

An analysis of the regulatory framework required for electric vehicles towards climate change mitigation action in South Africa

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Dissertation accepted in fulfilment of the requirements for the
degree *Master of Law in Perspectives on Law* at the North-
West University

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Graduation ceremony: August 2023
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ACKNOWLEDGMENTS

This dissertation would not have been possible without the support and guidance of some very important and special individuals.

I am deeply indebted to my supervisor, Professor Michelle Barnard, who has fulfilled the role of a teacher, mentor, and friend – always offering advice, insights and encouragement along with a perfect blend of wittiness and honesty. After my absence from academia for so many years I am extremely grateful for your willingness and patience in agreeing to have me as your student once more, but also for your continued faith in me over all these years.

To my dearest mother – you have been a source of great encouragement and light. Thank you for motivating and nurturing me through many months of late-night research and writing. All my life, you have actively supported me to continuously find and unlock my true potential.

I further wish to extend my sincerest appreciation to each and every selected individual from my community of work colleagues and friends who provided valuable and insightful commentary, read the many versions of this dissertation and shared their words of encouragement throughout the unexpected duration of this research study. Your generosity and expertise have improved this dissertation in innumerable ways.

Firstly, this dissertation is dedicated to my late father, who sadly passed away around the time when I commenced with this research study. Although he was never able to experience the moments of this postgraduate journey with me, he certainly paved the way to allow me to continue identifying life's opportunities and embracing them to the fullest.

Lastly, but most significantly, my entire research study and the finalisation of this dissertation are direct results of God's everlasting grace, continuously revealing itself in a truly divine manner – a gift I do not deserve.

ABSTRACT

South Africa is considered to be a major greenhouse gas (GHG) emitter, especially emissions stemming from its road transport subsector. Electric vehicles (EVs) are largely considered to be environmentally friendly technology designed to reduce GHG emissions. That said, and despite the exponential growth in global EV sales and production coupled with the international political pressure towards e-mobility, the use and development of EVs and related infrastructure in South Africa is still considered to be in its infancy.

This dissertation seeks to determine the nature and extent of the regulatory framework required to facilitate the development and use of EVs and related infrastructure within South Africa in order to address its international climate change mitigation commitments.

For this purpose, the author adopted a hybrid research approach to answer the above-mentioned research aim, whereby two research methods are applied, namely a literature review on the one hand (i.e. discussing and analysing primary sources of international law and policy frameworks, as well as national legislation and policies relating to, *inter alia*, climate change mitigation and EVs), and a comparative analysis on the other hand (i.e. analysing the legal positions in Norway and the United Kingdom (UK), both of which have established advanced EV regulatory and policy frameworks).

In addressing the research aim, this dissertation is accordingly divided into five chapters. Chapters 1 to 4 seek to: (1) contextualise the background and considerations giving rise to the need to determine the regulatory framework required in South Africa for the implementation and use of EVs as a measure of climate change mitigation; (2) examine the existing international principles and mechanisms on climate change mitigation which are directly applicable to South Africa; (3) examine the regulatory framework and perspectives on the development and use of EVs in Norway and the UK respectively; and (4) examine the existing South African law and policy framework and perspectives on climate change mitigation in the broader sense, and more specifically in respect of the local development and use of EVs and related infrastructure.

Chapter 5 then concludes by: (i) identifying the areas of potential improvement/development in the existing South African policy and legal framework on EVs when compared to the respective positions adopted in Norway and the UK; and (ii) providing practical recommendations on how the South African regulatory landscape on EVs can be adapted to enable government to ultimately move toward achieving its international climate change mitigation commitments. These recommendations include suggesting the formulation and adoption of a multifaceted EV policy with pragmatic deliverables whereby EV sales, EV and EV-component manufacturing, and EV-charging infrastructure development in South Africa are adequately addressed; obtaining recognition and funding for specified EV projects or initiatives as Clean Development Mechanism (CDM) projects in South Africa; and ensuring that unique local factors (being socio-economic considerations and the country's current energy matrix) serve as overarching considerations when formulating, finalising, and implementing a multifaceted EV policy in South Africa.

Keywords

Clean Development Mechanism; climate change mitigation; electric vehicles; EV policy; South Africa

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LIST OF ABBREVIATIONS

AC	Alternating Current
AGBM	Ad hoc Group on the Berlin Mandate
APDP	Automotive Production and Development Programme
BEV	Battery Electric Vehicle
CBU	Completely Built-Up
CC	Constitutional Court
CCC	UK Committee on Climate Change
CDM	Clean Development Mechanism
CDM EB	Clean Development Mechanism Executive Board
CER	Certified Emission Reduction
CKD	Completely Knocked-Down
CMA	Conference of the Parties serving as the meeting of the Parties to the Paris Agreement
CO ₂	Carbon dioxide
COP	Conference of the Parties
COP21	21 st Conference of the Parties to the UNFCCC
COP26	26 th Conference of the Parties to the UNFCCC
COP27	27 th Conference of the Parties to the UNFCCC
CPLO	Catholic Parliamentary Liaison Office
DAC	Department of Arts and Culture
DC	Direct Current

DFFE	Department of Forestry, Fisheries and the Environment
DHET	Department of Higher Education and Training
DMRE	Department of Mineral Resources and Energy
DOT	Department of Transport
DTIC	Department of Trade, Industry and Competition
EC	European Commission
e-MBT	Electric Minibus Taxi
Environ. Res. Lett.	Environmental Research Letters
ETF	Enhanced Transparency Framework
Eur. Transp. Res. Rev.	European Transport Research Review
EU	European Union
EV	Electric Vehicle
EVIA	Electric Vehicle Industry Association
EVSE	Electric Vehicle Supply Equipment
Gen Not	General Notice
GG	Government Gazette
GHG	Greenhouse Gas
GN	Government Notice
GTS	Green Transport Strategy
GW	Gigawatt
HEV	Hybrid Electric Vehicle
HFCEV	Hydrogen Fuel Cell Electric Vehicles
ICCT	International Council on Clean Transportation

ICEV	Internal Combustion Engine Vehicle
IISD	International Institute for Sustainable Development
IMF	International Monetary Fund
INC	Intergovernmental Negotiating Committee
INDC	Intended Nationally Determined Contribution
IOL	Independent Online
ITAC	International Trade Administration Commission of South Africa
ITMO	Internationally Transferred Mitigation Outcomes
LIB	Lithium-ion Battery
MER	Statkraft Mer Holding
MtCO ₂ -eq	Metric tonnes of carbon dioxide equivalent
MSA	Motorway Service Areas
NAAMSA	National Association of Automobile Manufacturers of South Africa
Nat Commun	Nature Communications
NATMAP 2050	National Transport Master Plan 2050
NCCRP	National Climate Change Response Policy
NCRGP	National Climate Change Response Green Paper 2010
NCCRWP	National Climate Change Response White Paper 2011
NDC	Nationally Determined Contribution
NDP	National Development Plan 2030
NEMA	National Environmental Management Act 107 of 1998

NEMAQA	National Environmental Management: Air Quality Act 39 of 2004
NEVA	Norwegian Electric Vehicle Association
NOK	Norwegian Krone
NRDC	Natural Resources Defence Council
NWU	North-West University
OEM	Original Equipment Manufacturer
PELJ	Potchefstroom Electronic Law Journal
PEV	Plug-in Electric Vehicle
PHEV	Plug-in Hybrid Electric Vehicle
PPD	Peak, Plateau and Decline
Proc. Instn Civil. Engrs: Energy	Proceedings of the Institution of Civil Engineers: Energy
RSA	Republic of South Africa
SA	South African Law Reports
SAAM	South Africa's Automotive Industry Master Plan to 2035
S Afr J Sc	South African Journal of Science
SAJELP	South African Journal of Environmental Law and Policy
SA LEDS	South Africa's Low-Emission Development Strategy 2050
SARS	South African Revenue Service
SCA	Supreme Court of Appeal
SET	Sectoral Emission Target
TIPS	Trade and Industrial Policy Strategies
UCT	University of Cape Town

UK	United Kingdom
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
USA	United States of America
VALA	Volume Assembly Localisation Allowance
VAT	Value-Added Tax
VED	Vehicle Excise Duty
WEF	World Economic Forum
World Electr. Veh. J	World Electric Vehicle Journal

Chapter 1: Introduction

1.1 Background

South Africa has been ranked among the world's top 20 largest carbon dioxide (CO₂) emitters and major greenhouse gas (GHG) pollutants, and is considered a significant figure in both the African and international climate change arena.¹ Historically, and by the nature of its economic activities, South Africa is largely dependent on fossil fuels, in particularly coal, for its energy production; this continued reliance means that fossil fuels will probably remain the primary energy source on the immediate South African horizon.² Moreover, the South African transport sector (which includes retail, manufacturing and mobility) relies almost solely on fossil fuels to ensure the mobility of its citizens and freight cargo.

In fact, the South African road transport sector dominates urban energy consumption, and is one of the largest GHG emitting sectors in the country. To illustrate, the South African road transport sector accounts for approximately 60 to 70 per cent of total energy consumption in metropolitan areas across South Africa,³ private motor vehicles are the largest GHG emitters in this sector,⁴ and the average CO₂ emissions of the country's passenger-vehicle fleet are an estimated 22 per cent higher than the EU's fleet average.⁵ Therefore, even though the automotive industry is one of the largest contributors to the South African economy,⁶ its environmental footprint cannot be ignored.

Equally significant, are the unavoidable socio-economic challenges that exist in South Africa. Based on modern assessment tools, South Africa is regarded as one of the most

¹ EVIA 2016 <https://www.evia.org.za/EVIA2016Booklet.pdf>; Department of Forestry, Fisheries and the Environment 2020 dffe.gov.za/sites/default/files/docs/2020lowemission_developmentstrategy.pdf.

² Kidd *Environmental Law* 327.

³ EVIA 2016 <https://www.evia.org.za/EVIA2016Booklet.pdf>; Department of Forestry, Fisheries and the Environment 2020 dffe.gov.za/sites/default/files/docs/2020lowemission_developmentstrategy.pdf.

⁴ Moeletsi and Tongwane 2020 *Atmosphere* 591.

⁵ ICCT 2018 fiafoundation.org/media/461198/south-africa-pv-emissions-stds_icct-white-paper_17012018_vf-1.pdf.

⁶ NAAMSA 2021 <https://naamsa.net/industry-overview-2021/>.

unequal societies in the world, with skewed income distribution levels, unequal access to opportunities, regional disparities, and a high unemployment rate.⁷ These factors seem to strongly suggest that a policy-driven transition to a low-carbon and climate-resilient society in South Africa must unquestionably encompass government's overriding priority to address poverty, unemployment, and inequality.⁸

Against the background of all of these challenges, one of the most pragmatic and widely recognised methods to reduce GHG emissions, and thereby to address climate change, is the pursuit of the electrification of the automotive industry.⁹ Such an approach entails a radical paradigm shift from conventional internal combustion engine vehicles (ICEVs) to automotive electro mobility, largely referred to as "e-mobility", which includes an increase in the production, importation and use of electric vehicles (EVs) and critical related components, as well as the development of the associated charging infrastructure networks.¹⁰ Even though some studies argue that EVs have a slim chance of making any contribution to climate change mitigation in coal-intensive economies (such as South Africa) and that, by implication, the full environmental impact of EVs largely depends on the cleanliness of a country's electricity grid,¹¹ the majority of recent studies do reveal the significant potential for EVs to contribute toward global climate change mitigation over time.¹² Parallel with scientific evidence in support of the climate change mitigation

⁷ IMF 2020 <https://www.imf.org/en/News/Articles/2020/01/29/na012820six-charts-on-south-africas-persistent-and-multi-faceted-inequality>.

⁸ DAC 2022 http://www.dac.gov.za/sites/default/files/NDP%202030%20-%20Our%20future%20-%20make%20it%20work_0.pdf 48.

⁹ Climate Home News 2020 <https://www.climatechangenews.com/2020/03/23/electric-cars-help-limit-climate-change-despite-blackspots-india-poland/>.

¹⁰ McKinsey & Company 2021 <https://www.mckinsey.com/industries/automotive-and-assembly/our-insights/why-the-automotive-future-is-electric>.

¹¹ Carbon Brief 2019 <https://www.carbonbrief.org/factcheck-how-electric-vehicles-help-to-tackle-climate-change>; UCT 2020 <https://www.climate-transparency.org/wp-content/uploads/2020/07/A-Low-Carbon-Transport-Future-for-South-Africa.pdf>; Liu and Hildebrandt 2012 *S Afr J Sc* 108.

¹² ICCT 2015 <https://theicct.org/publication/global-climate-change-mitigation-potential-from-a-transition-to-electric-vehicles/#:~:text=Electric%20vehicles'%20potential%20climate%20benefits,energy%20sources%20become%20widely%20available>; Knobloch *et al* 2020 *Nature Sustainability* 447; Moeletsi and Tongwane 2020 *Atmosphere* 591; Miler, Hastings and Al-Habaibeh 2021 *Energy and Built Environment* 204; Moeletsi and Tongwane 2021 *Scientific African Journal* 1; Wolfram *et al* 2021 *Nat Commun* 1.

potential of EVs to reduce so-called "supply chain emissions",¹³ is the increased global impetus to electrify the automotive industry.

While there is an ongoing debate as to the exact magnitude of the climate change mitigation impact of EVs, an increase in global EV marketing, sales and production seems to be inevitable – with the expectation that EVs will account for an estimated 70 per cent of global passenger-vehicle sales by 2040.¹⁴ Global EV sales rose to 43 per cent with 3.24 million units sold in 2020, compared to the 2.26 million units sold in 2019 – even in the face of an overall decline in global vehicle sales in 2020 – and it continues to grow on an annual basis.¹⁵ Adding further pressure to the mix, is the announcement by some highly developed and industrialised nations, such as the UK and the European Union (hereafter the EU), to effectively ban the sale of new ICEVs in less than a decade from now.¹⁶

1.2 Problem statement

Despite the exponential growth in global EV sales and production, coupled with the international political pressure towards e-mobility,¹⁷ the slow uptake of EVs in South Africa can primarily be ascribed to a number of obstacles hampering and/or complicating EV ownership and/or the use thereof. These obstacles mainly include high purchase prices and higher import duties for EVs when compared to ICEVs;¹⁸ lack of government

¹³ Wolfram *et al* 2021 *Nat Commun* 2 wherein the author defined "supply chain emissions" or otherwise known as "life-cycle emissions" as "the sum of direct, or tailpipe, emissions, and indirect emissions".

¹⁴ TechCentral 2021 <https://techcentral.co.za/the-struggle-to-get-electric-cars-onto-south-african-roads/203201/>.

¹⁵ *Auto Green Paper on the Advancement of New Energy Vehicles in South Africa* Gen Not 308 in GG 44606 of 21 May 2021 4.

¹⁶ In October 2022 the EU struck a deal to effectively ban the sale of new petrol and diesel vehicles from 2035 onwards, with the aim to expedite the shift to EVs and combat climate change. Negotiators from the EU countries and the European Parliament, who must both approve new EU laws, as well as the European Commission, agreed that vehicle manufacturers must achieve a 100% cut in CO₂ emissions by 2035, which would, in turn, make it impossible to sell new fossil fuel-powered vehicles in the EU region. Equally important, The UK has taken a historic step on the road to ending its contribution to climate change by announcing the end of the sale of new ICEVs by means of a two-phased approach: Phase 1 will see the phase-out date for the sale of new ICEVs and vans brought forward to 2030. Phase 2 will see all new cars and vans be fully zero emission at the tailpipe from 2035 onwards.

¹⁷ WEF 2021 <https://www.weforum.org/agenda/2021/01/electric-vehicles-breakthrough-tesla-china/>.

¹⁸ IOL 2019 <https://www.iol.co.za/business-report/economy/naamsa-disputes-elon-musks-view-about-high-south-african-vehicle-tariffs-31697949>.

incentives;¹⁹ limited awareness campaigns;²⁰ an inadequate public-charging infrastructure network;²¹ limited private-sector investment;²² battery-component costs;²³ concerns regarding the ability of South Africa's public electricity utility and state-owned entity, Eskom, to supply sufficient electricity for purposes of mass vehicle charging;²⁴ as well as an overall reluctance on the part of local consumers to embrace the transition from ICEVs to EVs.²⁵

The private sector, including important role players within the local automotive industry, has criticised government's approach to date, and this has also been flagged as a contributory factor obstructing the uptake of EV sales in the country.²⁶ In addition, the National Association of Automobile Manufacturers (hereafter NAAMSA) has voiced the following concern(s) about the development and use of EVs in South Africa:²⁷

We need regulatory certainty. Currently we don't have a clear policy on EVs in SA. We don't yet know what government's position on EVs is. We've appealed to the minister to give us a firm policy pronouncement on government's view on EVs and electro-mobility broadly.

Accordingly, the need has arisen to determine the regulatory framework required in South Africa for the implementation and use of EVs as a measure of climate change mitigation.

¹⁹ BizNews 2021 <https://www.biznews.com/thought-leaders/2021/12/06/electric-cars-in-sa>.

²⁰ Dane, Montmasson-Clair and Moshikaro 2020 <https://www.tips.org.za/research-archive/sustainable-growth/green-economy/item/3876-harnessing-electric-vehicles-for-industrial-development-in-south-africa>.

²¹ Smart Energy International 2020 <https://www.smart-energy.com/industry-sectors/electric-vehicles/whats-putting-the-brakes-on-ev-adoption-in-south-africa/>.

²² Business Insider SA 2021 <https://www.businessinsider.co.za/governments-plan-to-sell-more-electric-vehicles-in-south-africa-2021-5>.

²³ Moeletsi 2021 *World Electr. Veh.* 19.

²⁴ Daily Maverick 2019 <https://www.dailymaverick.co.za/article/2019-10-28-how-geared-up-is-south-africa-for-electric-vehicles/>.

²⁵ Business Day 2020 <https://www.businesslive.co.za/bd/national/2020-11-17-electric-cars-will-take-off-in-sa-when-the-state-incentivises-them-says-report/>; Energy Research Centre of the University of Cape Town *The potential of electric vehicles to contribute to South Africa's greenhouse gas emissions targets and other developmental objectives: How appropriate is the investment in electric vehicles as a NAMA?* 3; Dane, Montmasson-Clair and Moshikaro 2020 <https://www.tips.org.za/research-archive/sustainable-growth/green-economy/item/3876-harnessing-electric-vehicles-for-industrial-development-in-south-africa>.

²⁶ Daily Maverick 2023 <https://www.dailymaverick.co.za/article/2023-02-20-electric-vehicles-sa-motoring-industry-fights-for-relevance/>.

²⁷ Barron *Business Times* 6.

If EVs are to be utilised as such in South Africa, it would appear to be a complex task involving several multifaceted considerations from an international and local regulatory perspective, leading to the research aim posed further hereinbelow.²⁸

1.3 Contextual overview of international, foreign, and local considerations

1.3.1 International legal and policy framework

At the apex of climate change mitigation efforts are international law and policies responding thereto. Under the *United Nations Framework Convention on Climate Change* (1992) (hereafter the *UNFCCC*), the *Kyoto Protocol* (1997) (hereafter the *Kyoto Protocol*) was adopted in order to set enforceable climate change mitigation targets for signatory countries. In terms of the *Kyoto Protocol*, developed countries are required to reduce emission levels to specified emission targets within certain specified time frames;²⁹ whereas developing countries (including South Africa) are not subject to the same requirements.³⁰

One of the key climate change mitigation mechanisms which crystallised in the *Kyoto Protocol*, for both developed and developing countries, is the Clean Development Mechanism (hereafter CDM).³¹ The CDM, as defined in article 12 of the *Kyoto Protocol*, allows a country with emission-reduction or emission-limitation commitments under the *Kyoto Protocol* (i.e. an Annex B party such as South Africa) to implement an emission-reduction project, which will enable such a country to earn saleable Certified Emission Reduction (CER) credits. These credits can be allocated towards meeting the targets outlined in the *Kyoto Protocol*. The author has specifically earmarked the CDM for purposes of this research study, and its relevance in this regard will be outlined in the chapter to follow.

²⁸ See para 1.4 at page 9 of Chapter 1 below.

²⁹ Article 3 para 1 of the *Kyoto Protocol* (1997).

³⁰ Industrialised (Annex I) countries committed to absolute emission reduction or limitation targets, whereas all other countries (non-Annex I) had no such obligations.

³¹ Article 12 of the *Kyoto Protocol* (1997).

After decades of international climate change negotiations, following the adoption of the *Kyoto Protocol*, the international community made significant progress by establishing standards in climate change mitigation with the adoption of the *Paris Agreement* (2015) (hereafter the *Paris Agreement*). Signatory states (including South Africa) committed to a global action plan to mitigate climate change by limiting global warming to below 2°C, and further undertook to bridge the gap between existing policies and climate neutrality before the end of this century.³² Under the *Paris Agreement*, countries were called upon to establish their own voluntary national climate change mitigation objectives and to have these objectives included within their respective and individualised national climate action plans, known as nationally determined contributions (NDCs).³³ This was further echoed in the *Glasgow Climate Pact* (2021) (hereafter the *Pact*), which South Africa also participated in.³⁴

All of these mechanisms and commitments, although significant for South Africa's overall environmental reputation and commitment towards international climate change mitigation efforts, are not binding within South Africa until such time as these international treaties and conventions have been enacted and incorporated into domestic law by one of the means outlined in the *Constitution of the Republic of South Africa* 108 of 1996 (hereafter the *Constitution*).³⁵ This means that, in reality, South Africa is expected to regulate the topic of climate change mitigation by developing its own legislative and/or policy measures, including measures aiming to facilitate the development and use of EVs and related infrastructure networks, as these are underdeveloped measures within South Africa's legal framework.

³² Articles 2(1) and 4(1) of the *Kyoto Protocol* (1997).

³³ Articles 3, 4(2) and 4(3) of the *Kyoto Protocol* (1997).

³⁴ IISD 2021 <https://sdg.iisd.org/news/governments-adopt-glasgow-climate-pact-operationalize-paris-agreement/>.

³⁵ Section 231 of the *Constitution of the Republic of South Africa*, 1996. See also Kidd *Environmental Law* 48–49 for a theoretical explanation.

1.3.2 Selected foreign jurisdictions

In addition to international law instruments, country-specific EV laws and policies could and should influence and guide South Africa's EV future. It is for this reason that the author has selected to further examine the legislative and policy framework of two specific foreign jurisdictions relating to EVs, namely Norway and the United Kingdom (hereafter the UK). Even though these foreign jurisdictions are highly industrialised nations with significantly different socio-economic considerations at play when compared to South Africa, the author intends to draw valuable insights from these foreign jurisdictions regarding the development and implementation of their regulatory framework on EVs. Norway is widely considered to be the exemplary leader of the so-called EV revolution in the international community.³⁶ The Norwegian government has developed extensive EV policies, which largely comprise of different fiscal incentives, as well as certain driving and economic privileges, setting the global benchmark for EV policy and law reform.³⁷ Given the conceptual similarities between the English and South African legal systems, the UK government's approach to the regulation of EVs also merits consideration. With the bold announcement to end the sale of ICEVs in the UK by 2030, and a number of other significant green transport objectives, the UK government is attempting to rapidly unlock the electrification of its transport sector through law and policy reform.³⁸

The respective levels of progress achieved by these foreign jurisdictions in respect of the implementation and use of EVs could and should hold valuable contributions for the South African government on the regulation of EVs as a climate change mitigation action. This very aspect will be further examined by the author in this research study.

³⁶ Nickel 2019 <https://www.forbes.com/sites/davidnikel/2019/06/18/electric-cars-why-little-norway-leads-the-world-in-ev-usage/?sh=2d173e5913e3>; Fridstrøm 2021 *Sustainability* 1346; Figenbaum 2017 *Environmental Innovation and Societal Transitions* 15.

³⁷ Holtsmark and Skonhoft 2014 *Environmental Science & Policy* 161; Fridstrøm 2021 *Sustainability* 1346.

³⁸ GOV.UK 2020 <https://www.gov.uk/government/news/government-takes-historic-step-towards-net-zero-with-end-of-sale-of-new-petrol-and-diesel-cars-by-2030>.

1.3.3 The existing South African legal and policy framework

The *Constitution*, which "... applies to all law, and binds the legislature, the executive, the judiciary and all organs of state ...",³⁹ serves as the point of departure on domestic level. More specifically, South Africa's constitutional environmental right, as couched in section 24(b) of the *Constitution*, requires the legislative sphere of government to take reasonable 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.

In this context, section 24 of the *Constitution* should be read together with the national environmental management principles as envisaged in the *National Environmental Management Act* 107 of 1998 (hereafter the *NEMA*). These principles (coupled with the constitutional environmental right contained in the Bill of Rights) arguably mandate the South African government to address environmental degradation (such as climate change, for example) and the possible impacts thereof on South Africa, by means of legislation and other reasonable measures.⁴⁰ When directly applied to the research topic at hand, the aforementioned constitutional and national environmental framework mandate, alongside relevant international law instruments, serves as the foundation for the drafting of policies and/or legislation in South Africa to address climate change mitigation measures, such as the topic surrounding the regulation of the development and use of EVs and related infrastructure.

Furthermore, several framework policies and discussion papers support the South African government's recognition of its climate change mitigation responsibilities. From briefly recognising climate change and the *Kyoto Protocol's* CDM principle as mere factors in the development of an energy policy in the *White Paper on the Energy Policy of the Republic of South Africa* 1998, significant progress has been made in developing

³⁹ Section 8(1) of the *Constitution of the Republic of South Africa*, 1996.

⁴⁰ Kidd *Environmental Law* 324; Karsten and Van der Bank 2020 *Air, Soil and Water Research* 3.

climate change mitigation objectives, strategies and deliverables in the policy documents that came to fruition in the years thereafter. These policy documents include (but are not limited to) the *White Paper on the Renewable Energy Policy for the Republic of RSA*, 2003; the NCCRP in 2004; the *National Climate Change Response Green Paper*, 2010; the *Climate Change Bill*, 2022; and the *National Development Plan*, 2030 (NDP). Equally important is South Africa's Intended Nationally Determined Contribution (INDC) developed in light of the *Paris Agreement*.

In the road transport sector, the control of GHG emissions emanating from vehicles, the enhancement of the production and use of EVs, waste-sector mitigation, as well as creating awareness of and developing cleaner technology alternatives to ICEVs, appear to be recurring themes within the majority of specific mitigation policies and programmes. Greater detail surrounding these policies will be provided further in this study.

1.4 Research aim and objectives of the study

This dissertation seeks to determine the nature and extent of the regulatory framework required to facilitate the development and use of EVs and related infrastructure within South Africa in order to address its international climate change mitigation commitments.

In answering the main research aim of this study, the specific research objectives of this study are listed below:

- (a) Research objective one: Contextualising the background and considerations giving rise to the need to determine the regulatory framework required in South Africa for the implementation and use of EVs as a measure of climate change mitigation; taking into consideration the premises, assumptions and hypotheses applied by the author (which objective has already been dealt with in this chapter);⁴¹

⁴¹ See paras 1.1, 1.2 above and 1.7 below in this chapter.

- (b) Research objective two: Examining the existing international principles and mechanisms on climate change mitigation which are directly applicable to South Africa. More specifically, to address the most relevant international climate change mitigation principles in the context of the development and use of EVs and related infrastructure as a climate change mitigation measure in South Africa;⁴²
- (c) Research objective three: Examining the regulatory framework and perspectives on the development and use of EVs in Norway and the UK respectively, with a view to draw valuable lessons from the regulatory framework adopted in these foreign jurisdictions;⁴³
- (d) Research objective four: Examining the existing South African law and policy framework and perspectives on climate change mitigation in the broader sense, and more specifically in respect of the local development and use of EVs and related infrastructure;⁴⁴ and
- (e) Research objective five: Identifying any areas of potential improvement/development in the existing South African policy and legal framework regarding the regulation of the implementation and use of EVs and related infrastructure when compared to the respective positions adopted in Norway and the UK, and thereafter providing practical recommendations on how the South African regulatory landscape on EVs can be adapted to enable government to ultimately aim to address its international climate change mitigation commitments.⁴⁵

1.5 Definition of terms

The following terms will be used throughout this dissertation which are commonly used acronyms and jargon relevant to the research topic:

⁴² See Chapter 2 of this dissertation.

⁴³ See Chapter 3 of this dissertation.

⁴⁴ See Chapter 4 of this dissertation.

⁴⁵ See Chapter 5 of this dissertation.

- The term "EV" is an umbrella term, which includes Battery Electric Vehicles (BEVs), Hybrid Electric Vehicles (HEVs) and Plug-in Hybrid Electric Vehicle (PHEVs). It should further be understood that, in simple terms, an EV uses electric motors to drive its wheels. An EV derives some or all of its power from large, rechargeable batteries. The distance an EV drives between recharges is known as its "range".⁴⁶
- "Beneficiation" is a well-known term within the mining industry referring to the transformation of a mineral, or a combination of minerals, into a higher-value product, which can either be consumed locally or exported.⁴⁷
- "BEVs" or "All-EVs" refer to EVs which only have a battery as a power source, and which do not consume gasoline or produce tailpipe carbon emissions. In reality, a BEV's range varies according to driving style, terrain and the use of auxiliary vehicle features such as interior heating and/or air-conditioning.⁴⁸
- "Climate change mitigation" refers to those efforts implemented to either reduce or prevent GHG emissions by, *inter alia*, using new technologies and forms of renewable energies, making older equipment more energy efficient, or changing climate change management practices and/or consumer behaviour.⁴⁹
- "Electro mobility" or "e-mobility" is a general term used to describe the development of electric-powered drivetrains designed to shift away from the use of fossil fuels and carbon gas emissions in vehicle design.⁵⁰
- "ICEVs" are vehicles powered by a regular internal combustion engine (hereafter ICEV). An ICEV uses fuel which combusts inside a combustion chamber of the engine

⁴⁶ UK *Parliament Briefing Paper Number CBP07480, 4 December 2020: Electric vehicles and infrastructure* 5.

⁴⁷ Anglo American 2023 <https://southafrica.angloamerican.com/our-difference/hidden-transformation/beneficiation>.

⁴⁸ UK *Parliament Briefing Paper Number CBP07480, 4 December 2020: Electric vehicles and infrastructure* 5.

⁴⁹ UNEP 2022 <https://www.unep.org/explore-topics/climate-action/what-we-do/mitigation>.

