that provide network stability to ESKOM's network by reducing energy fluctuation and intermittence⁶⁴. The energy storage infrastructure shall (like the green energy generation) grow in accordance with the demand for energy from charging the growing EV population.

As per request for exemption under Schedule 2 of ERA and in the absence of regulations for energy storage and the purpose of the provisioning of needed energy security services, an eMobility Ecosystem needs permission to develop this imperative infrastructure alongside the proposed green energy generation. Further, the growing EV population in itself represents an ever growing energy storage capacity (sum of all EV batteries) that will be technically included via the already mentioned V2G technology. It is expected that support of approval by ESKOM for the implementation of grid-tied ESS at utility-scale are required.

⁶⁰ Cyril Ramaphosa wants to legalise the self generation of power, available at, <https://www.iol.co.za/business-report/energy/watch-cyril-ramaphosa-wants-to-legalise-the-self-generation-of-power-40613070>

⁶¹ DMRE publishes amendments to Electricity Regulations on new generation capacity to enable municipal power generation, available at, <https://www.gov.za/speeches/dmre-16-oct-2020-0000>

⁶² Intermittent: Renewable energy sources like solar and wind cannot guaranty constant energy supply (base load)

⁶³ ESS: Energy Storage Systems (e.g. LiFe-Batteries, Vanadium Redox Flow Batteries = VRFB, Hydrogen Storage, etc.)

⁶⁴ M Uddin , M Fakhizan , Romlie, MF Abdullaha, SA Halim S, A Halim , A Bakar , T C Kwang, A review on peak load shaving strategies (2018): available at, https://www.researchgate.net/publication/320820058_A_review_on_peak_load_shaving_strategies

Therefore, inclusions related to the opportunities from energy storage in connection with the eMobility Ecosystem shall be mentioned in the IRP 2019.

Electric Vehicle Charging:

(DoE) & (DoT)

The eMobility Ecosystem will have the aim to provide a domestic charging network infrastructure in line with the adaptation of the EV population in government fleets as well as in public transport (e.g. Minibus Taxi Industry). Significant investment will be required for planning, design, integration and rollout of the infrastructures as well as a charging service provider platform across South Africa.

It is proposed that the EV charging infrastructure development is guided by a license process for Charging Service Providers (NERSA) and regulations that set-out the processes, standards and permits related to charging points at public locations, private locations as well as residential properties (please also refer to Charging Tariff recommendation).

Since eMobility Ecosystem development needs large investment to (initially) serve government fleets and public transport, a Public Private Partnership (PPP) model could be envisioned to save-guard the investment into safer, cleaner, accessible, reliable, sustainable and more affordable transport services for all.

Inclusion of eMobility in the IRP 2019 shall inform further considerations like the above.

Charging Tariffs

National Treasury

As mentioned before, The basic concept of eMobility arrives for the usage of EaaF. The move from fossil fuel to green energy has many positive macro-economic aspects, as mentioned in this documents, but it also has the risk of TAX revenue base erosion (e.g. Fuel Levies for SANRAL⁶⁵ and RAF⁶⁶) and has to be evaluated in relation the overall revenue balance for government.

Charging Tariff regulations (via NERSA) should protect end-users, investors and could ensure that government is not deprived from urgently needed funds for roads as well as victims of road accidents

Time of Use (ToU) tariff mechanisms (like used in energy tariffs) assist ESKOM and Municipalities to combat unwanted peak loads (Note: eMobility Ecosystem architecture plans for energy storage infrastructure, as mentioned above, to reduce these effects of unwanted peak-loads).

⁶⁵ SANRAL: South African National Road Agency – responsible for the management, maintenance and development of South Africa’s proclaimed

National Road network

⁶⁶ RAF: Road Accident Fund

Implementing charging tariff regulations can be supported by the implementation of the mentioned Charging Service Provider license regime, hence, all charging stations as well as service providers are registered. All EV charging billing platforms will have to report back to NERSA and Charging Service Providers pay the obligations (e.g. SANRAL, RAF, etc.) to ensure that an increasing EV adaptation benefits the country and its citizens as a whole.

