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POLICY RESEARCH PAPER

Electrifying the State Fleet

Zambia's Readiness, Challenges and Opportunities for Public-Sector Electric-Vehicle Procurement, with a Focus on Training and Local Talent

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Abstract

On 9 October 2026, opening the First Session of the Fourteenth National Assembly, President Hakainde Hichilema announced that all Government institutions will acquire only electric vehicles (EVs), as part of Zambia's response to fuel-price volatility. This paper asks whether Zambia is ready to implement that directive, what constrains it, and where it creates opportunity for Zambian enterprise and workers. It draws on official energy-sector data, regulatory decisions, budget measures, development-partner project records and press reporting checked across outlets. It rates readiness on nine dimensions and models the energy economics and grid impact of fleet electrification under explicit, adjustable assumptions.

Three findings stand out. First, the running-cost economics favour electrification: at November 2026 pump prices and the electricity tariffs in force to October 2026, the energy to drive an electric vehicle costs between about one-seventh and one-quarter as much per kilometre as petrol or diesel. Second, the binding constraints are not the volume of electricity, since 10,000 government EVs would use under 0.4 percent of Zambia's 2024 electricity consumption. They are reliability of supply in a hydro-dependent system facing a 36 percent cut in Kariba's 2027 water allocation; near-absent public charging and standards; a thin dealer and after-sales base; and, above all, a workforce with no EV-specific national qualification. Third, the directive can become an industrial policy if procurement is designed for it: to anchor solar-backed charging at public facilities, to require certified service capacity inside Zambia, and to create demand for Zambian-trained technicians, charger installers and power-electronics repairers. The paper proposes a phased roadmap, a four-level EV competence framework for TEVETA to adopt, and indicators against which implementation can be monitored.

Keywords: electric vehicles; public procurement; e-mobility readiness; Zambia; energy security; hydropower; TEVET; skills development; battery value chain; local content

Key findings at a glance

- 1. Intent is strong; codification is weak.** Government said it would begin buying EVs in 2023, directed ministries to buy electric and hybrid vehicles in 2025, and in October 2026 moved to EV-only. No standalone e-mobility policy, procurement guideline or charging standard has been published.
- 2. The energy saving is large.** Petrol rose about 31 percent and diesel about 28 percent between September and November 2026. At those prices an electric car's energy costs roughly K 37–54 per 100 km against K 231 for a petrol car.
- 3. Energy volume is not the problem; reliability and location are.** The 2027 power outlook (El Niño, Kariba allocation cut from 36 to 23 billion m³) makes solar-backed, managed charging at public sites essential.
- 4. The government fleet alone barely moves the national fuel bill.** Every 1,000 vehicles electrified displace about 0.08 percent of national petrol and diesel use. The fleet's value is as anchor demand and as a demonstration for the private market.
- 5. Skills are the binding long-run constraint and the largest opportunity.** High-voltage safety, diagnostics, battery and power-electronics repair and charger installation are not yet covered by any national EV qualification.
- 6. Procurement design decides whether the value stays in Zambia.** Tender clauses on local certified technicians, training, diagnostic access, parts stocks and battery take-back cost little and determine who services the fleet for the next 15 years.

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1 Introduction

1.1 The directive

On 9 October 2026 President Hakainde Hichilema opened the First Session of the Fourteenth National Assembly with an address that set out the Grow Zambia agenda. Within a wider energy package he announced that “all Government institutions will now exclusively acquire electric vehicles”, to counter global fuel-price volatility worsened by geopolitical tensions (Republic of Zambia, 2026). He said Government would partner with the private sector to establish EV charging infrastructure across the country, and encouraged businesses, cooperating partners and citizens to embrace electric mobility to strengthen national energy security (The Zambian Observer, 2026).

The same address restored excise duty on fuel to fund commitments including free education, the Constituency Development Fund and social cash transfers. It accelerated petroleum pipelines to Angola, Namibia, Tanzania and Zimbabwe, called for a review of the Energy Regulation Board’s (ERB) monthly fuel-pricing mechanism, and set a target of 10,000 MW of generation capacity (Republic of Zambia, 2026; The Zambian Observer, 2026). Press reporting indicates that the transition is intended to be gradual, has begun at State House and Cabinet Office, and admits exceptions where electric vehicles are not practicable (Times of Zambia, 2026).

The directive landed in a month of sharp price movement. With the six-month excise relief over, the ERB raised pump prices for October 2026 from K 25.29 to K 31.46 per litre of petrol and from K 26.86 to K 33.27 per litre of diesel (Lusaka Times, 2026d). On 31 October it raised them again for November, to K 33.06 and K 34.45 respectively, citing international oil prices and the depreciation of the Kwacha (News Diggers, 2026b). In two months petrol rose 30.7 percent and diesel 28.3 percent.

1.2 Why it matters

Zambia imports all the petroleum it consumes. National imports of petroleum products rose 25.1 percent in 2024, to 2,032,382 tonnes, and diesel made up 73.8 percent of them (Energy Regulation Board [ERB], 2025a). Every litre is priced off international markets and the Kwacha–dollar exchange rate. Electricity, by contrast, is generated domestically, and 81.43 percent of installed capacity is hydropower (ERB, 2025a). In principle, moving vehicles from imported fuel to domestic electricity swaps exposure to oil prices and foreign exchange for exposure to rainfall. That swap is the core of the readiness question.

