ELECTRIC MOBILITY TRANSITION & LOCALISATION

Towards Unlocking the NEV Value Chain for Africa

SITUATIONAL AND BASELINE ANALYSIS REPORT SERIES REPORT 6: TRADE, POLICY, CONFORMITY



AIH GROUP

IDC
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1. INTRODUCTION

New Energy Vehicles (NEV) are seen as being an important step towards achieving global climate change objectives. This study has undertaken a comprehensive review of the relevant literature as it relates to the current NEV industry globally, for South Africa, and the Rest of Africa (RoA), whilst identifying key role players and stakeholders, and highlighting current and emerging gaps, and opportunities, in the NEV market.

In order to evaluate the NEV segments, markets and policy along the value chain, the literature review has been structured to provide a comprehensive overview of the most important NEV sectors in a logical framework as follows:

1. **NEV Landscape Overview:** New Energy Vehicles (NEVs) are vehicles that are powered by electricity or fuels made from non-fossil fuel sources. In May 2021, the dtic released the green paper on NEVs[1] for public comment and the intention was clear that the South African Automotive Value Chain was ready to transition from 'Internal Combustion Engines' (ICEs) to NEVs. The Just Energy Transition Implementation Plan (JET IP) provides a means to achieve the transition through investments spearheaded by various government authorities, private institutions, and development finance institutions (DFIs).

2. **Micro-mobility:** The context and rationale for micro-mobility, market developments, and particularly the rise in electrified two-, three-, and four-wheeler 'last mile' delivery vehicles, conversions and eco-tourism markets, together with closing comments.

3. **Public Transport:** This section examines buses from a global standpoint, drawing on best practice examples. It also explores the emerging trend of 'battery swapping,' reviews South African developments in the sector, considers the role of minibus taxis, and presents case studies from Kenya, Ghana, Rwanda, and Zimbabwe

4. **Machinery and Equipment:** A review is conducted on the production and sale of zero-emission heavy-duty vehicles and equipment, including trucks, mining machinery, and agricultural machinery, alongside the broader electrification of various equipment categories. The analysis also examines ownership models, the conversion of fossil fuel-powered vehicles to NEVs, and identifies key role players, stakeholders, and opportunities within the NEV value chain, including components for fuel cell electric vehicles (FCEVs)

5. **Infrastructure Providing Energy for NEV:** The NEV industry requires support infrastructure in the form of fuel supply infrastructure, charging stations and equipment, policy and incentives, together with other support and enabling investments, including finance and insurance. These issues are traversed, and opportunities identified.

6. **Battery Value Chain:** Batteries used in various NEVs are emerging as a critical technology in their own right, forming the foundation for key aspects of the NEV industry and its opportunities. This section analyses different battery types, addresses both small- and large-scale mobility considerations, and provides a brief review of battery-related studies conducted in South Africa.

7. **Trade Policy Conformity:** This section examines a range of trade policies, incentives, and tax schemes employed by various countries to accelerate the transition to NEVs. It also considers tariffs and regional integration measures aimed at enhancing trade, including Rules of Origin (RoO) and the potential implications of the African Continental Free Trade Agreement (AfCFTA) for Africa's emerging NEV industry.

[1] DTIC, 2021. Auto green paper on the advancement of New Energy Vehicles in South Africa, the South African road to production of electric vehicles (The Roadmap, 18th May 2021)