Inclusion of eMobility in the IRP 2019 shall inform further considerations like the above.

Local Manufacturing of Electric Vehicles:

(DTI) & (DoT)

eMobility Ecosystem developments must align especially with the Green Transport Strategy and the benefits for local manufacturers. Local manufacturing should reach a minimum 60% local content and must further strive to increase the local content via pro-active supply chain management and procurement methods.

As per extract from the GTS and its recommendations on Road Passenger Transport, its aim is to provide the policy, regulatory norms and standards, fiscal instrument and recommendations essential to achieve a modal shift of passengers from private vehicle use to public transport. As an extract of recommended action points, please refer as follows:

- BRT systems need to be significantly expanded throughout the large cities and the security, reliability and frequency of BRT systems improved.
- Infrastructure must be innovatively upgraded to allow the minibus taxi industry (or high occupancy vehicles such as carpooling initiatives) to utilize the BRT -only lanes. Cities will be engaged to allow this access.
- The taxi industry, a major component of the transport industry, needs to be engaged to develop their role as important feeders to the public transport system.
- The government will set an example for procuring energy efficient vehicles by instituting "Procurement Guidelines" for the government vehicle fleet.
- DoT will engage with National Treasury and relevant national departments, as well as provincial and local government to set appropriate targets for the procurement of alternative fuels and efficient technologies vehicles.

- In addition, the government will only procure the most fuel-efficient vehicle makes and models.
- DoT will engage with DTI to provide manufacturing incentives to vehicle manufacturers who supply the government fleet with high energy efficient vehicles and EV's, to consider options of manufacturing these vehicles within the country.
- DoT will develop a national green transport awareness campaign to be rolled out nationally. The awareness campaign will include behavior change initiatives such as eco- driving.
- Further, the government will work with the private sector to expand on the current number of electric charging stations powered by renewable energy sources. Those stations will also be accessible to the general public.

eMobility Ecosystem development follows the intentions from the DoT. Enforcement and motivation for a meaningful adaptation of green transport in government fleets and public transport is strongly supported by these government goals and incentives. In return, this means that the government must also set clear targets for the migration of government fleets to locally produced EVs and hybrid vehicles as well as incentives to public transport (including the MiniBus Taxi industry) green technology and locally produced EVs.

Again, as central resource policy, the IRP 2019 must be reviewed to include eMobility.

Environmental and Climate Change:

(DEA) & (DoT) & National Treasury

Government has proposed the carbon tax policy as a key mitigation instrument in South Africa's broader climate change policy response internalises negative externality costs of GHG emissions (NT, 2017). The introduction of a carbon price will change the relative prices of goods and services, making emission -intensive goods more expensive relative to those that are less emissions -intensive (Carbon tax, 2016). A carbon tax seeks to level the playing field between carbon intensive (fossil fuel based firms) and low carbon emitting sectors (renewable energy and energy efficient technologies) and provides an incentive for consumers and businesses to adjust their behaviour, resulting in a reduction

of emissions. GI-IG emissions arising from transport fuels will be covered by the carbon tax regime and incorporated into the current fuel tax regime as an add -on.⁶⁷

The design of the carbon tax aims to contribute to a meaningful and permanent reduction in greenhouse emissions whilst, at the same time, to minimise any potential adverse impacts on low income households and industrial competitiveness. The provision of tax-free emissions thresholds and allowances ranging from 60% to 95% will result in a relatively modest carbon tax rate ranging from R6 to R48 /tonCO₂eq during the first phase of the carbon tax up to the end of 2020 (Carbon tax, 2016).

The carbon tax in the case of GHG emissions from the use of petrol and diesel will be an add - on to the current fuel tax regime. The proposed carbon tax will result in a higher effective tax on diesel than on petrol due to the higher carbon intensity of diesel fuel relative to petrol. GHG resulting from the use of such fuels will be priced in terms of the international agreements that are currently being developed. South Africa has a number of environmentally-related taxes already in place. Together, these tax instruments account for approximately 2 per cent of GDP and just under 10 per cent of total tax revenue.