1.3 Research questions and scope

This paper addresses four questions:

RQ1. How ready is Zambia, institutionally, physically and commercially, to electrify the

public-sector vehicle fleet?

RQ2. Which constraints bind first, and which are binding in the long run?

RQ3. What opportunities does the directive create for Zambian enterprises, workers and training institutions?

RQ4. How should implementation be sequenced, and which policy instruments make it succeed?

The focus is the light-duty public fleet: sedans, SUVs, pickups and pool vehicles of ministries, provinces and spending agencies. Buses, two- and three-wheelers and mining haulage are discussed where they inform the main question. The analysis is national and deliberately practical. It is written for officials who must turn a presidential directive into tenders, budgets, curricula and charging sites.

2 Methodology

2.1 Approach

The study combines a structured policy and document analysis with transparent, illustrative quantitative modelling. Readiness is assessed on nine dimensions commonly used in e-mobility assessments: policy direction; fiscal incentives; regulation and standards; electricity supply; charging infrastructure; vehicle supply and after-sales; skills and workforce; industrial base; and data and monitoring. Each dimension is rated on a four-point scale (*Nascent*, *Emerging*, *Developing*, *Established*). The ratings are the author's judgement against the evidence cited, set out so that readers can disagree with specific ratings rather than with the whole.

2.2 Sources and evidence hierarchy

Evidence was weighted in the following order:

- (i) official statistics and regulatory decisions, chiefly the ERB's *Energy Sector Report 2024* and its October 2025 tariff decision;
- (ii) official statements, including the presidential address and Cabinet Office communications, where necessary as reported by the press;
- (iii) independent research, notably the Intergovernmental Forum on Mining's October 2026 assessment of the DRC–Zambia battery initiative;
- (iv) press reports, used only where they could be cross-checked or where the claim is clearly attributed in the text.

All sources were accessed on 31 October 2026.

2.3 Modelling

Energy costs per kilometre, fleet energy demand and fuel displacement are computed from published pump prices and tariffs, combined with stated vehicle-consumption and mileage assumptions (Section 5). The assumptions are illustrative, not measured Zambian fleet data. They are chosen to be conventional and are reported so that any ministry can substitute its own figures.

2.4 Limitations

There is no public register of government vehicles by type, age, mission or mileage, so the size of the fleet cannot be stated. The electricity tariffs used were approved for 1 November 2025 to 31 October 2026 (ERB, 2025b), and the tariffs applicable from November 2026 had not been published at the time of writing. Some Cabinet Office statements could be accessed only through press coverage. This paper has not yet undergone external peer review, and comments and corrections are invited.

3 The Policy Trajectory, 2022–2026

The October 2026 directive is the latest step in a sequence of measures that began with mineral-industrial diplomacy and moved, step by step, towards the fleet (Table 1).

Table 1: Milestones in Zambia’s electric-mobility policy

Date	Development	Source
Apr 2022	DRC–Zambia Cooperation Agreement for Manufacturing Batteries signed in Lusaka	IGF (2026)
Dec 2022	United States–DRC–Zambia MoU on an EV battery value chain	IGF (2026)
Feb 2023	First public EV charger in Lusaka (Subilo Energy, Northmead)	Zambia Tourism (2023)
Oct 2023	Secretary to the Cabinet: Government to begin procuring EVs before year-end	News Diggers (2023)
Jan 2024	Customs duty removed on electric cars, motorcycles, buses, trucks and charging systems; hybrid excise cut from 30 to 25 percent (2024 Budget)	RegFollower (2023)
2024	ERB approves an EV charging (pricing) methodology; a code of practice is planned	ERB (2025a)
Dec 2024	GEF approves “Supporting the Shift to Electric Mobility” (UNEP; executing agency ZEMA): US\$2.0 m grant, US\$8.57 m co-financing	GEF (2024)
Sep 2025	Cabinet Office directs Ministries, Provinces and Spending Agencies to start procuring electric and hybrid vehicles; Cabinet Office, Transport, Foreign Affairs and State House first adopters	Cabinet Office, Republic of Zambia (2025) and Lusaka Times (2025)
Sep 2025	2026 Budget removes customs duty on completely-knocked-down (CKD) kits for vehicle assembly, including EVs	Bowmans (2025)
Dec 2025	Lusaka meeting with Uganda’s Kiira Motors on a phased path from import and skills transfer to local production	MTN Uganda (2025)

Date	Development	Source
Jan 2026	EU-funded EcoCharge programme starts building EV and e-motorbike skills among TEVET lecturers in Zambia and Malawi	Zambia Daily Mail (2026)
Feb 2026	Government launches a 150-unit electric-motorbike delivery pilot (Yango)	Lusaka Times (2026a)
Mar 2026	UNDP US\$150,000 project on e-mobility policy, investment readiness and demonstration	Zambia Monitor (2026)
May 2026	Nine Government institutions reported to have procured EVs	Lusaka Times (2026b)
Oct 2026	Presidential directive: Government institutions to acquire only EVs	Republic of Zambia (2026)

Three features of this trajectory matter for implementation.

It is coordination-led, not law-led. The main instruments so far are fiscal measures in Finance Acts and administrative directives from Cabinet Office. Launching the UNDP project in March 2026, the Secretary to the Cabinet described e-mobility as a coordination challenge. He pointed to the commercially viable segments: public transport fleets, delivery vehicles, motorcycles, mining mobility and corridor charging (Zambia Monitor, 2026). That framing is right, but coordination without a published policy, guideline or standard leaves each spending agency to interpret the directive on its own.