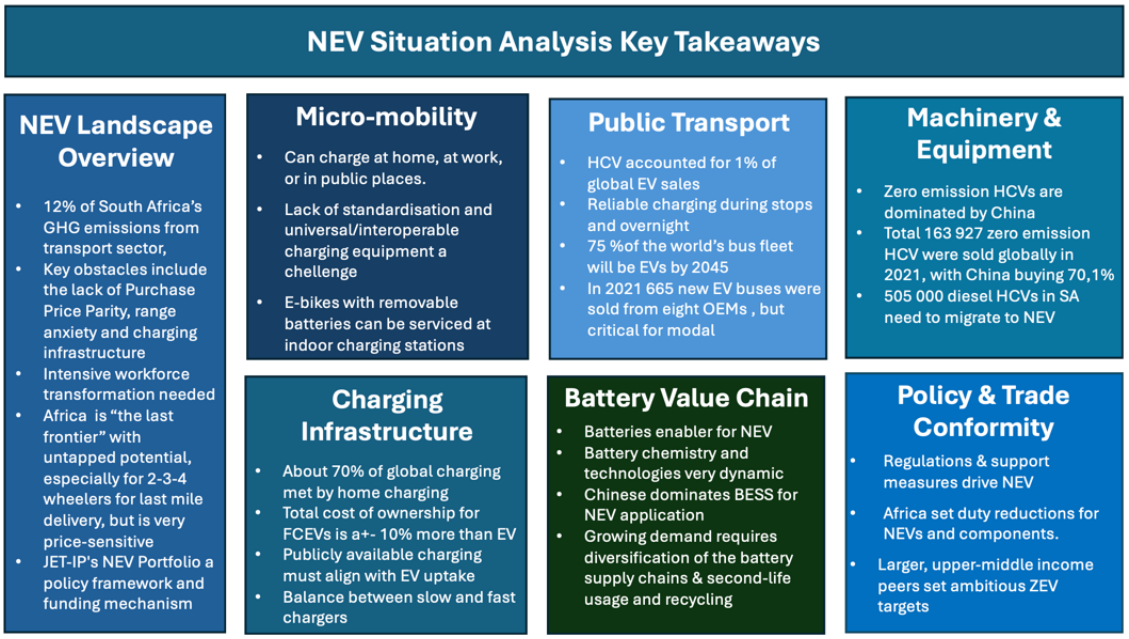


Figure 1: NEV Situational Analysis Key Takeaways

The key takeaways from each of the segments are summarised in the figure above. Each of these is dealt with in a separate chapter in the series review, highlighting key role players and stakeholders, culminating with an overview or statement of the opportunities which have been identified in the NEV segment considered.

2. TRADE, POLICY, CONFORMITY

Governments worldwide are implementing a range of policies aimed at accelerating the shift from internal combustion engine vehicles (ICEVs) to NEVs. With the notable exception of China, most developing countries remain far behind in this transition. These policies often combine industrial policy with protectionist measures to encourage domestic or regional production, including assembly and supply chains, particularly for batteries. China leads global electric vehicle production and exports, supported by extensive subsidies provided over many years. These purchase subsidies stipulate the use of locally manufactured batteries. Similarly, the United States' Inflation Reduction Act (IRA) of 2022 requires local production, while in the European Union, countries such as France have introduced subsidies that favour domestic manufacturing. In October 2023, the European Commission launched an investigation into subsidies granted to Chinese car manufacturers, which could result in new protectionist measures. Such developments present challenges for emerging producers in developing countries, including those in Africa, though opportunities may exist to leverage trade concessions to attract significant investment. Many of these subsidies, including those under the US IRA and certain EU schemes, do not fully comply with WTO/TRIMS regulations.

The purpose of this section is to provide an overview of trade and tariff issues in Africa's automotive industry, followed by an examination of the incentives and tax schemes adopted by various countries to accelerate the NEV transition.

2.1 Trade, Tariffs and Regional Integration

Trade in NEVs within Africa is currently minimal due to low domestic demand and limited production. However, outlining the structure of African automotive trade is important for two reasons: first, it provides insight into potential future developments as NEV adoption increases; and second, it highlights the critical role of closer regional integration, which has significant implications for the industry's growth. While progress towards this integration is ongoing, considerable work remains. At the regional level, within SADC for example, meaningful integration has already been achieved.

In 2021, Africa's total automotive exports were valued at US$30 billion, with about 15% destined for other African countries (intra-African trade). South Africa and Morocco dominate the export market, together accounting for over 80% of the continent's total automotive exports. As Figure 2 shows, Africa remains a substantial net importer of automotive products.

Of the US$4.5 billion in intra-African automotive trade, 60% consisted of finished goods and the remainder of intermediate goods. South Africa leads in exports to the rest of the continent, maintaining a significant trade surplus with the region, and stands to benefit further from expanded regional production and the resulting increase in demand.

