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Guide to E-mobility in Indonesia for UK Businesses

CATAPULT
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Definitions and Acronyms**ADB:** Asian Development Bank**BAPPEDA:** Regional Development Planning Board in Indonesia**BPPT:** Agency for the Assessment and Application of Technology**BRT:** Bus rapid transit**DAMRI:** Djawatan Angkoetan Motor Repoeblik Indonesia (Motor Transport Enterprise of the Republic of Indonesia)**DIT:** UK's Department for International Trade**EV:** Electric vehicle**FCDO:** UK's Foreign, Commonwealth and Development Office**FDI:** Foreign direct investment**GHG:** Greenhouse gas**MoU:** Memorandum of understanding**OECD:** Organisation for Economic Cooperation and Development**PLN:** PT Perusahaan Listrik Negara (state-owned electric company of Indonesia)**PPP:** Public-Private Partnership**SME:** Small and medium-sized enterprise**TKDN:** Level of Domestic Components

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Executive summary

This guide is a companion to Connected Places Catapult's Innovating for Clean Air: E-mobility in Indonesia research work commissioned by the UK's Department for Business, Energy and Industrial Strategy. The report supports the UK's commitment to Indonesia in strengthening the two countries' relationship in the areas of science, innovation and technology to contribute towards the global net-zero agenda. It is geared towards UK businesses with e-mobility expertise and aims to highlight the opportunities and challenges attached to entering the sizeable and growing Indonesian market by providing practical guidance to overcome the challenges and seize the opportunities.

This report reviews the Indonesian market for electric powered mobility as well as the current conditions that underpin the country's electric vehicle (EV) sector. E-mobility is defined as the use of electrically powered vehicles and the products, services and systems that support them, including the design of vehicles that are not dependent on fossil fuels. Having identified three of Indonesia's largest and most attractive urban markets to partner with local Indonesian academic institutions, industry and government, we highlight the vast, untapped opportunity for UK businesses to stimulate and speed up the growth and development of Indonesia's vibrant innovation ecosystem in these cities. The three urban areas and respective provinces - Bandung (West Java), Denpasar (Bali) and Surabaya (East Java) - exemplify the varied approaches to entering the e-mobility market in Indonesia based on which local stakeholders appear to have the most appetite for collaboration and innovation in this nascent, but growing sector.

This report is split into four sections

- 1.** In the first, we focus on the size and attributes of Indonesia's e-mobility sector opportunity, which make it particularly attractive.
- 2.** Then we explain the existing regulatory landscape and challenges to market entry in this space. We also provide guidance on how to overcome these barriers.
- 3.** Thirdly, we highlight the key players in the ecosystem, potential partnerships and preferred routes to entry for UK businesses. We outline the rationale for UK collaboration in prioritised areas of the e-mobility ecosystem where there are supply gaps and untapped opportunities.
- 4.** Finally, we summarise key takeaways and provide recommendations for models of engagement and collaboration to follow.

This guide should provide value for those UK e-mobility companies looking to the Asian market for partnership and business opportunities. The size and scale of the Indonesian market cannot be ignored. Understanding the challenges, as well as the opportunities, is key to preparing properly to become part of this exciting and fast-growing sector of Southeast Asia's biggest economy.

1 Introduction

The Indonesian e-mobility market is at its early growth stage due to limited selection, high price barriers vs traditional mobility options, and the dependence on fossil fuel powered transport in the country. The government has frequently expressed ambitions to be one of the largest battery manufacturing countries for EVs because Indonesia boasts high yields of natural resources such as nickel, a key battery component. If Indonesia can not only do this but stimulate its young and growing innovative ecosystem of e-mobility companies by giving them access to commercial opportunities, creating an attractive environment for foreign direct investment (FDI), and supporting partnership with overseas and local companies, then the country has the potential to move from a high-volume importer of EVs and their components, to a high-volume exporter.

Indonesia's national energy plan has set an ambitious target for the number of EVs in operation (2,200 EVs, 711,000 hybrids, and 2.1m electric two-wheelers on the streets by 2025, or 4m, 8m and 13m respectively by 2050)ⁱ, which is generally in line with 2015 Paris Agreement goals. For countries with large and complex geographies or a wider spectrum of incomes and of geographical development, a small scale 'building block' approach, has been seen as being more appropriate and achievable to meet those ambitious goals. Therefore, for Indonesia to adopt national policies across energy production, distribution and management, as well as transition

of public and private mobility to EVs in a short time is not practicable. But small-scale pilots across mass transit systems, or the dominant two-wheeler mode of transport, may catalyse wider adoption and spur the development of more widely scalable deployments of sustainable e-mobility options. As referenced in the **Innovating for Clean Air: E-mobility in Indonesia report**, the e-mobility landscape in Indonesia shows an emerging and vibrant ecosystem with the potential to drive this new and highly skilled sector and provide considerable economic growth opportunities for the country.

The current ecosystem does however have significant gaps, and these can either be filled by foreign companies selling into Indonesia, or by turning them into compelling FDI opportunities from countries like the UK.

These opportunities include partnering with Indonesian companies and supporting knowledge transfer, local growth and employment, and the introduction of new and high tech solutions. This second option will also act as a catalyst to grow this emerging industry sector at an even faster rate than seen at present.

Understanding the complex regulatory system in Indonesia and undertaking a gap analysis within the e-mobility landscape have been crucial in framing specific opportunities for engagement as outlined in the following sections.



ⁱ https://iesr.or.id/download/final_the-role-of-ev-in-decarbonizing-road-transport-sector-in-indonesia-pdf

2 The E-mobility Opportunity

There are clear opportunities in the Indonesian e-mobility market led by a booming, aspirational middle class set to reach 150 million by 2030. Indonesia represents half of the Southeast Asia market and is the most competitiveⁱ of all emerging markets, after China, with huge potential to be a regional hub.