Uptake has lagged intent. Three years after the 2023 announcement, about nine institutions had bought EVs (Lusaka Times, 2026b). Commentators have asked how many vehicles were actually procured (News Diggers, 2026a). The October directive closes the option of buying conventional vehicles. It does not close the practical gaps that slowed voluntary uptake.

The definition has narrowed. In 2025 the instruction covered “electric and hybrid” vehicles (Cabinet Office, Republic of Zambia, 2025). In 2026 it says “electric”. Whether “electric” includes plug-in hybrids (PHEVs), range-extended EVs or conventional hybrids needs to be settled in writing. The answer decides what can be bought for rural and long-distance missions.

3.1 Regional context

Zambia is not alone. Ethiopia banned the import of petrol and diesel vehicles in January 2024 (International Energy Agency [IEA], 2024). In April 2026 Rwanda required that at least 30 percent of new vehicles bought by public institutions be electric (KT Press, 2026). Kenya’s government ordered 3,000 EVs for security and administration officials in May 2026 (The Star (Kenya), 2026). For public fleets, Zambia’s EV-only rule is broader in scope than Rwanda’s 30 percent minimum. That makes the quality of its implementation guidance all the more important.

4 Readiness Assessment

4.1 Electricity supply

Table 2 summarises the state of the power system from the ERB’s most recent annual report.

Table 2: Zambia’s electricity system, 2023 and 2024

Indicator	2023	2024	Change
Installed capacity, all sources (MW)	3,812.06	3,885.86	+1.94%
of which hydro, grid-tied (MW)	3,162.80	3,162.80	0.00%
of which solar, grid-tied (MW)	123.00	183.00	+48.78%
of which coal (MW)	330.00	330.00	0.00%
of which diesel, grid-tied (MW)	80.00	203.80	+154.75%
Electricity sent out (GWh)	19,372.92	13,324.38	−31.26%
National electricity consumption (GWh)	14,642.2	10,436.3	−28.72%

Source: ERB (2025a), Table 4.1 and Section 1.4.1.

The 2024 shock. The 2024 drought cut hydro output so sharply that generation fell by almost a third. The ERB reports a generation deficit of 1,300 MW and load-shedding of up to 20 hours a day for domestic consumers between March and December 2024 (ERB, 2025a). Diesel consumption by the electricity sub-sector rose almost fifteen-fold as businesses and households ran generators (ERB, 2025a).

The recovery. Supply has since improved. The Ministry of Energy reported 841 MW of installed solar PV by the end of July 2026 (pv magazine, 2026). In June 2026 ZESCO ruled out a return to nationwide load-shedding that year (Lusaka Times, 2026c). Grid access is still limited: about half of Zambians have electricity (World Bank, 2025).

The 2027 risk. The 33rd Southern African Regional Climate Outlook Forum (SARCOF-33) found drier-than-normal conditions more likely across much of southern Africa in the 2026/27 season (Southern African Development Community [SADC], 2026). Citing strong El Niño forecasts, the Zambezi River Authority cut the combined 2027 water allocation for power generation at Kariba from 36 to 23 billion cubic metres, 11.5 billion for each utility. It projects usable storage falling to 5.83 billion cubic metres, about nine percent, by the end of 2027 (“Fears over hydropower generation in 2027 as River Authority cuts Kariba water allocation to 23bn cubic meters”, 2026).

Implication. The first large wave of government EV purchases will arrive just as the hydro system is expected to tighten. Section 5 shows the fleet’s energy demand is small. But vehicles that can charge only from a grid connection at an office or a home will be stranded during outages. Charging for government fleets should therefore be designed from the start around daytime solar generation, on-site battery storage and charging scheduled away from the evening peak.

4.2 Fuel dependence and price exposure

Zambia's daily average consumption in 2024 was about 4.51 million litres of diesel and 1.63 million litres of petrol (ERB, 2025a), roughly 2.2 billion litres in the year. The retail channel accounted for 98.2 percent of petrol and 39.8 percent of diesel, and mining for 30.7 percent of diesel (ERB, 2025a). Diesel imports through the TAZAMA pipeline more than doubled in 2024 as road haulage was displaced (ERB, 2025a). The pipeline and storage programme improves security of supply, but it cannot insulate pump prices from oil markets or the exchange rate.

4.3 Fiscal incentives

Since 1 January 2024 fully electric cars, motorcycles, buses, trucks and charging systems have been imported free of customs duty, and the excise duty on passenger hybrids fell from 30 to 25 percent (CleanTechnica, 2025; RegFollower, 2023). The 2026 Budget extended duty relief to CKD kits for local assembly, including EVs (Bowmans, 2025). Value-added tax still applies at the standard rate. Zambia's incentives are therefore real but narrow. They lower import costs, but they do not address the cost of capital, charging, residual-value risk or training.

4.4 Regulation and standards

The ERB approved a methodology for pricing EV charging services in 2024. It intends to develop a code of practice covering the design, installation, operation and maintenance of charging infrastructure, to ensure “compatibility, safety and interoperability” (ERB, 2025a). At the time of writing, the author could not locate a published Zambian standard for EV charging equipment, a national e-mobility policy or a procurement guideline for EVs. Registration of electric two-wheelers had also run into specifications missing from the motor-vehicle registration system, which the responsible minister acknowledged (Lusaka Times, 2026a).