⁵⁰ Techopedia 2022 <https://www.techopedia.com/definition/30913/electro-mobility-e-mobility>.

with the assistance of an oxidiser (typically oxygen from the air). This means that to generate power, ICEVs literally burn fuel. ICEVs most commonly use fuels derived from fossil fuels. These include (but are not limited to) petrol, diesel, jet fuel and compressed natural gas.⁵¹

- "PHEVs" differ from BEVs in that they can switch between electricity and fossil fuels. They typically have a smaller battery. However, a PHEV's maximum range is equivalent to that of a petrol or diesel vehicle.⁵²
- EVs are powered by battery electric power, with different types of batteries available in the market, including (but not limited to) Lithium-ion batteries (hereafter LIBs). LIBs are currently used in most EVs because of their high energy-per-unit mass relative to other electrical energy storage systems.⁵³ These batteries also have a high power-to-weight ratio, high energy efficiency, good high-temperature performance, and low self-discharge. Most components of LIBs can be recycled.⁵⁴
- "Range anxiety" refers to the common fear that an EV will not have enough battery charge to reach its intended destination, leaving its occupants stranded. This form of anxiety is particularly prominent in the context of travelling long distances with an EV, along roads where EV charging points might be few and far between.⁵⁵

In the context of EV-charging infrastructure, the following terminology will be used throughout this dissertation:

⁵¹ Car Rental Gateway 2022 <https://www.carrentalgateway.com/glossary/internal-combustion-engine-vehicle/>.

⁵² UK *Parliament Briefing Paper Number CBP07480, 4 December 2020: Electric vehicles and infrastructure* 5.

⁵³ ETAuto.com 2022 <https://auto.economictimes.indiatimes.com/news/auto-components/what-are-electric-vehicle-batteries-and-how-do-they-work/88799904>.

⁵⁴ ETAuto.com 2022 <https://auto.economictimes.indiatimes.com/news/auto-components/what-are-electric-vehicle-batteries-and-how-do-they-work/88799904>.

⁵⁵ NationalGrid 2022 <https://www.nationalgrid.com/group/what-ev-charging-anxiety-and-range-anxiety-thing-past#:~:text=Simply%20put%2C%20range%20anxiety%20is,be%20few%20and%20far%20between>.

- Alternating Current (AC) charging or slow charging is the most common method used to charge an EV. Inside an EV, there is a converter that converts power from AC to Direct Current (DC) and then puts the power back into the vehicle's battery. Generally, AC charging takes between seven to eight hours to fully charge an EV. An EV receives AC power from the grid via an AC charging station. The AC power is converted to DC by the on-board system, which is then stored in the battery of the EV. However, due to the size and weight limits of the on-board charger, there is also a limit to the amount of power output. As a result, it will take longer to charge the EV compared to DC charging.⁵⁶
- DC or fast charging is used in EV fast chargers. The power is then converted before entering the vehicle. After conversion, the electricity is fed straight into the vehicle battery, bypassing the EV's own converter. With DC charging, an EV can be fully charged in less than 40 minutes.⁵⁷

The words "government", "organs of state", "public sector", "state" and "state organs" bear the same meaning and will be used interchangeably throughout this dissertation.

1.6 Premises, assumptions, hypotheses, and limitations

This research study is based on two main premises:

- (a) The underlying purpose and rationale of EVs are to have a positive impact on the environment, as a viable climate change mitigation method; and
- (b) The South African government has a legal obligation and has undertaken to address climate change mitigation, whereby the development and use of EVs through legislative and policy reform is recognised as a tangible and effective climate change mitigation method.⁵⁸

⁵⁶ Nayak and Bohre 2022 *International Journal of Engineering, Science and Technology* 133-134.

⁵⁷ Nayak and Bohre 2022 *International Journal of Engineering, Science and Technology* 133-134.

⁵⁸ See para 4.5 of Chapter 4 at page 80 and further.

To frame the research study and the focus thereof, the following assumptions have been made:

- (a) The electrification of the road transport sector is widely regarded as a tangible and recognised climate change mitigation action.
- (b) The increased drive towards global e-mobility is inevitable, based on global trends and policy decisions;
- (c) The electrification of the South African transport sector will continue to grow due to international developments and pressure(s);
- (d) In order for the South African automotive industry to remain competitive in the international market, the systematic electrification of this industry is necessary; which further necessitates the development of a clear and comprehensive regulatory framework for EVs in South Africa;
- (e) Due to governmental pressure in most countries, the majority of vehicle manufacturers, worldwide, are increasing their production of EVs, and based on a wide variety of global media coverage vehicle manufacturers are establishing, as a long-term objective, the aim ultimately to only manufacture EVs;⁵⁹
- (f) South Africa is not regarded by the international community to have made significant progress in respect of the electrification of its transport sector to date, due to technical, legal, and socio-economic barriers to entry;

⁵⁹ McKinsey & Company 2021 <https://www.mckinsey.com/industries/automotive-and-assembly/our-insights/why-the-automotive-future-is-electric>; WEF 2021 <https://www.weforum.org/agenda/2021/01/electric-vehicles-breakthrough-tesla-china/>; [https://theicct.org/publication/global-climate change-mitigation-potential-from-a-transition-to-electric-vehicles/#:~:text=Electric%20vehicles'%20potential%20climate%20benefits,energy%20sources%20become%20widely%20available](https://theicct.org/publication/global-climate-change-mitigation-potential-from-a-transition-to-electric-vehicles/#:~:text=Electric%20vehicles'%20potential%20climate%20benefits,energy%20sources%20become%20widely%20available).

- (g) The legal system(s), socio-economic considerations, and the level of industrialisation of the selected foreign jurisdictions of Norway and the UK differ significantly when compared to the position in South Africa.

It is hypothesised that, despite the efforts displayed by the South African government in addressing its international climate change commitments thus far, the existing South African legal and policy framework regulating the development and use of EVs (in its current form) is still in its infancy – inadequate and in need of substantial reform.⁶⁰

The scope of this study is limited to the research aim at hand, and the following aspects fall beyond the scope of this dissertation and will either not be addressed in detail or not at all:

- (a) Any ancillary issues surrounding the supply of materials required for the production of EVs and related components, the production and distribution processes surrounding EVs or the recycling processes surrounding EV components.
- (b) Other viable forms of climate change mitigation activities available to the South African government, private sector, and domestic economy.
- (c) The concept of "adaptation" and the role thereof in addressing climate change, both in terms of international law and South African environmental law, whether related directly to the research topic or in general.
- (d) Other alternative renewable energy considerations available to the South African government, private sector, and domestic economy.

⁶⁰ Business Insider 2022 <https://www.businessinsider.co.za/evs-are-here-to-stay-heres-what-you-need-to-know-about-charging-them-in-south-africa-2022-5>.

- (e) South Africa's acute electricity generating capacity constraints and possible solutions in that regard (whereas the assessment of South Africa's electricity matrix is only limited to a contextual overview in this dissertation).⁶¹

1.7 Research methodology

The author intends to adopt a hybrid research approach to answer the above-mentioned research aim, whereby two research methods are applied, namely a literature review and a comparative analysis.

That said, this study will predominantly take the form of a literature review whereby the primary sources of international law and policy frameworks, as well as national legislation and policies relating to, *inter alia*, climate change mitigation and EVs will be discussed and analysed. Sources of international environmental law, such as international treaties, agreements and policies will be examined, including (but not limited to) the *UNFCCC*, the *Kyoto Protocol* and the *Paris Agreement*, in order to establish the core climate change mitigation principles which South Africa has undertaken to achieve. On domestic level, the relevant national legislation requires consideration, including (but not limited to) the *Constitution* and the *NEMA*. In addition, a number of relevant national policies, plans, programmes, strategies, discussion papers and reports will be analysed.⁶² A brief overview of the various government initiatives specifically designed and funded to enhance the development and use of EVs in South Africa will be included for contextual purposes and additional background.

This research study, as mentioned above, further justifies a comparative analysis of two selected foreign jurisdictions, namely Norway and the UK,⁶³ both of which have established an advanced regulatory framework for the enhancement and implementation of EVs as a climate change mitigation activity (both in law and policy). The purpose of

⁶¹ See para 4.7.2 at page 109 in Chapter 4 below.

⁶² For the sake of brevity, the author has specifically elected not to mention all of these policies under this paragraph, which policies will, in any event, be dealt with in greater detail in Chapter 4 below.

⁶³ The rationale for selecting these foreign jurisdictions has been detailed under para 1.3.2 above.

evaluating the position in these foreign jurisdictions is to determine which valuable insights can be drawn regarding the potential inadequacies that exist within the legislation and policies in South Africa on the regulation of EVs and related infrastructure. The rationale for the selected laws and policies discussed, are outlined in the relevant chapter hereinafter.

A hybrid research approach will thus best enable the author to draw conclusions from existing literature on the one hand, and to further evaluate the legal positions and perspectives of the selected foreign jurisdictions on the other hand, with a view to identify existing areas of potential improvement/development in South African legislation and policy development relating to the same subject matter. In doing so, the author will be placed in a position to make practical recommendations on the regulatory framework required for EVs towards achievable and practical climate change mitigation action in South Africa.

In support of the primary sources referenced in this study, the author made use of a number of secondary sources, including relevant published journal articles, discussion papers and reports, academic textbooks and other ancillary publications. It should be noted and acknowledged that this dissertation also contains some limited reference to popular media sources in relation to the subject matter as a whole or aspects thereof, which points of view are subjective; written for the general public; not peer-reviewed and usually published without a bibliography or reference(s).

Chapter 2: International climate change mitigation framework and perspectives

2.1 Introduction

The main purpose of this chapter is to address the second research objective, namely, to examine the applicable and existing international legal framework on climate change mitigation which directly applies to South Africa. More specifically, to address the most relevant international climate change mitigation mechanism(s) and/or commitment(s) in the context of the development and use of EVs and related infrastructure as a possible climate change mitigation measure in South Africa.⁶⁴

Considering that there is no universal international legal instrument which specifically deals with the development, implementation, and use of EVs *per se*, the focus, as far as international law⁶⁵ for purposes of this dissertation is concerned, stretches far wider. Instead, an understanding of the development and progression of the international legal framework on climate change mitigation obligations and principles serves as the point of departure in addressing the second research objective of this research study. The extent to which these obligations, principles and/or mechanisms apply to South Africa, as well as the role and manner in which these obligations, principles and/or mechanisms can potentially be integrated, enforced, considered and/or transposed into national legislation and policies in South Africa becomes a further consideration in addressing the second research objective.

⁶⁴ See para 1.4 at page 9 in Chapter 1 above.

⁶⁵ Dugard *International Law: A South African Perspective* 1 defines the concept of public international law as "...a body of rules and principles which are binding upon states in their relation to one another. These rules may broadly be divided into general and particular rules". Furthermore, and for contextual purposes, the sources of international law are described in article 38(1) of the *United Nations, Statute of the International Court of Justice* (1946) as (a) international conventions (treaties), whether general or particular; (b) international custom, as evidence of general practice accepted as law; (c) the general principles of law recognised by civilized nations; and (d) judicial decision and the teachings of the most highly qualified publicists, as subsidiary means for the determination of the rules of law.

For this purpose, this chapter commences with a brief chronological overview of the most prominent international legal instruments on climate change, which includes the *UNFCCC*, the *Kyoto Protocol* and subsequent amendment(s) thereto, the *Paris Agreement*, the more recent COP26 and further international developments. These instruments are discussed herein by specifically examining their respective historical significance, key mitigation objective(s), selected general and/or specific commitments and selected climate change mitigation mechanisms defined therein – relevant to this research topic. Secondly, the obligation(s), principle(s) and/or mechanism(s) most relevant to the research topic, which arose from these instruments, namely the CDM and NDC, are discussed. Thirdly, both the status and role of international law in South Africa are briefly discussed and contextualised, whereafter this chapter concludes with a summation of the manner in which these international obligations and principles are to be understood, operationalised and harnessed in national legislation and policies, aimed at enhancing the development and use of EVs and related infrastructure networks as a climate change mitigation measure in South Africa.

It should be noted that the purpose of this chapter is to provide context regarding the relevant international climate change mandate(s), objectives, and mechanisms as a general point of departure. Such context is intended to support the specific topics and considerations discussed in the subsequent chapters.

2.2 An overview of the prominent international law instruments on climate change mitigation

2.2.1 The United Nations Framework Convention on Climate Change

Given the direct relation between global average temperatures and the concentration of GHGs in the atmosphere, one of the key solutions to the climate change problem⁶⁶ rests

⁶⁶ The *UNFCCC* officially defines climate change in article 1 thereof as "a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods".

in decreasing the number of emissions released into the atmosphere and in reducing the current concentration of CO₂ – which efforts are referred to as "mitigation".⁶⁷

The concept of climate change mitigation found its genesis in the *UNFCCC* – an intergovernmental treaty developed to address the problem of climate change, which was initially signed by 154 countries at the United Nations Conference on Environment and Development (hereafter the UNCED), informally known as the Earth Summit, held in Rio de Janeiro, Brazil, from 3 to 14 June 1992. The *UNFCCC* only entered into force on 21 March 1994, and, in present day, it has near-universal membership of 197 countries, which includes South Africa who signed the *UNFCCC* in 1998 as a so-called Non-Annex I party.

The significance of the *UNFCCC* centres around the establishment of a basic legal framework and a set of clearly defined climate change mitigation principles aimed at international climate change cooperation amongst signatory countries, with the ultimate mitigation objective of achieving "stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system".⁶⁸

In summary, the *UNFCCC* –

- (a) formally recognised and defined that there is a global climate change problem,⁶⁹ even though, as a common fact, there was far less scientific evidence in support of climate change then in comparison to what exists in present day;
- (b) set a specific, albeit difficult, goal to stabilise global GHG concentrations at a level that will prevent dangerous human-induced interference with the climate change system;⁷⁰

⁶⁷ UNFCCC <https://unfccc.int/topics/mitigation/the-big-picture/introduction-to-mitigation>.

⁶⁸ A 2 of the *UNFCCC*.

⁶⁹ See the preamble of the *UNFCCC* at page 2 thereof.

⁷⁰ A 2 of the *UNFCCC*.

- (c) directed that financial support be provided to climate change activities, specifically in developing countries, by way of a system of grants and loans set up through the *UNFCCC* and subsidiary bodies;⁷¹
- (d) aimed itself at monitoring the climate change problem and measures to address it;⁷²
- (e) chartered the beginning of a trajectory to strike a balance between climate change mitigation on the one hand and economic development on the other;⁷³ and
- (f) initiated formal consideration of the adoption of the concept of climate change, whereby the vulnerability of all countries to the inevitable effects of climate change were acknowledged, especially developing countries which lack financial and other resources to adapt independently to the effects of climate change.⁷⁴

While it is clear that specific commitments within the *Kyoto Protocol* only applied to developed countries listed in Annexes I and II thereof,⁷⁵ the *UNFCCC* further outlined a set of general commitments applicable to all signatory parties,⁷⁶ which means that the principle of "common but differentiated responsibilities" appears to be the governing principle for the implementation of the general commitments listed in article 4(1) of the *UNFCCC*. Of most relevance to this dissertation, the *UNFCCC* outlined certain general commitments applicable to all signatory parties, including South Africa, to develop specific long-term national and regional development priorities to promote and cooperate in (a) the development, application and diffusion of technologies, practices and processes that control GHG emissions;⁷⁷ (b) scientific, technological, technical, socio-economic and other research related to climate change and mitigation measures;⁷⁸ and (c) education, training

⁷¹ A 12(7) of the *UNFCCC*.

⁷² See Articles 7(2)(f), 7(2)(j), 8(2)(b), 8(2)(d), 9(1) and 10(1) of the *UNFCCC*.

⁷³ See Articles 2, 3(4) and 3(5) of the *UNFCCC* as a starting point.

⁷⁴ See Articles 4(1)(b), 4(1)(e), 4(1)(f) and 4(4) of the *UNFCCC*.

⁷⁵ A 4(2) of the *UNFCCC*.

⁷⁶ A 4(1) of the *UNFCCC*.

⁷⁷ A 4(1)(c) of the *UNFCCC*.

⁷⁸ A 4(1)(g) of the *UNFCCC*.

and public awareness related to climate change,⁷⁹ all of which would form the basis for the international commitment of signatory states, including South Africa, to advance and implement climate change mitigation measures. The use of EVs and related infrastructure, as proposed by the author, is presented as a tangible example in this regard.

2.2.2 The Kyoto Protocol and the Doha Amendment

After the Earth Summit, the Intergovernmental Negotiating Committee (hereafter INC) for the *UNFCCC* met on a number of occasions to discuss matters relating to climate change commitments, arrangements for the desired financial mechanism, as well as technical and financial support to developing countries.⁸⁰ The INC ultimately completed its work in February 1995, and as a result the Conference of the Parties (hereafter COP) became the *UNFCCC's* ultimate authority. The COP then held its first session in Berlin, Germany, from 28 March until 7 April 1995, generally known as COP1 or the Berlin Mandate.⁸¹

The *UNFCCC* required COP1 to review whether the commitment of developed countries to take measures aimed at returning their GHG emissions to 1990 levels by the year 2000 was adequate for meeting the *UNFCCC's* main objective. The relevant parties agreed that new commitments were vital for the post-2000 period.⁸² They then established the Ad hoc Group on the Berlin Mandate (hereafter the AGBM) to draft "a protocol or another legal instrument" for adoption at COP3, in December 1997 in Kyoto, Japan.⁸³ The Berlin Mandate called on signatory parties to establish specific, legally binding targets and timetables for reducing the GHG emissions of developed countries.

Recognising that stronger climate change action was needed on a global scale, following the COP's second session from 8 – 19 July 1996, delegates from more than 150 countries

⁷⁹ A 4(1)(i) of the *UNFCCC*.

⁸⁰ UNFCC 2022 <https://unfccc.int/cop3/fccc/info/backgrod.htm>.

⁸¹ UNFCC 2022 <https://unfccc.int/cop3/fccc/info/backgrod.htm>. The Berlin Mandate is often referenced as Decision 1/CP.1.

⁸² UNFCC 2022 <https://unfccc.int/cop3/fccc/info/backgrod.htm>.

⁸³ UNFCC 2022 <https://unfccc.int/cop3/fccc/info/backgrod.htm>.

signed a further international treaty, called the *Kyoto Protocol* in Kyoto, Japan on 11 December 1997, which only entered into force on 16 February 2005, owing to a complex ratification process.⁸⁴

The *Kyoto Protocol* is directly linked and gave greater practical effect to the *UNFCCC*, and the rules and requirements for the implementation of the *Kyoto Protocol* were further elaborated on in a package of decisions, called the Marrakesh Accords, which were formally adopted by the Conference of the Parties to the *UNFCCC* in Montreal, Canada, in December 2005.⁸⁵ Currently, there are 192 signatory parties to the *Kyoto Protocol*,⁸⁶ including South Africa, who acceded to the *Kyoto Protocol* in July 2002.⁸⁷

The ultimate overarching objective of the *Kyoto Protocol*, identical to that of the *UNFCCC*, was to stabilise atmospheric concentrations of GHGs at a level that will prevent dangerous interference with the climate system.⁸⁸ In addition, it echoed the overarching principle of "common but differentiated responsibilities" originally found in the *UNFCCC*.⁸⁹ In pursuit of this objective, the *Kyoto Protocol* builds upon and enhances many of the commitments that were already in place under the *UNFCCC*, by operationalising the *UNFCCC* in obtaining the commitment of industrialised countries and so-called "economies in transition", to limit and reduce GHG emissions in accordance with agreed individual targets for the first commitment period (2008 – 2012).⁹⁰ Other commitments of Annex I parties included (a) the undertaking to develop domestic policies and measures to, *inter alia*, reduce GHG emissions;⁹¹ (b) a commitment by each Annex I party to strive to minimise any adverse impact of these policies and measures on other parties, particularly on developing country parties;⁹² (c) the obligation to provide additional financial resources to advance the

⁸⁴ UNFCCC 2022 https://unfccc.int/kyoto_protocol.

⁸⁵ UNFCCC 2022 https://unfccc.int/sites/default/files/08_unfccc_kp_ref_manual.pdf 12.

⁸⁶ UNFCCC 2022 https://unfccc.int/kyoto_protocol.

⁸⁷ UNFCCC 2022 <https://unfccc.int/node/61201>.

⁸⁸ See the preamble to the *Kyoto Protocol*.

⁸⁹ A 10 of the *Kyoto Protocol*.

⁹⁰ A 3(1) of the *Kyoto Protocol*.

⁹¹ A 5(1) of the *Kyoto Protocol*.

⁹² A 2(3) of the *Kyoto Protocol*.

implementation of commitments by developing countries.⁹³ The *Kyoto Protocol* further required both Annex I and Non-Annex I parties to cooperate in the areas of (a) the development, application and diffusion of climate-friendly technologies, know-how, practices and processes;⁹⁴ (b) research on and the systematic observation of the climate system;⁹⁵ (c) education, training and public awareness of climate change;⁹⁶ and (d) the improvement of methodologies and data for GHG inventories.⁹⁷

A key element of the *Kyoto Protocol* was the establishment of flexible market-based climate change mitigation mechanisms – based on the trade of emissions permits. In terms of the *Kyoto Protocol*, countries were required to meet their targets mainly through national measures, yet the *Kyoto Protocol* itself proposed three alternative means to enable signatory countries to meet their respective targets, namely through mechanisms such as (a) international emissions trading;⁹⁸ (b) the clean development mechanism (to be dealt with in greater detail further in this chapter);⁹⁹ and (c) joint implementation.¹⁰⁰ These aforesaid mechanisms encouraged global GHG reduction to start where it would be most cost-effective to do so – which was with developing countries. This meant that the *Kyoto Protocol* advocated that no matter where emissions are reduced, it matters that GHGs are ultimately removed from the atmosphere.

⁹³ A 11(2)(b) of the *Kyoto Protocol*.

⁹⁴ A 10(c) of the *Kyoto Protocol*.

⁹⁵ A 10(d) of the *Kyoto Protocol*.

⁹⁶ A 10(e) of the *Kyoto Protocol*.

⁹⁷ A 10(a) of the *Kyoto Protocol*.

⁹⁸ A 17 of the *Kyoto Protocol*. The mechanism known as "emissions trading", as set out in article 17 of the *Kyoto Protocol*, allowed countries that have emission units to spare (being emissions permitted to them but not utilised) to sell this excess capacity to countries that are already over their emission targets. This concept has created a new commodity in the form of emission reductions or removals. Since carbon dioxide is the principal greenhouse gas, the international community started speaking of trading in "carbon" in the so-called "carbon market."

⁹⁹ A 12 of the *Kyoto Protocol*.

¹⁰⁰ A 6 of the *Kyoto Protocol*. The mechanism known as "joint implementation", defined in article 6 of the *Kyoto Protocol*, allows a country with an emission reduction or limitation commitment under the *Kyoto Protocol* (i.e. an Annex B Party) to earn emission reduction units (ERUs) from an emission-reduction or emission-removal project in another Annex B party, each equivalent to one tonne of CO₂, which can be counted towards meeting its emission target under the *Kyoto Protocol*. Joint implementation offered parties flexible and cost-efficient means of partly fulfilling their commitments under the *Kyoto Protocol*, whilst the host party benefits from foreign investment and technology transfer.

Seven years after the ratification of the *Kyoto Protocol*, on 8 December 2012 in Doha, Qatar, the signatory parties to the *Kyoto Protocol* adopted the *Doha Amendment to the Kyoto Protocol* (2012) (hereafter the *Doha Amendment*) for a second commitment period (2013 – 2020). The *Doha Amendment* only came into force at the end of 2020 due to the majority country threshold for acceptance only then being achieved, to make the emission reduction commitments of Annex I parties under the second commitment period legally binding.¹⁰¹ The amendments to the *Kyoto Protocol* included (a) new (and additional) commitments for Annex I parties to the *Kyoto Protocol* who agreed to take on commitments in the second commitment period;¹⁰² (b) a revised list of GHGs to be reported on by parties during the second commitment period;¹⁰³ and (c) amendments to several articles of the *Kyoto Protocol* which specifically referenced issues pertaining to the first commitment period and which needed to be updated for purposes of the second commitment period.¹⁰⁴

2.2.3 The Paris Agreement

The *Paris Agreement*, being the third significant international treaty on climate change, is considered a major landmark in the multilateral global climate change process.¹⁰⁵ It was the final product of eight years of negotiations, starting in Bali, Indonesia, in 2008, and includes a failed attempt to finalise an agreement in 2009.¹⁰⁶ Given that the impact of climate change had become more prevalent over the last two decades, with extreme weather events from floods to droughts reoccurring more frequently across the globe, the urgency and pressure to conclude an even more meaningful and effective global climate

¹⁰¹ UNFCCC 2022 <https://unfccc.int/process/the-kyoto-protocol/the-doha-amendment>.

¹⁰² A 1(A) of the *Doha Amendment*.

¹⁰³ A 1(B) of the *Doha Amendment*.

¹⁰⁴ Aa 1(C) – (L) of the *Doha Amendment*.

¹⁰⁵ UNFCCC 2022 <https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement>; Bodansky 2021 *United Nations Audiovisual Library of International Law* 7; Wegener 2020 *Transnational Environmental Law* 19.

¹⁰⁶ CPLO 2016 <http://www.cplo.org.za/wp-content/uploads/2016/02/BP-408-The-Domestication-of-the-Paris-Agreement-June-2016.pdf>.

agreement seemed to be much more urgent.¹⁰⁷ A new round of negotiations kick-started in 2011 at the Durban Platform for Enhanced Action,¹⁰⁸ and after overcoming many different hurdles during negotiations at COP21 in Paris, France, the *Paris Agreement* was adopted by 196 countries on 12 December 2015 and entered into force on 4 November 2016.¹⁰⁹ South Africa signed the *Paris Agreement* on 22 April 2016,¹¹⁰ and it was ratified by the South African government on 1 November 2016.¹¹¹ Even though the *Kyoto Protocol* technically remains in force, the *Paris Agreement* has, for all intents and purposes, superseded the implementation of the *Kyoto Protocol* as the principal regulatory international instrument governing the current global climate change response.

The main objectives of the *Paris Agreement* is to "...strengthen the global response to the threat of climate change, in the context of sustainable development and efforts to eradicate poverty...", which the *Paris Agreement* aims to achieve by (a) limiting global warming in holding the increase of global temperatures to well below 2°C, preferably to 1.5 °C, compared to pre-industrial levels;¹¹² (b) increasing signatory countries' ability to adapt to the adverse effects of climate change, foster climate resilience and low GHG emissions development;¹¹³ as well as (c) "...making finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development".¹¹⁴ To achieve the aforesaid long-term temperature objective, countries aim to reach global peaking of GHG emissions as soon as possible to achieve a climate-neutral world by mid-century.¹¹⁵

¹⁰⁷ CPLO 2016 <http://www.cplo.org.za/wp-content/uploads/2016/02/BP-408-The-Domestication-of-the-Paris-Agreement-June-2016.pdf>.

¹⁰⁸ Often referred to as Decision 1/CP.17.

¹⁰⁹ CPLO 2016 <http://www.cplo.org.za/wp-content/uploads/2016/02/BP-408-The-Domestication-of-the-Paris-Agreement-June-2016.pdf>.

¹¹⁰ DFFE 2016 <https://www.dffe.gov.za/mediarelease/southafricasignsparisagreementonclimate>.

¹¹¹ DFFE 2016 https://www.dffe.gov.za/mediarelease/southafrica_ratifies_parisagreement.

¹¹² A 2(a) of the *Paris Agreement*; UNFCCC 2022 <https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement>.

¹¹³ A 12(2)(b) of the *Paris Agreement*.

¹¹⁴ A 12(2)(c) of the *Paris Agreement*.

¹¹⁵ UNFCCC 2022 <https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement>.

Even though the *Kyoto Protocol* and the *Paris Agreement* both set out to address climate change in their respective ways, there are significant differences. The *Kyoto Protocol* established legally binding emissions-reduction targets (as well as penalties for non-compliance) for developed countries *only*, whilst the *Paris Agreement* takes a nuanced approach to differentiation, by requiring that all countries, whether developed or developing, firmly commit to reducing GHG emissions in some shape or form. For the first time, with the commitments under the *Paris Agreement*, countries were given greater flexibility to set their own emissions targets consistent with their level of development and technological advancement.¹¹⁶ Even though no harsh penalties are on the cards, should countries not meet their individual emissions targets, which was the case with developed countries under the *Kyoto Protocol*, the *Paris Agreement* contains a robust system of monitoring, reporting, and reassessing individual and collective country targets over time, in order to move the world closer to the broader objectives of this treaty.¹¹⁷

When considering the *Paris Agreement*, five major key aspects are evident, namely (a) mitigation, (b) market mechanisms, (c) adaptation and loss of damage, (d) finance and transparency, as well as (e) ambition mechanism/global stocktake, all of which also directly affect South Africa:

- (a) From a mitigation perspective, the *Paris Agreement* places an obligation on signatory countries, including South Africa (except the least developed countries and so-called small island developing states), (i) to prepare and submit a domestic climate change mitigation plan, called a national determined contribution (NDC), every five years (which mechanism has been earmarked by the author further in this chapter); (ii) to ensure that such NDCs are progressive over time in addressing climate change; (iii) to account for these NDCs; and (iv) to pursue domestic measures with the aim of achieving the objective of their NDCs.¹¹⁸

¹¹⁶ NRDC 2021 <https://www.nrdc.org/stories/paris-climate-agreement-everything-you-need-know>.

¹¹⁷ NRDC 2021 <https://www.nrdc.org/stories/paris-climate-agreement-everything-you-need-know>.

¹¹⁸ Articles 3 and 4 of the *Paris Agreement*.

- (b) The *Paris Agreement* has introduced two voluntary cooperation market mechanisms, which allow parties to implement their respective NDCs through cooperation with other parties,¹¹⁹ by either (i) allowing parties on a voluntary basis to transfer mitigation outcomes and to use these so-called Internationally Transferred Mitigation Outcomes (ITMOs) to achieve the objectives of their NDCs (which boils down to a form of emissions trading),¹²⁰ or (ii) allowing parties to make use of an offset mechanism, similar to the CDM in the *Kyoto Protocol*, and directs the relevant supervisory body, the CMA, to adopt various rules and procedures for this new mechanism.¹²¹
- (c) The concept of "adaptation" is now also recognised as an integral part of addressing climate change, and is positioned as a primary concern for developing countries.¹²² Historically, the South African government always insisted on parity between adaptation and mitigation in addressing climate change on local soil.¹²³ That said, the *Paris Agreement* now requires parties to engage in adaptation-planning processes, which, by implication, should be communicated in their respective NDCs with an adaptation component.¹²⁴ Adaptation, however, falls beyond the scope of this dissertation.
- (d) As far as finance objectives are concerned, the *Paris Agreement* establishes the objective of making "finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development".¹²⁵ This very goal aims to go well beyond the historic focus of climate finance whereby support is provided to developing countries. This objective encompasses private as well as public

¹¹⁹ A 6 of the *Paris Agreement*.