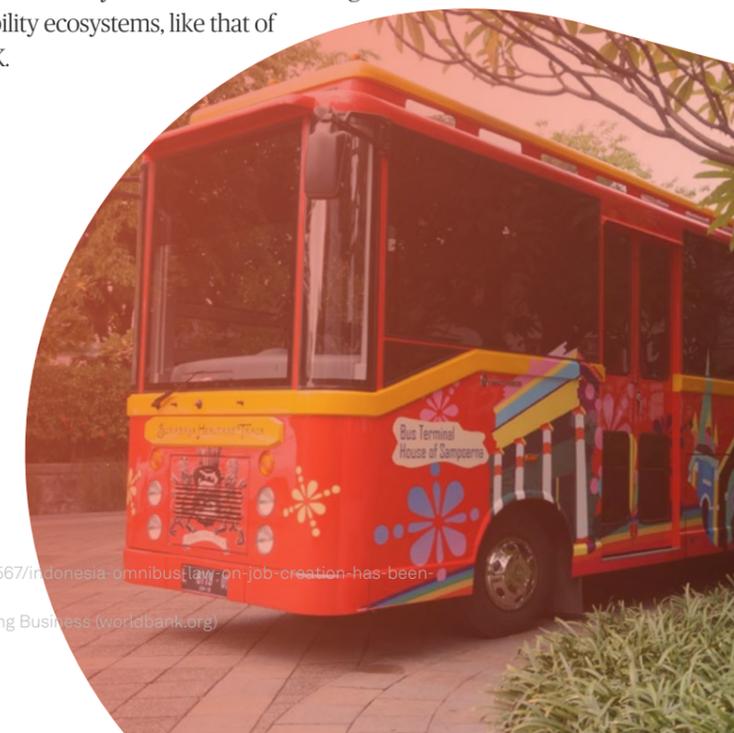
There is an existing track record and ongoing commitment by the Indonesian government to improving the investment climate. Optimism prevails for job creation and ease of doing business from the recently introduced Omnibus Lawⁱⁱ. The national government has rolled out market entry improvements and digitalisation, abolishing the minimum capital requirement for small and medium-sized enterprises (SMEs) setting up operations in the country. It has also introduced an online system to reserve company names. In the last decade or so, Indonesia has reformed the most in terms of starting a business, with eight reforms since 2003, according to the World Bankⁱⁱⁱ.

Moreover, local government has indicated a keen interest in growing local demand for e-mobility solutions. Indonesian cities are aware of the national commitment to the 2015 Paris Agreement and see e-mobility as a key route to achieving net zero targets. As rapidly growing urban centres, Surabaya, Bandung, Denpasar, as well as other large cities, are increasingly considered as expansion targets for multinational businesses. However, public transport in these major cities, especially Surabaya, is impoverished.

There is space and demand in the transport market for EV public transport solutions, for example: e-buses, similar to the pilots which TransJakarta - Southeast Asia's first bus rapid transit (BRT) system - has

operated. Unlike many countries where e-mobility solutions are seen as an enhancement to existing public urban mobility services, better services are required, and these can be used to showcase the benefits of e-mobility services.

Another sector, tourism, is vital to regions like Bali and important for the rest of Indonesia. As this sector restarts post Covid-19 EVs can be seen as a way to boost green credentials, helping to attract environmentally conscious tourists to the islands and increase green tourism. Blended biodiesel has been the focus of reducing emissions in the mobility sector for several years in Indonesia. This is however also a large consumer of palm oil, of which there is growing international attention on the environmental challenges of mass palm oil production. In addition to these improvements in the regulatory and business climates, Indonesia's growing urban e-mobility industry offers a range of potential opportunities for UK partners due to its early stage of development. To catalyse the local ecosystem the government must look at supporting equitable partnerships between the Indonesian ecosystem and more mature global e-mobility ecosystems, like that of the UK.



ⁱ According to WEF 2015-16 Competitiveness report

ⁱⁱ <https://investmentpolicy.unctad.org/investment-policy-monitor/updates/3567/indonesia-omnibus-law-on-job-creation-has-been-enacted>

ⁱⁱⁱ Indonesia continues strong pace of reforms to improve business climate: Doing Business (worldbank.org)

The global EV market is expected to register a compound annual growth rate of 22.6% by 2027, with the Asia-Pacific region the dominant region in 2019 and expected to be the most attractive market during the forecast period as well^I. Indonesia's growth is dependent upon increasing investments and government initiatives showing support for the sector. The two-wheeler market in Indonesia for example, which is dominated by e-scooters, closely followed by e-bikes and e-motorcycles, is expected to grow to 41 million units by 2024. In turn, e-motorcycles are expected to cover 67% of market share of the vehicles' market by 2050 and when considering the existing and planned government policies the penetration is predicted to reach 75% by 2050. With even more ambitious policy interventions, the EV market share could reach 85% for cars and 92% for motorcycles by 2050^{II}.

Table 1 highlights the current market overview and future potential for e-mobility in Indonesia - with reference to mass transit (buses) and two-wheelers (motorcycles and scooters) in particular. These types of e-mobility options are further along the journey to large-scale deployment in the Indonesian context. Therefore, for the purposes of this study, we consider only those forms of e-mobility that are either ready or nearly ready for large-scale deployment, and/or have future capability or potential in the near- to medium-term, thus excluding personal EVs.

Table 1: Market overview of e-mobility in Indonesia

Vehicle type	Current market	Future Market
 <p>E-motorbikes</p>	<p>There were 107m motorbikes in Indonesia in 2019^{III}.</p> <p>The 2019 value of the e-motorbike market was estimated at \$364m, with 7m units sold^{IV}.</p>	<p>By 2035 the Indonesian government is aiming for 16% of motorbikes to be electric^V. The market value in 2025 is estimated to be \$816m, an annual growth rate of 20.96%^{VI}.</p>
 <p>E-buses</p>	<p>No electric buses are currently produced in Indonesia.</p> <p>Several e-bus pilots are underway, including two in Jakarta and one in Bali^{VII}.</p>	<p>TransJakarta (the largest BRT in the world) is aiming to have 50% of its fleet electric by 2025 and 10,000 e-buses (83% of its fleet) by 2030^{VII}.</p>
 <p>E-scooters</p>	<p>Scooters represent up to 87% of the motorcycle market, which had annual sales of 7m units in 2019^{VIII}.</p>	<p>The scooter market is expected to grow alongside the motorcycle market and lead to growing exports.</p>

I Electric Vehicle Market Size, Share, Analysis, Growth by 2027 (alliedmarketresearch.com)
 II Julian Christian Adiatma and Idoan Marciano, 2020. The Role of Electric Vehicles in Decarbonising Indonesia's Transport Sector. Final_The Role of EV in Decarbonizing Road Transport Sector in Indonesia_Companded-Version.pdf (climate-transparency.org)
 III <https://www.statista.com/statistics/978944/indonesia-number-of-motorcycles-use/#:~:text=In%202019%2C%20the%20number%20of,107%20million%20units%20in%20Indonesia.>
 IV <https://english.nna.jp/articles/4195>
 V <https://www.prnewswire.com/news-releases/indonesia-electric-two-wheeler-market-report-2020-market-was-valued-over-usd-364-42-million-in-2019---forecast-to-2025--301205185.html>
 VI <https://www.prnewswire.com/news-releases/indonesia-electric-two-wheeler-market-report-2020-market-was-valued-over-usd-364-42-million-in-2019---forecast-to-2025--301205185.html>
 VII http://www.xinhuanet.com/english/2021-01/30/c_139709140.htm
 VIII <https://www.thejakartapost.com/news/2020/12/29/transjakarta-wants-10000-electric-buses-in-service-by-2030.html>
 IX <https://english.nna.jp/articles/4195>

The global e-mobility market is expanding to emerging economy cities. The 25 largest metropolitan area-level EV markets contained 40% of the world's passenger EV stock as of the end of 2019 - lower than in 2016 (45%)^I. Leading cities with higher levels of uptake are no longer growing at a faster pace than the rest of the world, as urban centres with smaller populations begin to experience more rapid e-mobility growth.