We are of the opinion that carbon tax related mechanisms will support the adaptation of environmentally friendly products and solutions. By providing support to eMobility Ecosystem infrastructure developments, the DEA and DoT help to build a platform for the support of economic transformation and job creation as well as paving the way to a lower-carbon economy that helps South Africa to meet its submitted National Determined Contribution (NDC) to the Paris Agreement and specially support the National Development Plan (NDP) Chapter 4 & 5, whilst upholding section 24 of the Constitution of the Republic of South Africa, 1996.

The inclusion of eMobility in the IRP 2019 shall set the direction for further methods of higher taxations (e.g. fossil fuel-based products) or incentives (especially locally produced green solutions) that need to be adapted in other policies and regulations.

⁶⁷ I Swart (Incentives Specialist)at Dilotte, *What the new carbon tax means for SA industry*, available at, <https://www2.deloitte.com/za/en/pages/tax/articles/what-the-new-carbon-tax-means-for-SA-industry.html> and Gilder, Andrew, Stiles, Geoffrey, *Comparative Approaches to Carbon Taxation in Canada and South Africa: Balancing National Aspirations with Global Realities*. 18649904, 2019, Vol. 13, Issue 4 .

3. IDENTIFIED EXISTING POLICIES AND REGULATIONS IN SUPPORT

Since the impact of climate change has driven commitments to lower CO2 economy environment, investors can already find existing policies and regulations that are supportive of green infrastructure development, but there are not written to motivate investment into innovative and sustainable infrastructure. In most cases, policies and regulations seem to be mildly reactive and falling behind technology developments. Nevertheless, one can find elements that show willingness/intention of the Government to be inclusive towards the mentioned energy and transport transitions.

We analyse the supporting elements of existing policies and regulations touching on the Energy Law Sector

- The National Development Plan (NDP) 2030 offers a long-term perspective. It identifies that renewable energy sources will become increasingly important. The paper also recognizes that the country's crucial need is to expand renewable energy sources. It set a target to generate 20 GWh of renewable energy by 2030.⁶⁸ Related to the economic infrastructure, the NDP highlights the need to maintain and expand its electricity, transport and other infrastructure in order to support economic growth and social development goals.⁶⁹ The NDP also sets out steps that aim to ensure that in 20 years, South Africa's energy system looks very different to the current situation, where renewable energy sources will play a much larger role; and 'public transport will be highly developed and hybrid and (locally build) electric vehicles will be more widely used'.⁷⁰
- The National Energy Act 34 of 2008 (NEA), aims to ensure that diverse energy resources are available, in sustainable quantities and at affordable prices to the South African economy to support economic growth and poverty alleviation. It seems that the Act does not give full effect to the Energy White Paper (1998) or to the Renewable Energy White Paper (2004); these two policies recognize the need for the promotion of renewable energy and energy efficiency⁷¹ with greater emphasis. The Act does raise concerns on energy efficiency⁷² in s 19, particularly on motor vehicles (I, j) that need (fossil fuel) energy. It needs to be emphasized that the Act does not contain explicit promotion of renewable energy and many issues related to renewable energy are absent in the Act. This is 'a

⁶⁸ National Planning Commission National Development Plan 2030 (NDP 2030) page 150 available at www.gov.za/sites/default/files/gcis_document/201409/ndp-2030-our-future-make-it-workr.pdf.

⁶⁹ NDP 2030 page 159.

⁷⁰ NDP 2030 page 163.

⁷¹ J Glazewski (ed) *Environmental Law in South Africa*, Service Issue 5 (2017) LexisNexis, Chapter 18 'Energy & the Environment' p18-33.