¹²⁰ A 6(2) of the *Paris Agreement*.

¹²¹ A 6(4) of the *Paris Agreement*.

¹²² A 7 of the *Paris Agreement*.

¹²³ CPLO 2016 <http://www.cplo.org.za/wp-content/uploads/2016/02/BP-408-The-Domestication-of-the-Paris-Agreement-June-2016.pdf>.

¹²⁴ A 7(9) of the *Paris Agreement*; CPLO 2016 <http://www.cplo.org.za/wp-content/uploads/2016/02/BP-408-The-Domestication-of-the-Paris-Agreement-June-2016.pdf>.

¹²⁵ A 2(1)(c) of the *Paris Agreement*.

financial funding, and calls not only for increasing green-finance¹²⁶ flows to support low-emission technologies and climate-resilience efforts, but also for phasing out of so-called brown-finance¹²⁷ flows used to fund GHG-emitting technologies.¹²⁸

- (e) As the obligation on parties to produce NDC's are not legally binding *per se*, the *Paris Agreement* relies on transparency to hold countries accountable for achieving the objectives as set out in their NDCs. The *Paris Agreement* therefore established an enhanced transparency framework (ETF), which involves self-reporting by signatory parties, as well as subjecting NDCs to both technical expert and peer review.¹²⁹
- (f) As a mechanism to achieve its goals, the *Paris Agreement* established a repetitive process intended to increase countries' ambition over time, loosely referred to as the "ambition mechanism".¹³⁰ To illustrate, every five years signatory parties must submit their revised NDCs;¹³¹ each party's progress in achieving its NDC is subjected to technical expert and peer review;¹³² all parties undertook to undergo a global stocktake of collective progress in achieving the purpose and long-term objectives of the *Paris Agreement*,¹³³ and once informed by the outcomes of the aforesaid stocktake, signatory parties must submit another round of NDCs to ensure that progress is displayed over time.¹³⁴

¹²⁶ UNEP 2023 <https://www.unep.org/regions/asia-and-pacific/regional-initiatives/supporting-resource-efficiency/green-financing> defines "green financing" as follows: "...to increase [the] level of financial flows (from banking, micro-credit, insurance and investment) from the public, private and not-for-profit sectors to sustainable development priorities."

¹²⁷ Climate Transparency 2017 http://www.climate-transparency.org/wp-content/uploads/2017/12/Financing_the_transition.pdf defines "brown financing" as "domestic and international finance flows that support carbon-intensive projects or activities and pathways that do not sufficiently consider future climate risks."

¹²⁸ Bodansky 2021 United Nations Audiovisual Library of International Law 5.

¹²⁹ A 13 of the *Paris Agreement*.

¹³⁰ Bodansky 2021 United Nations Audiovisual Library of International Law 6.

¹³¹ A 4(9) of the *Paris Agreement*.

¹³² A 13(11) of the *Paris Agreement*.

¹³³ A 14 of the *Paris Agreement*.

¹³⁴ A 4(9) of the *Paris Agreement*.

When compared to earlier climate agreements, the *Paris Agreement's* approach is rather nuanced, and instead of dictating each and every aspect at an international level, it largely leaves the substance of climate policy to national discretion.¹³⁵

2.2.4 COP26 and further international developments

From 31 October until 13 November 2021 the COP26 was held in Glasgow, Scotland, bringing parties together to accelerate action towards the goals of the *Paris Agreement* in order to formalise a critically important international policy on the transition path towards the attempt at stabilising rising global temperatures.¹³⁶ The fruit of intense negotiations was the adoption of the *Pact* by signatory countries (including South Africa), aiming to turn the 2020s into a decade of climate action and support. The *Pact* is generally *not* considered a "...step-change or species-level civilisational transformation, but rather a pact that promises to do better next year..." and although "...the climate crisis has not definitively been averted, there were some significant moves made, as reflected in the final text..." of the *Pact*.¹³⁷

Essentially, the *Pact* contains the following three overarching cover decisions that provide an overall political narrative of the COP: (a) For the first time in the *UNFCCC's* history, there is a now direct and express reference and commitment to "phasing down" unabated coal power and "phasing out" inefficient fossil-fuel subsidies;¹³⁸ (b) developed countries are called upon to double their adaptation finance from 2019 levels, by 2025;¹³⁹ and (c) for those parties who have not yet communicated new NDCs or have failed to update their NDCs, to do so before the COP27 (which took place close to the end of 2022).¹⁴⁰

¹³⁵ Bodansky 2021 *United Nations Audiovisual Library of International Law* 6.

¹³⁶ UK Government 2022 <https://ukcop26.org/>; Cohen *et al* 2022 *Proc. Instn Civil. Engrs: Energy* 1.

¹³⁷ Daily Maverick 2021 <https://www.dailymaverick.co.za/article/2021-11-15-the-glasgow-climate-pact-a-global-compromise-that-barely-keeps-the-goal-of-1-5c-alive/>.

¹³⁸ Para 20 of the *Glasgow Climate Pact*.

¹³⁹ Paras 10 – 14 and 27 of the *Glasgow Climate Pact*.

¹⁴⁰ IISD 2021 <https://sdg.iisd.org/news/governments-adopt-glasgow-climate-pact-operationalize-paris-agreement/>.

South Africa, however, was the sole beneficiary of what has been described by many as a "watershed" long-term climate finance deal, concluded during the COP26 – known as the *Just Energy Transition*.¹⁴¹ Funded by the United States of America (hereafter USA), Britain, France, Germany and the EU, to support South Africa's decarbonisation efforts, this deal provides close to an estimated amount of 131 million ZAR in the form of grants, concessional loans, investments and risk-sharing instruments over the next three to five years, advancing the move from South Africa's heavy reliance on coal to cleaner and renewable energy sources. To record this understanding, *the Political Declaration on the Just Energy Transition in South Africa* was formally published on 2 November 2021, during the COP26.¹⁴²

During November 2022, Egypt hosted the COP27, providing political momentum and guidance to the negotiators, including the significant decision to establish a special fund and to assist developing countries to respond to loss and damage caused by climate change. During COP27, President Ramaphosa met with the relevant *Just Energy Transition* representatives of Germany, France, the EU, the USA and the UK, regarding the next steps. He presented South Africa's Investment Plan surrounding this deal, whilst indicating the funds required by South Africa for implementation purposes – mainly in the form of highly concessional loans and grants – in the next five years from 2021 onwards.¹⁴³ The execution of the *Just Energy Transition*, however, is still in its infancy at the date of finalising the research of this study.

¹⁴¹ Daily Maverick 2021 <https://www.dailymaverick.co.za/article/2021-11-15-the-glasgow-climate-pact-a-global-compromise-that-barely-keeps-the-goal-of-1-5c-alive/>; Foreign Policy 2021 <https://foreignpolicy.com/2021/11/12/coal-climate-south-africa-cop26-agreement/>; EC 2021 https://ec.europa.eu/commission/presscorner/detail/en/IP_21_5768.

¹⁴² GOV.UK 2021 <https://ukcop26.org/political-declaration-on-the-just-energy-transition-in-south-africa/>.

¹⁴³ Government of South Africa 2022 <https://www.gov.za/speeches/south-africa-welcomes-cop27-outcomes-22-nov-2022-0000>.

2.3 Selected international climate change mitigation topics

As previously mentioned herein,¹⁴⁴ the two international climate change mitigation topics which crystallised in the *Kyoto Protocol* and *Paris Agreement* respectively, and which apply to South Africa as a developing country, have been specifically earmarked by the author for purposes of this dissertation. These topics are that of the CDM and NDCs which are dealt with separately below.

2.3.1 Clean Development Mechanism

The CDM, formally defined in article 12 of the *Kyoto Protocol*, allows a country with an emission-reduction or emission-limitation commitment under the *Kyoto Protocol* (i.e. an Annex B Party) to implement an emission-reduction project in a developing country/ies. The purpose of the CDM is to assist Non-Annex I parties in achieving sustainable development and thereby contributing to the ultimate objective of the *UNFCCC*.¹⁴⁵ Such emission-reduction projects could enable such country to earn saleable certified emission-reduction (hereafter CER) credits, each equivalent to one tonne of CO₂, which can be counted towards that specific country's targets under the *Kyoto Protocol*.¹⁴⁶

Given that South Africa is classified as a developing country for the purposes of the *UNFCCC* and the *Kyoto Protocol*, the CDM offers the following opportunities: (a) attracting capital investment for projects that can assist with the shift to a less carbon-intensive economy; (b) encouraging and permitting the active participation of private and public sectors; (c) the possibility of becoming an effective tool of technology transfer if capital investments are channelled into projects which replace old and inefficient fossil fuel technology or create new industries in environmentally sustainable technologies; and (d) assisting developing countries to define investment priorities in projects that could help them to meet their sustainable development goals.¹⁴⁷ Specifically relevant to this

¹⁴⁴ See par 1.3.1 of Chapter 1 at page 5 above.

¹⁴⁵ A 12(2) of the *Kyoto Protocol*.

¹⁴⁶ A 12(3) of the *Kyoto Protocol*.

¹⁴⁷ Department of Energy 2022 http://www.energy.gov.za/files/esources/kyoto/kyoto_sa.html.

dissertation, and during April 2015, the CDM Executive Board (hereafter CDM EB)¹⁴⁸ approved rule changes endorsing projects that encourage transition to EVs which will receive further incentives if those EVs are charged by renewable energy sources. In changing the small-scale CDM transport methodology used to calculate baseline emissions and measure on-going emissions to consider and credit the reduced emissions from renewable energy sources, the CDM EB endorsed the allocation of incentives to projects that cause a shift from fossil fuel powered vehicles to EVs. This means that these types of projects, going forward, would have a higher rewarded incentive if charging emanates from renewable sources.¹⁴⁹

2.3.2 Nationally Determined Contributions (NDCs)

The author has also identified the introduction of NDCs in terms of articles 3 and 4 of the *Paris Agreement*. The importance thereof has been voiced by many, including the *NDC Partnership* (as quoted directly below):¹⁵⁰

The NDCs are intended to be dynamic, with countries regularly updating them and advancing the level of ambition, reflecting advancing science and implementation experience, to meet the long-term temperature goal in the Paris Agreement.

Established as a tangible climate change mitigation commitment in terms of the *Paris Agreement* and thereafter, within this dissertation specific consideration will be given to the NDCs of selected foreign jurisdictions,¹⁵¹ but most importantly to South Africa's first NDC.¹⁵²

¹⁴⁸ The CDM Executive Board (CDM EB) supervises the CDM on a global scale, in terms of the *Kyoto Protocol*, under the authority and guidance of the COP serving as the Meeting of the Parties to the *Kyoto Protocol* (CMP). The CDM EB is therefore fully accountable to the CMP.

¹⁴⁹ UNFCCC 2022 https://cdm.unfccc.int/press/newsroom/latestnews/releases/2015/1604_index.html.

¹⁵⁰ NDC Partnership 2022 <https://ndcpartnership.org/facilitating-global-transition-role-nationally-determined-contributions-meeting-long-term>, which further states that "...the NDC Partnership brings together more than 200 members, including more than 115 countries – developed and developing – and more than 80 institutions to create and deliver on ambitious climate action that helps achieve the *Paris Agreement* and the Sustainable Development Goals (SDGs)".

¹⁵¹ See paras 3.1 and 3.2 of Chapter 3 at pages 38 and 39 below.

¹⁵² See para 4.3 of Chapter 4 at page 69 below.

2.4 The role and status of international law in South Africa

Against the background of the relevant international law instruments and climate change mitigation principles discussed above, and although significant for South Africa's overall environmental reputation and commitment towards international climate change mitigation efforts, these instruments and the corresponding climate change mitigation commitments and mechanisms are not automatically binding on local soil.¹⁵³ Section 231 of the *Constitution*¹⁵⁴ details the mandate and process for ratification of international agreements in South Africa. More specifically, section 231(2) of the *Constitution* provides the following:

An international agreement binds the Republic only after it has been approved by resolution in both the National Assembly and the National Council of Provinces, unless it is an agreement referred to in subsection (3).

Scholarly interpretations on the domestic effect(s) of an approval of an international law instrument in terms of section 231 of the *Constitution* include (a) imposing an obligation on our courts to interpret national legislation in terms of section 233 of the *Constitution*, and to include international treaties that are approved, but not ratified, in its interpretation thereof; (b) imposing a duty upon the South African government and its organs to act in good faith domestically and to refrain from acts which would defeat the object and purpose of the relevant international law instruments; and (c) interpreting parliamentary approval of an international law instrument as a positive statement that the South African Parliament will act in accordance with the approved treaty when exercising its legislative power.¹⁵⁵

Equally important, section 231(4) of the *Constitution* makes it quite clear that the *Constitution* does not oblige the South African Parliament to incorporate approved and ratified international treaties into domestic law.¹⁵⁶ This means that the South African

¹⁵³ CPLO 2016 <http://www.cplo.org.za/wp-content/uploads/2016/02/BP-408-The-Domestication-of-the-Paris-Agreement-June-2016.pdf>.

¹⁵⁴ 108 of 1996.

¹⁵⁵ Sucker 2013 *Constitutional Court Review* 434.

¹⁵⁶ Section 231(4) of the *Constitution*.

Parliament must decide whether to incorporate an international law instrument and how to incorporate the corresponding domestic measures in order to comply with South Africa's international obligations and to enforce same domestically.¹⁵⁷

Consequently, even though South Africa has, in good faith, subscribed to and has ratified specific climate change mitigation mechanisms and commitments on the international stage, South Africa should then, on its own, develop and implement its own domestic legislative and/or policy measures around climate change, generally (which would include measures to address the concepts of mitigation and adaptation respectively) It further follows that in the context of this dissertation such domestic legislative and/or policy measures could, by implication, include measures aiming to facilitate the development and use of EVs and related infrastructure networks.

2.5 Conclusion

This chapter set out to address the second research objective, namely, to examine the applicable and existing international legal framework on climate change mitigation which directly applies to South Africa. More specifically, to address the most relevant international climate change mitigation mechanism(s) and/or commitment(s) in the context of the development and use of EVs and related infrastructure as a possible climate change mitigation measure in South Africa.¹⁵⁸ In reaching this aforementioned objective, the foregoing consideration of sources has led the author to the following summation:

- (a) The public international law instruments most relevant for purposes of this research study relating to climate change and climate change mitigation are the *UNFCCC*, the *Kyoto Protocol* (and subsequent amendment(s) thereto), the *Paris Agreement*, as well as the *Pact*.¹⁵⁹

¹⁵⁷ Sucker 2013 *Constitutional Court Review* 427; Ferreira and Ferreira-Snyman 2014 *PELJ* 1478.

¹⁵⁸ See para 1.4 of Chapter 1 at page 9 and para 2.1 of Chapter 2 at page 18 above.

¹⁵⁹ See paras 2.2.1 to 2.2.4 of Chapter 2 herein above.

- (b) The development and progression of these instruments, from the *UNFCCC* up until the *Pact*, clearly display a pathway towards more definitive and tangible mechanisms and opportunities for both developed and developing countries, including South Africa, in achieving the ultimate and universal objective of reducing GHG emissions in combatting climate change.¹⁶⁰
- (c) Even though no international legal instrument which specifically deals with the development, implementation and use of EVs *per se* exists,¹⁶¹ the current public international law framework and associated climate change mitigation mechanism(s) and commitment(s) identified in this chapter create room for an outcome-based policy framework to enable countries, including South Africa, to give effect to their respective climate change commitments in a pragmatic and systematic fashion, whilst making provision for each country's unique economic and socio-economic circumstances and status on advancement in greener technologies such as the implementation and use of EVs and related infrastructure.
- (d) In formulating a regulatory policy framework for the use and development of EVs and related infrastructure in South Africa, the relevant public international-law instruments and related climate change mitigation mechanisms and/or commitments (such as CDM and NDCs, specifically identified by the author) could serve as the foundation in guiding domestic policy and legislation on this topic:
- (i) As far as the development and use of EVs and related infrastructure as a possible climate change mitigation measure in South Africa is concerned, the author has earmarked a well-known climate change mitigation mechanism, which originated in the *Kyoto Protocol*, being the CDM. This mechanism allows a country with emission-reduction or emission-limitation commitments under the *Kyoto Protocol* (i.e. an Annex B party such as South Africa) to implement an emission-reduction project, which enables such country to earn saleable

¹⁶⁰ See paras 2.2.1 to 2.2.4 of Chapter 2 herein above.

¹⁶¹ See para 2.1 of Chapter 2 at page 18 above.

CER credits in order to meet its climate change mitigation targets.¹⁶² If the development and use of EVs and related infrastructure in South Africa are coupled with associated CDM projects registered as such with the CDM EB, South Africa has the potential to utilise local EV incentives and/or policies to enable South Africa to reach some of its international climate change mitigation commitments.

- (ii) South Africa has further made an international climate change mitigation commitment to subscribe to the obligation which originated under the *Paris Agreement*, to regularly submit individualised national climate action plans, known as NDCs.¹⁶³ NDCs ensure accountability amongst signatory countries to develop and implement the climate change adaptation and mitigation commitments they make, with specific focus on its unique local factors of consideration such as its energy mix, access to funds, level of industrialisation, geographical factors and main polluting industries or sectors. With specific reference to this research study, significant synergy can be achieved if South Africa's own NDC is aligned with its local policy framework on the CDM and climate change mitigation, including the use and development of EVs and related infrastructure.

- (e) That said, only once these climate change mitigation objectives and principles have been incorporated in domestic policies and legislation in South Africa in terms of section 231 of the *Constitution*, will binding obligations on the part of the South African public and private sectors arise, to ultimately move South Africa towards achieving its international climate change commitments.¹⁶⁴

¹⁶² See para 2.3.1 of Chapter 2 at page 32 above.

¹⁶³ See para 1.3.1 of Chapter 1 at page 5 and sections 2.2.3 and 2.3.2 of Chapter 2 at pages 25 and 33 above.

¹⁶⁴ See para 1.3.1 of Chapter 1 at page 5 and section 2.4 of Chapter 2 at page 34 above.

Chapter 3: The policy framework and perspectives on electric vehicles of selected foreign jurisdictions

3.1 Introduction

The main purpose of this chapter is to address the third research objective, namely, to examine the policy framework and perspectives on the development and use of EVs and related infrastructure in two selected foreign jurisdictions, being Norway and the UK, with a view to draw valuable lessons for possible application in South Africa.¹⁶⁵

Even though these foreign jurisdictions are highly industrialised nations with significantly different socio-economic considerations, scales of economic development, levels of industrialisation, and energy matrices at play, when compared to South Africa, the author intends to examine whether valuable insights can be drawn from these foreign jurisdictions as regards the development and use of EVs and related infrastructure in South Africa. The author has specifically elected not to examine the position in foreign jurisdictions which are categorised as developing countries, or even countries with similar economic and socio-economic challenges to South Africa. The reason for this is twofold. Firstly, the recent increase in global momentum surrounding the development and use of EVs and related infrastructure, especially in developing countries, is still in its infancy. This would not provide the valuable insight(s) which the author hopes to extract for purposes of addressing the research aim at hand. Secondly, the author aims to examine in what manner these respective foreign jurisdictions of Norway and the UK have developed, implemented, and adapted their respective laws and policies on this topic. On the one hand, Norway's practices serve as the global yardstick, and on the other, as an internationally recognised front-runner, the UK, has been chosen by the author not only due to its historic connection with South Africa, but there are also conceptual similarities between the English and South African legal systems *vis-à-vis* environmental law and governance.

¹⁶⁵ See para 1.4 of Chapter 1 at page 9 above.

In order to answer the third research objective, this chapter follows a simple and systematic structure. It starts with a concise overview of the policy framework on EVs in Norway, by providing context to the unique considerations at play in Norway, the Norwegian EV policy framework and related core legislation, as well as the question as to whether Norway's commitments in terms of its NDC lend support to and/or are aligned with the Norwegian EV policy framework. Thereafter, the position in the UK is discussed in a similar fashion. Lastly, this chapter concludes with a synopsis of the main characteristics of these foreign EV policy frameworks, and the author comments on whether, in his view, some tangible climate change mitigation measures from these selected foreign jurisdictions are capable of practical implementation and/or integration in the further development of South Africa's EV policy and legislative framework.

3.2 Overview of the policy framework on electric vehicles in Norway

3.2.1 Introductory remarks and context

In this section, Norway's policy framework and perspectives on the development and use of EVs and related infrastructure is examined. The main reason being that Norway is considered by most of the international community as a climate change mitigation leader and frontrunner in the development and use of EVs and related infrastructure, and has set the international benchmark on the topic of EV use and integration.¹⁶⁶

Norway was the first developed country to submit an updated NDC under the *Paris Agreement*, on 7 February 2020. Similar to Norway's first NDC presented in 2016,¹⁶⁷ the updated version is a concise document with a strict focus on climate change mitigation. This updated NDC covers all sectors and types of GHGs, wherein Norway has mainly

¹⁶⁶ Farstad *et al* 2022 *Global Environmental Change* 74 102517 1; Nickel 2019 <https://www.forbes.com/sites/davidnikel/2019/06/18/electric-cars-why-little-norway-leads-the-world-in-ev-usage/?sh=2d173e5913e3>; Fridstrøm 2021 *Sustainability* 1346; Figenbaum 2017 *Environmental Innovation and Societal Transitions* 15; UK Parliament *Briefing Paper Number CBP07480*, 4 December 2020: *Electric vehicles and infrastructure* 23.

¹⁶⁷ In Norway's first NDC the objective was to reduce emissions by at least 40 per cent compared to 1990 by 2030.

committed to reduce GHGs by at least 50 per cent.¹⁶⁸ The emission-reduction target will be developed into an emissions budget, covering the period between 2021 and 2030.¹⁶⁹ Norway further aims to implement its NDC, jointly with the EU and Iceland. It does, however, intend to go beyond the EU in the target of 40 per cent, using voluntary collaboration under article 6 of the *Paris Agreement*, and to reach climate neutrality and transformation to a low-emission society by 2050.¹⁷⁰ This very objective mirrors the national objective enshrined in the *Act Relating to Norway's Climate Targets 2017 (Climate Change Act)*, LOV-2017-06-16-60 (which is locally known as the *Norwegian Climate Change Act* or *Klimaforliket*), which demonstrates a clear synergy between Norway's international climate change mitigation and local environmental policies.¹⁷¹

Both Norway's first NDC and updated NDC, more specifically the sections thereof dealing with planning processes, mention the use and development of EVs in the following manner (as quoted directly below):¹⁷²

Economic measures like CO₂-taxes and emission trading are central to Norwegian climate policy. Support for the development and adoption of low emissions technologies, including carbon capture and storage technologies and electric vehicles as well as policies for renewable energy are also important in Norwegian climate policy.

This express and direct recognition of EVs as an important tool in climate change mitigation, in Norway's NDC, as part of Norway's overall climate policy, solidifies the Norwegian government's firm support for the development and use of EVs and related infrastructure. This form of broad-scale recognition is a significant indicator of the alignment of Norway's NDC with the overall Norwegian EV policy framework, to be outlined further hereinbelow.

¹⁶⁸ UNFCCC *Update of Norway's nationally determined contribution* 1.

¹⁶⁹ This target was further established by law in the *Climate Change Act* adopted by the Norwegian Parliament in June 2017.

¹⁷⁰ UNFCCC *Update of Norway's nationally determined contribution* 1.

¹⁷¹ Sections 1, 3 and 4 of the *Act Relating to Norway's Climate Targets 2017 (Climate Change Act)* LOV-2017-06-16-60.

¹⁷² UNFCCC *Update of Norway's nationally determined contribution* 6.

To illustrate the remarkable progress made by Norway on the use and development of EVs and related infrastructure, some examples of recent statistical data show that –

- (a) almost 60 per cent of all new vehicles sold in Norway during March 2019 were electric;¹⁷³
- (b) an estimated total of 11 518 EVs were registered in Norway during the first quarter of 2019, which is twice as many as the previous year;¹⁷⁴
- (c) in 2020, the market share of BEVs and PHEVs were 52.3 and 20.4 per cent, respectively, when reviewing the total new passenger vehicles registered in Norway between 1992 and 2020;¹⁷⁵
- (d) BEVs made up a global record of 54.3 per cent of all new vehicles sold in Norway in 2020, which increased from 42.4 per cent in 2019 and from a mere one per cent of the overall market close to a decade ago;¹⁷⁶
- (e) BEV sales in Norway further accelerated at the end of 2020, hitting its highest level for any single month in December 2020, with a 66.7 per cent share of the total market share, and with new EV sales reaching 76 789 units of the total new vehicle sales of 141 412 units for 2020;¹⁷⁷
- (f) by the end of 2021, approximately 65 per cent of new vehicle registrations in Norway were BEVs and 28 per cent were PHEVs;¹⁷⁸

¹⁷³ Nikel 2019 <https://www.forbes.com/sites/davidnikel/2019/06/18/electric-cars-why-little-norway-leads-the-world-in-ev-usage/?sh=2d173e5913e3>.

¹⁷⁴ Nikel 2019 <https://www.forbes.com/sites/davidnikel/2019/06/18/electric-cars-why-little-norway-leads-the-world-in-ev-usage/?sh=2d173e5913e3>.

¹⁷⁵ Fridstrøm 2021 *Sustainability* 4.

¹⁷⁶ Reuters 2021 <https://www.reuters.com/article/us-autos-electric-norway-idUKKBN29A0ZT>.

¹⁷⁷ Reuters 2021 <https://www.reuters.com/article/us-autos-electric-norway-idUKKBN29A0ZT>.

¹⁷⁸ EnergyMonitor 2022 <https://www.energymonitor.ai/sectors/transport/weekly-data-why-norway-leads-the-world-for-electric-vehicles>.

- (g) Norway's fleet of PHEVs is considered the largest per capita in the world;¹⁷⁹
- (h) Norway manufactures no ICEVs locally, and its fuel prices are also among the highest in Europe, whereas electricity is relatively affordable in Norway, with more than 90 per cent of electricity produced from renewable sources such as wind, solar and hydro energy (It is estimated that powering all passenger vehicles in Norway would, for example, only consume approximately 5 per cent of the hydroelectric electricity produced per annum from existing grid networks);¹⁸⁰
- (i) there are more than 14 different fiscal incentives in place in Norway, bearing on vehicles, fuel, and road use, which directly benefit and encourage the use of EVs;¹⁸¹
- (j) Norway has, over the course of the last decade, managed to develop an advanced EV-charging-infrastructure network which has not only further aided EV uptake, but has also eased range anxiety as EV drivers are able to reach most remote areas around Norway with relative ease. To support a network of close to an estimated number of 480 000 EVs in Norway, there are close to 17 000 confirmed charging stations across Norway, including more than 3 000 DC chargers;¹⁸²
- (k) DC chargers have been installed on almost all main roads in the country, which translates into more than 4 000 vehicles being able to fast charge at the same time, and thereby removing any concerns around queuing;¹⁸³
- (l) Enova, the Norwegian government body and state-owned enterprise responsible for providing funding and advice for energy and climate projects in Norway, initially funded a 7-million-euro EV-infrastructure programme supplying and installing close to 1 900 charging points across Norway by 2011, along with maintenance and

¹⁷⁹ CleanTechnica 2022 <https://cleantechnica.com/2022/02/02/norways-plugin-ev-share-above-90-again-in-january-bevs-at-record-84/>.

¹⁸⁰ Figenbaum 2017 *Environmental Innovation and Societal Transitions* 15.

¹⁸¹ Fridstrøm 2021 *Sustainability* 4; MER 2022 <https://uk.mer.eco/news/ev-charging-infrastructure-best-practice-learnings-from-norway/>.

¹⁸² MER 2022 <https://uk.mer.eco/news/ev-charging-infrastructure-best-practice-learnings-from-norway/>.

¹⁸³ MER 2022 <https://uk.mer.eco/news/ev-charging-infrastructure-best-practice-learnings-from-norway/>.

support provided since then. Enova has allocated an additional 50.6 million euros for additional fast charging infrastructure – with 230 stations already installed and commissioned;¹⁸⁴

- (m) more than 13 000 public charging points have been installed across Norway;¹⁸⁵
- (n) the overall conditions for EV usage in Norway are favourable, as an estimated three-quarters of all Norwegians park their vehicles on their own land and can therefore easily install charging facilities, whilst another 12 per cent park less than 100 metres away from their homes;¹⁸⁶
- (o) many households in Norway have installed sufficient power capacity to charge electric vehicles;¹⁸⁷
- (p) a large part of Norway's electric-vehicle supply equipment (hereafter EVSE)¹⁸⁸ investment strategy is to provide financial support for housing associations to buy and install EV chargers – with special grants of 20 to 50 per cent of the cost thereof covered in several Norwegian cities;¹⁸⁹ and
- (q) the Norwegian Parliament has announced a national objective that all new vehicles sold by 2025 should be zero-emission vehicles (i.e. either electric or hydrogen-powered vehicles).¹⁹⁰

¹⁸⁴ MER 2022 <https://uk.mer.eco/news/ev-charging-infrastructure-best-practice-learning-from-norway/>.

¹⁸⁵ Ministry of Climate and Environment Norway's National Plan related to the Decision of the EEA Joint Committee No. 269/2019 of 25 October 2019 9.

¹⁸⁶ Figenbaum 2017 *Environmental Innovation and Societal Transitions* 15.

¹⁸⁷ Figenbaum 2017 *Environmental Innovation and Societal Transitions* 15.

¹⁸⁸ According to EVConnect 2022 <https://www.evconnect.com/blog/what-is-evse> EVSE is defined by the USA's National Electronics Manufacturers Association as devices that "... provide electric power to the vehicle and use that to recharge the vehicle's batteries. EVSE systems include the electrical conductors, related equipment, software, and communications protocols that deliver energy efficiently and safely to the vehicle".

¹⁸⁹ MER 2022 <https://uk.mer.eco/news/ev-charging-infrastructure-best-practice-learning-from-norway/>.

¹⁹⁰ Norsk elbilforening 2021 <https://elbil.no/english/norwegian-ev-policy/>.

