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#POLIS2022

Developing paratransit electrification policies: case studies analysis

4A. OUT OF THE BOX : EXPLORING NEW CASES FOR ELECTROMOBILITY

Solène Baffi, Project manager, CODATU

Codatu

Paratransit – what is it ?

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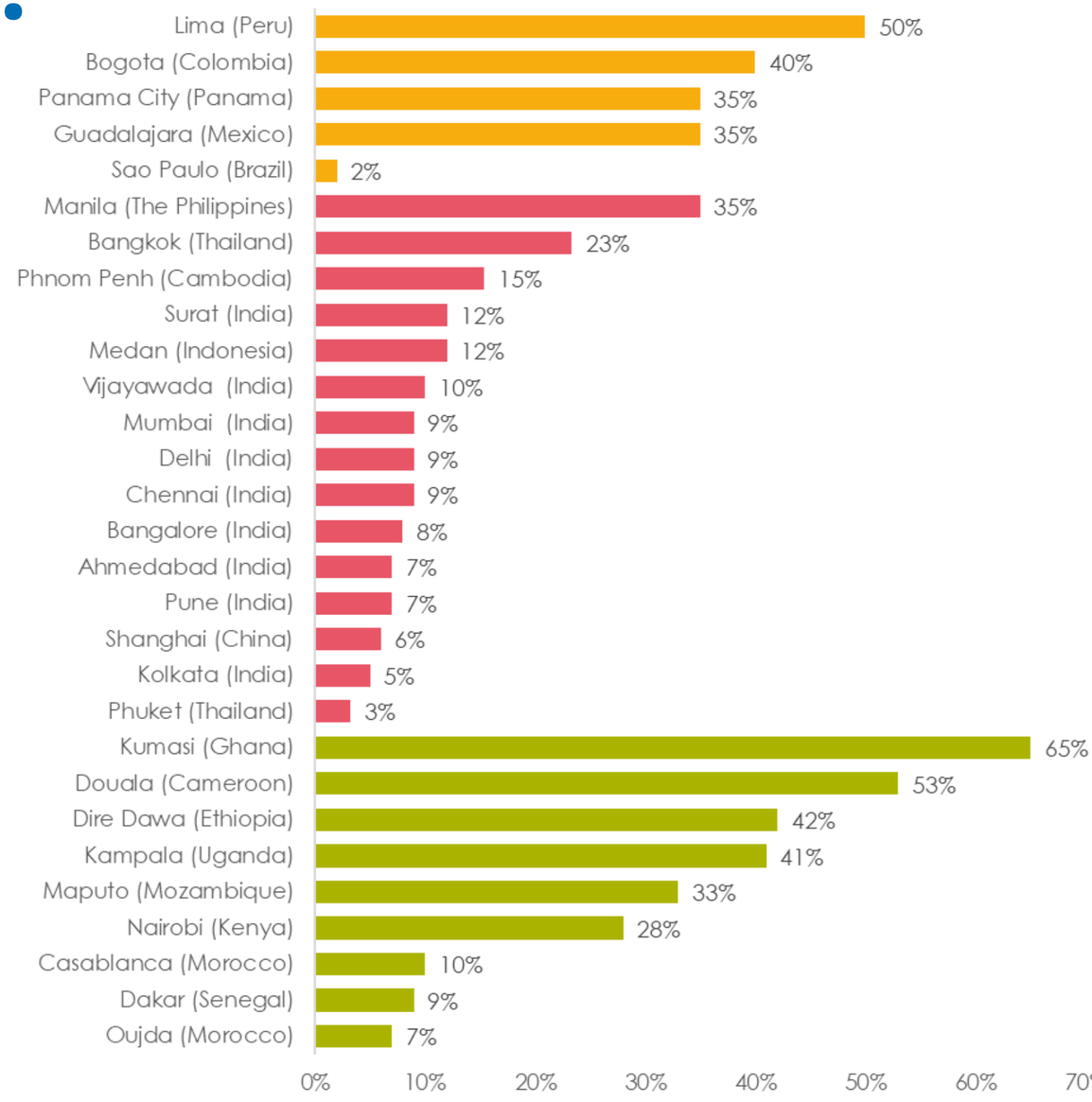
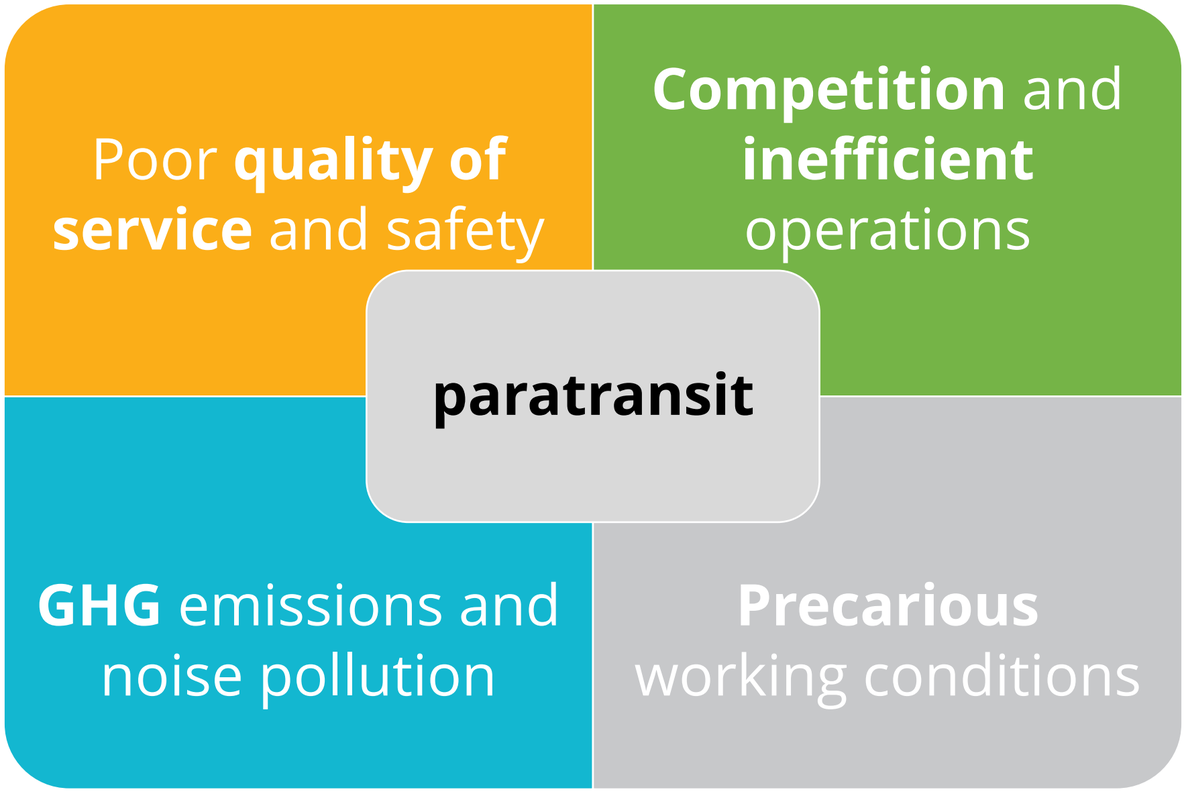