⁷² According to the Act – energy efficiency – means economical and efficient production and utilization of an energy carrier or resources.

significant dilution of the National Energy Bill (2004) in this regard'.⁷³ The NEA needs to be more concerned with the matters of renewable energy and the regulation of it;

- White Paper on Energy Policy (1998) is an overarching document that sets out the government's official policy on the supply and consumption of energy for the following decade. One of the goals of the paper is to create energy security by diversifying the energy supply and energy carriers. It stresses that all possible energy carriers should be tapped to ensure sustainable economic growth and development. In this paper government believes that renewables can in many cases provide the least cost energy services and that the government will provide focused support for the development, demonstrations and applications of renewable energy.⁷⁴ The paper also expresses the government's commitment to promote appropriate standards, guidelines and codes of practice needed for renewable energy. In the paper the government recognizes that renewables have significant medium and long-term commercial potential.⁷⁵ In the White Paper the government promises to provide focused support for the development, demonstration and implementation of renewable energy sources for both small and large-scale applications.⁷⁶ Also, in the paper, the government has expressed willingness to support renewable energy technologies for application in specific markets on the basis of researched priorities.⁷⁷ The government has shown willingness to promote the development and implementation of appropriate standards and guidelines and codes of practice for the correct use of renewable energy technologies.⁷⁸ The White Paper on Energy Policy's position regarding renewable energy is based on the integrated resource planning criterion of: 'ensuring that an equitable level of national resources is invested in renewable technologies, given their potential and compared to investments in other energy supply options'.⁷⁹
- The White Paper on Renewable Energy (2003) supplements the White Paper on Energy Policy. The Renewable Energy Paper sets out government's vision, policy principles, strategic goals and objectives for promoting and implementing renewable energy in the country. The paper raises concerns that the country's fiscal resources are limited in supporting renewable energy development. The paper further supports the idea of having renewable energy technologies produced locally⁸⁰. The main aim of the policy is to create the conditions for the development and commercial implementation of renewable energy technologies. Government will use a phased, managed and

⁷³ J Glazewski (ed) *Environmental Law in South Africa*, Service Issue 5 (2017) LexisNexis, Chapter 18 'Energy & the Environment' p18-33.

⁷⁴ White Paper on the Energy Policy (1998) page 14.

⁷⁵ Department of Minerals and Energy White Paper on the Energy Policy of the Republic of South Africa (WPEPRA) (1998) page 79 available at www.energy.gov.za/files/policies/whitepaper_energypolicy_1998.pdf.

⁷⁶ WPEPRA page 80.

⁷⁷ WPEPRA page 80.

⁷⁸ WPEPRA page 81.

⁷⁹ Department of Minerals and Energy White Paper on Renewable Energy (WPRRA) (2003) page vii, available at www.energy.gov.za/files/policies/whitepaper_renewables_2003.pdf.

⁸⁰ WPRRA page xi.

partnership approach to renewable energy projects that are well conceived and show the potential to provide acceptable social, environmental and financial returns for all investors and stakeholders.⁸¹

Supporting elements in Transport Law Sector

- The South African Department of Environmental Affairs published The South African Greenhouse Gas Mitigation Potential Analysis which was supported by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), on behalf of the Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety of the Federal Republic of Germany. The mitigation analysis was conducted by Camco Clean Energy, in partnership with Ricardo-AEA, PDG and Conningarth Economists, the Energy Research Centre of the University of Cape Town. Mitigation potential was identified and analysed for key sectors. These sectors include energy, transport, waste, and agriculture, forestry and other land use (AFOLU). Marginal abatement cost curves were developed for subsectors, sectors and key sectors, providing an estimate of mitigation potential and marginal abatement cost for a broad range of mitigation measures. This analysis further looked at the economic growth potential from each mitigation parameters, thus finding that projections of economic growth were aligned to targeted levels of future economic growth. The targeted level of future economic growth is based on the moderate growth rate defined by National Treasury. The moderate growth scenario forecasts real growth in gross domestic product (GDP growth) of 4.2% per annum over the medium-term (defined in the draft Integrated Energy Plan as 2015–2020) and 4.3% per annum over the long-term (2021–2050). South Africa through many international and multilateral instruments including the Paris Agreement committed to providing a world-class transport system that reduces both the cost of transport and the quantity of Greenhouse Gases (GHG), as well as other pollutants that are emitted by the sector. Emissions from the transport sector account for 10.8% of the country's total greenhouse gas emissions, with road transport being responsible for 91.2% of these GHG emissions (DEA, 2010). Should these trends continue in the absence of policies and measures, the transport sector is projected to emit a total of 136 Gg CO₂ eq by the year 2050 (DEA/GIZ: Mitigation Report, 2014).
- The Green Transport Strategy for South Africa: (2018-2050) recognises Greenhouse Gas (GHG) emissions that are coming from the transport sector and expresses the urgent need for real change in the sector. The strategy aims to minimise the negative impact of transport on the environment and promotes green mobility to ensure that the transport sector supports the achievement of green