These impressive statistics are certainly unique to Norway, given that the introduction and increase in the use of EVs and related infrastructure in Norway is enhanced by several factors which are not necessarily present in other countries (whether developed or developing), and is evidently far removed from the unique factors and circumstances at play in the present-day South Africa. Norway is not only a developed and highly industrialised country, when compared to South Africa, but additional factors and circumstances further weigh in favour of Norway's EV transition, including affordable and abundant electricity supply; strong grid networks; a large number of semi-detached housing (i.e. a single family-duplex dwelling house that shares one common wall with the next house) coupled with a garage or driveway; ample roadside space for fast charging facilities; above average road conditions, terrain and overall speed limits; strong governance, as well as widespread ferrying and toll charges; and a smaller geographical land area compared to South Africa.¹⁹¹ Moreover, the Norwegian population is just over five million,¹⁹² which is small compared to most other nations, let alone South Africa which surpassed the 59.62 million population mark by mid-2020.¹⁹³ Most importantly, and as already mentioned, most of Norway's electricity supply stems from renewable energy sources (mainly hydroelectricity). This factor alone inevitably makes the transition to greener technology and transport, such as the use of EVs, far easier and cost-effective when compared to countries whose electricity mainly stems from high-polluting coal-fired plants – which is the case in South Africa.¹⁹⁴ Despite these vast differences between Norway and South Africa in this regard, Norway's efforts cannot be overlooked, and it justifies being discussed as the international EV leader.

¹⁹¹ Fridstrøm 2021 *Sustainability* 10.

¹⁹² Nikel 2019 <https://www.forbes.com/sites/davidnikel/2019/06/18/electric-cars-why-little-norway-leads-the-world-in-ev-usage/?sh=2d173e5913e3>.

¹⁹³ Stats SA 2020 <https://www.statssa.gov.za/?p=13453>.

¹⁹⁴ Nikel 2019 <https://www.forbes.com/sites/davidnikel/2019/06/18/electric-cars-why-little-norway-leads-the-world-in-ev-usage/?sh=2d173e5913e3>.

3.2.2 Perspectives on Norway's EV policy

In the present context, a brief overview of the history of the Norwegian EV policy as well as the main implementation strategies and milestones achieved by the Norwegian government, are outlined directly hereunder. Norway's broader national climate goals aside,¹⁹⁵ the Norwegian EV policy represents a gradual effort in the development and implementation of policy and legislation reform over the past 15 years. It also forms part of the overarching and broader Norwegian climate change mitigation policy (which will not be discussed for purposes of this dissertation).¹⁹⁶ When reference is made to the Norwegian EV policy in this dissertation, it should be understood as a policy which is rooted and has been transposed into several Norwegian laws and regulations, mainly initiated and implemented by two Norwegian governmental departments – the Ministry of Finance and the Ministry of Transportation.¹⁹⁷

The Norwegian EV policy is driven by a so-called "top-down approach", with the Norwegian government being the originator of this initiative from the outset, by lending large-scale support to the EV industry and consumers by way of a wide range of incentives. This very same industry, in turn, structured and brought about the Norwegian Electric Vehicle Association (hereafter NEVA), which has a goal of promoting EVs that run fully or partially on renewable energy.¹⁹⁸ The overarching objective of Norway's EV initiatives originally focused on creating a self-sufficient industry in which the Norwegian economy could produce its own EVs. However, and as already stated, the focus later shifted to the provision of fiscal incentives to enable Norway to reach the main objective that all new vehicles purchased by 2025 emit either zero (electric or hydrogen) or low emissions (as with PHEVs). Coupled with the aforesaid objective, the Norwegian

¹⁹⁵ The policies gradually and increasingly over time expressly recognised the use and development of EVs and related infrastructure as a viable climate change mitigation measure.

¹⁹⁶ Hermansen and Sundqvist 2022 *Climatic Change* 15.

¹⁹⁷ Holtsmark and Skonhoft 2014 *Environmental Science & Policy* 161.

¹⁹⁸ European Commission, Directorate-General for Research and Innovation *Mission-oriented R&I policies, in-depth case studies: The Norwegian EV initiative: Case Study Report* 12-13.

government has simultaneously focused on developing and implementing a reliable and widespread EV charging infrastructure.¹⁹⁹

By early 2023 (at the time of finalising this dissertation), it was established that the Norwegian EV policy mainly consists of a variety of incentives to encourage Norwegian consumers or citizens to purchase and use EVs and related infrastructure instead of ICEVs. That said, the increase in EV sales and use thereof in Norway is not due to the large-scale subsidisation on the part of the Norwegian government, but rather due to their policy in taxing ICEVs and exempting EVs from the very same taxes. Broadly speaking, these incentives can be categorised as fiscal-related (or tax-related) on the one hand, and behaviour-related (also referred to as non-fiscal) incentives on the other hand.²⁰⁰

The Norwegian transport sector is a heavily taxed sector. These taxes include registration taxes on new vehicles, annual taxes, fuel levies and numerous toll-road and ferry charges. This government policy makes it possible to create incentives by selectively foregoing taxes which, in turn, influence the types of vehicles sold to Norwegian consumers.²⁰¹ The different fiscal-related incentives in place, all of which are in some shape or form CO₂-differentiated, include –

- (a) an exemption from purchase or import tax on EVs (since 1990 to date);
- (b) a once-off registration tax on passenger vehicles and light commercial vehicles, with EVs fully or partially exempt;²⁰²
- (c) a registration tax on passenger cars and light commercial vehicles, with EVs fully exempt;

¹⁹⁹ Joint Institute for Innovation Policy for the European Commission *Case Study Report: The Norwegian EV initiative (Norway)* 11.

²⁰⁰ Fridstrøm 2021 *Sustainability* 4.

²⁰¹ Figenbaum 2017 *Environmental Innovation and Societal Transitions* 15.

²⁰² Norway levies a registration or import tax on vehicles up to 10 000 euro or more depending on the particular vehicle model's CO₂ emissions. BEVs are fully exempt from this form of tax. PHEVs also pay a lower registration tax. This exemption ran out by the end of 2020, but due to the low-emissions, BEV owners still pay a lower amount.

- (d) an annual ownership tax on passenger vehicles and light commercial vehicles;
- (e) fuel levies, which, of course, are not applicable to most EVs, save for PHEVs;
- (f) an exemption from annual road tax for EV drivers between 1996 and 2021; thereafter a reduced annual road tax for EV drivers from 2021, and the full annual road tax for EV drivers from 2022 onwards;²⁰³
- (g) income tax on the private use of company cars, with a 50 per cent reduced company-vehicle tax for EV owners between 2000 and 2018, a company-vehicle tax reduction of 40 per cent from 2018, and further reduced to 20 per cent from 2022 onwards;
- (h) Value-Added Tax (VAT) on car purchases and sales, with EVs fully exempt from 25 per cent VAT (since 2001 to date);
- (i) weight and Euro-class-graduated annual ownership tax on heavy-duty freight vehicles, with a fiscal compensation for the scrapping of fossil-fuel vans when converting to a zero-emission van (since 2018);
- (j) government support initiatives for fast charging and hydrogen-refuelling facilities;
- (k) free recharging of EVs at public parking lots with a rapidly growing number of publicly funded charging stations;
- (l) a subsidy on new battery or fuel-cell-electric light commercial vehicles;
- (m) subsidies on zero-emission heavy-duty vehicles and machinery; and
- (n) from a public procurement perspective, from 2022, all vehicles procured are required to be EVs, and from 2025, the same applies to city buses.²⁰⁴

²⁰³ BEVs pay a lower annual road tax. Instead of NOK 3 060, BEVs owners pay NOK 435. The annual tax increased to half the rate of ICEVs in 2018 and increased to the full rate in 2020.

²⁰⁴ Fridstrøm 2021 *Sustainability* 5; Holtsmark and Skonhoft 2014 *Environmental Science & Policy* 161; Norsk elbilforening 2021 <https://elbil.no/english/norwegian-ev-policy/>; Figenbaum 2017 *Environmental*

In addition to these fiscal incentives, the following non-fiscal/behaviour-related incentives implemented by the Norwegian Parliament and local authorities mainly provide certain driving and economic privileges to Norwegian EV users. These include the following:

- (a) Allowing access to bus and collective traffic lanes by EV drivers since 2005, although the 2016 revised rules allow local authorities to limit the access to only include EVs that carry one or more passengers, from 2016 onwards.
- (b) Free municipal parking for EVs between 1999 and 2017.²⁰⁵
- (c) Exemption from charges on toll roads for EVs were applicable between 1997 and 2017, and since 2018 a maximum of 50 per cent of the total amount of charges on toll roads apply to EV drivers.²⁰⁶
- (d) Exemption from domestic ferry-connection fares for EV drivers between 2009 and 2017, followed by a maximum of 50 per cent of the total amount on ferry fares for EV drivers since 2018.
- (e) Allowing holders of a local Class B driving license (i.e. drivers who are usually only permitted to drive a passenger vehicle with or without a trailer) to drive electric vans that normally form part of the local Class C1 license (i.e. light lorries up to 4 250 kg), since 2019.²⁰⁷

Norway has received international acclaim for its regulatory framework for EVs, which targets consumers at the point of purchase, provides several incentives for the use thereof, and proposed to extensively roll out charging infrastructure. However, criticism

Innovation and Societal Transitions 15–16.; UK Parliament *Briefing Paper Number CBP07480, 4 December 2020: Electric vehicles and infrastructure* 23–24.

²⁰⁵ Local governments across Norway were given the authority to decide on incentives such as access to bus lanes and free municipal parking.

²⁰⁶ BEVs enjoy exemptions from road tolls and ferries. This can result in a substantial saving amounting to several thousand euros per year on certain roads in Norway. Complete exemption for toll roads is expected to likely phase out over the coming years.

²⁰⁷ Fridstrøm 2021 *Sustainability* 5; Norsk elbilforening 2021 <https://elbil.no/english/norwegian-ev-policy/>; UK Parliament *Briefing Paper Number CBP07480, 4 December 2020: Electric vehicles and infrastructure* 23–24.

against the Norwegian EV policy cannot be overlooked. Some major points of critique are dealt with directly below.

Firstly, current EV policy incentives in Norway appear to motivate high-income Norwegian families to simply buy a second vehicle, which will not necessarily guarantee the purchase of another (second) EV. At present, Norwegian households with two vehicles are the minority. However, if two vehicles per household (consisting of one EV and one ICEV) become more common, this could pose an environmental challenge across several dimensions and will undoubtedly render the Norwegian EV policy, as a GHG emission-reduction instrument, a pointless exercise.²⁰⁸ Secondly, subsidising EVs appear to equate to the value of a considerable amount of emission permits, close to the present yearly GHG emissions in Norway. Arguably (and instead of supporting EV owners by way of incentives and subsidies), the Norwegian government could have purchased emission rights to a similar amount as the fiscal incentives in the quota market and simply retained these rights unused, meaning that the quota supply would have shrunk. This would have led to an increase in the quota price and could also possibly have contributed to a technology push along different lines – thereby making Norway "carbon neutral" albeit through different means.²⁰⁹ Thirdly, the current publicised success of the Norwegian EV policy is the result of a long chain of unique events and circumstances leading to opportunities which were not or are not necessarily apparent in other countries.²¹⁰ Fourthly, granting EV users certain behavioural privileges such as free parking in designated areas or access to and use of certain driving lanes, could lead to traffic congestion and abuse, and Norway has, in any event, already ceased many of the behavioural incentives initially granted to its citizens.²¹¹ Lastly, and of particular concern to some, is that fiscal instruments place an unpopular extra burden of taxation on certain portions of the working-class population.²¹² When EVs are exempt from fiscal structures

²⁰⁸ Holtsmark and Skonhoft 2014 *Environmental Science & Policy* 167.

²⁰⁹ Holtsmark and Skonhoft 2014 *Environmental Science & Policy* 167.

²¹⁰ Figenbaum 2017 *Environmental Innovation and Societal Transitions* 15.

²¹¹ Aasness and Odeck 2015 *Eur. Transp. Res. Rev.* 6.

²¹² Fridstrøm 2021 *Sustainability* 11; Aasness and Odeck 2015 *Eur. Transp. Res. Rev.* 6.

which are ordinarily applicable to its ICEV counterparts, governments are deprived of substantial amounts of standard fiscal income streams which are ordinarily used for designated governmental expenditure outcomes and this might have a perceived negative impact on equity and fairness.²¹³ In fact, some research has shown that the cost of Norway's tax incentives are relatively high compared to the direct environmental benefits thereof, at least when compared to some other climate change mitigation programmes implemented in Norway.²¹⁴

In order to alleviate the pressure on fiscal revenue on local soil, there are studies that argue that considerable potential exists in establishing more CDM emission-reduction projects in Africa (which could include South Africa) across a range of sectors.²¹⁵ If a particular project is recognised as an official CDM project in a country, it could, as an alternative to the provision of a local fiscal incentive emanating from its own government fiscus, result in a substantial flow of funds from Annex I countries (under the *Kyoto Protocol*) to Non-Annex I countries (such as South Africa, for example), by way of the generation of CERs between such countries.²¹⁶ It therefore follows that some local initiatives and projects within the e-mobility space could hold untapped potential to be couched as CDM projects, if approved by the CDM EB, resulting in access to funding for South Africa to enhance climate change mitigation efforts. Based on the research by the author, this approach still appears to be in its infancy stages in South Africa, with close to no progress,²¹⁷ and would inevitably require a more in-depth analysis by government and various other role players within the EV space to truly unlock the potential opportunities in this regard (the specifics of which fall beyond the direct ambit and scope of this research study).

²¹³ Fridstrøm 2021 *Sustainability* 11; Aasness and Odeck 2015 *Eur. Transp. Res. Rev.* 6.

²¹⁴ IMF *Electric Vehicles, Tax Incentives and Emissions: Evidence from Norway* 15; Aasness and Odeck 2015 *Eur. Transp. Res. Rev.* 6.

²¹⁵ Burian and Arens 2014 *International Journal of Climate Change Strategies and Management* 19.

²¹⁶ Burian and Arens 2014 *International Journal of Climate Change Strategies and Management* 19.

²¹⁷ Kreibich *et al* 2017 *Climate and Development* 189.

3.3 Overview of the policy framework on electric vehicles in the UK

3.3.1 Introductory remarks and context

The UK government's approach to the regulation of EVs has also been earmarked by the author given the historic connection and conceptual similarities between the English and South African legal systems *vis-à-vis* environmental law and governance,. With the bold political announcement to end the sale of ICEVs by 2030 in the UK and several other significant green transport objectives, the UK government is attempting to rapidly unlock the electrification of its transport sector through law and policy reform.²¹⁸ This approach is aligned with the recommendation of the UK Committee on Climate Change (CCC), that the market for EVs dominate with a 100 per cent market share by 2035 at the latest, in order to meet the UK's target to bring GHG emissions to net zero by 2050.²¹⁹

The UK has seen exponential growth in the electrification of its passenger-vehicle market, and this trend is largely expected to continue.²²⁰ To illustrate the progress made by the UK on the use and development of EVs and related infrastructure, statistical data indicate the following:

- (a) PHEVs represented 3.2 per cent of new passenger-vehicle registrations in 2019, and that share tripled in the first half of 2020.
- (b) The UK has set a goal of 50 to 70 per cent of the new vehicle market being EVs by 2030 in order to achieve climate, air quality, and energy security ambitions.
- (c) Scotland aims to fully phase out the need to purchase and import petrol and diesel vehicles and vans by 2032.

²¹⁸ GOV.UK 2020 <https://www.gov.uk/government/news/government-takes-historic-step-towards-net-zero-with-end-of-sale-of-new-petrol-and-diesel-cars-by-2030>.

²¹⁹ UK *Parliament Briefing Paper Number CBP07480, 4 December 2020: Electric vehicles and infrastructure* 3.

²²⁰ ICCT *Quantifying the electric vehicle charging infrastructure gap in the United Kingdom* 1.

- (d) EV passenger-vehicle sales increased by 186 per cent in 2020 and by 2021 EV sales in the UK celebrated a record year against a market that was 28.7 per cent below pre-COVID-19 levels.
- (e) Overall, 1.65 million new vehicles were registered in 2021 in the UK (1 per cent up from 2020) due to the impact of the COVID-19 pandemic and the global semiconductor-chip shortage. Despite these challenges, more BEVs were sold than during the previous five years combined (i.e. between 2016 and 2020), with 190 727 registrations (being 11.6 per cent of all new vehicle sales), while PHEVs made up 7 per cent of the total market share with 114 554 units registered.
- (f) By April 2022, 12 899 new BEVs were sold in the UK – an increase of 40.9 per cent in April 2022 alone. This means that BEVs gained a 10.8 per cent market share, up from 6.5 per cent in 2021. Registrations of PHEVs in the UK also rose by 18.3 per cent in April 2022.
- (g) BEV sales have continued its growth streak as recent as June 2022, with 22 737 registrations – a year-on-year increase of 14.6 per cent.
- (h) As at the time of finalisation of this dissertation, there are an estimated 477 000 BEVs on the road in the UK and more than 790 000 PHEVs.
- (i) An estimated 32 663 public EV-charging devices are available in the UK, and an estimated 6 018 thereof are fast chargers.
- (j) In the UK, Scotland has the highest number of EV-charging devices per 100 000 of the population (47), followed by England (36), Wales (29) and Northern Ireland (17).
- (k) By the end of 2022, it is foreseen that EVs will outsell diesel and hybrid diesel vehicles in the UK.

- (l) The UK government has committed 1.3 billion pounds from the fiscus to accelerate the roll-out of charging points for EVs at homes, in streets and motorways across the UK to enable EV drivers to charge their vehicles more easily and conveniently.
- (m) In order to meet future demand, the UK government is now providing grants for homeowners, businesses, and local authorities to install charging points (specifically fast chargers), which has already enabled the installation of over 140 000 residential charging points and 9 000 charging points for staff parking at businesses across the UK.
- (n) In order to manipulate the price of EVs in the UK market and incentivise more people to make the transition to EVs, the UK government has further pledged 582 million pounds in grants for prospective EV buyers;
- (o) The growth of the EV market in the UK is expected to accelerate in the coming years, as the UK prepares itself for the effect of the UK government's bold announcement to ban new petrol and diesel vehicle sales by 2030.²²¹

Following the UK's departure from the EU in January 2020, the UK itself now has the flexibility to determine its own decarbonisation pathways to 2050, in a way that fully utilises the unique strengths and opportunities of UK diplomacy, industry and innovation.²²² Most prominently, and on 12 December 2020, the UK published and submitted its new and highly ambitious NDC under the *Paris Agreement* to the UNFCCC. This NDC commits the UK to reducing economy-wide GHG emissions by at least 68 per cent by 2030, compared to 1990 levels.²²³ It also includes information on how this target was developed and quantified,²²⁴ and specifies the time frame and/or period for

²²¹ ICCT *Quantifying the electric vehicle charging infrastructure gap in the United Kingdom* 1; heycar 2022 <https://heycar.co.uk/blog/electric-cars-statistics-and-projections>; GOV.UK 2020 <https://www.gov.uk/government/news/government-takes-historic-step-towards-net-zero-with-end-of-sale-of-new-petrol-and-diesel-cars-by-2030>.

²²² GOV.UK *Net Zero Strategy: Build Back Greener* 42.

²²³ UNFCCC *United Kingdom of Great Britain and Northern Ireland's Nationally Determined Contribution* 1.

²²⁴ Under the *Paris Agreement* this is known as 'information to facilitate clarity, transparency, and understanding' (ICTU).

implementation as 1 January 2021 to 31 December 2030.²²⁵ Although the drive towards the use and development of EVs is not expressly mentioned in the UK's NDC *per se* (more specifically, being absent from the planning processes section thereof), the use and development of EVs and related infrastructure continues to show promising uptake in the UK market, which the UK government is actively promoting and funding to cut CO₂ emissions across the UK.²²⁶ Accordingly, an overview of the UK's EV-adoption policy and the prospect of further development merits analysis.

When compared to South Africa, there are several unique considerations at play in respect of the UK government's approach to the use and development of EVs and related infrastructure, as well as the composition of the UK's EV policy in general. Aside from the reality that the UK is a developed and highly industrialised country, in comparison with the economic status of South Africa, this section of the chapter has revealed that the allocation of large-scale funding and political will on the part of the UK government appear to be the main drivers behind the radical move to an EV transition in the UK. This stands in contrast to the highly regulated and subsidised approach to EV uptake in the form of fiscal and behaviour-related incentives as seen in Norway. Given the current economic and socio-economic challenges which exist in South Africa, the large-scale allocation of government funds and a political will to prioritise EV uptake, as is the case in the UK, is not prioritised by the South African government, at present. This very consideration will be discussed in more detail in Chapter 4 of this dissertation.²²⁷

3.3.2 Perspectives on the UK's EV policy

Aside from the UK's overall climate change mitigation policies which predate the past decade, the UK government has also supported measures to encourage the uptake of EVs

²²⁵ UNFCCC *United Kingdom of Great Britain and Northern Ireland's Nationally Determined Contribution* 3.

²²⁶ Hill et al 2019 *Applied Energy* 2.

²²⁷ See section 4.7.1 of Chapter 4 at page 108 below.

through a mixture of different policies, targets, grants and incentives – specifically to UK residents buying new EVs – all of which holistically make up the UK’s EV policy.²²⁸

As far back as April 2009, the UK government published its so-called ultra-low-emission vehicle (ULEV) strategy, wherein 20 million pounds were committed to support the development of certain cities and regions in the UK to build the necessary EV-charging infrastructure. According to this strategy it is also expected from the private sector to ultimately take the lead in infrastructure provision.²²⁹ In 2010, the UK government mandated national recharging network development for EVs, and in delivering on this mandate, the UK government’s EV-infrastructure strategy of June 2011 clarified that its approach was "not to mandate 'a charge point on every corner' – this is not necessary to help the market grow and would be uneconomic".²³⁰ Instead, the UK government argued that the majority, including the manufacturers of EVs, supported the UK government’s claim that most charging would be done at home or at the workplace, and thereby limiting the need for concentrated and abundant public charging points.²³¹ The UK government’s April 2014 strategy paper on the ULEV pledged that by the end of 2014 there would be a fast-charging point at every motorway service station, comprising of a network of over 500 fast-charging stations across the UK by March 2015, and that 32 million pounds would be allocated towards EV-charging infrastructure between 2015 and 2020.²³² In 2011, the UK government launched a series of grants in favour of PHEVs (differentiating between PHEV categories such as passenger vehicles, motorcycles, vans and taxis), which grants are revised from time to time.²³³

²²⁸ UK *Parliament Briefing Paper Number CBP07480, 4 December 2020: Electric vehicles and infrastructure* 8.

²²⁹ SMMT *Briefing Paper: Ultra-Low Carbon Vehicles in the UK* 1.

²³⁰ UK *Parliament Briefing Paper Number CBP07480, 4 December 2020: Electric vehicles and infrastructure* 8

²³¹ UK *Parliament Briefing Paper Number CBP07480, 4 December 2020: Electric vehicles and infrastructure* 8.

²³² UK *Parliament Briefing Paper Number CBP07480, 4 December 2020: Electric vehicles and infrastructure* 8-9.

²³³ GOV.UK <https://www.gov.uk/government/news/plug-in-vehicle-grants-update-following-todays-budget>.

Following further selected governmental committee reports on the UK's EV policy between 2010 and 2016, the UK government published the *Road to Zero Strategy* in 2018, which is known as one of the most significant policies in the development of the UK's overall EV policy.²³⁴ Packaged as a long-term strategy, both in terms of scope and ambition, by considering the drivers of change, opportunities and risks to the year 2050 and beyond, the *Road to Zero Strategy* outlines several measures to enhance the UK's EV transition, including (but not limited to) the following:

- (a) The ambition for at least 50 to 70 per cent of all new vehicle sales and up to 40 per cent of the sales of new vans to be ULEVs by the year 2030.
- (b) An active drive for the installation of EV-charging points in newly built homes, where appropriate, and for new lampposts to also include EV-charging points.
- (c) The introduction of a 400-million-pound charging infrastructure investment fund to help accelerate charging infrastructure roll-outs by providing funding to new and existing companies that produce and install charging points.
- (d) Providing up to 500 pounds for EV owners to facilitate the installation of a charging point in their home through an EV home-charge scheme.
- (e) The extension of the PHEV grants (for both passenger vehicles and vans) to at least October 2018 at current rates.
- (f) The introduction of an EV-energy taskforce to bring together and create synergy between the UK's energy and automotive industries to plan for the larger energy demand that will inevitably arise from the increased use of EVs.
- (g) Setting the ultimate objective to only have EVs on UK roads by 2050.²³⁵

²³⁴ GOV.UK *The Road to Zero Next steps towards cleaner road transport and delivering our Industrial Strategy*.

²³⁵ The UK government has since moved its planned date for ending the sale of petrol and diesel vehicles from 2040 to 2030 and PHEVs to 2035.

Alongside the *Road to Zero Strategy*, the UK government established a grant scheme to further support the installation of charging points at UK homes, workplaces and on local streets. Firstly, the Electric Vehicle Homecharge Scheme provides grant funding of up to 75 per cent towards the cost of installing EV-charging points at domestic properties across the UK. Secondly, considering the common reality that EV charging points cannot be installed in or at all properties, the On-street Residential Chargepoint Scheme provides funding for local authorities towards the cost of installing on-street residential charging points for EVs. Lastly, the Workplace Charging Scheme is a voucher-based scheme that provides support towards the upfront costs of the purchase and installation of EV-charging points for eligible businesses, charities, and public sector organisations.²³⁶

In addition to the *Road to Zero Strategy*, in 2018 the UK's *Automated and Electric Vehicles Act* 2018 was enacted to help deliver the overarching aim for every vehicle and van on UK roads to be a zero-emission vehicle by the year 2050, and to support the deployment of EV-charging infrastructure across the UK.²³⁷ The powers laid out within the aforesaid act allow the UK government to regulate (if necessary), to improve the consumer experience of charging infrastructure and to ensure provision at significant strategic locations like motorway service areas.²³⁸

As far as vehicle excise duty (VED) is concerned, between 2003 and 2017, the UK government exempted vehicles that emitted less than 100g/km of CO₂. Sliding-scale rates were introduced for other vehicles, with the highest polluting vehicle(s) paying the highest level(s) of tax. Large-scale reforms to VED were introduced during 2015 (in effect from April 2017), which entailed that vehicles emitting less than 50g/km of CO₂ would continue to be exempt from VED, yet all other vehicles would be taxed at the same standard rate. Vehicle owners purchasing a vehicle with a price greater than 40 000 pounds were from

²³⁶ GOV.UK 2022 <https://www.gov.uk/government/collections/government-grants-for-low-emission-vehicles>.

²³⁷ UK Parliament *Briefing Paper Number CBP07480, 4 December 2020: Electric vehicles and infrastructure* 17; GOV.UK 2021 <https://www.gov.uk/government/publications/automated-and-electric-vehicle-act-report/automated-and-electric-vehicles-act-2018-regulatory-report>.

²³⁸ Part 2 of the *Automated and Electric Vehicles Act* 2018.

thereon also required to pay a supplement of 310 pounds per year for the first five years, however, zero-emission vehicles (regardless of their price) are exempt from this supplementary tariff.²³⁹

As in the case of Norway, and despite the bold objectives advanced by the UK government in encouraging the UK population to embrace the shift to the electrification of the UK transport sector, several forms of critique have been raised in respect of the existing UK EV-adoption policy and its implementation thus far. Firstly, the stark reality is that a truly accessible, user-friendly, and fast-charging national infrastructure network does not yet exist across the entire UK which poses a substantial barrier for the wider uptake of the EV transition amongst UK citizens.²⁴⁰ Secondly, the UK's current grid infrastructure presents a number of challenges for the UK population and businesses. The lack of network capacity often means that the cost of installing charging infrastructure outweighs the commercial case for installation; the general regulation and funding of the UK's electricity-grid network brings affordability concerns to the forefront; and given that EV charging is technically a supply of energy, it requires to be regulated – although both the UK government and the market regulator, Ofgem, appear to have no immediate plans to do so.²⁴¹

3.4 Conclusion

This chapter set out to address the third research objective, namely, to examine the policy framework and perspectives on the development and use of EVs and related infrastructure in the two selected foreign jurisdictions, being Norway and the UK, with a view to draw lessons for possible application in South Africa.²⁴²

²³⁹ GOV.UK 2020 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/871799/Budget_2020_Web_Accessible_Complete.pdf 67,81,94,95.

²⁴⁰ Pinsent Masons 2020 <https://www.pinsentmasons.com/out-law/analysis/electric-vehicles-uk-end-diesel-cars>.

²⁴¹ Pinsent Masons 2020 <https://www.pinsentmasons.com/out-law/analysis/electric-vehicles-uk-end-diesel-cars>.

²⁴² See para 1.4 of Chapter 1 at page 9 and para 3.1 of Chapter 3 at page 38 above.

In reaching this aforementioned objective, the author had to determine the main characteristics of these foreign EV-policy frameworks and whether tangible climate change mitigation measures could be identified, which could assist South Africa on the practical implementation and/or integration in the further development of its EV policy and associated legislative framework.²⁴³ The author was led to the following summation:

- (a) Recognising and earmarking the use and development of EVs and related infrastructure in a country's NDC, whereby such an initiative is advanced as a climate change mitigation mechanism by a country on the global stage, appear to either lead to and/or enhance the development of an independent national EV policy (as seen in Norway, and to a lesser extent in the UK).²⁴⁴
- (b) Ensuring alignment between a country's NDC, overarching climate change framework legislation and its local EV policy framework is important (as seen in Norway, and to a lesser extent in the UK).²⁴⁵
- (c) Incentives (both fiscal and behaviour-related) appear to be a key driver for overall EV uptake amongst the consumer population (as seen in Norway, and to a lesser extent in the UK).²⁴⁶ In particular, providing residential homeowners, local businesses and local authorities with financial assistance and mechanisms through grant schemes, subsidies, and rebates in respect of the installation of EV-charging points further drives EV uptake (primarily observed in the UK).²⁴⁷
- (d) The development of advanced, interconnected and widely accessible EV-charging infrastructure networks appear to be another key driver for overall EV uptake amongst the consumer population and local businesses.²⁴⁸

²⁴³ See para 3.1 of Chapter 3 at page 38 above.

²⁴⁴ See para 3.2.1 and 3.2.2 of Chapter 3 from pages 39 and 45 respectively above.

²⁴⁵ See para 3.2.1 and 3.2.2 of Chapter 3 from pages 39 and 45 respectively above.

²⁴⁶ See para 3.2.1 of Chapter 3 from page 39 and para 3.3.1 of Chapter 3 from page 51 above.

²⁴⁷ See para 3.3.2 of Chapter 3 from page 54 above.

²⁴⁸ See paras 3.3.1 and 3.3.2 of Chapter 3 from pages 51 and 54 above.