Figure from the publication « Paratransit services in Asian cities : scalable solutions to reform, modernise and integrate » AFD-MobiliseYourCity (by Espelia-Codatu)

A sector generating negative externalities



A difficult sector to reform

A complex set of stakeholders and flows

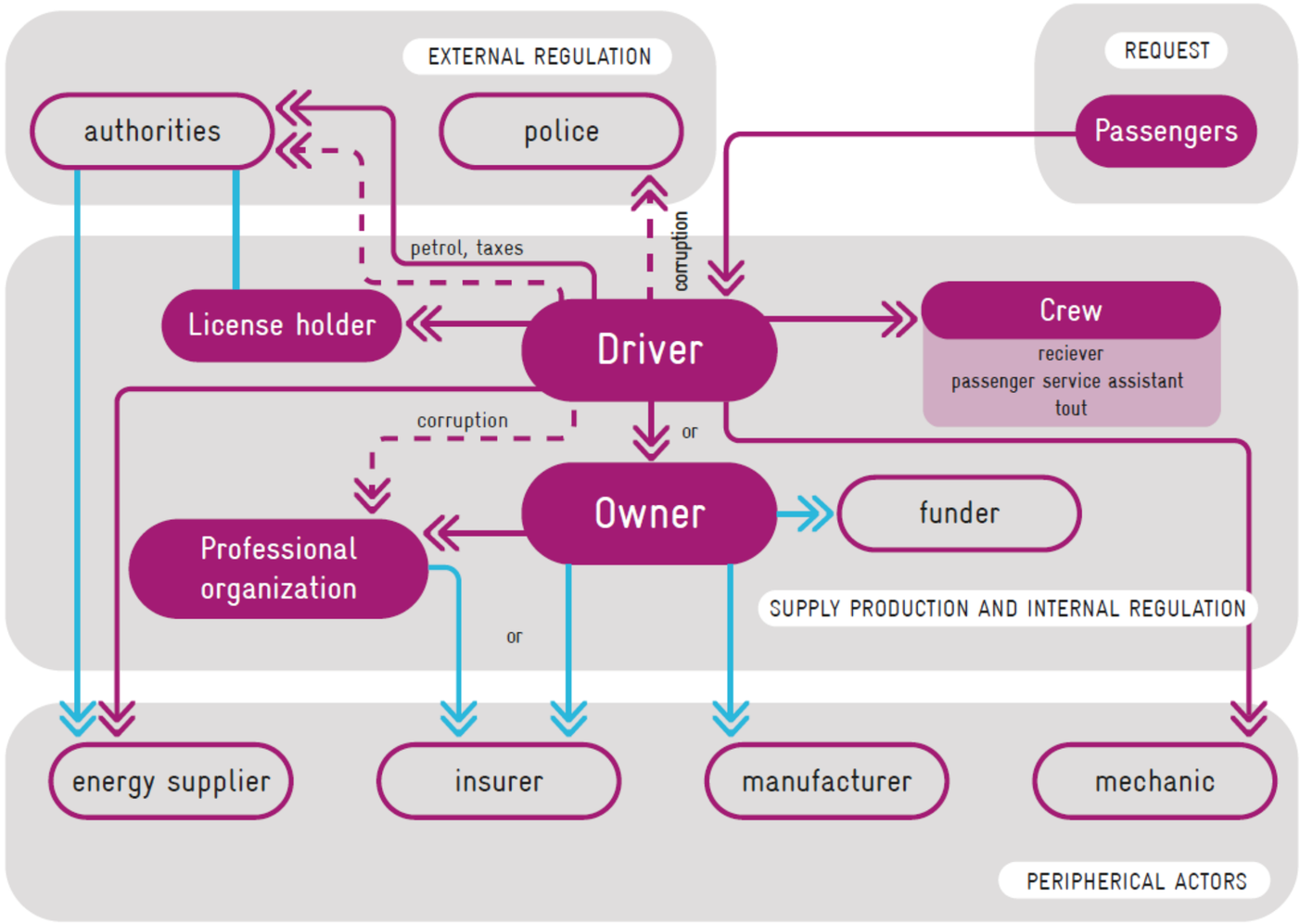


Figure from Baffi, S., & Lannes, J.P. (2021a) Understanding Paratransit: Defining and diagnosing paratransit for sustainable mobility plan-ning, MobiliseYourCity Paratransit Toolkit (Part 1)

The perspectives of electrification

Emissions savings of operating an EV instead of an ICE considering current electricity generation profiles