⁸¹ WPR A page xiii.

economic growth targets and the protection of the environment.⁸² The transport sector, especially in the context of environmental sustainability, mandates to lead a Transport Flagship Programme, which aims ‘to facilitate the development of an enhanced public transport programme to promote lower-carbon mobility in five metros and in 10 smaller cities and create an Efficient Vehicles Programme with interventions that result in measurable improvements in the average efficiency of the South African vehicle fleet by 2020... [and] It will encourage new efficient-vehicle technologies, such as electric vehicles, by setting procurement objectives for acquiring such vehicles’.⁸³ There are short-term strategic targets which form part of the ‘quick wins’ for the strategy. One part of it is ‘to convert 5% of the public and national sector fleet in the first seven years of the implementation of this strategy and an annual increase of 2% thereafter, to cleaner alternative fuel and efficient technology vehicles (ideally powered through renewable energy) and environmentally sustainable low carbon fuels by 2025, ... including the use of renewable energy to provide electricity for transport’.⁸⁴ Sustainable transportation is essentially the capacity to support the mobility needs of people, freight and information in a manner that is least damaging to the environment. Sustainable development applied to transport systems requires the promotion of linkages between environmental protection, economic efficiency and social progress. Under the environmental dimension, the objective consists of understanding the reciprocal influences of the physical environment and the practices of the industry and all aspects of the transport industry to address these environmental issues. Under the economic dimension, the objective consists of orienting progress in the sense of economic efficiency. Transport must therefore be cost -effective and capable of adapting to changing demands. Under the social dimension, the objective consists of upgrading standards of living and quality of life. In the strategy, DoT expresses willingness to support the uptake of EVs in the country in conjunction with DTI and National Treasury; where DoT will ‘offer producers of EV vehicles manufacturing incentives to both produce and sell affordable EVs in South Africa, for both the local and export markets; [also DoT] will work with national, provincial and local government departments and authorities and the automobile industry to set annual targets for the uptake of electric vehicles and hybrid electric vehicles in the Government vehicle fleet, as well as monitoring the local content of the manufacturing of cars locally, in line with the industrial Policy Action Plan (IPAP)’.⁸⁵

- National Land Transport Act (2009) prescribes that any measures relating to public transport must promote the efficient use of energy resources and limit adverse environmental impacts in relation to land transport.

⁸²Department of transport Green Transport Strategy for South Africa: (2018-2050) (GTSSA 2018-2050) pages 5-6 available at www.transport.gov.za/documents/11623/89294/Green_Transport_Strategy_2018_2050_onlineversion.pdf/71e19f1d-259e-4c55-9b27-30db418f105a.

⁸³GTSSA 2018-2050 page 10.

⁸⁴GTSSA 2018-2050 page 25.

⁸⁵GTSSA 2018-2050 page39.

- South Africa’s automotive industry masterplan to 2035⁸⁶. The Report is commissioned by the DTI and presents aspirational vision, objectives and strategic framework agreed upon by industry stakeholders to develop the country’s automotive industry through to 2035. The masterplan highlights the need of domestic market stimulation, increased localisation, electricity supply enhancement and product specialisation.⁸⁷