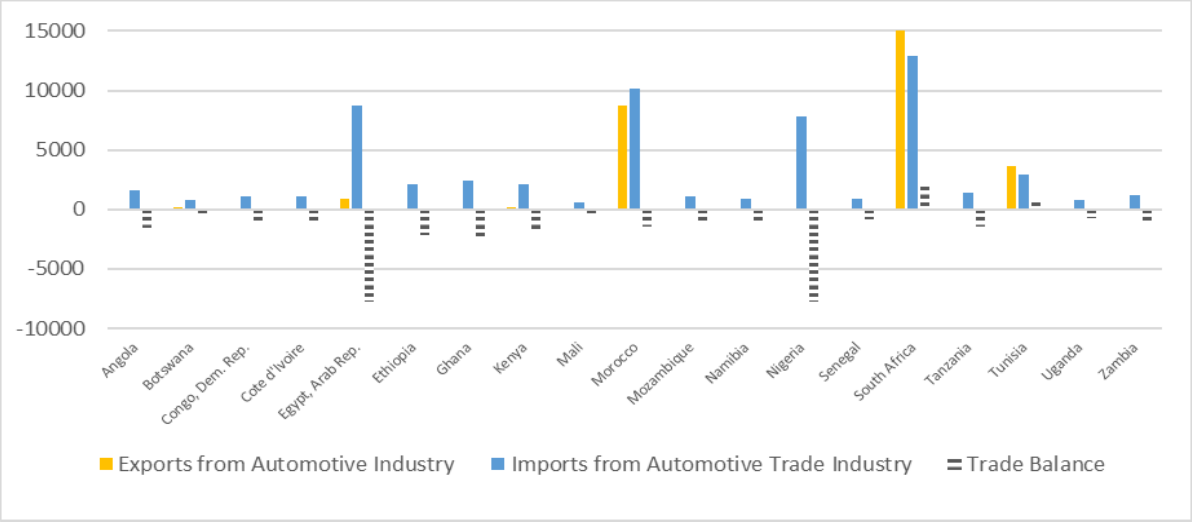


Figure 2: Global Automotive Exports and Imports for selected African countries (2019, US$ million)[2]

The importation of used vehicles presents a significant challenge and they account for the dominant means of transport in most countries. Regulations vary and while some producer countries such as Morocco, Egypt, Algeria and South Africa ban the import of second-hand vehicles, on average as many as 60% of new registrations are accounted for by used vehicles with the continent absorbing nearly a third of global exports of used cars.[3] While used vehicles provide a low cost means of transport for consumers and businesses, they obviously pose a barrier to investment in new vehicle production. Restrictions on the importation of used vehicles will be opposed particularly by countries with limited prospects in the automotive industry.

The automotive industry is highly scale-intensive, and this also applies to the products central to this report, such as batteries. While EVs may have a slightly lower optimal production scale due to their simpler design and fewer components, scale remains critical—particularly for developing a robust supply base. Achieving this requires trade policies that avoid encouraging numerous small-scale SKD operations, which can hinder the growth of supply chains. Given the prevalence of small economies across the continent, the need for scale further underscores the importance of regional integration. Unlike ICEVs, in some cases the intellectual property (IP) for EV batteries and drivetrains is owned by non-automotive original equipment manufacturers (OEMs).

A level of regional integration has been achieved by SADC, ECOWAS and other regional trade areas. Further progress with the further development of the AfCFTA could be very significant for the automotive industry. A stumbling block regarding the automotive sector has been regarding Rules of Origin (RoO) which are being established on a product specific basis. If they are too strict, they could deter the development of regional value chains.

Despite delays with the implementation of the AfCFTA, even partial trade liberalisation could have a major impact. A study by UNCTAD[4] (2021) estimates that partial trade liberalisation could increase intra-African exports by US$9.2 billion by 2025 with much of this expansion (nearly US$2 billion) taking place in the automotive industry. It would also lead to expanded inward investment and create the capacity for greater exports. While regional integration offers huge gains it is also likely that there would be major challenges as the industry tends to cluster in a few chosen locations leading to wide regional disparity in investment.

Africa is also a large importer of motorcycles with imports by Nigeria in 2021 amounting to US$680 million. This represents an important development opportunity for Nigeria and there are also possibilities in electric two wheelers, which already dominate the market in China and are growing in importance in Thailand, Indonesia, and Vietnam. An advantage is that used imports are not a major factor in this sub-sector, so policymakers do not have to contend with the problem of trying to restrict them.

[2] Agarwal, P., Black, A., Lemma, A., Mkhabela, V., and Stuart J. (2022) The African Continental Free Trade Area and the Automotive Value Chain. ODI report. The AfCFTA and the Automotive Value Chain | ODI: Think change
[3] Ibid
[4] UNCTAD, (2021) Economic Development in Africa Report: Reaping the Potential Benefits of the AfCFTA for Inclusive Growth. https://unctad.org/system/files/official-document/aldcafrica2021_en.pdf

Incentives

Lutsey et al (2018) state that four factors can contribute to the slow electric vehicle adoption rate across different types of economies, these are: limited availability of electric models, higher purchasing cost, inconvenience related to charging options, and consumer awareness and understanding of electric vehicles.[5]

The transition to NEVs is now proceeding rapidly driven by improved technology but also the widespread use of incentives and regulatory measures. China leads the way and is being followed by Europe with the EU and UK where EV sales are rising, spurred by the requirement that only zero emission vehicles can be sold in these markets from 2035. The US has lagged but through the Inflation Reduction Act (IRA) and other measures is now providing large scale industrial policy support for local production of EVs and related industries, including batteries. A key provision of the IRA, introduced in 2022, was consumer tax credits on the purchase of electric vehicles are contingent on these vehicles being manufactured locally with specified local content. While there have been some modifications, resulting mainly from concerns expressed by the EU, this is driving investment towards the US away from the EU, UK and developing countries. Future African and South African EV exports would still benefit from AGOA.