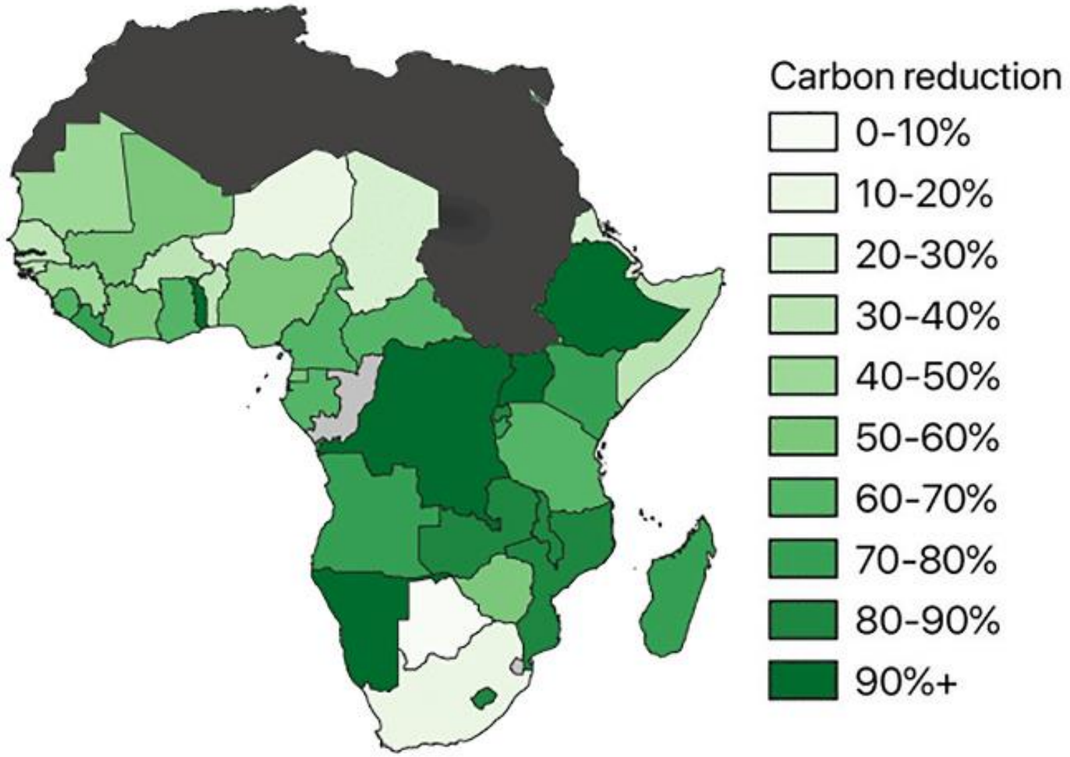
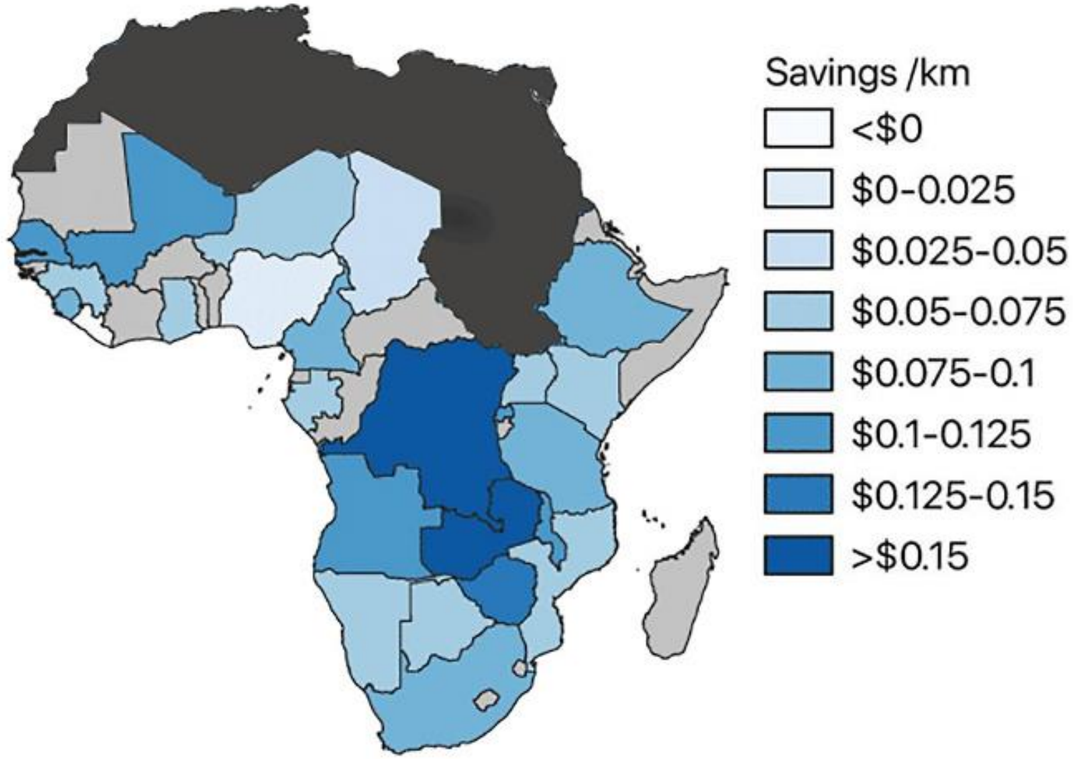


Figure from Collett K. A., Hiermer S. A., Dalkmann H., Crozier C., Mulugetta Y., McCulloch M. D. (2021). Can electric vehicles be good for Sub-saharan Africa? Energy strategy review, vol. 38

The perspectives of electrification

Operational cost savings per kilometre for the owner-operator if they were to run an EV instead of an ICE