Also support elements in Environmental Law & lower Carbon Economy

- As recognised by South Africa’s President on several occasions, climate change is one of the major challenges faced across the world. It has adverse impacts especially on developing countries and it needs to be mitigated by the reduction of greenhouse gases (GHG). There are many climate change regulative instruments internationally; the main document is United Nations Framework Convention on Climate Change (UNFCCC) (1994). The convention addresses climate change issues and amongst others sets out a framework for action aimed at stabilising atmospheric concentrations of GHG to avoid negative consequences. The convention has signatory parties and those are the countries who expressed willingness to participate in the common problem related to climate change.
- The Paris Agreement requires all parties to put forward their best efforts in reducing emissions through ‘nationally determined contributions’ (NDCs). In this regard South Africa came up with NDC in 2015.⁸⁸ According to NDC, South Africa aims to invest more in green public transport infrastructure. Related to this, the country established a South African Green Fund to support “catalytic and demonstration green economy initiatives” from domestic, private and international sources.
- South Africa also issued the Climate Change Bill in 2018 which sets out a framework for climate change mitigation and adaptation in the country. However, the country’s main law is the Constitution. Section 24 of the Constitution – provides that everyone has the right to an environment that is not harmful to their health or well-being; the right for environmental needs to be protected through reasonable legislative and other measures to prevent pollution and ecological degradation; secure ecologically sustainable development and the use of natural resources while promoting justifiable economic and social development.

⁸⁶Department of Trade and Industry South Africa’s Automotive Masterplan to 2035 (SAAM to 2035) available at www.afsa.org.za/Downloads/SA_Auto_Masterplan.pdf.

⁸⁷SAAM to 2035 page 16.

⁸⁸ South Africa’s Intended Nationally Determined Contribution (INDC) (2015) available at www.unfccc.int/sites/ndcstaging/PublishedDocuments/South%20Africa%20First/South%20Africa.pdf.

- Financing Sustainable Economy – Technical Paper 2020 draft. One of the mandates of the National Treasury is to seek environmental risk management to encourage the reallocation of capital to have a more positive impact and to raise new and dedicated funds to finance the transition to a less carbon intense economy.⁸⁹ The Paper raises some concerns related to transition risks and particularly on finances and that the transition requires participation of public and private stakeholders.⁹⁰
- South Africa also responded to climate change commitments with the Carbon Tax Act in 2019. The Act taxes GHG emissions. In addition, there are many tax reducing measures – called ‘allowances’ especially investments in projects which reduce GHGs, such as a public transport.⁹¹ Further, the Carbon Tax Policy Paper: Reducing green gas emissions and facilitating the transition to a green economy (2013) supports the transition to a lower-carbon economy.
- Air quality regulations under the National Environmental Management Act: Air Quality (Act No. 39 of 2004) provide that coal power plants under Eskom’s fleet, amongst others, have to meet the minimum emission standard (MES) by a certain time, or they would be non-compliant and cannot be legally operated.
- The Fuel Retailers case⁹² is a landmark case towards the goal of having an environment not harmful to health. The case concerned an application for a filling station in White River, Mpumalanga. One of the issues was that the filling station would have a negative impact on groundwater and directly affects the population’s health and the environment. The Constitutional court made clear what the legal obligations to the environment by analysing the concept of sustainable development.⁹³

⁸⁹ National Treasury Financing a Sustainable Economy Technical Paper 2020 (FSETP) page 2 available at www.treasury.gov.za/publications/other/Sustainability%20technical%20paper%202020.pdf.

⁹⁰ FSETP page 3.

⁹¹ www.sars.gov.za/Media/Pages/Tax-Relief-measures.aspx, also see www.treasury.gov.za/public%20comments/CarbonTaxBill2019/Explanatory%20Memorandum%20to%20the%202018%20Carbon%20Tax%20Bill%20-%202020%20Nov%202018.pdf.

⁹² *Fuel Retailers Association of Southern Africa v Director-General: Environmental Management, Department of Agriculture, Conservation and Environment, Mpumalanga Province, and Others* 2007 (6) SA 4 (CC), 2007 (10) BCLR 1059 (CC).

⁹³ *Ibid* at Para 72.