In this report we focus on three Indonesian cities - Bandung, Denpasar and Surabaya - as a starting point to understand how to navigate the Indonesian e-mobility ecosystem outside of Jakarta and identify supply gaps UK companies would be well positioned to fill.

We selected these cities for their economic diversity and innovation ecosystem characteristics which make them open to piloting new technologies and services. In the subsequent sections we outline some of the biggest and most common barriers to market entry, discuss current stakeholders and key prospective partners, and offer most appropriate route to market in each of the three cities.

I <https://theicct.org/sites/default/files/publications/ev-capitals-update-sept2020.pdf>



3 Navigating the Indonesian Regulatory System

As an archipelago consisting of over 17,000 islands, Indonesia faces unique governance challenges. The systems of interaction between the executive, legislative and judiciary branches of government are frequently in flux, resulting in inconsistent policy and execution. Moreover, urban, provincial and national government agencies do not seem to synchronise their strategic roadmaps, which adds another layer of complexity for the private sector to navigate efficiently. Our goal is that by outlining the major challenges and barriers to entering and operating in Indonesia's e-mobility market and providing guidance on how best to overcome these, we equip UK businesses with the appropriate contextual understanding and set them up on the path to success.

3.1 Barriers to entry

The Joint European Chambers' Business Confidence Index in 2016ⁱ showed that **the top challenges for doing business in Indonesia were the regulatory environment and bureaucratic inefficiency and red tape.**

More recent sentiment surveys by the British Chamber of Commerce in Indonesia show that the perceptions of the challenges remained the same in 2019-20ⁱⁱ. These are also expanded upon in Table 2 as policy challenges and general barriers. In addition to the general business operation challenges, the literature points to a series of additional barriers that apply to the current Indonesian e-mobility landscape specifically.

These include manufacturing, service provision and policy roadblocks, infrastructure, cultural and governance challenges, and barriers relating to attitudes and prioritisation. These hurdles point to the significant progress foreign companies in Indonesia can make, depending on the alignment of institutions, policies, leadership, local partners and the necessity to pull lots of different levers to operate in the country successfully.

ⁱ <https://www.ukabc.org.uk/wp-content/uploads/2017/03/Business-Confidence-Index-2016.pdf>

ⁱⁱ <https://ukabc.org.uk/publication/britcham-indonesia-business-confidence-index-2020/>

Table 2: Current barriers to progress e-mobility in Indonesia

	General barriers	E-mobility sector specific barriers
Policy challenges	<p>Difficulty establishing new businesses. There remains a complex bureaucracy, which make setting up a business difficult, involving 9-11 procedures and 20-60 days (compared to an OECD average of 5 procedures). Indonesia is ranked 166th globally for ease of doing business. It also takes up to 500 days to enforce contracts with frequent and unpredictable changes of regulations, lack of legal certainty and clarity.</p> <p>In addition, e-catalogues is something companies need to access the procurement system and naturally, to understand the procurement system in the first place.</p>	<p>Challenges relating to the specifics of the Indonesian strategy posed by the requirement for components to be domestically sourced and the nascence of the industry. The restrictions on foreign ownership limit retail businesses supporting car, motor cycle and commercial vehicles and spare parts which currently require 100% domestic ownership. Automobile maintenance firms are permitted to have maximum foreign ownership of up to 49%.</p>
	<p>Restrictions on foreign businesses entering the Indonesia market. Indonesia has a complex system of four types licensing for foreign companies importing goods or services. In addition to complying with licensing, companies must be aware of the Negative Investment List, which lists areas of the economy closed or partially closed to foreign investment or ownership. A company qualifies as foreign even if only 1% is foreign owned and must abide by the licensing systems.</p>	<p>Low price competitiveness. Diesel is publicly subsidised in Indonesia which makes it harder for EVs to achieve cost competitiveness and reduces incentives among commercial as well as private vehicle operators to switch to electric options.</p>
	<p>Language and cultural differences mean that it is recommended to engage a local partner as an on the ground representative (this is sometimes a legal requirement). Oftentimes, there is a preference to doing business face to face making remote working a challenge. A local agent or distributor is recommended for most government procurement, as successful bids are often based on long-established relationships, and participants not well-known in the market may miss out.</p>	<p>Competition with major firms in Japan, China and Korea. Up to now there is a sense that Asia Pacific companies such as BYD and LG Chem have clearer brands attached to them in the Indonesian market, granting them greater competitive advantage.</p>

General barriers	E-mobility sector specific barriers
<p>Lower access to capital and credit, making it difficult for businesses and local governments to raise funds to support expansion or investment. Skeptical view towards the investment climate and political environment as businesses are looking for more than just “pro-business” proclamations by the government.</p>	<p>Established interests and livelihoods. Denpasar in particular is resistant to the idea of public transport-based e-mobility initiatives (e.g. e-buses) as many of the city’s residents are currently employed as taxi drivers.</p>
<p>High carbon intensity of the electricity grid. Currently the GHG abatement impacts of e-mobility are likely to be relatively lower in Indonesian cities because of the high carbon intensity of the existing electricity system. Indonesia’s grid factor is currently nearly double that of nearby countries, such as Thailand and Laos.</p>	<p>In terms of public transport, e-bus rollout investment is still costly for the government so there is hesitation from cities to invest in it. Budget reductions during the recent pandemic are also delaying investment plans.</p>
	<p>Lack of education of the public with regards the benefits of e-mobility. It has been widely reported that the general Indonesian public are not aware about e-mobility options and there is a lack of trust in investing in a new technology, especially because the necessary infrastructure, such as charging stations, is not visible yet in many parts of the country. Moreover, floods are frequent in many parts of the country - education is needed as there is a common belief that people could get electrocuted with an EV in a flooded area.</p>
<p>Manufacturing and services challenges</p>	<p>Skills shortages. Indonesia suffers from low levels of acquisition, development and retention of high skilled workers, especially engineers. Moreover, there is also the issue of the process of obtaining required work permits for foreign workers, which is improving but remains a significant hurdle.</p>
	<p>Cost and experience of maintenance and repair of e-mobility. In the UK mechanics are retrained and certified to service electric vehicles due to the high voltage and risk of electrocution (they also require completely different repairs for the battery and powertrain). A MaaS option would place the responsibility of repair on the service provider which would allow more government control on the process.</p>