4.5 Charging infrastructure

Lusaka's first public charger opened in February 2023 (Zambia Tourism, 2023). In September 2025 Cabinet Office tasked the energy and transport ministries, with private partners, with establishing charging, including fast chargers, in every district (Cabinet Office, Republic of Zambia, 2025). The presidential directive repeats the public–private model (The Zambian Observer, 2026). No public registry or count of charging points exists.

Interoperability is a live risk. New vehicles sold in Europe and southern Africa mostly use the IEC Type 2 connector for AC charging and CCS2 for DC fast charging, under the IEC 61851 family of charging-system standards (International Electrotechnical Commission [IEC], 2017). Used imports from Japan commonly carry the CHAdeMO DC connector, and vehicles built to Chinese domestic specification carry GB/T. A government fleet bought agency by agency, from a mixed new-and-used market, could end up with three incompatible DC standards. Government should standardise on one and buy vehicles to match.

4.6 Vehicle supply and after-sales

The Road Transport and Safety Agency (RTSA) recorded 823,703 vehicles on the road at the end of 2023, and 86,846 new registrations that year. Registered EVs rose from 62 in July 2023 to 269 by the end of July 2025 (CleanTechnica, 2025). New EVs are sold through a small number of franchised dealers, including BYD through Pilatus Motors and GWM's Ora 03 through Southern Cross Motors. Used Nissan Leafs are imported by independent dealers (CleanTechnica, 2024, 2025).

The harder question is *mission fit*. Government work includes long rural trips on gravel roads, far from any charger, and much of it is done in four-wheel-drive pickups and SUVs. Electric pickups are only now arriving. Toyota's battery-electric Hilux carries a 59.2 kWh battery with a development target of 300 km or more on the optimistic NEDC cycle (Toyota Motor Corporation, 2025), and went on sale in some Asian markets in 2026 (WapCar, 2026). Laden, air-conditioned driving on gravel will deliver well below that figure. For many provincial and rural missions, battery-electric vehicles are not yet practicable. The exceptions mechanism, and what is bought in its place, therefore matters as much as the rule.

After-sales capacity is thin. Warranties normally require authorised servicing, battery and power-electronics faults need specialist diagnosis, and used imports arrive with unknown battery state-of-health. Without in-country capacity, a failed vehicle waits for a part or a technician from abroad.

4.7 Skills and workforce

TEVET institutions already train automotive electricians. For example, Kabwe Institute of Technology offers a Diploma in Automotive Electrical with a January 2026 intake (Ministry of Technology and Science [MoTS], 2026). However, the author found no EV-specific national qualification in publicly available TEVETA listings. In January 2026 the EU-funded EcoCharge programme began building EV and e-motorbike skills among TEVET lecturers in Zambia and Malawi (Zambia Daily Mail, 2026). At regional level, the African Centre of Excellence for Research and Innovation on Batteries (CAEB), founded at the University of Lubumbashi in 2022, has been constrained by limited funding. Its contribution so far has been “more institutional than operational” (IGF, 2026). Section 8 treats this dimension in depth.

4.8 Industrial base and minerals

Zambia is Africa's second-largest copper producer and has significant copper, cobalt, manganese and nickel reserves (IGF, 2026). Copper output rose to 890,346 tonnes in 2025, up from 825,513 tonnes, against a national target of 3 million tonnes by 2031 (Ecofin Agency, 2026). Under the battery initiative, Zambia has designated the Ndola Multi-Facility Economic Zone (MFEZ) as its industrial platform. The IGF finds implementation “at an early stage” and uneven,

citing administrative fragmentation and the long-term certainty of incentives as Zambia's main challenges (IGF, 2026). The siting of a shared precursor plant has also been contested (Natural Resource Governance Institute [NRGI], 2024).

Vehicle assembly remains prospective. A Chinese firm held exploratory talks in 2025 on assembling electric vehicles, motorcycles and bicycles, conditional on finding a local partner (Zambia Monitor, 2025). The December 2025 Kiira Motors meeting set out a phased path from import and skills transfer to local production (MTN Uganda, 2025). Mining already runs large electric systems: First Quantum's trolley-assist haulage at Kansanshi and Sentinel draws power from overhead lines on the pit ramps, displacing diesel (Engineering News, 2026). This gives Zambia a pool of high-voltage maintenance experience that an EV workforce can draw on.

4.9 Finance and procurement

Battery costs, the largest single component of an EV's price premium, continue to fall. BloombergNEF reports average lithium-ion pack prices of US\$108/kWh in 2025, US\$99/kWh for battery-electric car packs, and US\$182/kWh outside China (BloombergNEF, 2025). The premium is still real, and it falls on capital budgets while the savings accrue to recurrent fuel budgets. Without whole-life costing in procurement evaluation, agencies will tend to buy the cheapest compliant vehicle rather than the cheapest to own. Development-partner resources exist but are modest relative to fleet replacement: the GEF project and the UNDP initiative (Table 1).

4.10 Data and monitoring

The only quantitative tracking reported is a count of institutions that have bought EVs (Lusaka Times, 2026b). No public register sets out vehicles by type, age, mission, annual mileage or fuel use. Without one, an agency cannot tell which vehicles to replace first, and the Treasury cannot verify the savings.