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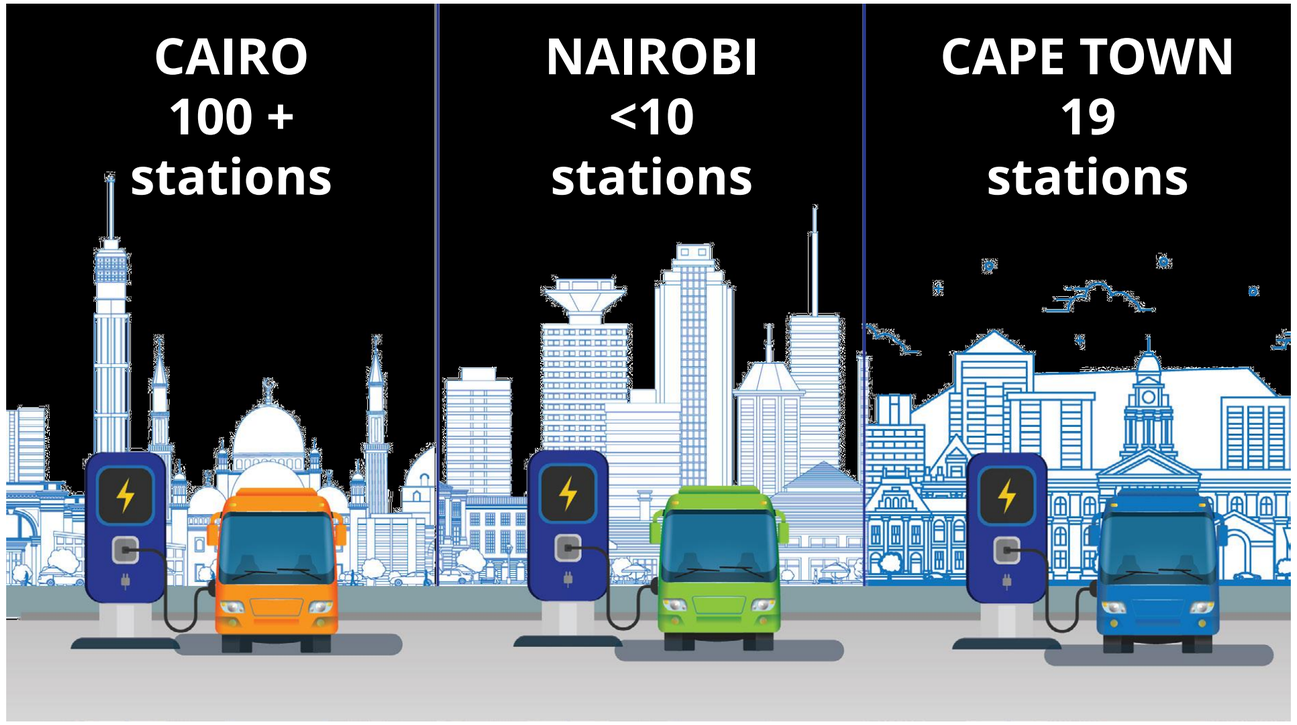
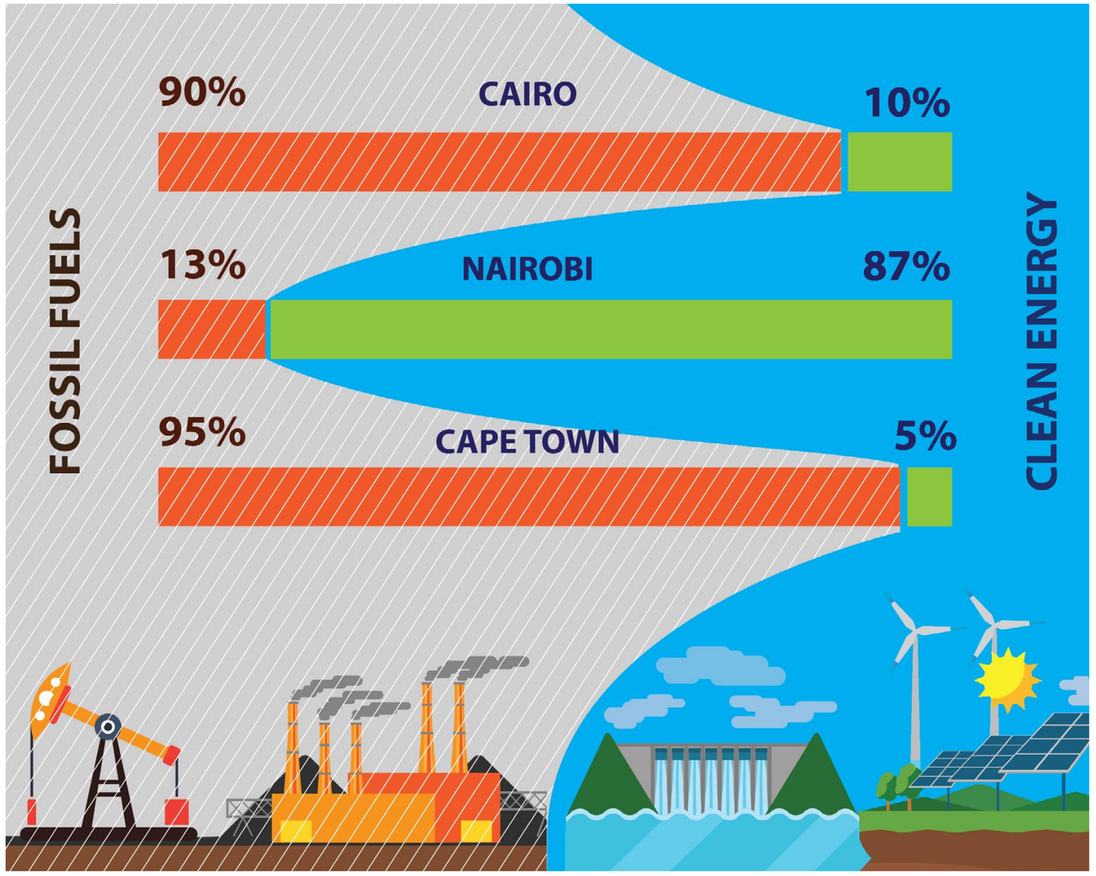
The perspectives of electrification