- (e) Bold political will and commitment to reduce GHG emissions and a move towards a progressive EV transition, coupled with substantial governmental investment (whether through direct allocation of funds for infrastructure development or indirectly through fiscal and behavioural incentives, subsidies, and grants in favour of EV owners and drivers), appear to play an important role in the remarkable EV uptake in both Norway and the UK respectively;²⁴⁹
- (f) In order to alleviate the pressure on local fiscal revenue, considerable potential arguably exists in establishing more CDM emission-reduction projects in South Africa across a range of sectors (which could obviously be EV related projects), to access funding for such projects as a result of the use of CERs.²⁵⁰
- (g) Sufficient grid capacity and the source of energy (preferably renewable energy sources) make an EV transition and policy reform not only easier to achieve, but are key components in determining whether EV transition in a particular country is in fact aiding the overall reduction of GHG emissions (as mainly seen from the position in Norway);²⁵¹
- (h) Despite the contribution which these selected foreign jurisdictions have made towards EV-policy reform, the respective approaches and the policies adopted by Norway and the UK appear to be neither fool proof, nor free from criticism for a variety of reasons, and therefore cannot be applied in a similar fashion in South Africa;²⁵² and
- (i) The level of industrialisation, as well as the geographical, cultural, political, economic, and socio-economic composition of Norway and the UK differ vastly from

²⁴⁹ See para 3.3.1 of Chapter 3 at page 51 above.

²⁵⁰ See para 3.2.2 of Chapter 3 at page 61 above.

²⁵¹ See para 3.2.1 of Chapter 3 from page 39 above.

²⁵² See para 3.2.2 of Chapter 3 at page 59 and para 3.3.2 of Chapter 3 at page 69 above.

the South African landscape, which means that those EV policies, in their current format, cannot simply be transposed locally.

Whether some or all these regulatory measures, ideals and legislative changes incorporated into the laws and policies of these foreign jurisdictions highlighted hereinabove can be integrated and implemented in South Africa's existing EV law and policy framework, is a question which can only be answered by reviewing the existing EV policy in South Africa and the prospective ambitions posed by the South African government and industry role players on this topic. Thereafter, these respective measures should be compared against the background of South Africa's unique economic and socio-economic landscape.

Chapter 4: The existing South African law and policy framework and perspectives on electric vehicles and related infrastructure

4.1 Introduction

The main purpose of this chapter is to address the fourth research objective, namely, to examine and gain an understanding regarding the existing South African law and policy framework and perspectives on climate change mitigation in its broadest sense, but more specifically to focus on the development and use of EVs and related infrastructure.²⁵³ Neither South Africa's approach towards climate change mitigation, nor the development and use of EVs and related infrastructure, is confined to one governmental sphere, department or single piece of legislation, policy or discussion paper. Instead, South Africa's existing approach and progress on this topic are embodied in several policy and regulatory tools, and involves the cooperation and input of an array of institutional bodies and governmental departments – all of which are encapsulated and condensed in a chronological and systematic manner for purposes of this chapter.

This chapter commences with an exploration of section 24 of the *Constitution* as well as the national environmental management principles found in the *National Environmental Management Act* 107 of 1998 (hereafter the *NEMA*) *vis-à-vis* the research topic, in order to identify the constitutional and national environmental framework mandate for drafting policies and/or legislation capable of regulating EVs as a climate change mitigation measure in South Africa. Thereafter, South Africa's most relevant climate change mitigation commitments as couched in its first NDC will be explored. Lastly, a chronological overview of the most relevant climate change policies in South Africa is provided, and for purposes of a more focused and specific evaluation, an overview of existing South African EV policies and discussion papers follow.²⁵⁴

²⁵³ See para 1.4 of Chapter 1 at page 9 above.

²⁵⁴ For the sake of brevity, the author has specifically elected not to mention all these policies under this paragraph, which policies will, in any event, be dealt with in greater detail further on in this chapter.

This particular order of discussion also calls for a top-down approach, i.e. by starting off with the main overarching governing principles found in the *Constitution*, national framework legislation and South Africa's international climate change mitigation commitments in its NDC, followed by national legislation, policies and discussion papers in the road transport and automotive sectors which specifically relate to climate change mitigation as well as EVs and the development thereof on local soil. All of these policies require evaluation in order to classify EVs as a climate change mitigation activity; to identify and earmark this mitigation activity as a CDM in favour of South Africa, driven by sector reform within the automotive and transport sectors. The aforesaid overview and evaluation will not only serve to answer the fourth research objective, but will also play a critical role in answering the research aim of this dissertation.

Against the aforesaid background, the author has selected to then outline the *status quo* surrounding the South African road transport and automotive sectors as well as the current development and use of EVs and related infrastructure in South Africa, based on the latest available statistical data. Of equal importance, the most prevalent realities that hamper the development and use of EVs and related infrastructure in South Africa, have been identified. These are South Africa's socio-economic challenges as well as its unique energy matrix and the associated challenges. Finally, this chapter concludes by outlining the most important characteristics of South Africa's existing policy framework (as derived from various policies and discussion papers) and the regulatory instruments available, if any, on climate change mitigation, more specifically the activation of EVs as a tangible climate change mitigation activity, and how local challenges impact on the development and progression thereof.

4.2 The constitutional and national environmental framework mandates

The *Constitution*, as the supreme law of South Africa, serves as the starting point for the top-down analysis. It contains the most important rules and rights of the law in connection

with the constitutional system of South Africa.²⁵⁵ It sets out the rights and duties of its citizens, as well as the obligations and structure of the spheres of government and related institutions, and "...applies to all law, and binds the legislature, the executive, the judiciary and all organs of state...".²⁵⁶ Even though there are various aspects found in the *Constitution* which are important for purposes of the environment, the most noteworthy aspect is the environmental right contained in section 24 of the *Constitution*, which comprises of the following two parts: firstly, paragraph (a) thereof which establishes the fundamental right that everyone has to an environment that is not detrimental to their health or well-being, and secondly, paragraph (b) thereof which is considered to be a strict directive imposing a constitutional imperative on the government to take positive steps towards the attainment of the aforesaid right.²⁵⁷ More specifically, section 24(b) requires government's legislative sphere to take reasonable 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.

In the case of *Government of the Republic of South Africa v Grootboom* (hereafter the *Grootboom* case),²⁵⁸ the Constitutional Court gave a clear indication how the South African government is to meet the type of obligation like the one envisaged in section 24(b):²⁵⁹

The State is required to take reasonable legislative and other measures. Legislative measures by themselves are not likely to constitute constitutional compliance. Mere legislation is not enough. The State is obliged to act to achieve the intended result, and the legislative measures will invariably have to be supported by appropriate, well-directed policies and programs implemented by the Executive. These policies and programs must be reasonable both in their conception and their implementation. The formulation of a program is only the first stage in meeting the State's obligations. The program must also be reasonably implemented. An otherwise reasonable program that is not implemented reasonably will not constitute compliance with the State's obligations.

²⁵⁵ Karsten and Van der Bank 2020 *Air, Soil and Water Research* 3.

²⁵⁶ Section 8(1) of the *Constitution of the Republic of South Africa*, 1996.

²⁵⁷ Karsten and Van der Bank 2020 *Air, Soil and Water Research* 3.

²⁵⁸ 2001 (1) SA 46 (CC).

²⁵⁹ *Grootboom* case para 42.

It is within the context of this constitutional mandate to address climate change through the drafting of policies and/or legislation that the general and broad-based national environmental principles contained in the *NEMA* ought to be read. The *NEMA* is South Africa's main piece of overarching environmental framework legislation and "...aims to define the overarching and generic principles in terms of which sectoral-specific legislation is embedded, as well as to enhance the co-operative environmental governance amongst fragmented line ministries..."²⁶⁰ The *NEMA* also specifically refers to section 24 of the *Constitution* in its preamble aiming at giving effect to this constitutional right at a national framework level, and has been interpreted by the Constitutional Court as such.²⁶¹ In giving more substance and effect to section 24 of the *Constitution*, the overarching general principles contained within the *NEMA* –

- (a) shall apply alongside all other appropriate and relevant considerations, including the State's responsibility to respect, protect, promote and fulfil the social and economic rights in Chapter 2 of the Constitution and in particular the basic needs of categories of persons disadvantaged by unfair discrimination;
- (b) serve as the general framework within which environmental management and implementation plans must be formulated;
- (c) serve as guidelines by reference to which any organ of state must exercise any function when taking any decision in terms of this Act or any statutory provision concerning the protection of the environment;
- (d) serve as principles by reference to which a conciliator appointed under this Act must make recommendations; and
- (e) guide the interpretation, administration and implementation of this Act, and any other law concerned with the protection or management of the environment.²⁶²

For purposes of this chapter, the author has specifically earmarked a number of national environmental management principles from the *NEMA*, which are most relevant (and which principles should be kept in mind as and when the balance of the relevant legislation

²⁶⁰ Du Plessis & Nel 2001 *SAJELP* 1.

²⁶¹ *MEC, Department of Agriculture, Conservation and Environment v HTF Developers (Pty) Ltd* 2008 2 SA 319 (CC) para 24.

²⁶² Section 2(1) of the *National Environmental Management Act* 107 of 1998.

and policies highlighted further in this chapter are discussed). The following principles have been identified:

- (a) Environmental management must place the citizens of South Africa and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural, and social interests equitably.²⁶³
- (b) Development (with a specific emphasis on economic development) must be socially, environmentally, and economically sustainable.²⁶⁴
- (c) The concept of "sustainable development" referenced in the *NEMA* requires the consideration of a number of relevant factors including (but not limited to) the following:
 - (i) Pollution and degradation of the environment should be avoided, or, where these occurrences cannot be altogether avoided, they should be minimised and remedied.²⁶⁵
 - (ii) Equitable access to all environmental resources, benefits, and services in order to meet basic human needs and ensuring that human well-being is pursued, and special measures taken to ensure access thereto by those persons disadvantaged by unfair discrimination.²⁶⁶
 - (iii) Community well-being and empowerment must be promoted through environmental education, the raising of environmental awareness, the sharing of knowledge and experience, and other appropriate means.²⁶⁷

²⁶³ Section 2(2) of the *National Environmental Management Act* 107 of 1998.

²⁶⁴ Section 2(3) of the *National Environmental Management Act* 107 of 1998.

²⁶⁵ Section 4(a)(ii) of the *National Environmental Management Act* 107 of 1998.

²⁶⁶ Section 4(d) of the *National Environmental Management Act* 107 of 1998.

²⁶⁷ Section 4(h) of the *National Environmental Management Act* 107 of 1998.

- (iv) The social, economic, and environmental impacts of activities, including disadvantages and benefits, must be considered, assessed and evaluated, and corresponding decisions must be appropriate.²⁶⁸
- (v) Intergovernmental coordination and harmonisation of policies, legislation and actions relating to the environment is considered vital.²⁶⁹
- (vi) Global and international responsibilities relating to the environment must be discharged in the national interest.²⁷⁰
- (vii) The environment is considered to be held in a public trust for the people, the beneficial use of environmental resources must serve the public interest and the environment must be protected as the people's common heritage.²⁷¹

These national environmental management principles serve an important function in the context of environmental preservation in South Africa, for a variety of reasons.

Firstly, these principles ought to steer government's actions when aiming to protect the environment. To illustrate, in the case of *MEC, Department of Agriculture, Conservation and Environment v HTF Developers (Pty) Ltd* (hereafter the *MEC, Department of Agriculture case*),²⁷² the Constitutional Court referred to the importance of these principles found in the *NEMA* to guide the South African government in exercising its functions (quoted directly below):²⁷³

The Constitution and the environmental legislation require authorities to adopt an integrated approach to the environment: an approach that protects the environment while promoting socio-economic growth. To this end, the authorities are enjoined to adopt a risk averse and cautious approach and to prevent and remedy the negative impacts on the environment.

²⁶⁸ Section 4(i) of the *National Environmental Management Act* 107 of 1998.

²⁶⁹ Section 4(l) of the *National Environmental Management Act* 107 of 1998.

²⁷⁰ Section 4(n) of the *National Environmental Management Act* 107 of 1998.

²⁷¹ Section 4(o) of the *National Environmental Management Act* 107 of 1998.

²⁷² 2008 2 SA 319 (CC).

²⁷³ *MEC, Department of Agriculture case* para 65.

Secondly, the *NEMA* (and by implication, the national environmental management principles contained therein) is considered to play a structural and integrative role in the protection of the environment, which has been described by the Constitutional Court as follows:²⁷⁴

NEMA was enacted as a general statute that coordinates environmental functions performed by organs of state. It also provides for "co-operative environmental governance by establishing principles for decision-making on matters affecting the environment". As is evident from the long title, NEMA was passed to establish a framework regulating the decisions taken by organs of state in respect of activities which may affect the environment. It lays down general principles which must be followed in making decisions of that nature.

Thirdly, these principles undoubtedly envisage to strike a balance between conflicting overarching factors (such as economic development, socio-economic development and challenges, and environmental protection) when a particular environmental topic or concern is addressed. For example, when the concept of "sustainable development" was further unpacked by the Constitutional Court in the case of *Fuel Retailers Association of Southern Africa v Director General: Environmental Management, Department of Agriculture, Conservation and Environment, Mpumalanga Province* (hereafter the *Fuel Retailers Association case*)²⁷⁵ it was held that:²⁷⁶

[t]he integration of economic development, social development and environmental protection implies the need to reconcile and accommodate these three pillars of sustainable development. Sustainable development provides a framework for reconciling socio-economic development and environmental protection.

Fourthly, when compared, these principles share many features with internationally accepted environmental management principles such as those found in the *Rio Declaration: United Nations Conference on the Environment and Development* (1992).²⁷⁷

²⁷⁴ *Maccsand (Pty) Ltd v City of Cape Town and Others* 2012 (4) SA 181 (CC) para 8; *Global Environmental Trust and Others v Tendele Coal Mining (Pty) Ltd and Others* (unreported) (1105/2019) [2021] ZASCA 13 para 32.

²⁷⁵ 2007 6 SA 4 (CC).

²⁷⁶ *Fuel Retailers Association case* para 55.

²⁷⁷ Kidd *Environmental Law* 38.

This creates a strong cohesion between international treaties and best practices on the one hand, and local legislation and policy on the other.

Lastly, and most importantly, these principles (coupled with the constitutional environmental right contained in the Bill of Rights) arguably provide the mandate for and place a direct responsibility on the South African government to address environmental degradation (such as climate change, for example) and the possible impacts thereof on South Africa, by means of legislation and other reasonable measures.²⁷⁸ When directly applied to the research topic at hand, the constitutional and national environmental framework mandate serves as the foundation for the drafting of policies and/or legislation in South Africa to address climate change mitigation measures, including the regulation of the development and use of EVs and related infrastructure.

4.3 South Africa's first NDC

Parallel to the constitutional and national environmental framework mandate discussed directly above, are South Africa's international commitments outlined in its own NDC, which are directly relevant to the research topic at hand. As mentioned earlier in this dissertation,²⁷⁹ the *Paris Agreement* places an obligation on all signatory countries, including South Africa, to prepare and submit a domestic climate change mitigation plan, known as an NDC, every five years.²⁸⁰

In September 2015, South Africa submitted its Intended NDC (hereafter the INDC) to the UNFCCC, which effectively became its first NDC upon South Africa's ratification of the *Paris Agreement* in November 2016. In the INDC, South Africa committed to keep national GHG emissions within a range of 398 to 614 Metric tonnes of carbon dioxide equivalent (hereafter MtCO₂-eq) for 2025 to 2030. South Africa's INDC is aligned with and formulated within the context of, *inter alia*, the constitutional environmental right in section 24 of the

²⁷⁸ Kidd *Environmental Law* 324; Karsten and Van der Bank 2020 *Air, Soil and Water Research* 3.

²⁷⁹ See para 2.2.3 of Chapter 2 from page 25 onwards.

²⁸⁰ Articles 3 and 4 of the *Paris Agreement*.

Constitution, its NDP (discussed further below in this chapter)²⁸¹ and its climate policy, which proclaims that full implementation of these various policies and plans will help bend the curve of South Africa's GHG emissions towards a so-called PPD trajectory range.²⁸² From a broader perspective, the INDC addresses South Africa's broad-based adaptation, mitigation, finance and investment requirements, whilst considering both development needs and climate change imperatives.²⁸³ The INDC further emphasises specific overriding priorities such as poverty alleviation, inequality and job creation, and clearly states that South Africa's INDC should be "...understood in the context of these and other circumstances...".²⁸⁴ This correlates directly with the unique factors of consideration that may impede a regulatory (law and policy) regime in support of EVs in South Africa as discussed further in this chapter.²⁸⁵ In addition, the INDC specifically identifies and recognises EVs and PHEVs as a form of mitigation action and as "...technologies that could help South Africa to further reduce emissions...", albeit acknowledging the significant financial investment needed for the use and development of EVs (estimated at around 513 billion USD from 2010 until 2050) and PHEVs (estimated at around 488 billion USD by 2030).²⁸⁶ This can only mean that South Africa's INDC has identified and earmarked the development and use of EVs as a climate change mitigation activity capable of implementation.

During September 2021, and in preparation for COP26, South Africa submitted updates to its first and final NDC to the UNFCCC with revised mitigation targets representing a significant progression from its INDC.²⁸⁷ Herein South Africa has now committed to a fixed

²⁸¹ See para 4.4.5 of Chapter 4 from page 75 below.

²⁸² *UNFCCC South Africa's Intended Nationally Determined Contribution (INDC)* at 2. *The NCCRP* included the specification of an emissions range to 2050 called "Peak, Plateau and Decline" (the PPD Range), derived from the Long-Term Mitigation Scenarios (LTMS) adopted by Cabinet in 2008. The PPD Range suggests that South Africa's emissions should be permitted to continue to grow to 2025, followed by a plateau period to 2035, before starting to decline indefinitely.

²⁸³ *UNFCCC South Africa's Intended Nationally Determined Contribution (INDC)* at 2.

²⁸⁴ *UNFCCC South Africa's Intended Nationally Determined Contribution (INDC)* at 2.

²⁸⁵ See para 4.7 of Chapter 4 at page 108 below.

²⁸⁶ *UNFCCC South Africa's Intended Nationally Determined Contribution (INDC)* at 9 and 10.

²⁸⁷ Incidentally, South Africa's second and next NDC will and must be communicated to the UNFCCC by 2025, as required in terms of the *Paris Agreement*.

target for GHG emissions levels of 398 to 510 MtCO₂-eq by 2025, and 350 to 420 MtCO₂-eq by 2030, compared to the estimation of 398 to 614 MtCO₂-eq between 2025 and 2030 as initially communicated in the INDC. Broadly speaking, the most significant updates to the first NDC include South Africa's first adaptation communication with elaborated measures on adaptation, its goal to reach zero emissions by 2050 in terms of its Low-Emission Development Strategy (dealt with further below in this chapter) and the aim to access significantly higher levels of climate finance during the periods of implementation of the first NDC, with a view to achieving a floor of 8 billion USD per year by 2030. South Africa has further committed to –

- (a) a long-term decarbonisation strategy for the South African economy in the 2020s focusing primarily on the electricity sector, with a deeper transition in the 2030s in respect of the electricity sector alongside a transition in the transport sector towards low emission vehicles;²⁸⁸ and
- (b) "...invest[ing] in energy efficiency, a range of green transport measures including electric and hybrid vehicles, mode shifting and the enhanced provision of safe and affordable transport..." and that all of these measures "...will be accompanied by just transition programmes to ensure that the costs of these measures to workers and communities are minimised and the benefits maximised".²⁸⁹

By identifying the development and use of greener transport technologies, such as EVs, as an express and tangible climate change mitigation activity, the first INDC creates a window of opportunity for such activity to serve as a CDM in favour of South Africa within the international climate change community, with both local and international benefits attached thereto.

²⁸⁸ UNFCCC *South Africa First National Determined Contribution under the Paris Agreement* at 5.

²⁸⁹ UNFCCC *South Africa First National Determined Contribution under the Paris Agreement* at 29 and 30.

4.4 Overview of the relevant climate change policies in South Africa

South Africa has managed to establish, what some consider to be, one of the most elaborate climate change governance systems amongst developing and emerging economies.²⁹⁰ This is the result of more than two decades of policy evolution that operates across multiple sectors and governmental departments. For purposes of this chapter, only a brief chronological overview of the most relevant local and broad-based climate change related policy documents *vis-à-vis* the research topic are provided, together with a succinct reference as to the reason(s) why the specific climate change policy relates to and/or interlinks with the research topic. This chronological approach demonstrates the progression in South African climate change law towards tangible climate change mitigation efforts, and the way in which there now exists room and whereby the scene has been set for more tangible topic-based climate change mitigation environmental policies, such as a comprehensive and multifaceted EV policy for example.

4.4.1 1998: White Paper on the Energy Policy

By the end of 1998 (close to 24 years ago), with the concept of climate change slowly starting to emerge on the South African scene, the then Department of Minerals and Energy (now the DMRE) published the *White Paper on the Energy Policy for the Republic of South Africa* of 1998 (hereafter the *White Paper on the Energy Policy*)²⁹¹ to "...clarify government policy regarding the supply and consumption of energy for the next decade...",²⁹² with the main objective of integrating various energy-related policy processes and providing policy stability for energy suppliers, investors and South African consumers.²⁹³ Of particular relevance, and although no mention of EVs were made *per se*, the *White Paper on the Energy Policy* tentatively introduced the idea of tax differentials for the first time "...to support government's policy of promoting more efficient and

²⁹⁰ Averchenkova, Gannon and Patrick *Governance of climate change policy: A case study of South Africa* 3.

²⁹¹ After Cabinet approved it on 2 December 1998.

²⁹² *White Paper on the Energy Policy for the Republic of South Africa* of 1998 at 3.

²⁹³ *White Paper on the Energy Policy for the Republic of South Africa* of 1998 at 17.

environmentally sound transport modes..." and government's undertaking to a possible "...environmental levy on energy sales, together with appropriate fiscal support for more environmentally benign and sustainable energy options including energy efficiency...".²⁹⁴ The *White Paper on the Energy Policy* further recognised the *Kyoto Protocol's* CDM principle as a factor in the development of an energy policy and thereby recognised the opportunity to access "...international funding to assist in re-directing development projects along lines which have more favourable global environmental effects...".²⁹⁵

4.4.2 2003: White Paper on Renewable Energy

In succession to the *White Paper on the Energy Policy*, the then Department of Minerals and Energy published the *White Paper on the Renewal Energy Policy for the Republic of South Africa* of 2003 (hereafter the *White Paper on Renewable Energy*)²⁹⁶ which was intended to directly supplement the *White Paper on Energy Policy* by setting out "...government's vision, policy principles, strategic goals and objectives for promoting and implementing renewable energy in South Africa..."²⁹⁷, with the overall vision of increasing the contribution of renewable energy to South Africa's energy mix, and thereby contributing to overall environmental conservation.²⁹⁸ Even though the use and development of EVs and related infrastructure are not specifically identified or listed as a tangible climate change mitigation measure through the use of renewable energy source(s), the *White Paper on Renewable Energy* did give recognition to the CDM principles, albeit in very brief and general terms.²⁹⁹ Most significantly, the *White Paper on Renewable Energy* recognised the need for financial incentives, fiscal treatment and

²⁹⁴ *White Paper on the Energy Policy for the Republic of South Africa* of 1998 at 16, 105.

²⁹⁵ *White Paper on the Energy Policy for the Republic of South Africa* of 1998 at 93.

²⁹⁶ After Cabinet approved it in November 2003.

²⁹⁷ *White Paper on the Renewal Energy Policy for the Republic of South Africa* of 2003 at vii.

²⁹⁸ *White Paper on the Renewal Energy Policy for the Republic of South Africa* of 2003 at 1.

²⁹⁹ *White Paper on the Renewal Energy Policy for the Republic of South Africa* of 2003 at v and 25.

finance for renewable energy technologies as a long-term objective, although again in very brief and general terms.³⁰⁰

4.4.3 2004: National Climate Change Response Strategy

The *National Climate Response Strategy for South Africa* of 2004 (hereafter the *National Climate Response Strategy*) is arguably the foundation of the national climate change policy in South Africa.³⁰¹ Most relevant in this context, the *National Climate Response Strategy* expressly recognised the importance of and gave practical context to the CDM principles and the need for government to invest in and establish procedures for local CDM projects between governmental departments as one of the defined "interventions" to achieve this policy's objectives.³⁰² In addition, the *National Climate Response Strategy* recognised more tangible medium term mitigation "intervention" opportunities with the biggest potential, including, (a) "...implementing a transport sector mitigation programme, in conjunction with the Government's energy efficiency strategy and the joint implementation strategy for the control of exhaust emissions from road-going vehicles, through the National Department of Transport...", (b) the significant upscaling of energy efficiency in the transport sector, and (c) the promotion of transport-related inventions, including switches to alternative vehicles such as EVs and PHEVs, for example.³⁰³ It was at this point in time when EVs and PHEVs were introduced within the national climate change mitigation policy space.

4.4.4 2010 – 2011: National Climate Change Response Green Paper & White Paper

In 2010 the then Department of Environmental Affairs (now the DFFE) published the *National Climate Change Response Green Paper* of 2010 (hereafter the NCRGP), which later became the *National Climate Change Response Policy* (hereafter the NCCRP), as

³⁰⁰ *White Paper on the Renewal Energy Policy for the Republic of South Africa* of 2003 at viii, xi, 25 and 33.

³⁰¹ Averchenkova, Gannon and Patrick *Governance of climate change policy: A case study of South Africa* 3.

³⁰² *National Climate Response Strategy for South Africa* of 2004 at vii, 9, 14, 15, 16, 17, 22, 32 and 35.

³⁰³ *National Climate Response Strategy for South Africa* of 2004 at 25.

further set out and refined in the *National Climate Change Response White Paper* 2011 (hereafter the NCCRWP). The NCCRWP effectively serves as the embodiment of the South African government's commitment to a fair contribution to the stabilisation of global GHG concentrations in the atmosphere. The key aspects most relevant to this chapter is that the NCCRWP, as ultimately contained in the NCCRWP, was (a) the express and upfront recognition that the NCCRWP effectively sets out South Africa's climate change response strategy (and thereby echoes and furthers the objectives of the *National Climate Response Strategy* mentioned earlier);³⁰⁴ (b) the express earmarking of the transport sector as one of the sectors with the largest emission reduction potential and focus;³⁰⁵ (c) the identification of transport-related interventions and shift to alternative vehicles (such as EVs and PHEVs) as one of the medium-term mitigation options with the biggest climate change mitigation potential;³⁰⁶ (d) the birth of the so-called Transport Flagship Programme, whereby it was envisaged that the DOT will, *inter alia*, facilitate the development of an enhanced public transport programme to promote lower-carbon mobility in five metros and in ten smaller cities, and create a so-called Efficient Vehicles Programme with interventions that would result in measurable improvements in the average efficiency of the overall South African vehicle fleet by 2020 (which deadline has now come and gone);³⁰⁷ and (e) the recognition, albeit in very brief terms, that incentives (including regulatory, economic and fiscal measures) should be implemented to encourage and reward efforts to reduce GHGs.³⁰⁸

4.4.5 2012: *National Development Plan 2030*

Aside from the climate change response policy documents which steadily progressed over time, and more so within the local socio-economic policy framework spectrum, in 2012,

³⁰⁴ *National Climate Response Strategy for South Africa* of 2004 at 25.

³⁰⁵ *National Climate Response Strategy for South Africa* of 2004 at 26.

³⁰⁶ *National Climate Change Response White Paper* 2011 at 27.

³⁰⁷ *National Climate Change Response White Paper* 2011 at 32. The Transport Flagship Programme was further set to include "... a Government Vehicle Efficiency Programme that will measurably improve the efficiency of the government vehicle fleet by 2020. It will encourage new efficient-vehicle technologies, such as electric vehicles, by setting procurement objectives for acquiring such vehicles".

³⁰⁸ *National Climate Change Response White Paper* 2011 at 41.

the then National Planning Commission³⁰⁹ published the *National Development Plan 2030* (hereafter the NDP), which aimed to provide a sustainable development blueprint for eliminating poverty and eradicating inequality in South Africa by 2030. Albeit in very brief and generic terms, the NDP anticipates and foresees South Africa's energy matrix to look significantly different by 2030 with the main objective to have more renewable energy sources, developments in public transport, as well as EVs and PHEVs being widely used in South Africa, whilst recognising the need to decarbonise electricity generation across South Africa.³¹⁰ In respect of the use and development of EVs, the NDP has earmarked a short-term objective set for the five years following its publication – to encourage greater use of PHEVs or EVs in general and in respect of public transport, but it also recognises grid challenges which will lead to an increase in electricity demand.³¹¹ As for one of the NDP's corresponding long-term objectives, the NDP foresees EVs and PHEVs to be "more widely" used by 2030.³¹²

4.4.6 2018 – 2022: Climate Change Bill

On 18 February 2022 the *Climate Change Bill, 2022* (hereafter the *Climate Change Bill*), in its amended form, was formally introduced to the South African Parliament by the DFFE as a coordinated response to climate change.³¹³ The publication and introduction of the *Climate Change Bill* to Parliament was done in accordance with and follows South Africa's implementation of an effective climate change response as set out in the NCCRP, together with South Africa's commitments provided under the *Paris Agreement*.

³⁰⁹ The National Planning Commission is a special ministerial body first constituted in 2009 by former President of South Africa, Jacob Zuma.

³¹⁰ DAC 2022 http://www.dac.gov.za/sites/default/files/NDP%202030%20-%20Our%20future%20-%20make%20it%20work_0.pdf at 174, 183 and 206.

³¹¹ DAC 2022 http://www.dac.gov.za/sites/default/files/NDP%202030%20-%20Our%20future%20-%20make%20it%20work_0.pdf at 176.

³¹² DAC 2022 http://www.dac.gov.za/sites/default/files/NDP%202030%20-%20Our%20future%20-%20make%20it%20work_0.pdf at 177.

³¹³ This Bill is currently under consideration by the National Assembly and members of the public had until 27 May 2022 to submit any comments on the Bill to the Portfolio Committee on Environment, Forestry and Fisheries. As the Bill has been tabled as an ordinary bill that affects the provinces (as per s 76 of the *Constitution*), it must also be considered by the National Council of Provinces.