African countries have begun to institute policies that support the transition in their nascent industries (Table 1) but face the problem of affordability. Without government assistance the transition will be delayed if not stalled completely.[6] Resources in African countries are limited both to support domestic consumption of EVs as well as domestic production.

Morocco is in the process of signing an agreement for the construction of a gigafactory to make EV batteries as the country is looking to become Africa's EV manufacturing hub, partially due to their FTA with the USA.[7] Morocco's finance minister further proposed that the import duty on lithium-ion cells should be reduced from 40% to 17.5% to promote the local assembly of Li-ion batteries. Morocco benefits from free trade access to the EU. They also have an FTA with the USA and therefore benefit from the IRA and hence companies are investing in Morocco.

Also, to the advantage of Morocco, the concerns regarding the DRC's mining conditions and the high price of cobalt have led to a shift towards lithium iron phosphate batteries. This is beneficial to Morocco since the country has the largest phosphate reserves in the world.[8]

South Africa has not made any significant binding commitments to accelerate the adoption and production of EVs in the country. Government has baulked at providing costly incentives to consumers, but a major policy statement is expected in the February 2024 Budget. Policy uncertainty has been a major problem for SA based vehicle assemblers because of the importance of exports to the UK and EU, both of which have committed to stop the sale/import of ICEVs by 2035.

Of the African countries listed in Table 1, Algeria, Tunisia, Ethiopia, and Rwanda are the only countries that have made legally binding commitments.

[5] Lutsey, N., Grant, M., Wappelhorst, S. and Zhou, H., 2018, May. Power play: How governments are spurring the electric vehicle industry. Washington, DC, USA: ICCT

[6] Yang, Z., Slowik, P., Lutsey, N. and Searle, S., 2016. Principles for effective electric vehicle incentive design. International Council Clean Transportation. June.

[7] Middle East Institute, 2022. Morocco's green mobility revolution: The Geo-Economic factors driving it's rise as an electric manufacturing hub. Available from: https://www.mei.edu/publications/moroccos-green-mobility-revolution-geo-economic-factors-driving-its-rise-electric [Accessed 25 November 2023].

[8] Ouabid, M. and Raji, O., 2023. Phosphate Minerals of Morocco. Rocks & Minerals, 98(2), pp.171-177.

Table 1: Legislation: legally binding commitments such as regulations and standards.

Country	Policy Type	Key Policy measures and targets	Category	Year
South Africa	Target	Add 40 solar powered public EV charging stations per annum.	Multiple	2018
	Target	Convert 5% of the public and national fleet to cleaner alternative fuel and efficient technology vehicles by 2025, with annual increase of 2% thereafter	Multiple	2018
		No final policy on incentives apart from those applying to the conventional ICE industry. A major announcement is expected in the National Budget (February 2024)		2024
Morocco	Ambition	COP26 Declaration: Work intensely towards accelerated proliferation and adoption of zero emission vehicles.	LDV	2022
Algeria	Legislation	50% reduction of both import duty and vehicle tax for EVs.	Multiple	2022
		Ban on imports more than 3 years old.	Multiple	2021
Angola	Legislation	50% reduction of both import duty and vehicle tax for EVs.	Multiple	2022
Ethiopia	Legislation	EVs are not subject to import duties if locally assembled, reduced rates apply for partially and fully assembled imports. They are also exempt from VAT, surtax, and excise tax.	Multiple	2022
Tunisia	Legislation	Customs duties rates are reduced to 10% and value-added tax rate to 7% levied on electric vehicle chargers	EVSE	2022
Rwanda	Legislation	Introduction of a carbon tax, establishment of restricted zones for green transport, and further preferential treatment for EVs.	Multiple	2021
		Tariffs at charging stations are capped at industrial rates, with lower off-peak tariffs; provision of charging stations including planning codes.	EVSE	2021
		VAT, withholding tax, and import duty exemptions for EVs and associated parts/ equipment.	Multiple	2021

Country	Policy Type	Key Policy measures and targets	Category	Year
Kenya	Legislation	Reduction of the excise tax on Electric Vehicles from 20% to 10%	Multiple	2019
	Ambition	5% of all newly registered vehicles to be Electric by 2025.	Multiple	2021
	Legislation	Electric Motorcycles and bicycles are exempt from VAT.	2/3W	2023
	Legislation	EVs assembled in the country are exempt from import duty and excise.	Multiple	2023

'Peer Group Countries'