In many African countries
80-90% of the vehicles are
imported from the US,
Japan and Europe

The challenges of electrification

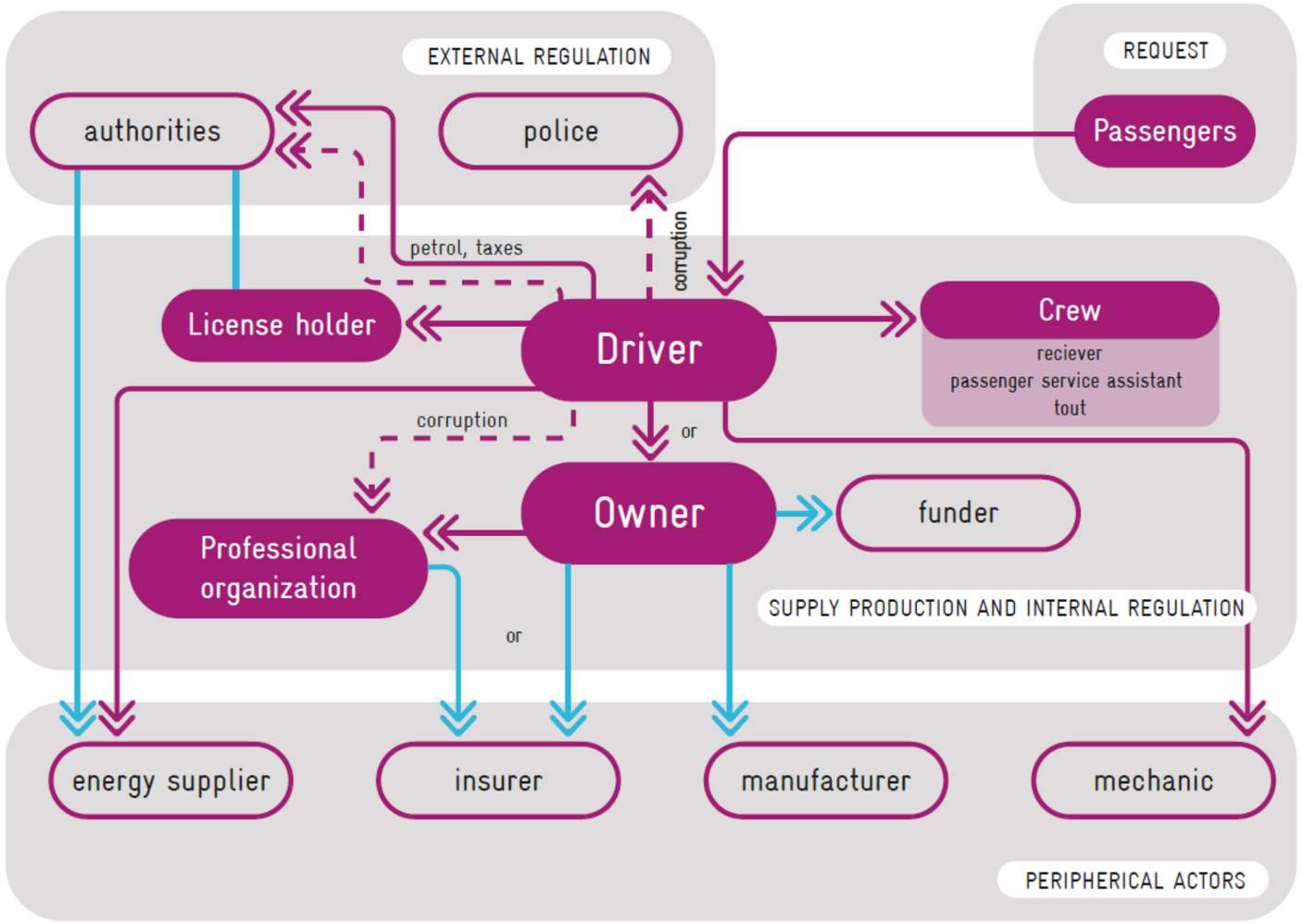




Figures from Odhiambo, E; Kipkoech, D; Hegazy, M; Hegazy, A; Manuel, M; Schalekamp, H; Klopp, J M ; (2021) The potential for minibus electrification in three African Cities; Cairo, Nairobi and Cape Town. Volvo Research and Educational Foundations (VREF). August 2021

The challenges of electrification

- Vehicle and batteries manufacturers
- Charging station providers
- Energy providers
- Waste/ recycling management providers



- National energy/climate strategy
- Energy ministry
- Standards & regulation

Figure from Baffi, S., & Lannes, J.P. (2021a) Understanding Paratransit: Defining and diagnosing paratransit for sustainable mobility plan-ning, MobiliseYourCity Paratransit Toolkit (Part 1)

The challenges of electrification

National level

- Legislation
- Regulation
- Fiscal incentives
- Strategy

Local level

- Planification
- Regulation
- Fiscal incentives
- Operators formalization
- Communication

Project level

- Fleet renewal
- Tools development