If and when the *Climate Change Bill* becomes law, it will be the first legal framework act in South Africa to respond to the impacts of climate change, and will arguably serve as the direct mandate for climate change mitigation policies and policy alignment. The main purpose of the *Climate Change Bill* is to "...enable the development of an effective climate change response and a long-term transition to a low-carbon and climate-resilient economy and society for South Africa in the context of sustainable development".³¹⁴ In broad strokes, the *Climate Change Bill* aims to (a) provide for a coordinated and integrated response to climate change; (b) provide for the effective management of climate change impacts; (c) make a fair contribution to the global effort to stabilise GHG concentrations, (d) ensure a just transition towards a low carbon economy and society; (e) give effect to South Africa's international commitments and obligations in relation to climate change; and (f) protect and preserve the planet for the benefit of present and future generations.³¹⁵ Once in force, the *Climate Change Bill* will, among other –

- (i) establish provincial and municipal forums on climate change which will be responsible for coordinating climate change response actions in each province within South Africa;³¹⁶
- (ii) cement the establishment of the so-called Presidential Climate Change Coordinating Commission, which has already been established and has been working for government since December 2020. However, its establishment only carries legal force once the *Climate Change Bill* becomes an act;³¹⁷

³¹⁴ *Climate Change Bill*, 2022 at 1, 22.

³¹⁵ Section 2 of the *Climate Change Bill*, 2022.

³¹⁶ Sections 8 and 9 of the *Climate Change Bill*, 2022.

³¹⁷ Sections 10 and 11 of the *Climate Change Bill*, 2022.

- (iii) put in place, within one year of the act coming into force (once this bill is promulgated as such), a National Adaptation Strategy. This strategy will guide South Africa's adaptation to the impacts of climate change and develop adaptation scenarios which anticipate the likely impacts over the short, medium, and long term;³¹⁸
- (iv) determine a national GHG-emissions trajectory which indicates a GHG emissions reduction objective, which trajectory must be reviewed every five years;³¹⁹
- (v) put in place a Sectoral Emission Target (hereafter SET) for identified sectors and subsectors, once every five years. The SETs must be aligned with the national GHG-emissions trajectory, and include quantitative and qualitative GHG emission reduction goals;³²⁰ and
- (vi) bring into force the carbon budget-allocation mechanism, which will replace the current National Pollution Prevention Plan mechanism, which is currently being enforced under the *National Environmental Management: Air Quality Act 39 of 2004*.³²¹

This prospective framework legislation presents itself as promising and provides more emphasis on the need for climate change mitigation and adaptation responses to be formed.³²² Although no specific reference is made to the road transport sector or EVs *per se*, the *Climate Change Bill* will, when in force, effectively govern South Africa's climate change response and will serve as the framework on institutional arrangements for how different ministries and tiers of government are mandated to provide a climate change response, to have the appropriate responsibilities assigned to them, as well as being

³¹⁸ Section 18 of the *Climate Change Bill*, 2022.

³¹⁹ Section 21 of the *Climate Change Bill*, 2022.

³²⁰ Section 22 of the *Climate Change Bill*, 2022.

³²¹ Section 24 of the *Climate Change Bill*, 2022.

³²² Joubert and Rushton 2022 <https://www.fasken.com/en/knowledge/2022/06/9-key-aspects-of-south-africas-much-anticipated-climate-change-bill>.

empowered to take, in general terms, the necessary action.³²³ This means that any EV policy will have to be read in conjunction with, and be guided by, the principles as set out in the *Climate Change Bill*.

4.4.7 2018: South Africa's Automotive Industry Master Plan

Commissioned by the Department of Trade, Industry and Competition (hereafter the DTIC), and published after the completion of the South African Automotive Master Plan project (hereafter the Master Plan project), *South Africa's Automotive Industry Master Plan to 2035* (hereafter SAAM) was published in December 2018.³²⁴ This report summarises the findings from the comprehensive research completed, and presents the aspirational vision, objectives and strategic framework agreed upon by industry stakeholders at the time, to optimally develop the South African automotive industry with 2035 in mind.³²⁵

Despite significant EV technology already being available globally at the time of publication of this report, the SAAM only laid out a number of brief suggestions on production and consumer incentives, intended to influence industry planning until 2035, but remained completely silent on the issue of EV incentives. The SAAM acknowledged that South Africa is required to invest in alternative technology infrastructure to enable the effective transition to EVs, stating that "...it is incumbent on the industry and government to invest in the required infrastructure to ensure South Africa does not become a laggard in the next evolutionary phase of the global automotive industry...".³²⁶ The SAAM also briefly

³²³ Mail & Guardian 2022 <https://mg.co.za/environment/2022-05-19-climate-change-bill-one-of-the-most-important-draft-laws-to-cross-the-desks-of-sas-lawmakers/>.

³²⁴ DTIC 2018 http://www.thedtic.gov.za/wp-content/uploads/Masterplan-Automotive_Industry.pdf.

³²⁵ The SAAM's main goals include (a) growing South Africa's vehicle production to 1 per cent of global output (projected to reach 140 million units annually by 2035); (b) increasing local content of vehicles assembled in South Africa from 60 per cent, from a 38.7 per cent base; (c) doubling total employment in the automotive value chain from 112 000 to 224 000 jobs; (d) improving the competitiveness of the local automotive industry to levels that compete with leading international competitors; (e) achieving the transformation of the South African automotive industry by through B-BBEE motivated measures; and (f) deepening the value additions within the South African automotive value chains across selected commodities or technologies.

³²⁶ DTIC 2018 http://www.thedtic.gov.za/wp-content/uploads/Masterplan-Automotive_Industry.pdf 25.

recommended the need for a local EV-technology roadmap to be developed and implemented, "...focusing on likely changes to the domestic, regional, and international markets supplied by the local industry, and the associated technology developments that will shape its future growth...".³²⁷

4.4.8 2020: South Africa's Low-Emission Development Strategy until 2050

In accordance with the *Paris Agreement*³²⁸ and the COP's decision 1/CP 21³²⁹ all signatory parties were required to communicate a long-term development strategy to reduce GHG emissions to the Secretariat of the UNFCCC by 2020. In early 2020, South Africa (through the DFFE) submitted and published its *Low-Emission Development Strategy* (hereafter the SA LEDS), setting the goal to reach net zero emissions by 2050, and a broad-based strategy on how to achieve the aforesaid objective, and thereby "...reiterat[ing] its commitment to achieving the Paris [Agreement] goals...".³³⁰ As part of the acknowledgement that cleaner mobility in the transport sector is a priority, the SA LEDS specifically recognises and confirms, that the *Green Transport Strategy 2018 – 2050* (which will be discussed in greater detail further in this chapter)³³¹ contains measures that explore the potential for local EV and battery production, as well as the installation of charging stations in South Africa.³³²

4.5 Existing South African EV policy and related discussion papers

Moving from general climate change policies to EV specific policies in South Africa, the existing framework is dealt with directly below in chronological order, and focuses on the

³²⁷ DTIC 2018 http://www.thedtic.gov.za/wp-content/uploads/Masterplan-Automotive_Industry.pdf 27.

³²⁸ A 4.19 of the *Paris Agreement*.

³²⁹ *UNFCCC Report of the Conference of the Parties* on its twenty-first session, held in Paris from 30 November to 13 December 2015 at para 35.

³³⁰ Department of Forestry, Fisheries and the Environment 2020 dffe.gov.za/sites/default/files/docs/2020lowemission_developmentstrategy.pdf. at viii and x.

³³¹ See para 4.5.1 of Chapter 4 at page 81 below.

³³² Department of Forestry, Fisheries and the Environment 2020 dffe.gov.za/sites/default/files/docs/2020lowemission_developmentstrategy.pdf at 32.

objectives, strategic initiatives, policy implications and recommendations found within these respective policies and related discussion papers.

4.5.1 2018: Green Transport Strategy 2018 – 2050

With government's urgent need at the time, to develop a transport master plan that is comprehensive, multimodal, integrated and dynamic, the *National Transport Master Plan 2050* (hereafter the NATMAP 2050) was developed from 2007 onwards and finalised in 2011 – which was then eventually approved by Cabinet in late 2016.³³³ The NATMAP 2050 was intended to be "...South Africa's cornerstone policy instrument which outlined key transport planning themes..." and emphasised the need for the "...preservation of the environment in tandem with accessible, cost reflective and affordable transport services".³³⁴ In accordance with the NATMAP 2050 and in response to the NCCRWP (outlined above), both of which advocate for a climate-resilient and low carbon economy in South Africa by 2050, the DOT produced the *Green Transport Strategy 2018 – 2050* (hereafter the GTS) in 2018.³³⁵ The GTS bolstered the DOT's commitment to make a significant impact on reducing the GHG emissions, in recognising the transport sector as a key role player and to contribute towards South Africa's GHG reduction targets by 2050. More specifically, the vision of the GTS is to substantially reduce GHG emissions and other environmental impacts from the transport sector by 5% by 2050.³³⁶

The GTS found that the road transport subsector contributed 91.2 per cent of the transport sector's total emissions in South Africa (at the time of publication thereof), meaning that this subsector offers the highest mitigation potential, and would be the main focus of the GTS among all the other transport subsectors such as rail, aviation, and

³³³ Makhari and Morapedi 2017 https://repository.up.ac.za/bitstream/handle/2263/62758/Morapedi_National_2017.pdf?sequence=1&isAllowed=y 1.

³³⁴ Climate Compatible Growth 2021 <https://climatecompatiblegrowth.com/wp-content/uploads/2021/07/4B-COP26-Policy-Brief.pdf> 1.

³³⁵ DOT 2018 https://www.transport.gov.za/documents/11623/89294/Green_Transport_Strategy_2018_2050_onlineversion.pdf.

³³⁶ DOT 2018 https://www.transport.gov.za/documents/11623/89294/Green_Transport_Strategy_2018_2050_onlineversion.pdf. 21.

maritime transport.³³⁷ Although not directly related to the development of EVs and related infrastructure, the GTS made the following vital recommendations in respect of the road transport subsector:

- (a) Legislative framework development and incentives to promote the uptake of sustainable transport modes and infrastructure were specifically listed as desirable outcomes.³³⁸
- (b) The announcement of a vehicle energy-efficiency programme by setting an example for procuring energy-efficient vehicles, by implementing procurement guidelines for government's vehicle fleet to only procure the most fuel-efficient vehicles and to set targets for the procurement of EVs.³³⁹
- (c) The DOT (in consultation with municipalities) assisting with the development of regulatory and policy frameworks for levying a congestion charge on vehicles entering central business hubs; the DOT (in consultation with stakeholder and the National Treasury) reviewing the current environmental levy on new motor vehicles based on CO₂ emissions to "...influence energy efficient and the environmental performance of the country's vehicle fleet...", and developing a regulatory framework for the annual taxing for vehicles based on their emissions through the annual vehicle licensing-renewal system.³⁴⁰
- (d) The proposal of a carbon-tax policy as a key mitigation instrument was specifically listed, by recommending that carbon tax (in the case of GHG emissions from the use of petrol and diesel) be added to South Africa's current fuel tax structure (which

³³⁷ DOT 2018 https://www.transport.gov.za/documents/11623/89294/Green_Transport_Strategy_2018_2050_onlineversion.pdf. 18.

³³⁸ DOT 2018 https://www.transport.gov.za/documents/11623/89294/Green_Transport_Strategy_2018_2050_onlineversion.pdf. 19.

³³⁹ DOT 2018 https://www.transport.gov.za/documents/11623/89294/Green_Transport_Strategy_2018_2050_onlineversion.pdf. 29.

³⁴⁰ DOT 2018 https://www.transport.gov.za/documents/11623/89294/Green_Transport_Strategy_2018_2050_onlineversion.pdf. 30.

already includes government's fuel levy, Road Accident Fund levy and the customs and excise levy).³⁴¹

Given that the GTS specifically recognises EVs as a technology with significant climate change mitigation potential,³⁴² it includes bold commitments from the DOT (in broad terms) on how to further the use and development of cleaner fuels and EVs in South Africa as a mitigation measure:

- (a) The GTS specifically earmarked the obligation of the DOT to actively promote investment in the production of, *inter alia*, fuel, cell and solar-powered EVs, and further expressly earmarked the development of regulatory and policy frameworks for cleaner fuels and alternative fuels by recognising that at the time. It is noteworthy to mention that by early 2023 (at the time of finalisation of this dissertation) no such measures have yet been developed.³⁴³
- (b) When mentioning EVs directly, the GTS acknowledges that given "...the fossil fuels associated with electricity production and the pressures on South Africa's electrical power generation and distribution systems, EVs should preferably be charged via renewable energy and in future may even assist as back-up power sources to households and grid feed through their batteries...".³⁴⁴ Accordingly, the GTS recommended a number of so-called electric vehicle actions, with the aim of radically increasing the uptake of EVs in South Africa, by committing the DOT (in conjunction with the (now) DTIC and National Treasury) in (a) offering local manufacturers of EVs incentives to both produce and sell affordable EVs in South Africa, for both the local and export markets; (b) working with local research institutions to conduct

³⁴¹ DOT 2018 https://www.transport.gov.za/documents/11623/89294/Green_Transport_Strategy_2018_2050_onlineversion.pdf.15.

³⁴² DOT 2018 https://www.transport.gov.za/documents/11623/89294/Green_Transport_Strategy_2018_2050_onlineversion.pdf. 16.

³⁴³ DOT 2018 https://www.transport.gov.za/documents/11623/89294/Green_Transport_Strategy_2018_2050_onlineversion.pdf. 36.

³⁴⁴ DOT 2018 https://www.transport.gov.za/documents/11623/89294/Green_Transport_Strategy_2018_2050_onlineversion.pdf. 39.

research on EV batteries; (c) working with all three tiers of government and authorities, as well as the automotive industry, to set annual targets for the uptake of EVs and PHEVs in government's vehicle fleet, as well as monitoring the local content of the manufacturing of vehicles locally; (d) introducing the conversion of old technology vehicles with higher emission factors to be retrofitted with EV technology; (e) considering the implementation of incentives related to the beneficiation of local resources in the manufacturing of key machineries and/or components (e.g. fuel cells); and (f) assisting with the establishment and development of local EV OEMs.³⁴⁵

- (c) The GTS further endorsed the so-called uYilo e-Mobility Programme whereby the Department of Science and Technology (in partnership with the Technology Innovation Agency) provides support to the development of EV components and research on the use as well as localisation of renewable energy-based charging points, and a battery-testing facility, for testing and validating batteries for safety and compliance in collaboration with other institutions.³⁴⁶
- (d) The GTS further endorsed the so-called Energy Storage Research Programme whereby support is provided for the development of high-energy, density nickel manganese cobalt precursor material for LIBs targeted at the EV market.³⁴⁷
- (e) Electric scooters were also flagged as a mitigation measure within the EV space, and mention was made of collaborative projects underway to possibly increase production and use thereof.³⁴⁸

³⁴⁵ DOT 2018 https://www.transport.gov.za/documents/11623/89294/Green_Transport_Strategy_2018_2050_onlineversion.pdf. 39.

³⁴⁶ DOT 2018 https://www.transport.gov.za/documents/11623/89294/Green_Transport_Strategy_2018_2050_onlineversion.pdf. 40.

³⁴⁷ DOT 2018 https://www.transport.gov.za/documents/11623/89294/Green_Transport_Strategy_2018_2050_onlineversion.pdf. 40.

³⁴⁸ DOT 2018 https://www.transport.gov.za/documents/11623/89294/Green_Transport_Strategy_2018_2050_onlineversion.pdf. 42.

- (f) The GTS further earmarked development of the local LIB industry by describing the benefits to be that manganese and other mineral sources are available in Southern Africa, and also recognising that the carbon footprint of EVs can be lowered by using charging stations powered by a renewable energy source, such as solar power.³⁴⁹
- (g) The GTS urged both the public and private sector to join forces in order to provide the necessary infrastructure required to increase projects within this sphere to ultimately enhance the development and use of EVs in South Africa.³⁵⁰
- (h) The GTS identified a number of barriers impacting the development and use of EVs and cleaner transport alternatives in South Africa, which include aspects such as range anxiety which consumers generally have in respect of EVs, the lack of public charging infrastructure and the lack of a high-level integrated plan to align all policies and regulations surrounding this subject matter.³⁵¹
- (i) A further bold stance adopted in the GTS was the obligation set for the DOT to facilitate the arrangements around so-called preferential funding through South Africa's development finance institutions to, *inter alia*, support local EV development (OEMs, chargers, and overall EV innovation), and to support EV businesses through supplier funding and the buy-in of major financial institutions by structuring specific and preferential vehicle finance for EVs.³⁵²
- (j) As far as the implementation plan for EVs and related aspects in the GTS are concerned, the short-term aspects (i.e. five to seven years for implementation) identified were the completion of the feasibility study of a local manufacturer of EV batteries at a reduced cost, the expansion of public charging stations by 40 units per

³⁴⁹ DOT 2018 https://www.transport.gov.za/documents/11623/89294/Green_Transport_Strategy_2018_2050_onlineversion.pdf. 43.

³⁵⁰ DOT 2018 https://www.transport.gov.za/documents/11623/89294/Green_Transport_Strategy_2018_2050_onlineversion.pdf. 43.

³⁵¹ DOT 2018 https://www.transport.gov.za/documents/11623/89294/Green_Transport_Strategy_2018_2050_onlineversion.pdf. 47.

³⁵² DOT 2018 https://www.transport.gov.za/documents/11623/89294/Green_Transport_Strategy_2018_2050_onlineversion.pdf. 51.

annum and the development of green standards and guidelines for the erection of, *inter alia*, EV charging points.³⁵³

The GTS presented a refreshing perspective in South African climate change mitigation policy, specifically in the transport sector, as it contains tangible outcomes and recommendations to be further elaborated on and detailed by future policy reform. The GTS even received praise by some scholars claiming that it could see an achievement of substantial GHG mitigation based on scientific modelling and that the "... 5% by 2050..." target is considered conservative and achievable.³⁵⁴ In fact, some scholars even argue that a policy encouraging and incentivising the adoption of EVs could exceed the GTS's 5% mitigation benchmark.³⁵⁵

4.5.2 2019 – 2020: The TIPS Reports

4.5.2.1 2019: The TIPS I Report

A significant development in the local EV space occurred during May 2019 when the Trade & Industrial Policy Strategies (hereafter TIPS), a South African non-profit economic research organisation aiming to facilitate policy development, published a report on the possible policy impacts of a transition to EVs in South Africa (hereafter referred to as the TIPS I Report).³⁵⁶ The first portion of the TIPS I Report considers the possible impact of an EV transition in South Africa on the macro-economy, other parts of the South African economy such as the liquid fuels and power sectors respectively, the South African

³⁵³ DOT 2018 https://www.transport.gov.za/documents/11623/89294/Green_Transport_Strategy_2018_2050_onlineversion.pdf. 54–55.

³⁵⁴ Climate Compatible Growth 2021 <https://climatecompatiblegrowth.com/wp-content/uploads/2021/07/4B-COP26-Policy-Brief.pdf> 4.

³⁵⁵ Climate Compatible Growth 2021 <https://climatecompatiblegrowth.com/wp-content/uploads/2021/07/4B-COP26-Policy-Brief.pdf> 4.

³⁵⁶ Dane, Montmasson-Clair and Wright 2019 <https://www.tips.org.za/research-archive/sustainable-growth/green-economy/item/3646-exploring-the-policy-impacts-of-a-transition-to-electric-vehicles-in-south-africa>.

automotive sector, South African consumers, and the South African population, as well as the natural environment – to be categorised in further detail directly hereinbelow.

Firstly, the TIPS I Report foresees that an EV transition would ultimately have "...deep, multifaceted, macroeconomic implications for the South African economy...";³⁵⁷ anticipating that an EV transition would result in a decrease in petrol and diesel consumption, reducing government revenue generally collected from fuel levies. The TIPS I Report does, however, anticipate that this negative impact would be compensated for by a decrease in imports of crude, petrol, and diesel, with favourable impacts on South Africa's foreign exchange reserves, the Rand exchange rate and economic development. The closure of fuel refineries is expected to then lead to an increase in imports of jet fuel and other products unless local refineries stay open or biofuels can be produced locally.³⁵⁸ Secondly, the TIPS I Report anticipates that a full EV transition would lead to a significant reduction in the demand for petrol and diesel, local production thereof (at current production rates) would then exceed the demand, and as a result it would have to be exported. Exported fuel is usually not as profitable as those sold locally due to, at the very least, the freight costs to the destination port being absorbed by the exporter. The TIPS I Report predicts that an EV transition could ultimately lead to refinery profitability becoming negative and poses the risk of a potential shutdown of operations by refinery owners.³⁵⁹ Equally important, the TIPS I Report acknowledges that an increase in EV usage would inevitably increase annual electricity demand, which will put significant strain on South Africa's current electricity-generation capacity.³⁶⁰ Thirdly, the TIPS I Report

³⁵⁷ Dane, Montmasson-Clair and Wright 2019 <https://www.tips.org.za/research-archive/sustainable-growth/green-economy/item/3646-exploring-the-policy-impacts-of-a-transition-to-electric-vehicles-in-south-africa> 6.

³⁵⁸ Dane, Montmasson-Clair and Wright 2019 <https://www.tips.org.za/research-archive/sustainable-growth/green-economy/item/3646-exploring-the-policy-impacts-of-a-transition-to-electric-vehicles-in-south-africa> 6.

³⁵⁹ Dane, Montmasson-Clair and Wright 2019 <https://www.tips.org.za/research-archive/sustainable-growth/green-economy/item/3646-exploring-the-policy-impacts-of-a-transition-to-electric-vehicles-in-south-africa> 8–9.

³⁶⁰ Dane, Montmasson-Clair and Wright 2019 <https://www.tips.org.za/research-archive/sustainable-growth/green-economy/item/3646-exploring-the-policy-impacts-of-a-transition-to-electric-vehicles-in-south-africa> 9.

expresses a concern that with the EV transition unfolding in high-income countries, the South African automotive industry (in its current state and form) would likely lose its principal export markets (such as the EU and the USA). Such changes are anticipated to have structural impacts on the nature of the government incentives required by the local automotive sector to maintain its production viability, including the manufacturing of components such as catalytic converters, for example (which is not found in EVs). In addition, the global decline in catalytic converters could severely impact South Africa's platinum industry, as the TIPS I Report states that catalytic converters accounts for approximately 39 per cent of global platinum demand.³⁶¹ Fourthly, an aggressive or full EV transition is expected to have a positive impact on air quality, specifically in urban areas, whereby the TIPS I Report anticipates eventual health benefits for the general population in those areas, leading to a long-term reduction in health expenditure and an overall increase in productivity levels (with positive spill over effects on the state fiscus), as well as an increase in disposable income for households due to lower transport expenditure which EVs are expected to ultimately accomplish.³⁶² Lastly, the TIPS I Report found that, despite South Africa's heavy reliance on a coal-fired electricity grid, an EV transition would lead to an overall decrease in GHG emissions from the road transport sector, and further recognises that EVs on average consume less energy per kilometre travelled compared to ICEVs, yet recognises that the effect of an EV transition on overall air quality is a rather complex situation as "...EVs would result in a significant reduction in air pollutants at the point of use but an increase in demand for electricity would increase air pollutants from coal-fired electricity...", and therefore requires a bigger push towards renewable electricity sources to reduce overall GHG emissions.³⁶³

³⁶¹ Dane, Montmasson-Clair and Wright 2019 <https://www.tips.org.za/research-archive/sustainable-growth/green-economy/item/3646-exploring-the-policy-impacts-of-a-transition-to-electric-vehicles-in-south-africa> 10–11.

³⁶² Dane, Montmasson-Clair and Wright 2019 <https://www.tips.org.za/research-archive/sustainable-growth/green-economy/item/3646-exploring-the-policy-impacts-of-a-transition-to-electric-vehicles-in-south-africa> 7, 11.

³⁶³ Dane, Montmasson-Clair and Wright 2019 <https://www.tips.org.za/research-archive/sustainable-growth/green-economy/item/3646-exploring-the-policy-impacts-of-a-transition-to-electric-vehicles-in-south-africa> 11–12.

The second portion of the TIPS I Report earmarks the policy implications of an EV transition and provides broad recommendations on what is required to move towards an EV transition in South Africa whilst addressing the very aspects affected by the aforesaid transition. These recommendations are summarised directly hereafter:

- (a) The urgent need for a proactive EV policy, whereby the TIPS I Report states that a "...proactive policy is necessary to drive the EV transition in a particular direction..." because if "...left to the [private or open] market, the benefits and costs of an inevitable transition would not be equitable".³⁶⁴

For this purpose, the TIPS I Report recommends possible policy options to be included in such a proactive EV policy by grouping these options to achieve six specific outcomes:

- (i) Firstly, to achieve a high penetration of EVs in the consumer market the TIPS I Report suggests lowering the total cost of EV ownership (through reduced EV import tariffs, a favourable electricity tariff structure, EV purchase subsidies and a definitive public procurement programme to establish an EV fleet for government), enabling a supporting environment for EV users (by incentivising and investing in public-charging infrastructure and providing preferential access incentives for EV users such as free parking in certain areas, reduced license costs and dedicated lane access), and also allaying consumer fears by way of increased EV awareness campaigns.
- (ii) Secondly, to see that an incremental liquid fuel sector transition occurs, the TIPS I Report suggests the absorption of the liquid-fuel sector labour force into other sectors (by way of skills development, incentives and regional economic development programmes) and the conversion of existing production and supply infrastructure (by way of refinery upgrades and/or changes to refinery

³⁶⁴ Dane, Montmasson-Clair and Wright 2019 <https://www.tips.org.za/research-archive/sustainable-growth/green-economy/item/3646-exploring-the-policy-impacts-of-a-transition-to-electric-vehicles-in-south-africa> 13.

capacity, new storage and pipeline capacities and incentivising charging stations at existing areas previously used as fuel stations).

- (iii) Thirdly, to effectively manage the integration of EVs into the electricity sector, the TIPS I Report suggests monitoring and controlling charging behaviour through charging controls and EV electricity tariffs as a price mechanism to change behaviour.
- (iv) Fourthly, to ensure that the South African automotive sector has the ability to compete in the global EV-market manufacturing support programmes, skills development, and research and development programmes (such as projects focused on batteries, charging infrastructure and fuel cells) are suggested.
- (v) Fifthly, to ensure a just transition from ICEVs to EVs, the TIPS I Report suggests a combined approach through the effective reconversion of workers employed by small businesses and communities on the one hand (through employment vulnerability assessments, resilience plans, active labour-market policies and a regional economic-development programme), and the inclusive roll-out of EVs on the other hand (through modernisation programmes for public transport and support to new consumption models that do not rely on ownership).
- (vi) Lastly, the TIPS I Report suggests that a specific budget be allocated by government to achieve a balance between the decrease in revenue streams in the form of fuel levies and the benefits that arise from EV use in the transport sector.³⁶⁵

³⁶⁵ Dane, Montmasson-Clair and Wright 2019 <https://www.tips.org.za/research-archive/sustainable-growth/green-economy/item/3646-exploring-the-policy-impacts-of-a-transition-to-electric-vehicles-in-south-africa> 13–14.

- (b) A transition plan for the liquid-fuels industry is recommended to minimise the impact of its gradual demise in the face of an incremental EV transition, including addressing topics such as the minimisation of job losses, maintaining the liquid-fuel and petrochemical feedstock supply for as long as these product(s) are needed, minimising the abrupt effects of refinery downscaling and closures, the transformation of existing refineries to new modern world-scale refineries to meet the future, the redesign of the logistics infrastructure handling liquid fuels for possible other uses, and the possibility/ies of converting existing fuel service stations to alternative uses such as charging stations or economic hubs for local communities.³⁶⁶
- (c) The integration of EVs in the local power value chain should be managed, given that the incremental increase in electricity demand would require planning in respect of additional electricity generation capacity. In this regard, the TIPS I Report recommends that several interventions be considered, including (i) setting different electricity tariffs for different types of users depending on the extent to which a social benefit is delivered; (ii) setting "time-of-use tariffs" for residential users; (iii) combining real-time pricing³⁶⁷ and forced load control mechanisms³⁶⁸ to leverage the benefits of both mechanisms; (iv) setting or prescribing appropriate standards in relation to payment platforms, charging technology, access to user data and building codes; and (v) better understanding EV-charging behaviour.³⁶⁹

³⁶⁶ Dane, Montmasson-Clair and Wright 2019 <https://www.tips.org.za/research-archive/sustainable-growth/green-economy/item/3646-exploring-the-policy-impacts-of-a-transition-to-electric-vehicles-in-south-africa> 14–15.

³⁶⁷ Real-time pricing is a concept used to described utility rate structure whereby the per-kWh charge varies each hour based on the specific utility's real-time production costs.

³⁶⁸ Load control is a measure which power utilities can use to reduce demand on the electrical grid. When the load on the grid from consumers using electric devices rises, instead of increasing production to make more supply available, the utility cuts down on the load. There are several measures utilities can use to do this, including ripple control, timed meters, incentive payments, or penalizing tariffs. Power utilities may use a combination of these techniques to balance the load with the available supply.

³⁶⁹ Dane, Montmasson-Clair and Wright 2019 <https://www.tips.org.za/research-archive/sustainable-growth/green-economy/item/3646-exploring-the-policy-impacts-of-a-transition-to-electric-vehicles-in-south-africa> 15.

- (d) Maintaining the local automotive industry's global competitiveness. Given that the South African automotive industry has a strong position in the manufacturing space, the TIPS I Report states that significant investment is required by OEMs to update existing production lines and processes to maintain the functionality of existing manufacturing plants to produce EVs instead of ICEVs. To this end, the TIPS I Report proposes that government levels the playing field in respect of import duties for EVs compared to ICEVs, lowering of production thresholds and the introduction of non-specificity into the Automotive Production and Development Programme (hereafter APDP),³⁷⁰ allowing OEMs to import EVs while manufacturing ICEVs. The TIPS I Report submits that further support to develop local capabilities in the manufacturing of EV-related systems, infrastructure and components are also vital to enable South Africa to play a significant role in developing the global EV value chain.³⁷¹
- (e) Declaring that a "...just transition is imperative to ensure inclusive development in the long run". To this end, the TIPS I Report argues that a just transition centres around two key dynamics – (i) ensuring that the workforce, small business and communities who are negatively affected by the phasing out of ICEVs are adequately

³⁷⁰ According to SARS 2023 <https://www.sars.gov.za/customs-and-excise/registration-licensing-and-accreditation/automotive-production-and-development-programme-apdp/> the "...APDP is a production incentive scheme [administered by the ITAC] for the motor industry aimed at promoting production volumes in the specified motor vehicle industry, promoting added value in the automotive-component industry..." and thereby "...creating employment across the automotive value chain. The APDP is legislated in Rebate Item 317.03 of Schedule No. 3 to the *Customs and Excise Act* 91 of 1964. Any motor vehicle manufacturer and/or OEMs importing original equipment components for use in the manufacture of specified motor vehicles must license their special manufacturing warehouse and register for home-use processing under Rebate Item 317.03. Registrants wishing to apply for refunds, where applicable, must comply with the requirements of Refund Items 536, 537 as well as section 75 of the *Customs and Excise Act* provided that they qualify." In essence, the APDP framework consists of the following four key pillars aimed at supporting local manufacturing: (a) customs duty on imported vehicles and components; (b) a rebate mechanism for OEMs, the Vehicle Assembly Allowance (VAA), to be replaced with a Vehicle Assembly Localisation Allowance (VALA) from 2021; (c) a rebate mechanism linked to the supply chain, the Production Incentive (PI); and (d) a cash grant for investment, the Automotive Investment Scheme (AIS), as further explained by Dane, Montmasson-Clair and Moshikaro 2020 <https://www.tips.org.za/research-archive/sustainable-growth/green-economy/item/3876-harnessing-electric-vehicles-for-industrial-development-in-south-africa> 6.