This section summarises support given to South Africa's 'peer group' countries (Table 2) These are upper middle-income countries with significant automotive industries and we cite the cases of Brazil, Mexico, Thailand and Turkey. These countries have varying political economies[9] but in all cases the automotive industry receives government priority and to a greater or lesser extent they have developed transition strategies. In terms of actual sales, however, change is rather latent. Only 620 BEVs were sold in South Africa in 2022. The peer group countries faired a little better. Thailand, Brazil, Mexico, and Turkey sold 21 000, 18 500, 8 400, and 7 540 EVs respectively.[10]

Thailand, through its three-phase development plan launched in March 2022, has an objective of producing 725 000 EVs (cars and pick-up trucks) and 675 000 electric motorcycles by 2030. To support this ambition, the country has set up financial incentives, tax incentives –and safety standards, for EV and battery manufacturers.[11]

More specifically, PHEVs, EVs, low-emissions eco-cars, and fuel-cell pickup trucks are subject to new and different excise rates. EV passenger cars are charged 2%, and EV pickup trucks and fuel cell pickup trucks are charged 0%. Moreover, BEVs have a 5–6-year tax exemption period, and PHEVs and Hybrid Electric Vehicles receive a 5–12.5% tax reduction depending on their fuel economy. Moreover, imported EVs are taxed less than their ICEV equivalents.

As for subsidies, the government approved an EV promotion framework that will offer subsidies for the purchase of EVs. Depending on the battery capacity, passenger EVs qualify for 70 000 Thai Baht or 150 000 Thai Baht (approximately R37 000 or R80 000). Electric pick-up trucks qualify for 150 000 Thai Baht while electric motorcycles qualify for 18 000 Thai Baht (R10 000). Electric vehicles that cost more than 2 million Thai Baht (R1 million) and motorcycles that cost more than 150 000 Thai Baht, however, do not qualify for any of the subsidies.[12]

As for manufacturers, the Thai government has granted EV manufacturing-related investment incentives that amount to 58 billion Thai Baht (R31 Billion) and 15 billion Thai Baht (R8 Billion) for EV components (including batteries) and related projects. The government also has tax incentives for manufacturers of EVs, for example, a 3–8-year corporate tax exemption. Manufacturers that produce only HEV and/or PHEVS do not qualify for this tax exemption.

[9] See for instance Barnes, J., Black, A and Techakanont, K. (2017) Industrial policy, multinational strategy, and domestic capability: A comparative analysis of the development of South Africa's and Thailand's automotive industry, European Journal of Development Research 29, 37–53 and Black, A., Roy, P. El-Haddad, A. and Yilmaz, K. (2020) The political economy of automotive industry development policy in middle income countries: A comparative analysis of Egypt, India, South Africa and Turkey. ESID Working Paper No. 143. Manchester, UK: The University of Manchester. Available at www.effective-states.org

[10] International Energy Agency, 2023. Global EV Outlook 2023. Available from: https://www.iea.org/data-and-statistics/data-product/global-ev-outlook-2023#global-ev-data [Accessed 24 November 2023].

[11] Purtanto, S.S., Okamura, T., Takemura, K., Iwai, M., Matsumoto, A. and Katayama, K., 2023. EV Policies in ASEAN Countries.

[12] Ibid

As indicated in Table 2, other 'Peer Group' countries have introduced a growing range of support measures.

Table 2: Incentives in 'Peer Group' countries

Country	Policy Type	Key Policy measures and targets	Category	Year
Thailand	Legislation	Tax exemptions for BEVs to promote their deployment.	Taxation	2022
	Legislation	Grants towards the purchase of electric LDVs, motorcycles, and LCVs.	LDV	2022
	Ambition	31 000 EV buses/trucks by 2025, and 430 000 buses/trucks by 2035.	M/HDV	2021
	Ambition	622 000 EV two/three-wheelers by 2025, and 8.75 million by 2035.	2/3W	2021
	Ambition	30% share of ZEVs in domestic LDV production by 2030, 50% by 2035. 35% share of ZEVs in domestic bus production by 2025, 50% by 2030 and 85% by 2035.	Manufacturing	2021
	Ambition	30% of total vehicle production (two/three-wheelers, LDVs and urban buses) to be EVs by 2030.	Manufacturing	2020
	Legislation	3-year Corporate Income Tax exemption; maximum total of 10-year tax exemption; available if all requirements are met.	Battery Electric Three-Wheelers; Buses and Trucks	2021
	Ambition	12 000 Direct Current charging stations.	EVSE	2021
	Legislation	PHEVs (passenger cars and pickup trucks), EVs (passenger cars and pickup trucks), low-emissions eco-cars, and fuel cell (FC) pickup trucks will be subject to new excise tax rates. 2% for EV passenger cars and 0% for EV pickup trucks and FC pickup trucks until 31 December 2025, respectively. The rate for EV pickup trucks will increase to 2% from 2026 and remain unchanged up until 2035.	Multiple	2022