4.11 Readiness scorecard

Table 3 consolidates the assessment.

Table 3: Readiness scorecard for public-fleet electrification (author's assessment)

Dimension	Rating	Basis
Policy direction	●●●○ Developing	Presidential directive; Cabinet Office coordination since 2023; no published policy or guideline
Fiscal incentives	●●●○ Developing	Zero customs duty on EVs and chargers (2024) and CKD kits (2026); VAT applies; no capital or financing support
Regulation & standards	●○○○ Nascent	ERB charging-price methodology only; no published charging standard or code of practice; registration gaps
Electricity supply	●●○○ Emerging	3,886 MW, 82% hydro; 841 MW solar by mid-2026; 2027 Kariba allocation cut by 36%
Charging infrastructure	●○○○ Nascent	Handful of public chargers; no registry; district roll-out not yet started
Vehicle supply & after-sales	●●○○ Emerging	269 registered EVs (2025); few franchised dealers; electric 4×4 options only now arriving
Skills & workforce	●○○○ Nascent	No EV-specific national qualification; lecturer training began 2026
Industrial base	●●○○ Emerging	Minerals and Ndola MFEZ designated; CKD incentive; no EV or battery plant operating
Data & monitoring	●○○○ Nascent	No public fleet register; adoption tracked only as a count of institutions
Scale: ●○○○ Nascent ●●○○ Emerging ●●●○ Developing ●●●● Established.		

The pattern is clear. Zambia is strongest where a decision can be made at the centre (policy and tax) and weakest where capability must be built in the field (standards, charging, skills and data). The directive's success depends on the second group.

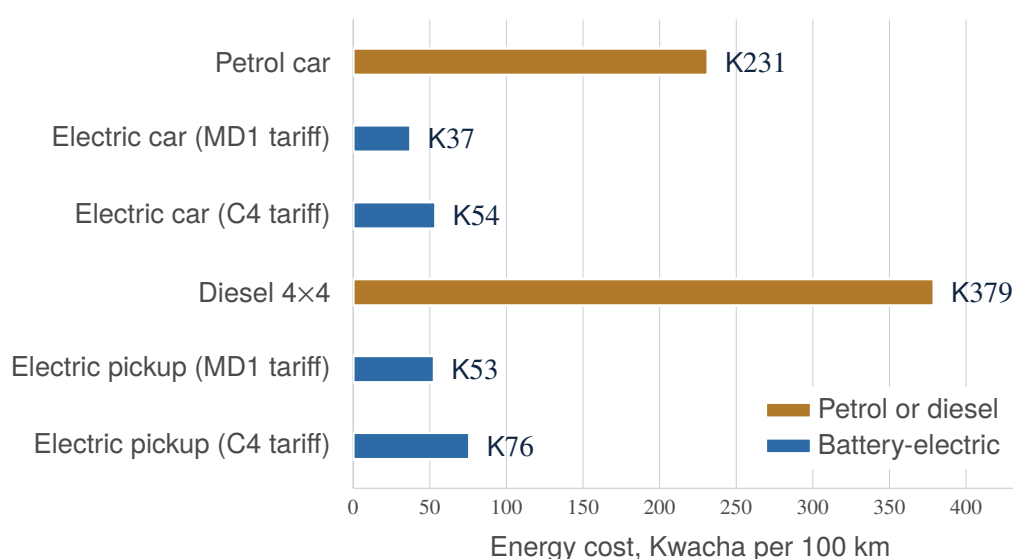
5 The Economics of Electrifying the Fleet

5.1 Energy cost per kilometre

Table 4 sets out the assumptions and Figure 1 the results. Fuel prices are the ERB's November 2026 pump prices (News Diggers, 2026b). Electricity is costed at two tariffs in force to 31 October 2026: the maximum-demand MD1 rate of K 2.20/kWh, typical of an office supply of 16–300 kVA, and the top commercial band C4 of K 3.16/kWh (ERB, 2025b). Vehicle consumption figures are conventional, illustrative values. They include charging losses for EVs and are not measurements of Zambian vehicles.

Table 4: Assumptions for the illustrative cost model

Parameter	Value	Basis
Petrol price (November 2026)	K 33.06/L	ERB, via News Diggers (2026b)
Diesel price (November 2026)	K 34.45/L	ERB, via News Diggers (2026b)
Electricity, MD1 office supply	K 2.20/kWh	ERB (2025b)
Electricity, commercial C4	K 3.16/kWh	ERB (2025b)
Petrol car consumption	7.0 L/100 km	Assumption (range 6–8)
Diesel 4×4 consumption	11.0 L/100 km	Assumption (range 9–13)
Electric car, at the plug	17 kWh/100 km	Assumption (range 15–20)
Electric pickup, at the plug	24 kWh/100 km	Assumption, from 59.2 kWh battery
Annual distance per vehicle	20,000 km	Assumption

**Figure 1:** Energy cost per 100 km at November 2026 pump prices and the 2025–26 ZESCO tariffs. Assumptions in Table 4.

On these assumptions, an electric car's energy costs 16–23 percent of a petrol car's, and an electric pickup's 14–20 percent of a diesel 4×4's. The result is robust. Even under a stress case in which electricity tariffs rise 50 percent and pump prices fall 25 percent, electricity remains below half the cost of fuel per kilometre for both vehicle classes.