General barriers	E-mobility sector specific barriers
<p>Local content requirements. For example, by 2021 electric cars produced in Indonesia must have at least 35% local components (manufactured in Indonesia), at least 40% by 2023, at least 60% by 2029, and at least 80% by 2030.</p>	<p>Price of the vehicles. Currently, it is still considered high for some EVs. The price of the batteries is 30% of the cost of the vehicle. Total cost of ownership for EVs is on parity or lower than ICE vehicles, but only for commercial use type of vehicles with high degree of usage.</p>
<p>High logistics costs and poor infrastructure have implications for vehicle design and needs due to the poor road quality and archipelagic nature of the country. Subnational roads, which are critical to local connectivity, are in especially poor condition - with 40% being classified as damaged or poor.</p>	<p>Battery life. Without the ability to partake in battery swapping, if there are traffic jams, it will take 3-4 hours to charge the battery which needs to be made more efficient and optimised.</p>
<p>Underdeveloped electricity infrastructure. There is a lack of electric infrastructure and electric storage capacity in or close to cities. Space in urban areas, particularly in Jakarta, for charging infrastructure is limited. Grid integration for EVs also needs to be planned for in Indonesia.</p>	<p>Long charging times or uncertainty around charging locations and availability. The charging network needs to be easy to find, with high availability. Understanding the current supply and demand graphs for electricity supply in Indonesia and how they currently respond to any outages would be extremely beneficial to evaluating how ‘smart’ the charging network needs to be (i.e. charging only when there is surplus energy supply).</p>



3.2 Doing business in Indonesia

In addition to the challenges of navigating complex bureaucratic systems, companies attempting to conduct business in Indonesia are subject to a multi-layered license system.

Importing into Indonesia

Documentation in Indonesia is complex. Foreign companies usually appoint local agents who can keep track of changes in regulation or documentation which occur regularly. This is a strongly recommended service and the British Embassy as well as other UK government affiliated bodies can assist with finding trusted agents to act on behalf of UK companies.

Generally, companies importing goods require, at a minimum, a commercial invoice signed by the manufacturer which specifies place and date of shipment, name and address of consignee, number and kind of packages including content and weight, and any tariff numbers. Additionally, companies may require a certificate of origin, bill of lading, packing

list, insurance certificate, as well as certificates detailing conformance where required or aspects of content. The customs office should be notified prior to the arrival of any goods via its electronic data exchange. An import fee applies to all goods coming into the country, based on their classification in the Indonesian Customs Tariff Book or the Harmonised System Code.

The Indonesian Product Quality Assurance Mark is the national standard of Indonesia and should be used where appropriate. Moreover, transferring more than Rp100 million (£5,000) in or out of Indonesia requires prior approval from the Bank of Indonesia and must be reported to the Director-General of Customs and Excise.

Licenses

Companies must apply for an import license or permits to employ non-Indonesian workers from the Ministry of Manpower and Transmigration. All imported products must clearly identify the importing agent on the label. Companies must be aware of the Indonesian Consumer Protection Laws which are formulated by the Indonesian National Consumer Protection (Badan Perlindungan Konsumen Nasional).^I Businesses intending to provide goods or services to the public sector must be listed on the e-catalogue, which is maintained by the Government Goods/Services Procurement Policy

Agency (Lembaga Kebijakan Pengadaan Barang/Jasa Pemerintah - LKPP). UK companies who supply goods, services or technologies on the UK Strategic Export list must also have an export license issued by the UK government.^{II}

Entities setting up franchises in Indonesia must obtain a Franchise Registration Licence (Surat Tanda Pendaftaran Waralaba or STPW). Franchisors and franchisees can only engage in the activities specified on the licenses and must use local components for at least 80% of the raw materials, business equipment and merchandise.

Business Ownership

Setting up a business in Indonesia usually requires a variety of licences depending on the company activities. Primary licences include general business licences, industrial licence and construction business licence. Import licenses are subdivided into^{III}:

I Institute of Export and International Trade, 2020. Doing Business in Indonesia

II Institute of International Trade and Export, 2020. Doing Business in Indonesia

III Import Licenses for Indonesia | GBG (gbgindonesia.com)

- **A General Import License** may be used to import finished products or to trade goods with a third party. Licenses are issued by the Head of the Provincial Trade Service Office of where the company is based and take around two months to obtain. The API-U is valid for five years and then subject to renewal.
- **A Producer Import License** may be used to import raw materials, unfinished products and goods for the production process for the company's use only. Licenses are issued by Badan Koordinasi Penanaman Modal (BKPM), an investment data service company.
- For **a company to import both raw and finished products it must hold both licenses** and the business must be divided into two entities to hold the licences. Transfer of goods between the entities is viewed as third party transaction and subject to VAT.

In addition to acquiring the correct licenses, companies must consider the [Negative Investment List](#), which lists sectors or industries that either entirely closed to foreign investment or have strict conditions about foreign companies working in those sectors. As of 2020, the national government has started to issue a [Positive Investment List](#) for areas it is actively encouraging foreign investment under the newly introduced Omnibus Law.^I

Setting up a business entity in Indonesia as a Joint Venture falls under the 'Penanaman Modal Asing' (PMA), corporate entity required for foreign investors under the terms of the foreign investment law. It takes the form of a Limited Liability Company or 'Perseroan Terbatas' (PT) with the joint ventures as shareholders. PMA companies:

- may be either publicly listed on the stock exchange or privately owned
- must have two parties holding shares, either a legal entity or an individual. The foreign investor's shareholding percentage must meet requirements under the Indonesia Investment Coordinating Board's Negative Investment List which lists sectors closed or partially closed to foreign investment

3.3 Business guidance

To address regulatory barriers especially and to assist companies with entry into the Indonesian market, several UK government departments and affiliated non-governmental bodies offer varied methods of support. Of the vibrant community of 255 member organisations within the British Chamber of Commerce in Indonesia, between 30-40% are British companies that are already established or are in the process of establishing their presence in the country. The Chamber is well connected in the country and the region and presents several [guides](#), such as the [Perception Survey: Doing Business in Indonesia](#).

In addition, the UK's [Foreign, Commonwealth and Development Office \(FCDO\)](#) and [Department for International Trade \(DIT\)](#), non-governmental bodies such as the [Institute of Export and International Trade](#) and [Institute of Chartered Accountants in England and Wales](#) and [HSBC](#) provide further useful guides on doing business in the country.

These guides and affiliated support services can be accessed for free by those interested in the potential which the world's 10th, and Southeast Asia's largest, economy offers in terms of the vast possibilities of its e-mobility market.

I <https://www.aseanbriefing.com/news/indonesias-omnibus-law-the-positive-investment-list-and-the-liberalization-of-business-sectors/>

4 Market Entry

In order to evaluate the possible routes to entry of the Indonesian e-mobility market, we shine a spotlight on the key stakeholders and existing and potential partnerships that could make this happen.

4.1 Key stakeholders in the Indonesian e-mobility sector

As previously mentioned, from a legislative standpoint, the e-mobility ecosystem in Indonesia is characterised by complex regulatory landscape, with transport policy divided between local and central government. No comprehensive plan has yet been agreed as to how e-mobility can be implemented nationwide. In addition, coordination and enforcement remain challenging amongst the numerous ministries involved in setting or enforcing transport policies (see Table 3).