Country	Policy Type	Key Policy measures and targets	Category	Year
Thailand	Legislation	Depending on the battery capacity, passenger EVs qualify for 70 000 Thai Baht or 150 000 Thai Baht (approximately R37 000 or R80 000). Electric pick-up trucks qualify for 150 000 Thai Baht while electric motor-cycles qualify for 18 000 Thai Baht (R10 000). Electric vehicles that cost more than 2 million Thai Baht (R1 million) and motor cycles that cost more than 150 000 Thai Baht, however, do not qualify for any of the subsidies.	Multiple	2022
	Legislation	5–year corporate tax exemption applicable to investments in charging stations with 40 or more chargers (25% of which should be Direct Current). 3-year tax incentive for smaller charging stations.	EVSE	2022
	Legislation	EV manufacturing related investment incentives that amount to 58 Billion Thai Baht (R31 Billion) and 15 Billion Thai Baht (R8 Billion) for EV components (including batteries) related projects. Manufacturers that produce only HEV and/or PHEVS do not qualify for this tax exemption.	Manufacturing	2022
	Legislation	3-year CIT exemption (maximum total of 11-year tax exemption available).	2/3W	2021
	Legislation	3-year CIT exemption (maximum total of 10-year tax exemption available).	Battery Electric Three-Wheelers Buses and Trucks	2021
	Legislation	Battery production: 5–8-year CIT exemption.	Manufacturing	2021
Turkey	Ambition	30% ZEV sales in M/HDVs by 2030, 100% by 2040.	M/HDV	2021
	Legislation	Battery Electric Vehicle buyers pay a lower Special Consumption Tax.	Multiple	2021
	Legislation	BEVs are exempted from the Motor Vehicle Tax.	Multiple	2011
	Legislation	It is compulsory for shopping mall vehicle parks to have charging stations that are at least 1/50 of the maximum vehicle capacity.	EVSE	2018

Country	Policy Type	Key Policy measures and targets	Category	Year
Brazil	Legislation	Recognition of lithium as strategic mineral, nationalisation of its value chain. Creation by decree of "Lithium for Mexico" (Litio para-Mexico), a decentralised public body.	Manufacturing	2022
	Ambition	50% of vehicles produced to be ZEV by 2030.	Manufacturing	2022
	Proposal	5% of HDV sales to be HEVs and EVs by 2030, 100% of HDV sales to be electric by 2050.	M/HDV	2021
	Proposal	5% of bus sales to be HEVs and EVs by 2030 and 50% by 2040; 100% of bus sales to be electric by 2050.	Bus	2021
	Proposal	100% EV share of all vehicle sales by 2050; 5% by 2030, 50% by 2040.	Multiple	2021
	Legislation	Import tax exemption for EVs (electric passenger vehicles, light vehicles, cargo vehicles and trolleybuses) as temporary measure until 30 September 2024.	Multiple	2020
	Legislation	The owners of hybrid or full-electric vehicles have been exempted from the payment of the ownership tax, as well as from the charges of vehicular control services provided by the city (number plate, vehicle registration, and transit permits).	Multiple	2019
	Legislation	The Mexican Income Tax Law grants benefits, in the form of tax deductions, consumers renting electric and hybrid vehicles through leasing contracts.	Multiple	2017
	Legislation	In addition, the Income Tax Law adds another tax deduction incentive of 30% for investments made in public charging stations for EVs.	EVSE	2017
	Legislation	Preferential Tariffs for Charging Electric Vehicles.	EVSE	2016
	Legislation	Electric Vehicles are exempted from sale and import tax.	Multiple	2016

Notes: Table 1 and Table 2

1. "Legislation" means legally binding commitments such as regulations and standards. "Targets mean" announced government targets, for example those incorporated into legislation, budgetary commitments, national climate plans, or electric vehicle strategies. "Ambitions" mean government goals or objectives (also known as unofficial targets) as set out in a policy document such as a deployment roadmap or strategy, often without specific targets. "Proposals": policies or actions that have been formally proposed and that may form part of a future policy or target.
2. "Manufacturing" applies to manufacturing of EVs and related components; Taxation = applies specifically to duties and taxes; Multiple = equally applies to multiple categories.

Ad Valorem

Ad valorem tax, essentially a luxury excise tax that exponentially increases with the price of the vehicle and is calculated according to a formula. Set at a maximum of 30%, the ad valorem excise duty is calculated on the basis of a sliding scale, with the rate of the duty increasing with the value of the vehicle. See ad valorem tax example in Table 3 below.