4. eMOBILITY INCLUSION IN THE IRP 2019

In addressing a potential non-compliance of an eMobility Ecosystem infrastructure development by proposing innovative policies and regulations, a balance must be found to equate just transitions in the context of the South African socio-economics in respect to resource planning that includes but is not limited to energy generation, - security, - management, - cost, - sustainability and - usage as well as their impacts on health, skill development, job creation and a broader higher quality of life for all South African people.

The IRP 2019 needs to be reviewed and updated to make provision for eMobility Ecosystem infrastructure developments in order to give investor confidence to attract FDI to support South Africa in benefiting from the inevitable energy and transport transitions.

The IRP 2019 is an electricity infrastructure development plan based on the least-cost electricity supply and demand balance, taking into account security of supply and the environment through the minimisation of negative emission and water use. It recognises that ‘renewable technologies present huge potential for the creation of new industries, jobs and localisation across the value chain’.⁹⁴ and is envisaged as a “living plan” to be revised regularly.⁹⁵

Accordingly, it is set to facilitate the core vision of the NDP pertaining to energy security and socially equitable for all South Africans. Moreover, for the energy sector to provide reliable efficient energy services at competitive rates; and that is environmentally sustainable through reduced emissions and pollution.⁹⁶

Energy security in the backdrop of the IRP 2019 means a flexible approach must be deployed at the given time to meet the electricity demand under both the current low-growth economic environment and even when the economy turns and improves to the level of 4% growth per annum. Generation capacity must accordingly be paced to restore the necessary reserve margin and to be ahead of the economic growth curve at least possible cost. The IRP remains cognisant of international obligations in relation to a just energy transition but makes clear that countries are different and their energy transition paths will also be different due to varying local conditions.⁹⁷

⁹⁴ Department of Energy Integrated Resource Plan (IRP) (2019) page 13 available at www.africis.org/wp-content/uploads/bsk-pdf-manager/2019/10/South-Africa-DoE-IRP-2019_October-2019.pdf.

⁹⁵ J Govender and E Dempster at Cliffe Dekker Hofmeyr, *The Integrated Resource Plan 2019: A promising future roadmap for generation capacity in South Africa*, <https://www.cliffedekkerhofmeyr.com/en/news/publications/2019/Corporate/energy-alert-22-october-The-Integrated-Resource-Plan-2019-A-promising-future-roadmap-for-generation-capacity-in-South-Africa.html>

⁹⁶ IRP2019 at 8.

⁹⁷ IRP2019 at 14.

Therefore, given the destitute position the COVID-19 crisis has placed on the South African economy and the obvious energy deficits (load shedding), innovative policies are imperative to attract much needed sustainable infrastructure investments (e.g. eMobility Ecosystem).

Additionally, the IRP 2019 has to make provision and must recognise that it is inevitable incumbent energy delivery methods are not insulated from technological disruptions. The fear about job losses emanating from the energy and transport transitions, namely (but not limited to) renewable energy, EaaS, EVs, EMS, ESS, IoT, etc. has to be translated into the “new normal” that provides the much needed economic recovery, which will foster sustainable jobs.⁹⁸

Working groups and public stakeholder engagement needs to be intensified to discuss and structure the inclusion of eMobility into the IRP 2019. As mentioned, this research paper considers the IRP 2019 as a central and guiding policy to facilitate positive sustainable innovations for the better of the South African people.

Points to be considered in respect to the inclusion of eMobility in the IRP 2019 and supportive of the envisioned energy mix are high-lighted, but not limited to, as the following:

- EV uptake driving the energy demand shifting towards electricity
- Positive effect on energy demand-side flexibility (smart charging), which supports the integration of renewable in the energy generation model
- Energy wheeling aspect to bring green energy from renewable energy sources to the charging points.
- Increasing stationary and mobile/portable energy storage availability for energy security services
- Higher local manufacturing intensity opportunities in relation to components of EVs as well as the eMobility Ecosystem infrastructure
- Opportunities in battery technology localisation in consideration of South Africa’s natural resources
- Public transport (as first market catalyst) to become cleaner, safer, more reliable and affordable for a wider base of South African’s
- Positive national trade balance with respect to less fuel import
- License regime for EV charging to ensure continues revenues for SANRAL, RAF, etc.
- Health benefits from cleaner air and lower noise pollution in cities
- Green investment support structures (e.g. Green Bonds), especially to attract FDI

⁹⁸ IRP 2019 at 20-27.