- Professionalization & capacity building

Case study: the Safa Tempo in Nepal

Early 1990's : 640 diesel-powered auto-rickshaws

1996: locally produced Safa Tempos

1999 : ban of diesel auto-rickshaws

2000 : more than 600 zero-emission Safa Tempos
→ *Battery issues*

Pictures from Shrestha S., Lah O. (2019). Nepal Project scoping. UEMI.

Case study: the Safa Tempo in Nepal

2000 : import of diesel/petrol/LPG microbus and LPG 3-wheelers allowed

→ *Decline of Safa tempos*

2007 : Nepal imports e-vehicles

2020 : between 700 and 1 200 operators

Picture from Shilu Manandhar, Global Press Journal

Case study: India, the FAME program

National level

Faster **A**doption and **M**anufacturing of **E**lectric (and hybrid) vehicles

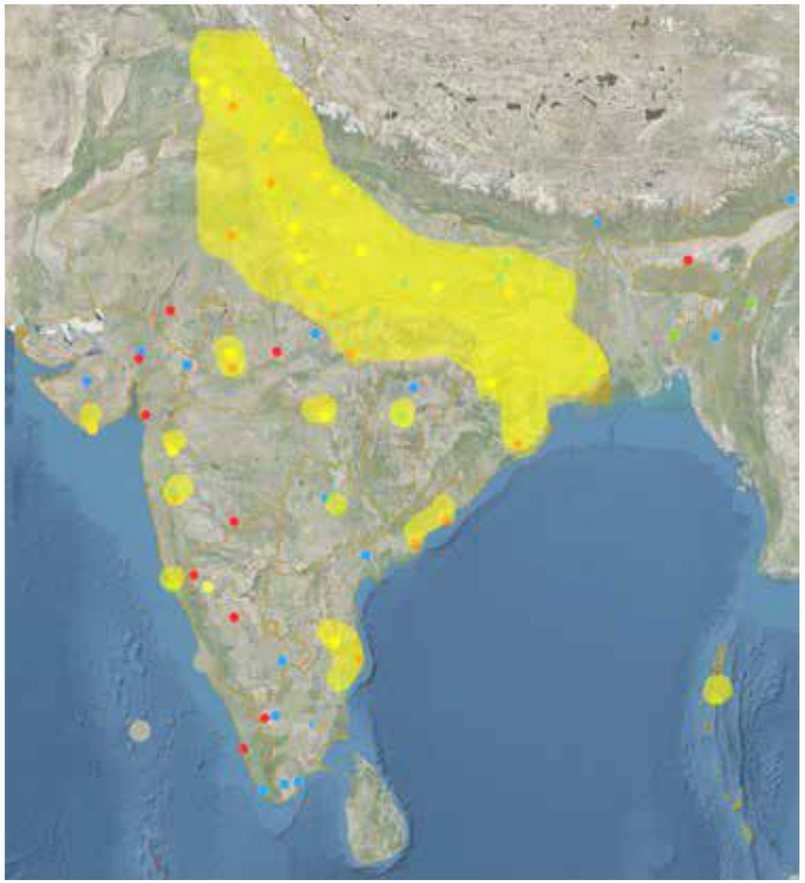
FAME I : 2015 to 2019

FAME II : 2019 - 2022

Legislation	Regulation	Fiscal incentives
Define the role of paratransit in the mobility system	*Define specific criteria to obtain a licence and operatore e-vehicles,* *Creation of 2 bureau to control standards*	*Rebates on e-vehicles to encourage the purchase and foster industry,* *Cheaper price on electricity,* *Support from IFIs*