However, the fact that there are UK companies doing business in Indonesia means that this complex set of stakeholders can be navigated successfully. Furthermore, the teams at the Embassy and the British Chamber of Commerce are highly experienced at supporting the navigation of this landscape.

Table 3: Roles and responsibilities for E-mobility in Indonesia. Source: expanded from Wijaya & Imran, 2019¹

Ministry	Role and Responsibility
Ministry of National Development Planning (BAPPENAS)	Construct national development planning, including transport sector
Ministry of Transport (MoT)	Construct national transport policy and manage public transport infrastructure operation
Ministry of State-Owned Enterprise (MSOE)	Manage the national transport infrastructure and operation of public transport services; administer state-owned enterprises, like toll roads and rail
Ministry of Public Works and Housing (MPWH)	Prepare policy for development of national road and bridges network
Ministry for the Environment and Forestry (MoEF)	Prepare national policy for pollution control and environmental impact management of transport sector
Ministry of Home Affairs (MoHA)	Regulate development programs at sub-national level (provincial, city and regency) including for local transport
Ministry for Economic Affairs (CMEA)	Develop national economic and fiscal policy, including for the transport sector; provide economic policies for urban transport proposed by different ministries
Ministry of Finance (MoF)	Prepare state budgeting, including for road and public transport infrastructure
Ministry of Energy and Mineral Resources (MEMR)	Develop energy planning and supply, including for the transport sector

¹ https://www.researchgate.net/publication/331322400_Transport_Planning_and_Policies_in_Indonesia_Case_Studies_from_Indonesia

Ministry	Role and Responsibility
Ministry of Communication and Information Technology	Communication and information affairs
Ministry of Trade	Responsible for ensuring local domestic components, TKDN (Tingkat Komponen Dalam Negeri)
Ministry of Industry	Coordinates and synchronises the formulation, and execution of ministerial policy in industry. It also executes technical guidance and supervises policy implementation in industry
DAMRI (Motor Transport Enterprise of the Republic of Indonesia)	State-owned company that carries out passenger and cargo transport on the road using motorised vehicles
Regional Development Planning Board (BAPPEDA)	Carries out government affairs and development for employment and economy, infrastructure development planning and others.

Depending on the services provided and the usual companies worked with, sold to, or whose services were utilised, other key parties involved in the Indonesian e-mobility sector of notable and strategic importance include:

Supranational development banks

- **Asian Development Bank (ADB):** whose strategy from 2020 aims to “contribute to smart cities with a reliable and affordable supply of electricity through smart grids and distributed systems as well as charging infrastructure for electric vehicles.”¹

Energy and electricity agencies and companies

- **PLN (PT Perusahaan Listrik Negara):** The state-owned electricity distributor is overseeing EV rollout projects, signing memorandums of understanding (MoUs) with automobile and energy companies to build cars and support charging infrastructure.
- **Pertamina:** The state-owned oil and gas distributor is planning to add charging stations to its petrol stations.
- **MedcoEnergi:** The private energy company has entered into agreements with PLN and Grab (see below) to develop EV charging stations across the country, with a focus on Jakarta and Bali. In Bali, it has launched a platform for charging infrastructure by partnering with local government, OEMs, and charging infrastructure developers in order

to create a new pilot ecosystem, with the ultimate aim of scaling to other cities.

Major overseas firms

- **BYD:** The Chinese vehicle maker has already entered the Indonesian market, with two buses used in the Transjakarta e-bus trial and another trial that has just finished in Bali, testing e-buses in tourist areas. Bluebird has also ordered electric vans from BYD to be used as taxis in Jakarta and Bali. Its success seems to stem from partnerships with established, large companies like Bluebird and Transjakarta.
- **LG Chem:** The South Korean giant is heavily involved in the e-mobility industry, investing in a \$9.8bn battery factory, as well as seeking to participate in an electric motorcycle battery swap scheme.
- **Major car companies:** Hyundai, Honda and Toyota are all investing in the Indonesia e-mobility sector. The Hyundai Ioniq is available for commercial sale and the Honda PCX is available through fleet rental for institutions. Toyota has invested \$2bn to develop EVs in Indonesia.

¹ <https://www.adb.org/what-we-do/sectors/energy/strategy>

Local manufacturers and charging developers

- **Inka:** A rolling stock manufacturer which has signed an MoU with Bali - represented by Perusda Bali - to develop an electric public transport system, including electric buses and trams. One of their electric buses is undergoing testing with Transjakarta on an operational route.
- **BPPT (Agency for the Assessment and Application of Technology):** is a non-ministerial agency that is heavily involved in the installation of charging stations, with three nationwide, including one in Bandung.

Local mobility disruptors

- **Grab:** The ride hailing company has deployed over 5,000 EVs across Indonesia, with drivers reporting lower overall costs. They are invested in deploying charging stations, battery swap stations and electric bikes.
- **Gojek:** Grab's competitor in Indonesia is also investing in EVs, making bikes available to rent for delivery drivers and providing financing for user EVs.
- **Gesits:** an Indonesian e-scooter and motorcycle manufacturer, which has made significant in-road in this segment with the electric motorcycle.

4.2 Local consumer context

There are several factors unique to the local consumer landscape in Indonesian cities of note:

E-bikes: The low uptake of e-bikes via trials is due to several non-exclusive factors. The Covid-19 pandemic-related local and global lockdowns has impacted negatively on participation in trials and attendance of e-bike demonstrations which require outdoor movement. There is also limited consumer education about the availability and benefits of e-bikes. Batteries for e-bikes in Indonesia can currently last for 3 hours (~50km) and there are concerns about the range of travel when travelling long distances. Few e-bike manufacturers offer more than two batteries for the initial sale of the bike due to the cost of the battery itself. This has been reported to account for up to 40% of the overall cost of the vehicle.

Low price competitiveness. The key messaging and focus for many low- and middle-income Indonesians will be not the benefits of e-mobility options, but how affordable this mode of transport is for them. Therefore, focusing on mass transit, publicly subsidised electrified fleet in urban centres should be the main goal for both Indonesian national and local government authorities as well as companies engaging in this market.

Charging infrastructure. One of the largest hurdles in the broad transition to e-mobility up to now has been the construction of a comprehensive charging infrastructure network to build range confidence and maximise EVs' emission reductions and cost savings. This means that from an EV perspective Indonesian cities are already well placed in terms of having the necessary consumer base for e-motorcycles, e-buses and e-scooters. There are more opportunities to encourage uptake of e-mobility for short day-to-day trips (e.g. to healthcare and education facilities) that are well-suited to two-wheeler EVs.

Current economic climate. The minimal local manufacturing content requirement and the shift in the political climate to "buying local" would make it challenging to bring UK manufacturing and brands into the Indonesian market¹. A focus on providing e-mobility related services rather than manufacturing goods in the country would be key for foreign companies to be successful in the country's business environment.