(a) Vehicles manufactured in the Republic shall be -

i. ((0,00003 x A) – 0,75)% with a maximum of 30%; and

ii. "A" means the recommended retail price, exclusive of value-added tax, less 20%.

(b) Vehicles imported into the Republic shall be -

i. ((0,00003 x B) - 0,75)% with a maximum of 30%; and

ii. "B" means the value for the ad valorem excise duty on imported goods as prescribed in section 65(8)(a) of the Act.

(c) The result of the calculations 0,00003 x A and 0,00003 x B shall be rounded-off to the third decimal comma.

Table 3: Ad Valorem Customs Duty Example

Ad Valorem (Sch1P2B) Customs duty on imported fully built up vehicles			
	CBU		
Fob Value		200 000,00	
Customs duty @ 25%		50 000,00	
VPB		280 000,00	(VPB = Value for schedule 1P2B purposes)
			(FOB + 15% + customs duty)
Sch1P2B rate		7,65	(VPB x 0,00003 -0,75)
Sch1P2B duty		21 420,00	(VPB x rate of duty / 100)

Sources: Table 1 and Table 2

Burak, Ö.K.D.E., 2022. Differences between Turkey and EU Countries on Taxation Policy for Electric Vehicles. Journal of Accounting and Taxation Studies, 15(2), pp.415-435.

De Souza Oliveira, Y.E., Oliveira, D.Q. and Saavedra, O.R., 2022, October. A review on challenges for the dissemination of battery electric vehicles in Brazilian market. In 2022 IEEE PES Generation, Transmission and Distribution Conference and Exposition–Latin America (IEEE PES GTD Latin America) (pp. 1-7). IEEE.

Gönül, Ö., Duman, A.C. and Güler, Ö., 2021. Electric vehicles and charging infrastructure in Turkey: An overview. Renewable and Sustainable Energy Reviews, 143, p.110913.

International Energy Agency, 2023. Policy Database – Data & Statistics. Available from: https://www.iea.org/policies [Accessed 30 November 2023].

International Energy Agency, 2023. Global EV Policy Explorer. Available from: https://www.iea.org/data-and-statistics/data-tools/global-ev-policy-explorer [Accessed 11 November 2023].

Kenya Ministry of Roads and Transport, 2023. Electric Mobility Aug 2023 GAZETTE NOTICE. Available from: https://transport.go.ke/sites/default/files/2023-08/Electric%20Mobility%20Aug%202023%20GAZETTE%20NOTICE.pdf [Accessed 30 November 2023].

Msingo, J., 2023. Trade and Industrial Policy Strategies Conference: Kenya's E Mobility Policy Land Scape [PowerPoint presentation], delivered 20 October 2023.

Purtanto, S.S., Okamura, T., Takemura, K., Iwai, M., Matsumoto, A. and Katayama, K., 2023. EV Policies in ASEAN Countries

United States of America Department of Commerce, 2023. Kenya E-Mobility. Available from: https://www.trade.gov/market-intelligence/kenya-e-mobility [Accessed 30 November 2023].

United States of America Department of Commerce, 2023. Turkey Automotive & Smart Mobility. Available from: https://www.trade.gov/market-intelligence/turkey-automotive-smart-mobility [Accessed 30 November 2023].

2.2 Case Study

Case Study 1 – TCO and Policy Recommendations – China (2021)[13]:

For the BET models, Total cost of ownership (TCO) parity relative to Diesel Trucks is mainly achieved during this decade. Battery-electric tractor-trailers will reach TCO parity relative to their diesel counterparts by 2029–2030, while straight trucks achieve cost parity by 2026–2027 and generate a cost advantage exceeding 100 000 CNY by 2030 relative to diesel straight trucks. Battery-electric dump trucks will become more cost-effective than diesel dump trucks as early as the middle of this decade (2024–2025).

Regarding FCETs, cost parity will not be achieved before 2030 for all truck segments, and the TCO of this technology is many times higher than the diesel and battery-electric trucks.

This section presents a set of policies that can be implemented to accelerate the deployment of zero-emission HDVs across the cities analysed in this study. Several types of policy interventions could be applied such as purchase premiums and in-use incentives (incentives that target the operational costs of trucks). The impact of six policy measures on TCO parity is studied:

Policy Recommendations for China to reach TCO Price Parity

1. Exempting HD-NEVs from road tolls could help BETs reach TCO parity by 2024–2027 for all segments: Partial exemption (75%) from road tolls can help tractor-trailers achieve TCO parity by 2027. Straight trucks can achieve cost parity by 2025. FCETs also benefit from those exemptions, but the impact on their cost-parity point is not significant.
2. Waiving electricity demand charges helps BETs reach their TCO parity 3 years earlier (2022–2027): Demand charges are a significant component of the electricity bill, representing 33%–40% of the total electricity costs.
3. Green hydrogen incentives up to 20 CNY/kg could help some truck segments to achieve cost parity by the second half of the decade: FCET straight and dump trucks could reach cost parity by 2027 under this policy.
4. Carbon pricing, that is, taxes on the CO_2 tailpipe emissions of diesel trucks, can help BETs reach TCO parity in the next 3–4 years: The current Emissions Trading Scheme in China can accommodate such a tax where the tailpipe CO_2 emissions of diesel trucks are subject to emissions tax.
5. Purchase incentives can bring TCO parity 1–3 years earlier, an effect similar to what can be achieved by a combination of in-use incentives: While it is still unclear what the FCET purchase incentives will be in 2021, the 400 000 CNY incentive applicable in 2019 is needed for FCETs to achieve TCO parity this decade. BETs, with purchase incentives capped at 40 000 CNY, benefit only marginally from this subsidy. The effect of purchase incentives is similar to other measures targeting operational costs.
6. Under vehicle dimensions legislation there is a problem with BEV long haul heavy trucks as they are longer and heavier and fall outside of the current Road Traffic Act. The industry is pushing for change but this is anticipated to be a lengthy process.

[13] S Mao et al. - Total Cost of Ownership for Heavy Trucks in China: Battery-Electric, Fuel Cell Electric, And Diesel Trucks (2021)

3. Annexure: Inclusion of Motorcycles in the APDP

Preamble

The Industrial Development Corporation has commissioned a comprehensive study: "Electric Mobility Transition and Localisation: Towards Unlocking The New Value Chain For Africa", which examines the opportunities outside the light passenger and commercial vehicle sector. The "Strategy and Investment Report", which is the second key component of this study, has identified electric two- and three-wheelers as a major investment opportunity.

The motorbike market in Africa (and South Africa) is growing rapidly. In parts of West and East Africa, the market is already substantial. In South Africa, online sales and the associated delivery of goods are driving the rapid expansion in demand for smaller motorbikes.

Asia accounts for the majority of global motorcycle sales and production. In this market, a major transition to electric propulsion is underway. In China, this transition is already largely complete while in other countries, such as India and Vietnam, it is accelerating. Electric two-wheelers also account for a rapidly growing share of the European market. Currently, very few motorbikes (both conventional ICE and electric motorcycles) are manufactured in South Africa (or the rest of the continent), apart from a small-scale assembly. However, it is clear that motorcycles represent a major production opportunity across the continent.

Consideration therefore needs to be given to how this important new industry can be established in South Africa (and Africa more broadly). This would require some form of tariff protection for imports into Africa as well as free trade within the continent to achieve economies of scale and encourage the development of regional value chains.

In South Africa, the majority of automotive production falls under the Automotive Production and Development Programme (APDP). Motorcycles are currently excluded from the APDP, which like, its predecessor, the MIDP, focuses on the light passenger vehicle and light commercial vehicle segments. The original reason for this is that light vehicles make up the majority of the South African industry. Medium and heavy commercial vehicles (MCV/HCV) partially qualify as they can apply for support under the Automotive Incentive Scheme (AIS) and export of components is eligible for APDP support.

Zero tariffs currently apply to motorbikes (and motorcycle parts). As part of the South African Automotive Masterplan (SAAM), it was proposed to impose a duty on motorcycles on the grounds that this would give other SADC countries the opportunity to assemble motorbikes, which could then access the South African market duty-free.

Proposal to Accelerate Adoption and Assembly:

The partial inclusion of motorcycles in the APDP should be considered. It is noted that full inclusion would mean greater policy alignment. The following steps could be taken partially to include the sector:

1. Consider tariffs on motorcycle imports (as proposed in the SAAM process). These tariffs would apply to imports from outside Africa.
2. Provide AIS support for skilled investment in motorcycle assembly. An important condition for qualifications would be the size of the operation, as small-scale assembly adds little value and also precludes the possibility of supplying components to assemblers.
3. Allow AIS support for qualified investments in batteries for electric motorbikes. As with assembly, the scale of the investment would be important as there are economies of scale in this sector.
4. Allow the export of certain motorcycle components to enjoy APDP benefits. These are components that are supplied into established supply chains.

It is important to note that the above measures would put the motorcycle segment on a similar footing as the MCV/ HCV sector.

With the exception of the proposal for AIS support for electric motorbike batteries, these proposals do not differentiate between ICE and electric motorcycles. There are many common parts, and the two sub-sectors could develop together.

It would also be easy to use the AIS to specifically support the assembly of electric two wheelers and related components.

Other policies, both locally and across the continent, would be needed to encourage the transition to electric two-wheelers.

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