5. IN CONCLUSION

Most current policy and regulation reviews globally might rightly focus on the fight against the COVID-19 pandemic. But the climate change crisis remains, as does the need for decisive policy action to address it. Directions given now to drive “post” COVID-19 economic recovery may shape the climate, and human health for many decades. This research paper calls on SA’s policymakers to “green” their response to this crisis to prevent one crisis leading to another.⁹⁹

In 2018, the IPCC urged the world to intensify its efforts to combat climate change by meeting the goal of the 2016 Paris Agreement. Upper middle-income nations have contributed more than 70% of the global growth in carbon dioxide emissions over the last 35 years.¹⁰⁰ However, emerging markets are more vulnerable to the impacts of climate change due to inadequate capacity and adaptation mechanisms to effectively deal with extreme weather changes, such as rises in the sea level, floods, droughts, tropical storms, hurricanes, and heatwaves.¹⁰¹

SA belongs to the more exposed economies to climate change risks and faces a significant challenge to decarbonise its economy, while maintaining a sustainable economic development trajectory. One of the biggest challenges for emerging markets is balancing increased infrastructure financing that warrant broad-based environmental and social development and at the same time ensure that new sustainable infrastructure meets climate change requirements.

Key aspects in attracting FDI into emerging markets from developed markets are clear directives though policy and regulation that support the development of sustainable green infrastructure. With more innovative green finance instruments becoming available, South Africa has a unique opportunity to take advantage of the already elaborated transitions in transport and energy.¹⁰² The absence of eMobility in the current form of the IRP 2019 does not help to grow the needed confidence that investors require to view South Africa as a significant enough market for investments into eMobility Ecosystem infrastructure (including the local manufacturing of EVs).¹⁰³

The IRP is the central policy of South Africa’s resource policy, because it serves as a guideline for how today’s and tomorrow’s needs will be met. Especially energy infrastructure buttresses economic activity and development in a country. An IRP has no definite directive about how the country’s energy resources need to meet the demand for electricity in transport, SA’s collective development plans are compromised. As mentioned above policies and regulations are crucial in order to unlock investment. In conclusion, we need the IRP to give directives in relation to eMobility, because it serves as a blueprint that details South Africa’s energy generation needs. The IRP is a central policy that sets the tone for our future infrastructure development.

⁹⁹ Greening the Recovery, IMF, *Fiscal Affairs*, pg 1-3.

¹⁰⁰ Emerging Market Green Bond Report 2018 – written in collaboration between J Masse, (Chief Investment Officer, Financial Institutions Group at International Finance Corporation) and Y Syzdykov (Global Head of Emerging Markets at Amundi Asset Management)

¹⁰¹ C Toulmin C, *Climate Change in Africa* ed 1 (2009) and Centre for International Governance In Innovation (CIGI Special Report): *Climate Change in Africa: Adaptation, Mitigation and Governance Challenges* : https://www.unicef.org/esaro/Climate_Change_in_Africa.pdf

¹⁰² Y Dagnet and J Jaeger , World Resources Institute, *Not Enough Climate Action in Stimulus Plans*: available at, <https://www.wri.org/blog/2020/09/coronavirus-green-economic-recovery>

¹⁰³ H Kretchmer (Senior Writer, Formative Content) World Economic Forum , *Billions for sustainable investments – Germany’s plan for a green recovery*, available at, <https://www.weforum.org/agenda/2020/07/germany-green-recovery-billions-sustainable-investments/>

e-Mobility is changing how we interact with vehicles, use energy, and extract resources!

Irrespective of which policy position the South African government and private sector decide to take, the regional and global landscape will be affected by the e-Mobility e-evolution.

By being proactive, South(ern) Africa can avoid the inevitability of becoming a dumping ground for old ICE technology which become stranded assets that are even prohibited in global markets in the near future.