Operational concerns about electrocution risks during floods, which are frequent in an island-nation, as well as the apprehension of not being able to repair EVs in case of emergency are also prevalent within the country. Visibility of EV maintenance workshops is low which exacerbates the problem that existing workshops in the country primarily service conventionally-fuelled vehicles.

Cultural differences may inhibit the 'following of rules' which may be prevalent in other countries in Southeast Asia. Again, education becomes powerful in this context, but so are pilot projects demonstrating e-mobility's potential.

4.3 Routes to market

Considering the key stakeholders and the specific local context of the e-mobility landscape, there appear to be five main routes for entry into the Indonesian market and specifically this sector (see Table 4).

- The most common route to entry is through **acquiring an already established local business** which can be converted into an Indonesian subsidiary of the UK firm (Jardine Matheson, HSBC, British American Tobacco and GSK). This may not be an option for SMEs due to the capital expense, but should not be overlooked due to the inherent advantages.
- Other companies have found success in **partnering with local firms** (e.g. Prudential).
- SMEs may find it challenging to enter the e-mobility market in Indonesia on their own. Therefore, **pursuing supply chain opportunities** with larger, established companies in the manufacturing, construction or engineering space in Indonesia before opening a physical office in the country might be better suited to contract them.
- Another less common route for UK companies to enter the market is to **establish a subsidiary in Singapore and export goods and services to Indonesia** from there, taking advantage of the low tariffs between the two countries and strong business support (Unilever, BP).
- **Directly working for or alongside local or regional governments** would also be another route of engagement, albeit more challenging without the help of a local partner, UK firm's subsidiary or the UK government. That is why this route has not yet been identified vis-a-vis an existing case study and is not included in Table 4.

Table 4: Route to entry into Indonesia for large UK companies

Name of firm	Size of firm (2019 revenue)	Country of origin	Route to entry
Jardine Matheson	\$40.9 bn	UK	Local acquisition
HSBC	\$55.4 bn	UK	Local acquisition
BAT	\$33 bn	UK	Local acquisition
GSK	\$43.1 bn	UK	Local acquisition
Prudential	\$64.8 bn	UK	Local partnership
Unilever	\$60.1 bn	UK	Local subsidiary
Standard Chartered	\$15.3 bn	UK	Local subsidiary
BP	\$278.4 bn	UK	Local subsidiary

¹ <https://www.channelnewsasia.com/news/asia/indonesia-love-local-hate-foreign-products-jokowi-growth-14331276>

4.4 The city as a market

When considering the cities of Bandung, Surabaya and Denpasar in particular, it can be helpful for UK companies to appoint a local partner to aid in the distribution of products and services. In fact, a local agent or distributor, who is well-integrated in the ecosystem and has a successful procurement and project delivery track record, is recommended for most government level procurement. These partners are often crucial as successful bids can be based on long-established relationships, while participants new to the market and less well-known may miss out. Successful partnerships can be brokered via the British Embassy, Business Councils or Chambers of Commerce, as well as UK government sponsored programmes targeted towards bilateral (UK-Indonesia) relationship building and investment in science, technology and innovation.

When looking to sell into the mobility supply chain the state-owned bus operator DAMRI is an obvious potential partner or client. This is due to its existing research funding with ADB and its stated aim of purchasing 500 electric buses over the next five years, which will require extensive supporting infrastructure. DAMRI is aiming to have 10,000 electric buses by 2030, or 83% of its fleet, with the remainder being natural gas or diesel buses¹. Something to keep in mind, however, is that there is a limited number of local partners such as DAMRI, and that as a result they are in high demand.

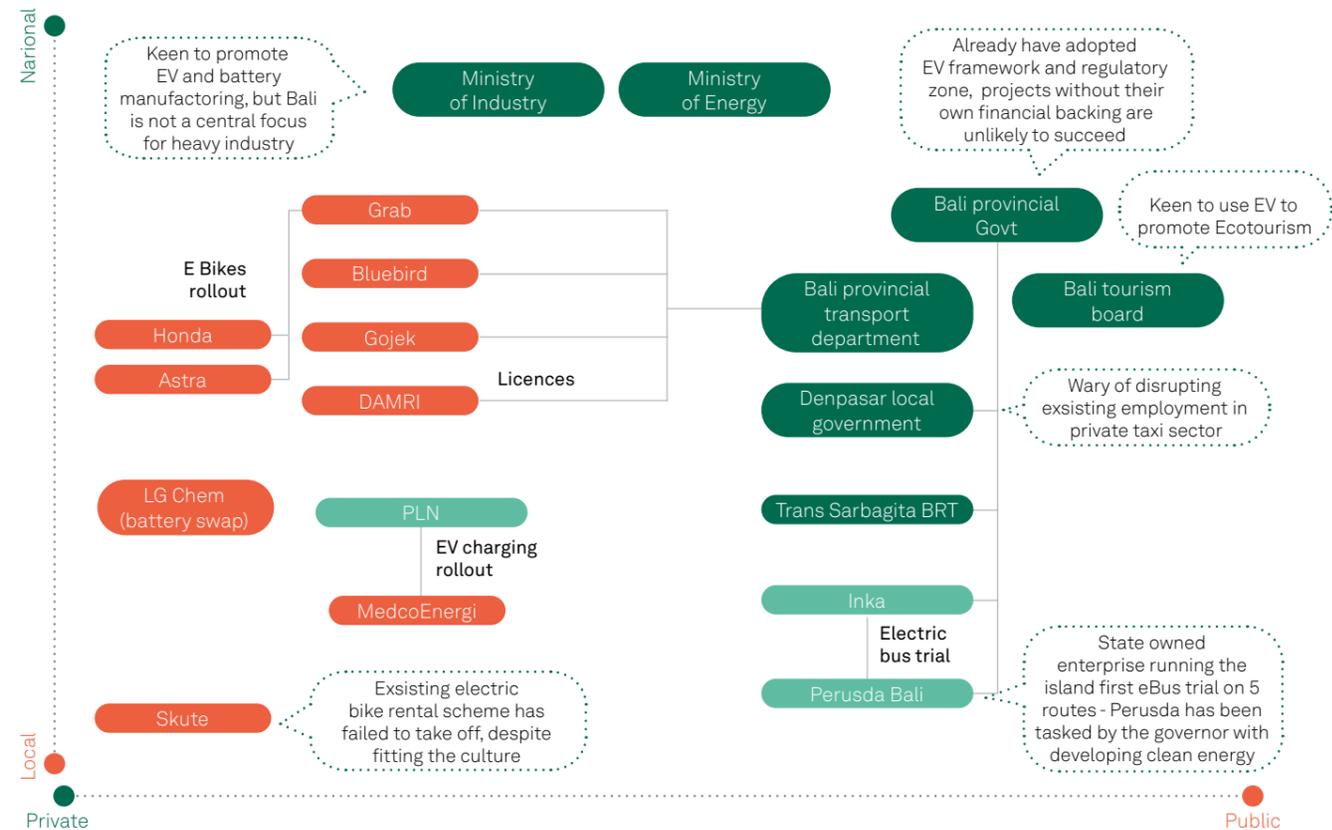
The below diagrams illustrate the landscape of key players, where the size of the box approximately represents the importance of the organisation in the e-mobility sector in that city. The red borders indicate the organisations that appear to have most appetite for collaboration and innovation in e-mobility.