³⁷¹ Dane, Montmasson-Clair and Wright 2019 <https://www.tips.org.za/research-archive/sustainable-growth/green-economy/item/3646-exploring-the-policy-impacts-of-a-transition-to-electric-vehicles-in-south-africa> 15-17.

supported by way of an employment vulnerability assessment combined with so-called resilience plans, and (ii) ensuring that an EV transition brings about benefits to all citizens and not just to focus solely on EV ownership benefits, whereby the main recommendation found in the TIPS I Report speaks of public transportation systems and ancillary offerings embarking on an incremental EV transition.³⁷²

- (f) The TIPS I Report categorically states that an EV transition would bring about major changes to government's revenue streams from fuel levies, calling for a reassessment of its financing models, and further suggests that government should urgently assess the way in which an EV transition could lead to a reduction of expenses in different sectors of government arising from efficiency mechanisms (such as a reduction in government expenses due to improved balance of payments; reduced transport costs and improved health arising from better air quality), to ensure that the net financial position remains balanced.³⁷³

4.5.2.1 2020: The TIPS II Report

Further to the TIPS I Report, and during June 2020, the TIPS (at the instruction of the DTIC and NAAMSA) published a further report on EVs (hereafter referred to as the TIPS II Report) in a more comprehensive and in-depth format.³⁷⁴ The TIPS II Report's core conclusion is that an EV transition in South Africa "...requires supporting the development of the sector, both from a market development and manufacturing perspective, through a coherent policy framework consistent with South Africa's domestic context...".³⁷⁵ This is

³⁷² Dane, Montmasson-Clair and Wright 2019 <https://www.tips.org.za/research-archive/sustainable-growth/green-economy/item/3646-exploring-the-policy-impacts-of-a-transition-to-electric-vehicles-in-south-africa> 17–18.

³⁷³ Dane, Montmasson-Clair and Wright 2019 <https://www.tips.org.za/research-archive/sustainable-growth/green-economy/item/3646-exploring-the-policy-impacts-of-a-transition-to-electric-vehicles-in-south-africa> 18.

³⁷⁴ Dane, Montmasson-Clair and Moshikaro 2020 <https://www.tips.org.za/research-archive/sustainable-growth/green-economy/item/3876-harnessing-electric-vehicles-for-industrial-development-in-south-africa>.

³⁷⁵ Dane, Montmasson-Clair and Moshikaro 2020 <https://www.tips.org.za/research-archive/sustainable-growth/green-economy/item/3876-harnessing-electric-vehicles-for-industrial-development-in-south-africa> 3.

amplified by focusing on four major areas of development by considering how government and private sector support can be provided to the (a) passenger EV offering; (b) the shift to EVs in public transport; (c) local manufacturing of EVs; and (d) local manufacturing of EV components, all of which will be dealt with below. Due to the sheer size of the TIPS II Report, only the most relevant key policy considerations and recommendations (referred to hereinafter as focus areas) have been included in this dissertation.

The first focus area in the TIPS II Report centres around how the passenger EV offering in South Africa can be improved by addressing two interwoven aspects, being the availability of EVs in the local market and the competitiveness of such an offering. The TIPS II Report acknowledges that the main inhibitors to increase EV uptake in South Africa are the high upfront purchasing cost of EVs, the effects of VAT, ad valorem excise duty and import tariffs, limited product availability, high interest rate(s) associated with vehicle finance, range anxiety emanating from a lack of public awareness, the security of constant electricity supply, and a limited understanding of this type of green technology. To address all of these issues, the TIPS II Report stresses the urgent need for a coherent and coordinated policy environment, aimed at improving local EV demand, with key strategies aimed at reducing the upfront price differential of EVs compared to ICEV equivalents, such as (a) reducing the VAT and/or ad valorem excise duties on EVs (either by way of a lower rate compared to ICEVs or by discounting the battery/fuel cell(s) contained in the EV); (b) changing the customs duties to deliver a so-called "level playing field" for EVs originating from the EU; and (c) facilitating access to preferential interest rates for financing an EV through an authorised financial services provider. In conjunction with the aforementioned key strategies, the TIPS II Report further recommends a series of complementary interventions to reduce the capital cost of vehicles and to introduce non-fiscal benefits in favour of EV owners to enhance customer experience, such as tax incentives for company fleets or fringe benefits to innovative financing models, reducing administrative (i.e. licensing) and associated costs (such as lower costs/fees/premiums for insurance, parking and toll fees) for EV users, with non-financial benefits in the form of dedicated lanes, dedicated parking and/or zones for EVs and restrictive measures for

ICEVs such as restricted access, manufacturing or fleet targets. The TIPS II Report does, however, express concern that "...reducing the VAT and/or ad valorem excise duties [in respect of new EV's] would have a meaningful impact [to reduce the high upfront cost of ownership] but would be difficult to justify socially (and therefore politically)... " which could be widely perceived as "...subsidising a product which, initially at least, would be purchased only by high-income earners" resulting in an unjust transition, politically speaking.³⁷⁶

The second focus area in the TIPS II Report explores how the shift to EVs in public road transport can be supported. Given that public road transport in South Africa is responsible for transporting the majority of the population (specifically the low to middle-income households who cannot afford their own private vehicles), the TIPS II Report opines that the electrification of public road transport would "...contribute to an inclusive rollout of e-mobility in the country...", yet acknowledges the key barriers to entry for such an EV transition are the high upfront costs, concerns around scalability (i.e. the capacity to be changed in size or scale), delayed procurement decisions on the part of government, charging electricity tariffs and electricity-grid stability concerns, the lack of an electronic payment system for EV public transport and/or large-scale EV public transport charging, the lack of EV-charging infrastructure and related standardisation, as well as no available suitable electric minibus taxi (hereafter e-MBT). Based on international observations and best practices, the TIPS II Report recommends the implementation of the following four key strategies to support the shift to EVs within the public road transport space: (a) changing the VAT and/or ad valorem excise duties for public transport EVs (as for passenger EVs); (b) promoting the deployment of e-MBTs through so-called Taxi Recapitalisation Programmes; (c) access to preferential interest rates for financing an e-MBT or e-bus through an authorised financial services provider; and (d) ensuring that an EV transition is built into the relevant government procurement programmes.

³⁷⁶ Dane, Montmasson-Clair and Moshikaro 2020 <https://www.tips.org.za/research-archive/sustainable-growth/green-economy/item/3876-harnessing-electric-vehicles-for-industrial-development-in-south-africa> 3–4.

Complementary interventions proposed by the TIPS II Report in this regard include a tariff structure incentivising fleet owners to charge these e-MBTs or e-buses during off-peak periods, leveraging operating licenses for selected routes awarded to private bus companies or MBTs by including conditions that vehicles must be powered by electricity or hydrogen.³⁷⁷ The TIPS II Report concludes that a mix of measures aimed at promoting EVs in public transport would have to carefully manage a balancing act between various costs and benefits (as quoted directly below):³⁷⁸

Reducing the VAT and/or ad valorem excise duty would have a meaningful impact on the upfront cost of vehicles but would come with an opportunity cost, particularly in the current constrained fiscal space. Using the TRP to promote e-MBTs would leverage an existing instrument but would require a partnership with the private sector and come with a much higher price tag than the current programme. Brokering preferential EV finance for e-buses and e-MBT would also have a material impact on the cost of vehicles. This would, however, require a partnership with the financial sector. Public procurement of EVs (by municipalities essentially) would dramatically springboard the rollout of EVs in public transport and could be linked to local manufacturing. This would, however, be limited to pro-active and well-resourced municipalities. More broadly, the rollout of EVs in public transport needs to be done in tandem with an investment in adequate infrastructure (electricity grid and/or hydrogen network). This could be alleviated by providing the lowest possible electricity costs to fleet owners that can charge during off-peak periods, and other measures to shift charging behaviour. Operating licences for selected routes awarded to private bus companies and to MBTs could also be leveraged by including conditions that vehicles be powered by electricity or hydrogen.

The third focus area in the TIPS II Report provides recommendations on how the local manufacturing of EVs can be supported – which ranges from the mining and beneficiation of minerals to the manufacturing of parts and components, to the eventual manufacturing of vehicles. As far as local EV manufacturing is concerned, the TIPS II Report recommends that three key strategies be implemented in the short term: (a) enhancing the level of APDP to set a favourable environment for EV manufacturing investment by OEMs; (b) implementing targets for corporate and government-vehicle fleets to actively trigger

³⁷⁷ Dane, Montmasson-Clair and Moshikaro 2020 <https://www.tips.org.za/research-archive/sustainable-growth/green-economy/item/3876-harnessing-electric-vehicles-for-industrial-development-in-south-africa> 5–6.

³⁷⁸ Dane, Montmasson-Clair and Moshikaro 2020 <https://www.tips.org.za/research-archive/sustainable-growth/green-economy/item/3876-harnessing-electric-vehicles-for-industrial-development-in-south-africa> 6.

market changes; and (c) stimulating demand for EVs, with a focus on public transport. The TIPS II Report also explores other options to trigger local EV manufacturing, but states that "...manufacturing-level targets, increased duty protection and a "bottom-up" approach through the value chain (aimed at leveraging the country's endowment in minerals), do not appear viable in the foreseeable future. Additional support, in the form of development finance, infrastructure provision and small business development assistance, could also be further provided, particularly to attract investment by new OEMs and entrepreneurs".³⁷⁹

Ancillary to the recommendations around local EV manufacturing, the TIPS II Report's fourth and final focus area is on how local manufacturing of EV components can be supported, given the crucial role of the local components industry in South Africa's automotive value chain. The main concern flagged by the TIPS II Report on this topic is that South Africa's top component(s) for exports are ICE-specific and largely exported to EU markets. However, with these major European OEMs and large suppliers looking to expand their own output of EVs and EV components, thereby lowering the demand for ICE components, the TIPS II Report remarks that the adoption of EVs across Europe is expected to greatly affect South Africa's component exports. The two main options identified in the TIPS II Report to advance the manufacturing of EV components in South Africa are (a) to adopt a so-called "top-down" approach through the existing APDP pillars, by modifying Vehicle Assembly Localisation Allowance (hereafter VALA) to include the support of local sourcing for EV components, adjusting the AIS targets to include EV powertrains, manufacturing of LIBs, fuel cells and telematics, and increasing the PI for EV-specific components; and (b) to adopt a so-called "bottom-up" approach to promote value-addition and beneficiation of the local mining of certain minerals through a mineral-beneficiation policy (such as an export tax and/or developmental pricing). However, the TIPS II Report recognises that the success of policy interventions in this regard "...will

³⁷⁹ Dane, Montmasson-Clair and Moshikaro 2020 <https://www.tips.org.za/research-archive/sustainable-growth/green-economy/item/3876-harnessing-electric-vehicles-for-industrial-development-in-south-africa> 6-7.

ultimately depend on the extent to which these policies can influence competitiveness and facilitate the integration of the local industry into the global value chain".³⁸⁰

4.5.3 2021: Auto Green Paper

During May 2021, the DTIC published the (draft) *Auto Green Paper on the Advancement of New Energy Vehicles in South Africa* (hereafter the *Auto Green Paper*).³⁸¹ The purpose of the *Auto Green Paper* is to establish a clear policy foundation that will enable the country to coordinate a long-term strategy that will position South Africa at the forefront of advanced vehicle and vehicle-component manufacturing in the EV space, complemented by a consumption leg to stimulate local consumer interest for EVs, and to increase South Africa's competitiveness in the global transition from ICEVs to EVs.³⁸²

Against the background of the huge world-class automotive manufacturing subsector that already exists in South Africa and the significant contribution thereof to the South African economy, the *Auto Green Paper* sets out five key principles and challenges which it envisages to be addressed in a formal EV policy still to be developed in South Africa, as –

- (a) delicately balancing the support for so-called Completely Knocked-Down (hereafter CKD) vehicles (i.e. vehicles which were completely assembled in a local manufacturing plant) on the one hand, versus Completely Built-Up (hereafter CBU) vehicles imported from other jurisdictions on the other hand, in order to ensure that South Africa caters for a carefully managed and systematic transition to the localisation of EVs and eliminating any risk of merely becoming an import market for EVs;

³⁸⁰ Dane, Montmasson-Clair and Moshikaro 2020 <https://www.tips.org.za/research-archive/sustainable-growth/green-economy/item/3876-harnessing-electric-vehicles-for-industrial-development-in-south-africa> 7-8.

³⁸¹ Gen Not 308 in GG 44606 of 21 May 2021.

³⁸² *Auto Green Paper on the Advance of New Energy Vehicles in South Africa* Gen Not 308 in GG 44606 of 21 May 2021 5; DTIC 2021 <http://www.thedtic.gov.za/government-releases-auto-green-paper-on-the-advancement-of-new-energy-vehicles-in-south-africa/>.

- (b) developing a so-called technology-agnostic framework (i.e. an approach of being unbiased towards the use of different types of technologies) with the aim of keeping South Africa's options for overall development and opportunity open;
- (c) creating a structured approach to the localisation of EV components in South Africa;
- (d) structuring the support for EVs by taking cognisance of so-called "step-change" reductions in battery and other EV costs (i.e. a significant change in manufacturing and production costs resulting in improvement or an increase in production output versus input costs) that will materialise over time, and to formulate a realistic trajectory of the likely timeframes plausible to achieve cost parity between ICEVs and EVs over the next eight to fifteen years; and
- (e) ensuring that the foundations are established to provide the best outcome for securing future exports from South Africa to Europe.³⁸³

In addition to these principles and challenges, the *Auto Green Paper* further earmarks the following five policy considerations:

- (a) The need for the expansion of charging infrastructure in the domestic market to incentivise local motorists to switch to EVs, with specific mention of the fact that the private sector ought to play a key role in enabling this development on commercial terms.
- (b) Recognising that the full value of carbon-reduction efforts in the domestic EV market can only be achieved in tandem with a transition in South Africa's current energy matrix to more renewable energy sources – which means increased renewable energy sources forming part of the national electricity grid to "...ensure that the

³⁸³ *Auto Green Paper on the Advancement of New Energy Vehicles in South Africa* Gen Not 308 in GG 44606 of 21 May 2021 10.

electricity used to charge vehicles does not negate the positive effects on the environment of the electric vehicle technologies".

- (c) Even though South Africa's approach of adopting a technology-agnostic framework surrounding this topic is recognised in the *Auto Green Paper*, it further recognises that certain innovations may provide market-driven advantages to particular technologies, which may require a revised policy approach. In addition, technological development may change the price gap between EVs and ICEVs, with an impact on whether and the extent to which support measures will be required from government.
- (d) It is widely accepted that, subject to technology developments that can reduce costs, the use of fuel-cell technologies based on platinum group metals catalysers can play to South Africa's economic strengths and can potentially provide significant demand for its raw materials.
- (e) The value proposition for South Africa needs to be clearly established in the form of additional jobs, stimulation of local industrial capabilities and expansion of production for new markets. Where changes are required to be made to existing production technologies, appropriate "just-transition" arrangements will need to be put in place.³⁸⁴

Although discussed in brief terms, the *Auto Green Paper* states that supporting the EV offering in South Africa and stimulating greater domestic demand in the immediate future would hinge on the implementation of two tax reform strategies acting as consumer incentives. The first tax reform strategy would entail reducing the VAT and/or ad valorem excise duties on EVs (by means of a lower rate or by discounting the battery/fuel cell(s)

³⁸⁴ *Auto Green Paper on the Advancement of New Energy Vehicles in South Africa* Gen Not 308 in GG 44606 of 21 May 2021 10.

of the vehicle),³⁸⁵ while the second tax reform strategy would be changing local customs duties to level the playing field for EVs originating from the EU region.³⁸⁶

That said, the *Auto Green Paper's* main focus is clearly the stimulation of local manufacturing of EVs and EV components whereby six main EV industrialisation policy options were recommended for consideration:

- (a) Declaring lower or zero-rated customs duty for certain identified unique EV components. As at the date of this dissertation, components imported for CKD assembly attracted a 20 per cent customs duty under the standard Automotive APDP conditions. The *Auto Green Paper* proposes lower or zero duties on EV components in order to reduce the customs amount owed to SARS by OEMs.³⁸⁷
- (b) Deeming the value of imported EV components as local for VALA purposes only.³⁸⁸ The *Auto Green Paper* further proposes that EV generated VALA credits should be used exclusively for the purpose of offsetting a manufacturing OEM's customs account, and that the valuation thereof should be independently verified and audited to ensure global market-related values are being used.
- (c) Ensuring that government's incentives are subject to a so-called sunset-clause time period.³⁸⁹ The *Auto Green Paper* recommends that the application of lower or zero duties and VALA-deemed local content should be implemented for a short period, i.e. for a limited number of years only. During this aforesaid period, the *Auto Green Paper* further recommends the need for the implementation of a dedicated

³⁸⁵ *Auto Green Paper on the Advancement of New Energy Vehicles in South Africa* Gen Not 308 in GG 44606 of 21 May 2021 11.

³⁸⁶ *Auto Green Paper on the Advancement of New Energy Vehicles in South Africa* Gen Not 308 in GG 44606 of 21 May 2021 10.

³⁸⁷ *Auto Green Paper on the Advancement of New Energy Vehicles in South Africa* Gen Not 308 in GG 44606 of 21 May 2021 10-11.

³⁸⁸ VALA is calculated as per Rebate Item 317.04 of the *Customs and Excise Act*, and can be used by a motor vehicle manufacturer to reduce the value owed to SARS for customs duty purposes.

³⁸⁹ According to <https://www.collinsdictionary.com/dictionary/english/sunset-clause> a "sunset clause" refers to a provision of a law that will automatically be terminated after a fixed period unless it is extended by law.

localisation development plan for EV components, and that such policy choices should correspond with the exact timing synchronisation of the period(s) that apply to the application of lower or zero duties and VALA-deemed local content. Upon the conclusion of the aforesaid sunset clause, and assuming the EV component has been localised, a possible form of continuation to support the EV component production in SA, could then be considered.

- (d) Ring-fencing EV support ecosystem(s) or networks. As an alternative to the independent application of options (b) and (c) directly above, *the Auto Green Paper* recommends implementing a combination of elevated VALA and production incentives for EVs with the necessary local content deeming as described. However, the *Auto Green Paper* states that all credits generated in this regard should be used exclusively for offsetting duties on imported EVs for sale in South Africa, or EV-unique components used in CKD assembly. Should any surplus credits then be generated, these surplus credits can be traded with independent importers of EVs only in order to support the demand related to market development of the new EV network in South Africa.
- (e) Strengthening the investment in the local value chain. Whilst options (a) to (c) directly above seek to support OEM incentive positions, the *Auto Green Paper* recognises that these options bring about the possible risk of introducing so-called "cheap" assembly credits into the customs-duty system that is at the heart of the APDP and thereby reducing the demand for South African local content. An alternative, if duty credits are seen as the necessary mechanism, would be to support value-chain investments by re-introducing the concept of Productive Assets Allowance, where OEMs previously earned duty credits for the value of investments made into production, and this should include those by suppliers into the list of unique EV components.³⁹⁰

³⁹⁰ *Auto Green Paper on the Advancement of New Energy Vehicles in South Africa* Gen Not 308 in GG 44606 of 21 May 2021 13-14.

Ancillary to the above key EV industrialisation policy considerations, the *Auto Green Paper* briefly tables other options intended to "...complement a transition of local automotive manufacturing across technologies..." which include non-APDP support policies, such as policies incentivising the use of regional raw materials, especially those used in EV manufacturing value chains, subject to careful modelling; the use of a technology incentive to stimulate competition among OEMs to be the first to produce EVs in South Africa; supporting the transition towards renewable energy supply for manufacturing operations; government support measures to recycle/store water; finding efficiencies in reliable logistics that decreases the effective costs incurred in domestic EV car production and using cleaner fuels to ensure the necessary product mixes of ICE production sales and production are maintained.³⁹¹

The publication of the *Auto Green Paper* requested comments from the public by the end of May 2021, which resulted in extensive feedback supplied by South Africa's major automotive manufacturers. Thereafter, this document was expected to be gazetted and presented to Cabinet for approval in October 2021, which, at the time of finalisation of this dissertation (early 2023), has not occurred as of yet.³⁹² However, it would appear that government's own cost analyses have revealed that possible incentives to further activate the EV transition in South Africa are more likely to focus on EV production and less likely on the subsidisation of local EV ownership (despite much anticipation by the local market).³⁹³ Equally noteworthy, is the current electricity generation-capacity crisis in South Africa (to be outlined in greater detail further below in this chapter),³⁹⁴ which is a major factor that may impede more progressive consumer relief in favour of an EV transition, as

³⁹¹ *Auto Green Paper on the Advancement of New Energy Vehicles in South Africa* Gen Not 308 in GG 44606 of 21 May 2021 14.

³⁹² Christianson 2022 <https://www.tralac.org/blog/article/15521-south-african-policy-needs-to-catch-up-with-electric-vehicles.html>; Daily Maverick 2023 <https://www.dailymaverick.co.za/article/2023-02-20-electric-vehicles-sa-motoring-industry-fights-for-relevance/>.

³⁹³ Furlonger *Business Day* 1.

³⁹⁴ See para 4.7.2 of Chapter 4 at page 109 below.

an increase in EVs would inevitably mean increased pressure on the national electricity grid.³⁹⁵

4.6 Status quo of the South African road transport and automotive sectors vis-à-vis electric vehicles

To understand why the road transport subsector is demarcated as a viable and significant sector for the implementation of climate change mitigation methods, as well as to understand the sheer size and economic contribution of the local automotive manufacturing and sales industry, the following statistics broadly paint the current landscape in South Africa:

- (a) South Africa is considered to have the most developed transport and logistics sector in Sub-Saharan Africa, as is evident in its relatively modern infrastructure and effective trade facilitation.³⁹⁶
- (b) There are more than 12 million vehicles on South Africa's road networks, with the provinces of Gauteng, Kwa-Zulu Natal and the Western Cape responsible for the highest vehicle sales and ownership.³⁹⁷
- (c) As of July 2021, there are more than 347 248 minibuses and 64 848 buses in South Africa, which equates to around 412 096 public transport vehicles, representing 3.54 per cent of the total self-propelled vehicles in the country. This effectively then represents the potential market for public transport electrification.³⁹⁸
- (d) According to the GTS (already discussed in greater detail further hereinabove),³⁹⁹ the average GHG emissions from the South African transport sector (consisting of the road, rail, aviation, and maritime transport subsectors) account for 10.8 per cent

³⁹⁵ Furlonger *Business Day* 1.

³⁹⁶ UCT 2020 <https://www.climate-transparency.org/wp-content/uploads/2020/07/A-Low-Carbon-Transport-Future-for-South-Africa.pdf> 3.

³⁹⁷ GreenCape *Electric Vehicles 2022 Market Intelligence Report* 30.

³⁹⁸ GreenCape *Electric Vehicles 2022 Market Intelligence Report* 50.

³⁹⁹ See para 4.5.1 of Chapter 4 at page 81 above.

of South Africa's total GHG emissions, with road transport being responsible for close to 91.2 per cent of these GHG emissions.⁴⁰⁰

- (e) Aside from environmental concerns surrounding the South African road transport subsector, the other primary challenges associated with this subsector are the unequal and inefficient public transport sector, the migration of freight from rail to road, and the overall underinvestment in road infrastructure and maintenance, as well as the subsequent deterioration of national roads spanning over the course of the most recent decades.⁴⁰¹
- (f) The automotive sector has been and remains a key contributor to South Africa's economic landscape, contributing a substantial 18.7 per cent of value-addition within the domestic manufacturing output for the 2020/21 period.⁴⁰²
- (g) The total market size of the automotive sector in South Africa is estimated to be more than 522 billion ZAR in 2021, with the industry employing around 900 000 skilled, semi-skilled and unskilled employees – including in wholesale, retail trade and vehicle-maintenance industries.⁴⁰³

Despite the large scale and size of the South African road transport and automotive sectors, the use and development of EVs and related infrastructure on domestic level is still considered to be in its infancy.⁴⁰⁴ By way of a brief background, EVs were first reported in South Africa in the 1970s, but the development thereof subsequently stagnated until an EV revival occurred from 2013 onwards.⁴⁰⁵ By the end of 2018 South Africa only had a total of 1 000 EVs imported and approximately 100 public charging stations.⁴⁰⁶ To further

⁴⁰⁰ DOT 2018 https://www.transport.gov.za/documents/11623/89294/Green_Transport_Strategy_2018_2050_onlineversion.pdf. 3.

⁴⁰¹ UCT 2020 <https://www.climate-transparency.org/wp-content/uploads/2020/07/A-Low-Carbon-Transport-Future-for-South-Africa.pdf> 3; BusinessTech 2022 <https://businesstech.co.za/news/government/642791/south-africa-is-slowly-collapsing/>.

⁴⁰² GreenCape *Electric Vehicles 2022 Market Intelligence Report* 25.

⁴⁰³ GreenCape *Electric Vehicles 2022 Market Intelligence Report* 25.

⁴⁰⁴ Moeletsi 2021 *World Electr. Veh.* J 2; Moeletsi and Tongwane 2021 *Scientific African Journal* 14.

⁴⁰⁵ GreenCape *Electric Vehicles 2019 Market Intelligence Report* 13.

⁴⁰⁶ Moeletsi and Tongwane 2021 *Scientific African Journal* 4.

illustrate the most significant and recent developments surrounding EVs and related infrastructure in South Africa up until the finalisation of this dissertation, examples of recent statistical data indicates the following:

- (a) A total of 205 EVs were registered for licensing purposes in South Africa in the first half of 2022.⁴⁰⁷
- (b) New EV sales in South Africa performed in 2022 showing a 431.7 per cent year-on-year increase from 896 units in 2021 to 4 764 units in 2022.⁴⁰⁸
- (c) EVs accounted for around 0.19 per cent of the total new vehicle sales market in South Africa in 2021, although the figure of 896 units sold in 2021 compared to the 324 units sold in 2020 represents a 176 per cent increase in nationwide new vehicle EV sales.⁴⁰⁹
- (d) From February 2021 and onwards BEV registrations overtook PHEV registrations locally.⁴¹⁰
- (e) South Africa has ranked fifth place globally in the ratio of public EV chargers to EVs from 2020 to 2021.⁴¹¹
- (f) The local public charging network which are largely accessible by the general public (excluding chargers installed exclusively for use by certain private businesses) are estimated at more than 250 units (which include both AC and DC chargers), with more private entities investing in and developing the local public charging network.

⁴⁰⁷ NAAMSA 2022 <https://naamsa.net/electric-vehicles-will-change-the-face-of-fuel-stations/>.

⁴⁰⁸ Daily Maverick 2023 <https://www.dailymaverick.co.za/article/2023-02-20-electric-vehicles-sa-motoring-industry-fights-for-relevance/>.

⁴⁰⁹ Frost *Business Day Earth* 2022 194.

⁴¹⁰ GreenCape *Electric Vehicles 2022 Market Intelligence Report 7*.

⁴¹¹ GreenCape *Electric Vehicles 2022 Market Intelligence Report 7*. Only Korea, Chile, Mexico, Indonesia and the Netherlands have more chargers per EV than SA, according to the IEA Global EV Outlook 2021 Report.

This occurs especially in South Africa's main commercial hubs and metropolitan areas and along the major connecting highways.⁴¹²

- (g) Most of the charging stations installed around South Africa are found in the country's main commercial hub – the province of Gauteng, which largely consists of AC charging stations that can take up to six hours to complete a full charge. In the metropolitan cities of Cape Town, Johannesburg and Durban, EV drivers would more than likely be able to locate a charge point within less than 20km from where they are situated.⁴¹³
- (h) It is common cause that mainly the private sector has been driving and funding the roll-out of public charging infrastructure in South Africa with limited support from the government. Studies have revealed AC chargers are expected to hold a significant market share with an estimated increase in demand from the residential sector (such as multi-dwelling units), and to a larger extent, the retail sector (such as shopping complexes and vehicle dealerships) and the fuel (filling stations) sector. These studies further reveal that the potential growth for DC chargers is also expected to increase over time, driven by the growth of commercial vehicles for use in the public transport segment and a limited group of consumers looking to travel further than 400km at a time.⁴¹⁴
- (i) Recent research studies show that the four main drivers accelerating the demand for EVs in South Africa (despite the multiple barriers of entry discussed throughout this dissertation)⁴¹⁵ are (i) an increase in climate conscious consumers who undergo behavioural changes towards a need to partake in climate change mitigation mechanisms or programmes and with a heightened environmental awareness; (ii) rising fuel costs and associated market volatility; (iii) energy storage innovations and pricing changes seeing the overall cost of EVs reduce with the aim of achieving price

⁴¹² ITWeb 2022 <https://www.itweb.co.za/content/G98YdMLGxXw7X2PD>.

⁴¹³ GreenCape *Electric Vehicles 2022 Market Intelligence Report* 51.

⁴¹⁴ GreenCape *Electric Vehicles 2022 Market Intelligence Report* 57.

⁴¹⁵ See for example para 4.7 of Chapter 4 from page 108 onwards below.

parity by the middle of the this decade; and (iv) reduced range anxiety of prospective EV buyers due to heightened awareness campaigns and the expansion of existing EV public charging infrastructure networks.⁴¹⁶

4.7 Unique considerations that may be impeding regulatory (law and policy) regime in support of EVs in South Africa

For purposes of this chapter and the entire research study, consideration must be given to those main factors that may be impeding regulatory (law and policy) regime in support of EVs in South Africa. The author has earmarked two prominent factors in this regard, being South Africa's socio-economic challenges on the one hand and its unique energy matrix and the associated challenges on the other hand.