Pictures from Shandilya, N., Saini, V., & Ghorpade, A.R. (2019) E-Rickshaw Deployment in Indian Cities - Handbook (Supporting Sustainable Mobility under Smart City Mission), ICLEI- Local Governments for Sustainability, South Asia (ICLEI South Asia) and Shakti Sustainable Energy Foundation

Case study: India



E-rickshaws operations in India

In 2017, e-rickshaws in Delhi helps in commuting approximately **6 344 378 passengers** per day, i.e. 2,5 more than the number of passengers moved by metro per day

More than **100 000** registered and unregistered e-rickshaws operating in Delhi

88 % of trips are short

5 swapping stations in Delhi

80 % operators have a monthly income ranging from INR 15 000 (180 euros) to 30 000 (360 euros)

Figure and data from Shandilya, N., Saini, V., & Ghorpade, A.R. (2019) E-Rickshaw Deployment in Indian Cities - Handbook (Supporting Sustainable Mobility under Smart City Mission), ICLEI- Local Governments for Sustainability, South Asia (ICLEI South Asia) and Shakti Sustainable Energy Foundation

Case study: fleet renewal in the Philippines

Old and new jeepneys in Manilla

Figures from Kaenzig R., Mettke, C., & Mariano P. (2020), Reforming the (semi-)informal minibus system in the Philippines, The 'Public Utility Vehicle Modernization Program' Early Route Evaluation, GIZ

Case study: fleet renewal in the Philippines

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Average (range)		Traditional Routes	Modern Routes	Average % ch.
	Daily operating hours	14hrs (13-15hrs)	19 hours (11-22 hours)	+36%
	Vehicle utilisation	127km (60km-190km)	150km (80-220km Euro IV diesel) (80-120km E-Jeepney)	+18%
	Days of operation per week	5.6 days (5.5-6 days)	6 days	+7%
	Staff per vehicle/day	1 driver (1-2 drivers)	2 drivers, 1.5 conductors (1-2.5 drivers, 0-2.5 conductors)	+350%
	Daily staff earnings	650 PHP (11.57 EUR) (574-755 PHP – 10.21-13.44 EUR) (non-salaried)	600 PHP (10.68 EUR) + benefits (537 M/W-1,000+ PHP – 9.56-17.80+ EUR) (salaried)	~
	Vehicle capacity	20 seats (16-24 seats)	30 seats max. (22-24 seated)	+50%
	Fuel economy	5.9 km/l (4.2-7.8 km/l)	5.2 km/l (4.2-6.2 km/l)	-12%
	Fuel economy per passenger/km	111 km/l	156 km/l	+41%
	Daily ridership Pax./day/vehicle	300 (150-350)	460 (Euro IV Jeep 300-750) (E-Jeepney 200-250)	53%

Temporary conclusion

- Electrification of paratransit: an **urgent topic** not to be neglected, and a lever for transformation
- Many **technical** barriers still on the way, local energy provision to be considered
- Need for consistent **policies** at all levels and stakeholders coordination
- Lack of **data** and information
- Communication and **integration** of the paratransit operators and users

Baffi, S., & Lannes, J.P. (2021a). *Understanding Paratransit: Defining and diagnosing paratransit for sustainable mobility planning*, MobiliseYourCity Paratransit Toolkit (Part 1).
URL: https://www.mobiliseyourcity.net/sites/default/files/2021-11/Un-derstanding%20Paratransit.pdf

Baffi, S., & Lannes, J.P. (2021b). *Reforming Paratransit: A catalogue of practical actions for policy-makers and practitioners*, MobiliseYourCity Paratransit Toolkit (Part 2).
URL: https://www.mobiliseyourcity.net/sites/default/files/2021-11/Reform-ing%20Paratransit.pdf

Espelia-Codatu. (2022). *Paratransit in Asia: Scalable solutions to Reform, Modernise and Integrate*. Agence Française de Développement (AFD), MobiliseYourCity.
URL: https://www.mobiliseyourcity.net/paratransit-asia-scalable-solutions-reform-modernise-and-in-tegrate

Thank you for your attention!

For questions:

sbaffi@codatu.org