In Denpasar, the main opportunity highlighted in our report to explore is the Denpasar local government and the Bali Tourism Board. This is due to the catalytic potential of tourism and the possibilities that EVs can boost the island's post Covid-19 brand of responsible ecotourism (see Figure 1).



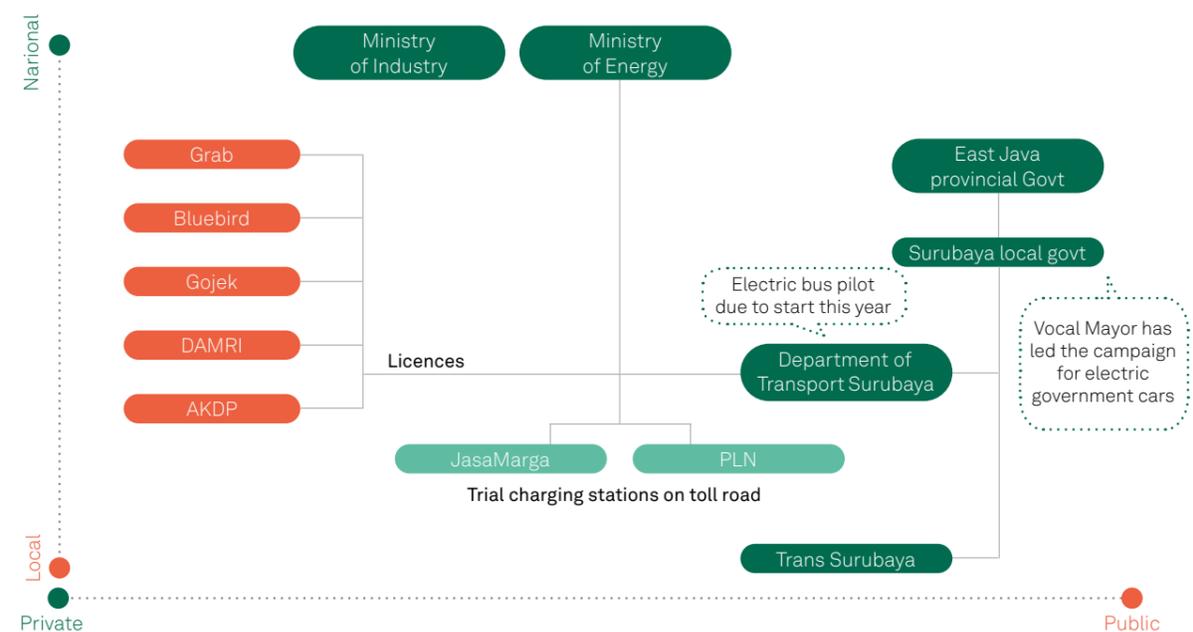
¹ <https://theinsiderstories.com/indonesias-damri-to-spend-us150m-for-electric-cars/>

Figure 1: Organisational chart showing potential routes to entry in Denpasar.
Source: Expanded upon Asian Development Bank



In Surabaya, the key enabler and potential partner is the Surabaya local government, who have already expressed their desire for increased EV uptake through the commitment to an entirely EV governmental fleet and the department of transport, who are due to oversee an electric bus trial this year (see Figure 2).¹

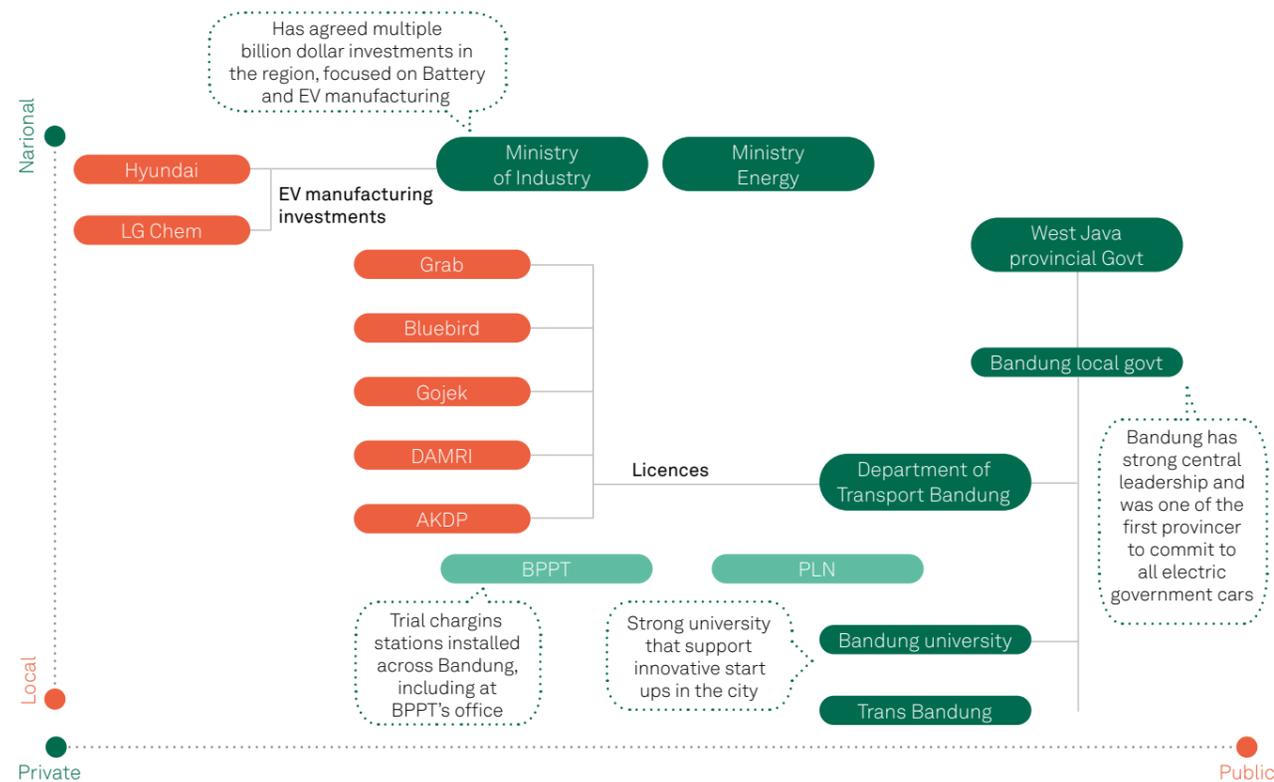
Figure 2: Organisational chart showing potential routes to entry in Surabaya
Source: Expanded upon Asian Development Bank



¹ <https://netral.news/en/expensive-prices-become-a-constraint-for-electric-buses-in-indonesia.html>

Bandung has a far greater focus on the production of EVs as well as their deployment in the city - both from government and industry perspective¹. The Ministry of Industry are particularly engaged in this region relative to others, and their participation and buy-in is likely to be advantageous in exploring potential routes to entry as they are already supporting manufacturers' investments in the region. The local government is also supportive of e-mobility, with West Java being the first regional government in Indonesia to have outlined their ambition to shift official government vehicle fleets to electric. Therefore for a UK company's first venture into the Indonesian market, Bandung can be a compelling starting point, given the leadership, infrastructure and innovation conditions in the city (see Figure 3).