5.2 What the saving can pay for

At 20,000 km a year, an electric car saves about K 35,500–38,800 a year in energy over a petrol car, and an electric pickup about K 60,600–65,200 over a diesel 4×4. Over a five-year holding period, undiscounted, that is K 178,000–194,000 for a car and K 303,000–326,000 for a pickup. This is roughly the purchase-price premium that energy savings alone could repay. The figures exclude maintenance, which is generally lower for EVs with no engine oil, filters or clutch. They also exclude insurance, financing costs, discounting, battery degradation and residual value. Any

of these can move the answer, which is why procurement should evaluate bids on whole-life cost under published assumptions rather than on purchase price.

5.3 Grid impact and fuel displacement

Table 5 scales the model to fleets of 1,000, 5,000 and 10,000 vehicles, assuming an even mix of cars and pickups.

Table 5: Electricity demand and fuel displaced by an electrified government fleet

Government EVs	1,000	5,000	10,000	Note
Electricity use (GWh/yr)	4.1	20.5	41.0	a
Share of 2024 national consumption	0.04%	0.20%	0.39%	b
Worst-case simultaneous load (MW)	7.4	37	74	c
Fuel displaced (million litres/yr)	1.8	9.0	18.0	d
Share of 2024 petrol and diesel use	0.08%	0.40%	0.80%	e
Net energy saving (K million/yr)	48–52	239–259	478–517	f

a: 500 cars × 3,400 kWh + 500 pickups × 4,800 kWh per 1,000 vehicles. b: against 10,436.3 GWh (ERB, 2025a). c: every vehicle charging at once at 7.4 kW (single-phase 32 A); managed charging cuts this sharply. d: 1,400 L per car and 2,200 L per pickup. e: against about 2.25 billion litres, derived from ERB daily averages for 2024. f: fuel at November 2026 prices less electricity at K 2.20–3.16/kWh.

Two conclusions follow. First, *energy volume is not the constraint*: even 10,000 government EVs would need well under one percent of national consumption. Peak load and location matter more. A worst-case 74 MW of simultaneous charging would be material during a deficit like 2024's 1,300 MW, which is why charging must be managed and, where possible, solar-supplied.

Second, *the government fleet alone cannot fix the fuel import bill*. Each 1,000 vehicles displace about 0.08 percent of national petrol and diesel use. The fiscal saving is meaningful, roughly K 48–52 million a year per 1,000 vehicles, but the national lever lies in the private fleet, minibuses, freight and mining. The public fleet's strategic value is as anchor demand. It is a large, predictable buyer that can justify charging networks, dealer investment, service centres and training programmes the private market will then use.

There is also a fiscal tension. The same address that mandated EVs restored fuel excise to fund social programmes (Republic of Zambia, 2026). At public-fleet scale the revenue effect is small, but a successful spill-over into the private market would erode the fuel-tax base over time. Long-term planning should anticipate a distance- or registration-based road-user charge.

6 Challenges

The assessment points to ten challenges, in rough order of urgency:

C1. Definitions and exceptions. “Electric” is undefined, and so are the conditions under which

an EV is “not practicable”. Without a written rule, agencies will either stall or improvise.

- C2. Power reliability in 2027.** A forecast dry season and the reduced Kariba allocation coincide with the first purchases. Grid-only charging at offices is a single point of failure.
- C3. Charging coverage and interoperability.** There are few public chargers, no registry, no published equipment standard, and a real risk of mixed CCS2, CHAdeMO and GB/T fleets.
- C4. Mission fit.** Electric options for rural, long-distance and off-road work are new, and their range is limited. Forcing BEVs onto those missions risks failure and discredit.
- C5. Up-front cost and budget structure.** Premiums fall on capital votes while savings accrue to fuel votes. Lowest-price evaluation penalises the cheaper-to-own option.
- C6. After-sales and parts.** Dealer networks are thin, warranties tie servicing to authorised workshops, and used imports carry unknown battery health.
- C7. Skills and safety.** No national EV qualification exists. Untrained work on high-voltage systems, typically 400 V-class DC, endangers technicians and first responders.
- C8. Data.** With no fleet register, replacement cannot be prioritised and savings cannot be verified.
- C9. End-of-life batteries.** Collection, storage, transport, second-life use and recycling are not yet regulated for traction batteries. The GEF project explicitly includes environmentally sound management of EV waste (GEF, 2024).
- C10. Fiscal base.** Over the long run, mass electrification erodes fuel excise and road-fund revenue.

7 Opportunities

The directive is also a demand signal of a kind Zambian industry rarely receives: a large, long-lived public market for new technical services. The opportunities below are listed with the actors best placed to capture them.

- O1. Solar-backed charging at public facilities** (electrical contractors, solar EPC firms, ZESCO). Fleet vehicles are parked at offices during daylight, when solar output peaks. Solar carports with battery storage at ministry, provincial and district offices turn the 2027 hydro risk into a design brief. The installer base already exists: the ERB issued 251 licences for the manufacture, supply, installation and maintenance of renewable-energy equipment in 2024, up from 90 in 2023 (ERB, 2025a).