4.7.1 South Africa's socio-economic challenges

Even though South Africa has publicly declared its stance on climate change imperatives, as a developing country it faces major socio-economic challenges, with its overriding priorities in policy decision-making aimed at eliminating poverty and eradicating inequality, coupled with overall low economic growth over the last decade.⁴¹⁷ To eliminate poverty and eradicate inequality "...requires addressing major challenges in creating decent employment which in turn requires sustainable economic development, improving basic education, health and social welfare and many other basic needs such as access to food, shelter and modern energy services".⁴¹⁸ This means that in the short term (or at least until 2025) South Africa will face significant rigidity not only in its economy, but also any policy decisions towards a low carbon transition (whether on the EV front or

⁴¹⁶ GreenCape *Electric Vehicles 2022 Market Intelligence Report* 61–65.

⁴¹⁷ According to Moeletsi and Tongwane 2021 *Scientific African Journal* 14 "...South Africa has a highly unequal society that is skewed to the poor. About half of the population are considered chronically poor, 4% are rich, the middle class is growing but remain small in size (20%), and a quarter of the population are frequently in and out of poverty. Generally, most old technology vehicles in the country are purchased by the lower income brackets...".

⁴¹⁸ UNFCCC *South Africa's Intended Nationally Determined Contribution (INDC)* at 2; UNFCCC *South Africa First National Determined Contribution under the Paris Agreement* at 3.

otherwise), as any such efforts must address government's overriding priority to address poverty and inequality.⁴¹⁹

Furthermore, EV ownership by the majority of the South African adult population, frequency of vehicle trips and occupancy patterns are highly influenced by an array of socio-economic considerations such as (a) the high cost of capital of EVs and battery components; (b) social factors which consist of lifestyle practices, income levels, household size and literacy levels; as well as (c) external factors such as EV-charging infrastructure availability and accessibility.⁴²⁰ These factors simply make EVs unaffordable and inaccessible for the majority of South Africa's working class, which means EVs and the use thereof can only, based on its current positioning in the South African market, be afforded by the wealthiest citizens, who make up a miniscule portion of the population.⁴²¹

4.7.2 South Africa's unique energy matrix and the associated challenges

South Africa's electricity supply is currently dominated by coal-fired power generation, with these stations having an installed capacity of 38.7 gigawatts (hereafter GW),⁴²² with the additional coal unit(s) at some power stations expected to be commissioned and added to the existing electricity grid in the near future. These stations are primarily owned and operated by Eskom, which supplies close to 95 per cent of South Africa's total electricity demand, and is responsible for both electricity generation and transmission (and partly for distribution in some areas). The remaining 5 per cent of nationwide electricity demand is met through local municipalities, imports and independent power producers.⁴²³ At present, the four major sources of primary energy supply in South Africa are (a) coal (responsible for the majority of approximately 69 per cent of national electricity supply), (b) crude oil (responsible for approximately 14 per cent of national

⁴¹⁹ UNFCCC *South Africa's Intended Nationally Determined Contribution (INDC)* at 2; UNFCCC *South Africa First National Determined Contribution under the Paris Agreement* at 30.

⁴²⁰ Moeletsi and Tongwane 2021 *Scientific African Journal* 13.

⁴²¹ Moeletsi and Tongwane 2021 *Scientific African Journal* 14.

⁴²² A gigawatt is a unit of measurement of electrical power. For some context, a gigawatt is equal to one billion watts.

⁴²³ GreenCape *2022 Energy Services Market Intelligence Report* 15.

electricity supply), (c) nuclear (responsible for approximately 6 per cent of national electricity supply) and (d) the remaining 11 per cent stemming from a variety of renewable energy sources and waste - such as hydro, solar, wind and biogas.⁴²⁴

Against the aforesaid background, and although the adoption of EVs is projected to decrease annual liquid fuel demand by 40 per cent by 2050,⁴²⁵ South Africa has been experiencing and continues to face significant energy-supply constraints that necessitate an intensive national load-shedding programme⁴²⁶ which directly hampers local economic development.⁴²⁷ In South Africa load shedding has been applied by Eskom in excess of ten years and is still an ongoing occurrence as at the date of finalisation of this dissertation.⁴²⁸ This factor alone is of grave concern for purposes of any discussion surrounding an EV transition in South Africa for two significant reasons. Firstly, between 2022 and 2023 South Africa has experienced the worst year on record for load shedding to date, as Eskom's coal fleet continues to deteriorate even further, and with load shedding expected to worsen before seeing any form of substantive improvement on Eskom's side.⁴²⁹ Secondly, studies show that EVs would inevitably place more demands on the national electricity grid, which (in its current state) is already beyond capacity – especially if medium to large-scale charging activities are uncoordinated.⁴³⁰ Of a further

⁴²⁴ Moeletsi and Tongwane 2021 *Scientific African Journal* 7.

⁴²⁵ Moeletsi and Tongwane 2021 *Scientific African Journal* 7.

⁴²⁶ When the demand for electricity exceeds the available supply, planned supply interruptions may have to be carried out. This is called load shedding - a controlled way of rotating the available electricity between all Eskom customers. Load shedding has also been described by the Western Cape Government 2019 https://www.westerncape.gov.za/110green/files/atoms/files/Load%20Shedding%20FAQ%202019_FINAL_2.pdf as "... an energy utility's method of reducing demand on the energy generation system by temporarily switching off the distribution of energy to certain geographical areas. Load shedding is only applied when the system has insufficient capacity to fulfil all energy demands and is undertaken to optimally manage the energy that is still available in order to maintain system stability. It is undertaken on a rotational basis to distribute the impacts. If load shedding is required, Eskom's National Control Centre instructs its stakeholders (i.e. the municipalities and customers that it sells electricity to) on the stage of load shedding required. The duration of load shedding will depend on the specific supplier (Eskom or municipality), region and circumstances".

⁴²⁷ UNFCCC *South Africa's Intended Nationally Determined Contribution (INDC)* at 2.

⁴²⁸ GreenCape *2022 Energy Services Market Intelligence Report* 16.

⁴²⁹ BusinessTech 2022 <https://businesstech.co.za/news/energy/630667/south-africas-horror-year-of-load-shedding-heres-how-it-compares/>.

⁴³⁰ Moeletsi and Tongwane 2021 *Scientific African Journal* 7; GreenCape *Electric Vehicles 2022 Market Intelligence Report* 53. For example, a 2015 study done by the CSIR projected a gradual increase in

concern is the inevitability that a number of South Africa's existing coal-fired power stations will also be retired between 2030 and 2050, creating the real need for large investments in additional generation capacity (whether it being additional coal-fired electricity capacity or from renewable sources).⁴³¹

To illustrate, most EV charging in other countries typically occurs at night and during the weekends, when passenger vehicles are often not used and when most EV drivers are at home and/or sleeping. However, EVs used for public transport would need to charge during the day on an intermittent basis and even during peak demand periods, which could severely strain the national electricity grid.⁴³² At present, charging around four million EVs can exceed the available national electricity supply, which means that EV charging would require an additional 10 to 20 GW of electricity to be added to the existing electricity grid, between 2030 and 2045.⁴³³

These realities translate into the deduction that any move towards an EV transition in South Africa (as a climate change mitigation measure) demands that future electricity generation be more than 60 per cent renewable for EVs to be environmentally sustainable. This means that the electricity grid must therefore be largely decarbonised with renewable energy alternatives before EVs can seamlessly integrate with the existing road transport demand and ultimately be regarded as a credible climate change mitigation benefit.⁴³⁴

the uptake of EVs in the metropolitan city of Cape Town. According to this study, EVs are projected to account for almost half of all vehicles in Cape Town by 2050, and further found that this projected uptake in EVs would lead to an 11 per cent increase in the total energy consumption in the City of Cape Town metropolitan area 2050.

⁴³¹ Department of Forestry, Fisheries and the Environment 2020 dffe.gov.za/sites/default/files/docs/2020lowemission_developmentstrategy.pdf 9.

⁴³² GreenCape *Electric Vehicles 2022 Market Intelligence Report* 55.

⁴³³ Ahjum *et al* 2018 *Journal of Energy in South Africa* 45.

⁴³⁴ Moeletsi and Tongwane 2021 *Scientific African Journal* 7; TIPS 2022 <https://www.tips.org.za/policy-briefs/item/4323-towards-an-inclusive-rollout-of-electric-vehicles-in-south-africa> 4; UCT 2020 <https://www.climate Transparency.org/wpcontent/uploads/2020/07/A-Low-Carbon-Transport-Future-for-SouthAfrica.pdf> 6, 19; Liu and Hildebrandt 2012 *S Afr J Sc* 1,6; Moeletsi and Tongwane 2020 *Atmosphere* 12; Dane 2014 https://www.africaportal.org/documents/10875/13-Dane-Electric_vehicles.pdf 11,12,33; EVIA 2016 <https://www.evia.org.za/EVIA2016Booklet.pdf> 16, 31, 38, 55.

4.8 Conclusion

This chapter set out to address the fourth research objective, namely, to examine the existing South African law and policy framework and perspectives on climate change mitigation in the broader sense; more specifically the position in respect of the local development and use of EVs and related infrastructure in South Africa.⁴³⁵ In reaching this aforementioned objective, the foregoing consideration of sources has led the author to the following summation:

- (a) Section 24(b) of the *Constitution*, read together with the national environmental management principles in the *NEMA*, specifically identified and earmarked herein, arguably serves as the mandate, foundation and source of interpretation in guiding any environmental legislation and policy reform in South Africa (including any proposed multifaceted EV policy that may come to fruition in future).⁴³⁶ These principles ought to steer government's actions when aiming to protect the environment; play a structural role in its protection; aim to strike a balance between economic development, the applicable socio-economic factors at play and environmental protection; share many features with internationally accepted principles on this subject matter; and place a direct responsibility on government to address environmental concerns through legislation and other reasonable measures (such as integrated policies, programmes and initiatives).⁴³⁷
- (b) By identifying and earmarking the development and use of greener transport technologies, such as EVs, as an express and tangible climate change mitigation activity in South Africa's first NDC, the window of opportunity has been created for such activity to serve as a CDM in favour of South Africa within the international

⁴³⁵ See para 1.4 of Chapter 1 at page 9 and para 4.1 of Chapter 4 at page 62 above.

⁴³⁶ See para 4.2 of Chapter 4 from page 63 above.

⁴³⁷ See para 4.2 of Chapter 4 from page 63 above.

climate change community, with both local and international benefits attached thereto.⁴³⁸

- (c) South Africa has established an elaborate climate change governance system with policies across multiple sectors and governmental departments, most of which demonstrate a gradual progression towards a more aggressive climate change mitigation approach over the course of many years, and with specific recognition that an EV transition could play an important role in this context.⁴³⁹ That said, and until most recently, the use and development of EVs and related infrastructure has merely been earmarked in brief terms in almost all local climate change and energy policies, with little to no detail on how such an activity is to be integrated in the South African landscape in order to ultimately achieve its international climate change mitigation objectives. Equally important, the CDM principle has also been recognised and mentioned in some of these policies, but without detail and specific focus areas (such as designated EV programmes) on how to actively unlock the benefits which the CDM principle can hold for South Africa in achieving its climate change objectives.⁴⁴⁰
- (d) There has been some incremental developments and discussions surrounding possible support to be provided by government towards the use and development of EVs and related infrastructure. With the publication of the GTS, the widespread adoption of EVs through a number of proposed initiatives and the implementation of the strategies suggested therein introduced greater detail in formulating a comprehensive EV policy to facilitate the EV transition in South Africa.⁴⁴¹ This was followed by material proposals made in the TIPS I and II Reports, which contain substantive findings and recommendations on what the extent and nature of a local EV policy ought to entail.⁴⁴² Finally, the *Auto Green Paper* symbolises a large step in

⁴³⁸ See para 4.3 of Chapter 4 from page 69 above.

⁴³⁹ This becomes evident from para 4.4 of Chapter 4 above (as set out in chronological form).

⁴⁴⁰ See paras 4.4.1, 4.4.2 and 4.4.3 of Chapter 4 above.

⁴⁴¹ See para 4.5.1 of Chapter 4 from page 81 above.

⁴⁴² See para 4.5.2 of Chapter 4 from page 86 above.

respect of a local EV transition with a view to kickstart local production of EVs and related components, and to stimulate local demand of EVs and related infrastructure.⁴⁴³ That said, the transition of the *Auto Green Paper* to a policy white paper is yet to occur as at the date of finalisation of this dissertation.

- (e) Despite the scale and size of the South African road transport and automotive landscapes, the use and development of EVs and related infrastructure on domestic level is still considered to be in its infancy.⁴⁴⁴ As at the date of finalisation of this dissertation, there is also no coherent, integrated and/or consolidated local EV policy to address the main issues surrounding EVs (being the need for support to stimulate the uptake in local demand for EVs, specifically to ensure large private EV ownership and use of EVs within the public transport subsector, as well as support for local EV manufacturing and EV-components manufacturing) and the development of related infrastructure.
- (f) The two major factors earmarked by the author, which may be impeding regulatory (law and policy) regime in support of EVs in South Africa, are the country's unique socio-economic challenges as well as its unique energy matrix and the associated challenges in that regard.⁴⁴⁵ It has become common cause that the awareness surrounding these challenges must form an integral part of the planning and formulation of a comprehensive EV policy and cannot be ignored. Both research and statistical data on the one hand and political pressure on the other now dictate that any policy decision(s) or drafting and implementation of policies and/or legislation aiming to facilitate a low carbon transition in South Africa (whether on the EV front or otherwise) must consider and substantively address government's overriding priority to address poverty and inequality.⁴⁴⁶ Moreover, and given South Africa's energy matrix (being largely coal-based) and the current major constraints on the

⁴⁴³ See para 4.5.3 of Chapter 4 from page 98 above.

⁴⁴⁴ See para 4.6 of Chapter 4 from page 104 above.

⁴⁴⁵ See para 4.7 of Chapter 4 herein above from page 108 onwards.

⁴⁴⁶ See para 4.7.1 of Chapter 4 herein above from page 108 onwards.

national electricity grid, the decarbonisation thereof with renewable energy alternatives has become vital in order for EVs to integrate seamlessly with the existing road transport demand and ultimately be regarded as a credible climate change mitigation benefit(s) in South Africa.⁴⁴⁷

With the above in mind, the author is able to consider and analyse the position in South Africa alongside the previous chapters of this dissertation in order to answer the main research aim in the final chapter to follow.

⁴⁴⁷ See para 4.7.2 of Chapter 4 herein above from page 109 onwards.

Chapter 5: Conclusions and recommendations

The purpose of this dissertation was to determine the nature and extent of the regulatory framework required to facilitate the development and use of EVs and related infrastructure in South Africa to address its international climate change mitigation commitments.⁴⁴⁸

In addressing the research aim, this dissertation was accordingly divided into five chapters, whereby Chapters 1 to 4 covered the first four broad research objectives of the overall research aim of this study,⁴⁴⁹ and whereby the fifth and final broad research objective is dealt with further hereinbelow.

5.1 Conclusions

5.1.1 Research objective one: Background and contextualisation

Chapter 1 of this dissertation set out to contextualise the background and considerations giving rise to the need to determine the regulatory framework required in South Africa for the implementation and use of EVs as a climate change mitigation measure.⁴⁵⁰ In this regard, the author has reached the following conclusion(s):

- (a) South Africa is a major GHG emitter, especially its road transport subsector.
- (b) EVs are largely considered to be environmentally friendly technology designed to reduce GHG emissions, provided that supply-chain emissions can be addressed adequately and that the charging thereof mainly emanates from renewable sources.
- (c) Whether or not the global roll-out of EVs can lower GHG emissions throughout the supply chain thereof, there is a clear global impetus towards e-mobility which has become inevitable; requiring South Africa to follow suit.⁴⁵¹

⁴⁴⁸ See para 1.4 of Chapter 1 at page 9 above.

⁴⁴⁹ See Chapters 1 – 4 above.

⁴⁵⁰ See para 1.4 of Chapter 1 at page 9 above.

⁴⁵¹ See para 1.1 of Chapter 1 from page 1 above onwards.

5.1.2 Research objective two: International climate change mitigation framework and perspectives

Chapter 2 of this dissertation set out to examine the applicable international legal framework on climate change mitigation which applies directly to South Africa. More specifically, to address the most relevant international climate change mitigation objectives and/or principles in the context of the research topic.⁴⁵² In this regard, the author has reached the following conclusion(s):

- (a) The development of the applicable international climate change law instruments displays a clear pathway towards more tangible mechanisms for countries, including South Africa.
- (b) The current public international law framework on this topic creates room for an outcome-based policy framework for South Africa to give effect to its respective climate change commitments in a pragmatic and systematic fashion.
- (c) In formulating an EV-policy framework in South Africa, the relevant public international law instruments, and the climate change mitigation objectives and/or principles identified by the author herein, serve as the foundation in guiding domestic policy and legislation on this topic.
- (d) However, binding obligations on the part of the South African public and private sectors to allow South Africa to achieve its international climate change mitigation objectives only arise once the aforesaid has been incorporated into domestic policies and/or legislation in terms of section 231 of the *Constitution*.⁴⁵³

5.1.3 Research objective three: The policy framework and perspectives on electric vehicles of selected foreign jurisdictions

⁴⁵² See para 1.4 of Chapter 1 at page 9 and para 2.1 of Chapter 2 at page 18 above.

⁴⁵³ See para 2.5 of Chapter 2 at page 35 above.

Chapter 3 of this dissertation set out to examine the policy framework and perspectives on the development and use of EVs and related infrastructure in Norway and the UK respectively, with a view to draw valuable lessons for possible application in South Africa.⁴⁵⁴ In this regard, the author has reached the following conclusion(s):

- (a) Recognising and earmarking the use and development of EVs and related infrastructure within a country's NDC appears to enhance the development of most leading countries' independent national EV policy.
- (b) Ensuring alignment between a country's NDC and its local EV policy framework is imperative.
- (c) Fiscal and behaviour-related incentives appear to be a key driver for overall EV uptake among EV consumers in leading countries.
- (d) Providing residential homeowners and local businesses with financial assistance and mechanisms through grant schemes, subsidies, and rebates, in respect of the installation of EV charging points, could further drive EV uptake.
- (e) Bold political will and commitment to reduce GHG emissions and to move towards a progressive EV transition, coupled with governmental investment, appear to play a significant role in the remarkable EV uptake in both Norway and the UK.
- (f) In order to alleviate the pressure on local fiscal revenue, considerable potential arguably exists in establishing more CDM emission-reduction projects in South Africa (including EV related projects) to access funding for such projects as a result of the use of CERs.

⁴⁵⁴ See para 1.4 of Chapter 1 at page 9 and para 3.1 of Chapter 3 at page 38 above.

- (g) Sufficient grid capacity and renewable energy sources are key components in determining whether an EV transition in a particular country is, in fact, assisting with the overall reduction of GHG emissions.
- (h) The respective approaches adopted by Norway and the UK appear to be neither fool proof nor free from criticism for a variety of reasons, and therefore cannot be applied in a similar fashion in South Africa. Moreover, the geographical, political, economic, and socio-economic composition, as well as the levels of industrialisation of these countries differ vastly from the South African landscape.⁴⁵⁵

5.1.4 Research objective four: The existing South African law and policy framework and perspectives on electric vehicles and related infrastructure

Chapter 4 of this dissertation set out to examine the existing South African law and policy framework and perspectives on climate change mitigation in the broader sense, but more specifically in respect of the local development and use of EVs and related infrastructure.⁴⁵⁶

In this regard, the author has reached the following conclusion(s):

- (a) Section 24(b) of the *Constitution*, read together with the national environmental management principles in the *NEMA* specifically earmarked herein, arguably serves as the mandate, foundation, and source of interpretation in guiding an EV policy reform in South Africa.
- (b) By identifying and earmarking the development and use of greener transport technologies, such as EVs, as a tangible climate change mitigation activity in South Africa's first NDC, the window of opportunity has been created for such activity to serve as a CDM in favour of South Africa within the international climate change community.

⁴⁵⁵ See para 3.4 of Chapter 3 at page 58 above.

⁴⁵⁶ See para 1.4 of Chapter 1 at page 9 and para 4.1 of Chapter 4 at page 62 above.

- (c) South Africa has established an elaborate climate change governance system, which demonstrates a gradual progression towards a more aggressive climate change mitigation approach, and with specific recognition that an EV transition could play an important role in this regard.
- (d) There have been some incremental developments surrounding possible support to be provided by government for an EV transition, but there has been no definitive roll-out thereof as of yet.
- (e) Despite the large scale and size of the South African road transport and automotive sectors, the use and development of EVs and related infrastructure on domestic level is still considered to be in its infancy.
- (f) As at the date of finalisation of this dissertation, there is also no coherent, integrated and/or consolidated local EV policy to address the main issues surrounding EVs and the development of related infrastructure.
- (g) The two major factors earmarked by the author as obstacles to the EV transition in South Africa are (i) the country's unique socio-economic challenges, as well as (ii) its unique energy matrix and associated challenges.⁴⁵⁷

5.1.5 Research objective five: Identifying the areas of potential improvement/development in the existing South African EV policy and legal framework

By addressing the first four research objectives, it became possible to shift the focus to the fifth research objective – identifying the areas of potential improvement/development in the existing South African policy and legal framework on EVs when compared to the respective positions adopted in Norway and the UK (both in terms of laws and policies), and thereafter providing practical recommendations on how the South African regulatory landscape on EVs can be adapted to assist South Africa in meeting its international climate

⁴⁵⁷ See para 4.8 of Chapter 4 at page 112 above.

change mitigation commitments.⁴⁵⁸ The areas of potential improvement/development identified by the author, which ought to form part of the regulation of EVs in South African (and accordingly be incorporated in the associated local law and policy reform), are as follows:

- (a) The existing South African EV policy is still in its infancy, with limited tangible deliverables and/or forms of relief to stimulate local EV sales, manufacturing and/or EV-charging infrastructure networks.
- (b) The absence/lack of –
 - (i) support for the EV industry and consumers in the form of incentives to increase EV sales and use, whether fiscal-related or non-fiscal/behaviour-related;
 - (ii) medium to large-scale local manufacturing of EVs and EV components;
 - (iii) special or designated production rebates or schemes to incentivise EV or EV-component manufacturing;
 - (iv) ring-fencing or special allocation of government funds to develop, implement and/or subsidise designated EV projects, whether on national, provincial, or local governmental level;
 - (v) grant schemes or rebates to support the installation of EV chargers in South African homes, local workplaces and on local streets or highways;
 - (vi) designated skills development programmes, tertiary courses or training programmes accredited by the Department of Higher Education and Training (hereafter the DHET), coupled with special bursaries or other study incentives, specifically in the field of cleaner technologies such as EV and EV

⁴⁵⁸ See para 1.4 of Chapter 1 on page 9 above.

component development, EV aftersales services and/or EV-charging infrastructure development and maintenance; and

- (vii) wide-scale awareness programmes, initiatives, and campaigns to enhance the awareness of EV use, sales, manufacturing and charging.
- (c) Designated EV projects have been earmarked and registered as CDM projects with the CDM EB, which has been identified as a possible way in obtaining additional funding for local EV projects.
- (d) The majority of EV charging units in South Africa are reliant on the current coal-driven electricity grid, whereas only an insignificant amount of EV charging units utilise renewable energy alternatives.
- (e) EV-charging infrastructure networks are primarily funded, developed, installed, maintained, upgraded, and expanded on by the private sector which caters for a limited pool of targeted consumers.

5.2 Recommendations

The author has formulated the following practical recommendations, by incorporating some of the lessons learned from the selected foreign jurisdictions, on how the South African regulatory landscape (both in terms of law and policy reform) on EVs can broadly be adapted to enable government to ultimately move toward achieving its international climate change mitigation commitments.

5.2.1 Multifaceted EV policy with pragmatic deliverables

South Africa requires a comprehensive, multifaceted, and pragmatic EV policy, spread across multiple spheres and ministries within government, to ultimately address three overarching objectives namely poverty, unemployment and inequality whilst aiming to strike a balance between economic development, socio-economic development, and

environmental protection. In this regard, a multifaceted EV policy ought to address three broad categories as discussed below.

5.2.1.1 Recommended policy framework considerations for EV sales in South Africa

As far as EV sales in South Africa is concerned, it is recommended that a multifaceted EV policy incorporates the following short to medium-term objectives (i.e. within one to five years of implementation):

- (a) Adjustments to the importation and pricing structures of EVs compared to ICEVs to level the playing field by (i) adjusting the customs duties for EVs originating from the EU to be the same or slightly lower than that of its ICEV equivalents; (ii) reducing the VAT and/or ad valorem excise duties for EVs; and (iii) facilitating preferential interest rates for financing EVs by customers through authorised financial services providers.
- (b) Fiscal incentives or benefits for company fleets and public transport schemes (especially the minibus taxi industry) who invest in EV equivalents.
- (c) Additional incentives for both EV users and owners, such as reduced licensing and registration fees, reduced public parking fees, reduced toll fees and reduced insurance premiums.
- (d) Behavioural incentives in favour of EV users in South Africa would require the co-operation and buy-in of the private sector, and could include providing dedicated parking and/or zones for EV users at commercial office parks, shopping centres, airports, filling stations and governmental offices.
- (e) The roll-out of cost-effective awareness campaigns with the assistance of OEMs and other role players within the road transport sector.

5.2.1.2 Recommended policy framework considerations for EV and EV-component manufacturing in South Africa

As far as EV manufacturing in South Africa is concerned, it is recommended that a multifaceted EV policy incorporates the following short to medium-term objectives (i.e. within one to five years of implementation):⁴⁵⁹

- (a) Declaring lower or zero-rated customs duty for certain identified EV components.
- (b) Deeming the value of imported EV components as local VALA, and further declaring that EV generated VALA credits should be used exclusively for the purpose of offsetting a manufacturing OEM's customs account (coupled with independent verification and audits to ensure that global market-related values were used in the valuation process).
- (c) Structuring and implementing a dedicated localised development plan for EV components, and to further ensure that the aforesaid plan synchronises with the application of lower or zero duties and VALA-deemed local content.
- (d) Alternatively to the above measures, ring-fencing EV support ecosystem(s). This means implementing a combination of elevated VALA and production incentives for EVs. The credits generated in this regard must, however, exclusively be used for offsetting duties on imported EVs for sale in South Africa, or EV-unique components used in the CKD assembly process.
- (e) Supporting value-chain investments by way of reintroducing the concept of APDP.
- (f) Formulating non-APDP support policies, such as policies incentivising the use of regional raw materials (especially those used in EV manufacturing value chains); the

⁴⁵⁹ Most of these recommendations mirror the tangible objectives already identified in the TIPS I & II reports and the *Auto Green Paper*. However, if the objectives outlined in the *Auto Green Paper* are to be implemented, it would be critical for the DTIC and industry role players to attempt to fast track this process by way of pro-active efforts.

use of a technology incentive to stimulate competition among OEMs; supporting the transition towards renewable energy supply for manufacturing operations; government support measures to recycle/store water; and endorsed skills development programmes and/or schemes within the EV value chain.

- (g) Creating a formal process to review and assess these measures on an annual basis in order to ensure that progress is monitored effectively, and making provision for a process to amend, alter and/or terminate these measures (depending on the results of an annual review).

5.2.1.3 Recommended policy framework considerations for EV-charging infrastructure development in South Africa

As far as EV-infrastructure development in South Africa is concerned, it is recommended that a multifaceted EV policy incorporates the following short to medium term-objectives (i.e. within one to five years of implementation):

- (a) Focused and demarcated investment in the erection of public charging stations by public-private partnerships in identified commercial hubs and along major connecting highways (based on a needs and cost analysis, as well as with the buy-in, co-operation and assistance of the public sector).
- (b) Declaring formal and defined fiscal benefits for individuals and local businesses who install private and public charging units, and further distinguishing between charging that stems from renewal energy sources on the one hand, and non-renewable sources on the other, whereby a preferential or increased fiscal benefit is awarded to households or businesses who installed the former.
- (c) Commencing a pragmatic skills-development plan to expand and develop the skill set of the considerable workforce employed at existing fuel service stations across the country.

- (d) Creating a formal process to review and assess these measures on an annual basis in order to ensure that progress is monitored effectively and making provision for a process to amend, alter and/or terminate these measures (depending on the results of an annual review).

It is further recommended that the installation of EV-charging infrastructure networks ought to slightly exceed the potential increase in local EV demand and sales to ultimately strike a balance between circumventing a sudden and unexpected shortage of charging infrastructure in commercial hubs on the one hand; yet to avoid the large-scale installation of unused EV chargers disproportionate with overall EV uptake on the other hand.

5.2.2 Obtaining recognition and funding for specified EV projects or initiatives as CDM projects

It is further recommended that the South African government (specifically through the structures and resources of the DFFE) identify, earmark, and register specific EV related programmes and/or initiatives with the CDM EB, as officially recognised CDM projects to ultimately gain access to funding for these projects and to assist in the aim of South Africa possibly meeting its commitments in terms of its own NDC. This strategy will serve as an additional method to obtain adequate funding, which ought to run parallel with the current objectives to access funding under the *Just Energy Transition* (which is, in any event, not EV focused, but rather on the decarbonisation of South Africa's electricity grid).

An example of such a project, with a specific focus on establishing projects in main commercial hubs such as Johannesburg, Pretoria, Cape Town, and Durban, would be the installation of public infrastructure networks in designated areas, coupled with apt renewable energy sources (such as solar or wind power) depending on weather patterns, logistics and geographical locations.

5.2.3 Unique local factors as overarching considerations

There are unique local factors which must serve as overarching considerations when formulating, finalising, and implementing a multifaceted EV policy in South Africa:

- (a) South Africa is simply not in a position to adopt a radical and highly fiscal driven EV policy similar to other countries, especially when compared to the EV policy reform of developed countries such as Norway and the UK, mainly because of its unique socio-economic considerations and current energy matrix. Therefore, it is recommended that a systematic, gradual, and flexible approach should be adopted to avoid the formulation and implementation of an unrealistic and ineffective EV policy framework.
- (b) To ensure cohesion and cooperative environmental governance amongst various governmental departments and ministries when formulating and drafting legislation and/or policies surrounding this research topic, the buy-in, commitment and cooperation of, *inter alia*, the following governmental departments and institutions – DFFE, DTIC, DOT, DMRE, DHET and SARS – are vital.

If these aforementioned recommendations are explored, expanded on and further developed, the implementation thereof could facilitate the development and use of EVs and related infrastructure in South Africa in order to ultimately assist South Africa in addressing its international climate change mitigation commitments in a realistic and systematic fashion. A gradual EV transition in South Africa is certainly not impossible, but requires a multifaceted and realistic EV policy which is fit for purpose for the South African economic, socio-economic and environmental landscapes.

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