Figure 3: Organisational chart showing potential routes to entry in Bandung
Source: Expanded upon Asian Development Bank



4.5 The city market for UK companies

Because the market for innovative firms in mobility and associated sectors is not yet saturated in the three Indonesian cities we have looked at in further detail in the [Innovating for Clean Air: E-mobility in Indonesia report](#), there is room for new e-mobility solution providers from the UK to enter it. Table 5 summarises the drivers, challenges and opportunities for UK firms to engage with the Indonesian e-mobility market.

The least saturated supply chain elements **most suited to UK engagement and intervention** are mainly focused on **communication and consumer behaviour change and platform and technology integration**. Our report identified large gaps in the supply chain in these areas. E-mobility manufacturing and charging infrastructure have many more local and international companies operating at present, while the lack of large-scale charging infrastructure roll-out means that at present the market opportunity is smaller.

¹ Bandung hosts one of the country's only fast chargers, and Hyundai, LG Chem and Toyota have all outlined commitment to supporting local production in West Java.

Table 5: Summary of drivers, barriers and opportunities for Indonesia's e-mobility market

Drivers	<ul style="list-style-type: none"> • Growth of EV market and supply base • Government policies to support Paris Agreement commitments • Government commitment to transform transport sector through National Action Plan for GHG Reduction • Proliferation of pilots in Jakarta, West and East Java • Moderate demand for e-mobility across Indonesian cities
Barriers	<ul style="list-style-type: none"> • Weak or sporadic infrastructure • High carbon intensity of the electricity grid • Lack of investment, lower budgetary capacity • Regulatory environment • Lacking roadmap for scaling up from the pilot stage • Government, academia and industry are not tightly aligned in pushing forward the e-mobility agenda
Opportunities	<ul style="list-style-type: none"> • Battery swapping and battery services value chains • Transformation of the transport and energy sector is underway • The market for innovative firms in this sector is not yet saturated • Catalysing the growing indigenous start-up and innovation ecosystem • Cities have an advantage in test-bedding and piloting solutions • Routes to entry via private transport operators or local firm partnerships

Other key areas identified where UK companies can bring expertise and capabilities are:

- Enabling **national policy** to avoid disincentivising e-mobility options' uptake.
- A more comprehensive **charging infrastructure network**, including possibilities for fast charging, whole-city charging networks and electric highway infrastructure. This will be necessary to build range confidence and access to convenient charging locations.
- Efforts to maximise electric vehicles' **emission reductions and cost savings**.
- Focus on **commercial vehicles**, where the cost benefits are realised far more quickly.
- Supporting a **culture of working with both local and central government** to implement EV infrastructure and incentives.
- An ability to compete with, or the removal of, **public diesel subsidies** which reduce the cost competitiveness of electric vehicles.
- Greater access to funds and **investment de-risking tools** to finance new implementations.
- Working with **last-mile delivery services** (e.g. Grab) to implement electric motorcycles, as the relatively low power and acceleration of these vehicles makes them unsuitable for private use.
- Efforts to spur **behaviour change**, for example through strengthening environmental awareness, designing incentives, and implementing new exchange programmes.
- **Leveraging on university platforms** as potential test beds for new technology and at the same time building the local resource knowledge base around errors that could potentially occur with new developments. This may simultaneously address development of local human capital to support a move towards a **new labour ecosystem** to support e-mobility.

Ultimately, the most successful approaches to entering the Indonesian e-mobility market combine:

- 1. National-level government enablers**
- 2. Tailored city-level delivery mechanisms**
- 3. Specific market entry strategies.**

5 Summary and Recommendations

Despite existing barriers to entry, the opportunities presented by the Indonesian e-mobility market are substantial. Emerging demand, government plans to grow locally based EV supply chain, a young but vibrant local e-mobility ecosystem, city based public transport systems in need of an upgrade, and a growing appetite for green tourism as a means to boost post Covid-19 economic recovery all create a range of opportunities and potential for UK companies.

The city space has multiple opportunities, which to date have been of trial scale. Therefore, there is a growing awareness that these new e-mobility solutions need to be tested before entering into widescale deployments. This can be to the advantage

of agile SMEs. With the lack of city and nationwide charging infrastructure, the clearest short- to medium-term opportunity for UK SMEs is either entering the supply chain of a larger local company, such as Gojek, or as a partner delivering trials on the electrification of city services, such as mass transit, or waste collection.

The lower budgetary capacity of Indonesian local governments, together with the lower number of major urban innovation players to partner with, means routes to entry for UK companies are likely to be centred around private transport operators or partnerships with local firms as opposed to directly contracting with local government authorities.

The national government agenda to build local supply chain capacity should not be overlooked. Thus, those SMEs looking to succeed in the Indonesian market will need to set up a local entity, and in some cases secure local partnerships, if they are to compete in the marketplace.

Contracting and working with national government may be too resource constraining for a small company, and in the short term the opportunities there are limited for the UK supply chain.

To assist UK companies with market entry in Indonesia, the UK government, through the [British Embassy](#), and affiliated non-governmental bodies, such as the [British Chamber of Commerce in Indonesia](#) and [UK ASEAN Business Council](#), offers a wide range of support - from guides to doing business to networking, funding and other engagement programmes.

Through these, UK companies have access to the resources to make sure they are fully prepared to approach the unmissable opportunity presented by the Indonesian market.

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is experienced at helping companies grow their market share in the built environment and mobility space, both in the UK and overseas. The Catapult has for many years worked around the world to convene projects that stimulate local ecosystems across a range of themes and technologies. It does this through understanding what is needed and what is possible, and then supporting the collaboration of local businesses, academia and government with UK SMEs to create win-win projects that provide real socioeconomic benefits for all involved.

The Catapult connects businesses and public sector leaders to cutting-edge research. We help develop, implement and commercialise the latest technology and innovation for existing markets, as well as create demand and grow new markets globally. With transport and the built environment sectors contributing the majority of worldwide emissions, we are prioritising innovations that tackle carbon in the ways we travel and manage buildings. E-mobility is precisely an area of innovation whose potential we are looking to grow domestically and abroad.

If you would like to learn more about what we do or the opportunity which Indonesia represents, please get in touch at global@cp.catapult.org.uk.



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