- O2. Charger installation, operation and maintenance** (licensed electricians, energy-service companies, local authorities). Every public site needs design, installation, commissioning, metering, payment and upkeep. Most of this work is local by nature and cannot be imported.
- O3. Power-electronics repair and remanufacture** (Zambian electronics firms, TEVET graduates). EV inverters, on-board chargers, DC–DC converters, battery-management systems (BMS) and charging stations are power-electronic and embedded systems. They are close relatives of the variable speed drives, UPS units, rectifiers and inverters that Zambian industrial-repair firms already service for mines, utilities and telecoms. Board-level repair in Zambia is faster and cheaper, and it keeps foreign exchange at home.
- O4. Battery services** (specialist workshops, recyclers, mining-chemical firms). Battery state-of-health testing for used imports, module-level repair, second-life use of retired vehicle batteries in stationary storage, and ultimately recycling. These link fleet electrification to the DRC–Zambia battery value chain (IGF, 2026).
- O5. Local assembly** (assemblers, the Ndola MFEZ, ZDA). Duty-free CKD kits make assembly of two- and three-wheelers, buses and light vehicles commercially testable. A predictable government order book is the anchor demand assemblers need.
- O6. Two- and three-wheelers and buses** (logistics firms, transport operators). The Yango pilot (Lusaka Times, 2026a) and the Kiira discussions (MTN Uganda, 2025) show that these segments, which the Secretary to the Cabinet flagged as commercially viable (Zambia Monitor, 2026), can move faster than cars.
- O7. Fleet software and data** (Zambian software firms, mobile-network operators). Telematics, energy and charging management, mobile-money payment for public charging, and the fleet register the Treasury needs. All of this can be built and run locally.
- O8. Training as an industry** (TEVET institutions, universities, accredited private providers). Section 8 sets out the demand. Zambia can also export it: neighbouring states face the same transition without the same mineral and industrial base.

8 Training and Local Talent

8.1 Why skills are the binding constraint

Money can buy vehicles and chargers quickly. It cannot quickly produce a technician who can safely isolate a 400 V battery, diagnose an inverter fault, or commission a DC charger to standard. If the skills are missing, the State will own vehicles that only the importer can repair. Downtime will rise, service will be paid for in foreign exchange, and the case for electrification will be weakened by its own early failures. If the skills are built, the same fleet becomes the training

ground for a workforce the private market will soon need. Skills are therefore both the slowest dimension to fix and the one with the largest local return.

8.2 Who needs to be trained

Table 6 maps the roles the transition requires against current pathways in Zambia.

Table 6: EV workforce map: roles, competencies and gaps

Role	Core competencies	Level	Current pathway and gap
Drivers and transport officers	EV operation, range planning, charging practice, eco-driving	1	None specific; short orientation needed
Light-vehicle mechanics (in-service)	High-voltage (HV) awareness, safe isolation and lock-out, routine EV maintenance, scan-tool diagnostics	2–3	Automotive and auto-electrical programmes exist; no HV or EV module
HV specialists	Battery module diagnosis and repair, BMS, traction inverter and motor, on-board charger, DC–DC converter	4	No national route; OEM training abroad only
Electricians and charger installers	AC and DC charger installation, earthing, protection, load management, commissioning to IEC 61851	2–3	Electrical trades exist; no EV-charging module
Power-electronics and embedded engineers	Repair and design of chargers, BMS and telematics; firmware; solar and storage integration	4	Engineering degrees and diplomas; little EV-specific content
Fleet, energy and procurement officers	Whole-life costing, specifications, charging plans, data	1–2	None specific; short course needed
First responders	EV fire and thermal runaway, rescue and extrication, scene safety	1–2	Not covered
Recyclers and environmental officers	Battery handling, storage, dangerous-goods transport, second life	2	Not covered

8.3 A four-level Zambian EV competence framework

The paper proposes that TEVETA adopt a four-level framework, benchmarked against the four-level IMI TechSafe professional standards used internationally for EV work (Institute of the Motor Industry [IMI], [n.d.](#)). TEVETA would map it onto existing qualification levels as short-course awards for in-service staff and as modules within craft-certificate and diploma programmes:

Level 1: Awareness.

Recognise HV components, warnings and hazards. Operate and charge an EV safely. For drivers, transport officers, first responders and workshop support staff.

Level 2: Routine maintenance.

Work safely on an EV that has been made safe by others: tyres, brakes, suspension, coolant, 12 V systems and charger inspection.

Level 3: HV isolation and diagnosis.

Isolate and verify the absence of voltage, diagnose faults, and remove and refit HV components. Commission AC and DC chargers.

Level 4: Live working and component repair.

Repair battery modules, BMS, inverters and chargers at component level, including live diagnostic work under controlled procedures.

Assessment should be practical, on real HV training rigs, and certificates should be time-limited with refresher requirements. These are standard features of high-risk electrical competence schemes.

8.4 How to deliver it

- 1. Train the trainers first.** Build on the EcoCharge lecturer programme (Zambia Daily Mail, 2026). A small cohort of certified Level 3–4 instructors is the multiplier for everything else.
- 2. Equip a few regional EV skills labs before many weak ones.** Locate them at existing TEVET institutions on the main corridors (Lusaka, the Copperbelt, Central and Southern provinces) with HV training rigs, insulated tooling, battery modules, AC and DC chargers and diagnostic equipment.
- 3. Upgrade, don't duplicate.** Add HV and EV modules to automotive-electrical and electrical-engineering curricula, such as the Kabwe diploma (MoTS, 2026). Use recognition of prior learning to fast-track experienced auto-electricians and industrial-electronics technicians.
- 4. Bring industry in as co-trainer.** OEM dealers, mining houses with HV maintenance experience (Engineering News, 2026) and Zambian power-electronics repair firms can provide instructors, equipment and supervised placements on real faults.
- 5. Link universities to the battery agenda.** Power electronics, battery chemistry, BMS design and grid integration belong in UNZA and CBU engineering programmes and their research links with CAEB, which the IGF identifies as under-resourced (IGF, 2026).
- 6. Fund it from the transition.** A small fixed share of each vehicle and charger contract, plus development-partner programmes (GEF, 2024; Zambia Monitor, 2026), can finance labs and instructors. Existing TEVET financing instruments can support trainees.
- 7. Design for inclusion.** Recruit women and young people deliberately into a new trade whose workplace norms are still being set.

8.5 Procurement as a skills lever

The cheapest and most powerful skills instrument is the tender document. For every government vehicle and charger contract, the paper recommends requiring:

- (a) a minimum number of TEVETA-certified Level 3 technicians employed in Zambia, scaled to the number of vehicles supplied;
- (b) training of named public-workshop or local-SME technicians to Level 2–3 as a contract deliverable;
- (c) licensed access to diagnostic tools, software and service information for government workshops and approved independent Zambian repairers;
- (d) in-country stocks of critical parts, with turnaround commitments;
- (e) battery state-of-health certificates for any used vehicle, and long battery warranties for new ones;
- (f) weighting in evaluation for installation and maintenance by Zambian firms;
- (g) take-back of traction batteries at end of life.

These clauses add little to contract cost. They decide whether the next 15 years of servicing, repair and training revenue stays in Zambia.

8.6 Safety and first responders

EV battery fires behave differently from fuel fires, and stranded energy in a damaged pack can stay dangerous after a crash. Fire services, police, RTSA inspectors and recovery operators need Level 1 training and clear protocols before government EVs are on every highway, not after.

9 Recommendations and Roadmap

Table 7 sets out a phased implementation. Lead institutions are named by function, since ministerial portfolios were reorganised in October 2026.

Table 7: Phased roadmap for public-fleet electrification

Phase	Actions	Lead
0. Set the rules (0–6 months)	Publish an implementation circular defining eligible vehicles (BEV, PHEV, range-extended) and a transparent exceptions test by mission. Build a government fleet register. Issue an EV procurement guideline with whole-life cost evaluation and the skills clauses in Section 8. Adopt Type 2/CCS2 as the government charging standard. Fast-track the ERB code of practice and the corresponding national standards. Start train-the-trainer cohorts.	Cabinet Office; Treasury; public procurement authority; ERB; ZABS; TEVETA
1. Prove it where it works (6–24 months)	Replace urban pool cars and light pickups first in Lusaka, the Copperbelt and the line of rail. Install solar-backed, managed charging at headquarters and provincial offices. Open DC charging on the main corridors with private partners. Commission the first regional EV skills labs. Certify the first Level 2–3 technicians. Retain hybrids or PHEVs, under the exceptions test, for long-range rural missions.	Spending agencies; energy ministry; ZESCO; local authorities; TEVET institutions
2. Scale and localise (2–5 years)	Extend to provincial and district fleets as electric 4×4 options mature. Electrify urban buses and two- and three-wheel services. Aggregate demand to support CKD assembly. Establish battery second-life and recycling capacity. Design a road-user charge to replace fuel-tax erosion.	Transport ministry; ZDA; ZEMA; Treasury

9.1 Indicators to monitor

Implementation should be reported publicly, at least annually, against a small set of indicators (Table 8).

Table 8: Proposed monitoring indicators

Indicator	Why it matters
Share of new government vehicles that are battery-electric, and exceptions granted	Compliance and realism
Fuel litres avoided and net energy cost saved (K)	Fiscal case
Share of government charging energy from on-site solar	Resilience to hydro shortfalls
Vehicle availability (percent of days fit for service)	Whether after-sales works
Average repair turnaround, and share of repairs done in Zambia	Local capability
Certified EV technicians by level, province and gender	Skills pipeline
Public charging points in service, by district and corridor	Infrastructure coverage
Traction batteries collected for second life or recycling	Environmental compliance

10 Conclusion

Zambia's directive that Government institutions acquire only electric vehicles rests on sound economics. With every litre of fuel imported and priced in dollars, and pump prices up by nearly

a third in two months, the energy to drive an EV in Zambia costs a fraction of the fuel it replaces. Political commitment and fiscal incentives are in place.

What is not yet in place is capability in the field: standards, charging, after-sales, data, and, above all, people. The 2027 power outlook adds urgency to designing charging around solar and storage rather than the grid alone. The government fleet will not by itself transform the national fuel balance. Its real power is as a predictable anchor customer that can call into being the chargers, service centres, assembly lines and trained workforce the rest of the economy will need.

Whether that happens is a matter of design. A directive implemented through lowest-price tenders will import vehicles and export the service revenue. A directive implemented through whole-life costing, interoperable standards, solar-backed charging and procurement clauses that require Zambian certified technicians will build an industry. The second path costs little more, and the window to choose it is the next six months, before the first large orders are placed.

Declarations

Competing interests. The author is the founder of Hero Control Systems Ltd., a Zambian company that provides industrial electronics repair, power-electronics design and technical training. The company could benefit from the service and training markets this paper discusses. Readers should weigh the recommendations accordingly. The evidence base is public and cited throughout.

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