Electric mobility

# Electric mobility business models and exploitation pathways

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# In this video you will learn:

- Electric mobility service agents and roles
  - Electric mobility business models
    - PAYGO, pay-per-use, Leasing, E-sharing
      - Battery swapping
        - Existing business cases in Africa

# E-mobility service agents and roles

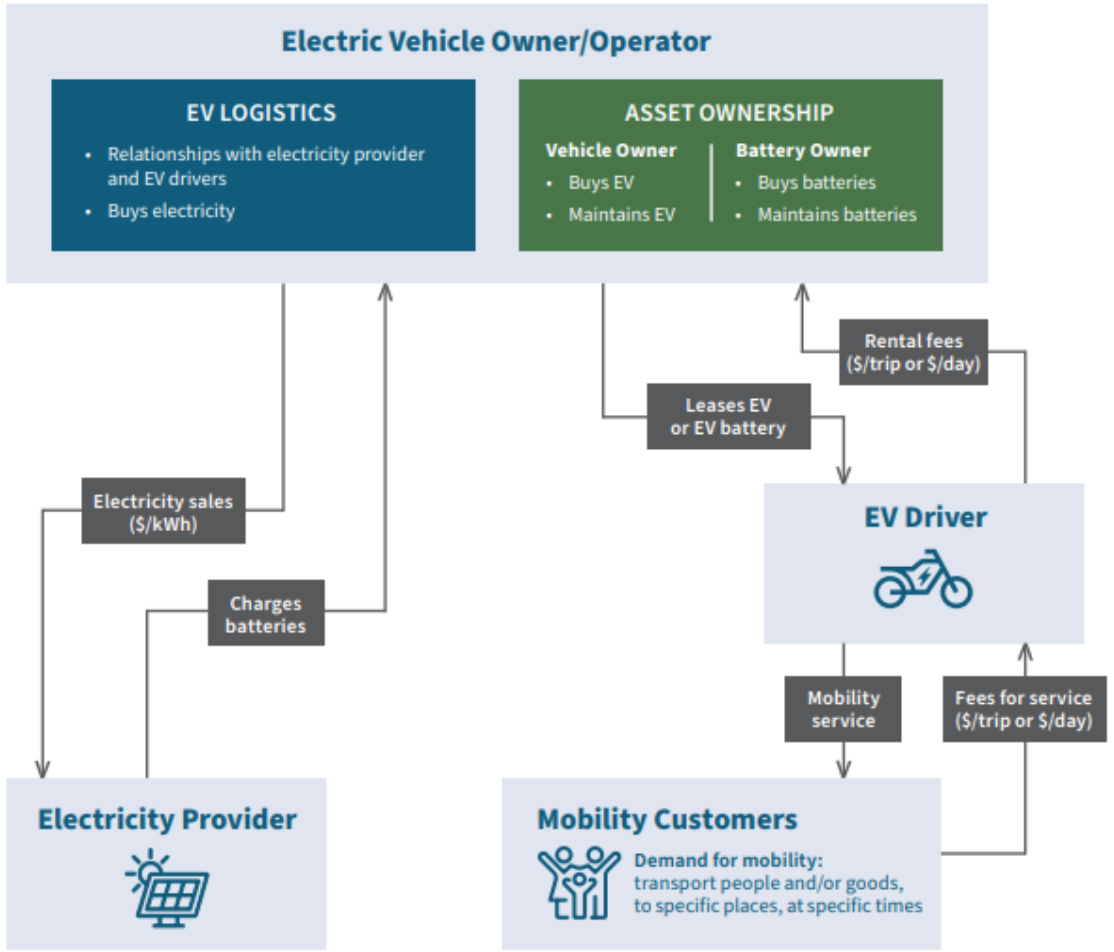


*Figure 1. Principal agents involved in minigrid powered EV business models (RMI, 2022).*

1. **EV owner/operator:** Own charging or swapping stations and E-mobility assets (vehicles and/or batteries).
2. **Electricity provider:** Offer renewable power for minigrids feeding vehicle batteries.
3. **E-mobility driver:** Offer mobility services and rent vehicles from EV owners.
4. **E-mobility customer:** Acquire services related to vehicles.

# E-mobility business models: PAYGO

**Pay-as-you-go (PAYGO):** it is based on offering fractional payment methods to avoid high initial expenditure. Down payments are offered upfront instead.

**Example:** Zero Emission Motorcycle Boda, Uganda.

*Figure 2. Zembo motorcycles launching in Kampala-Masaka highway in Uganda.*

# E-mobility business models: pay-per-use

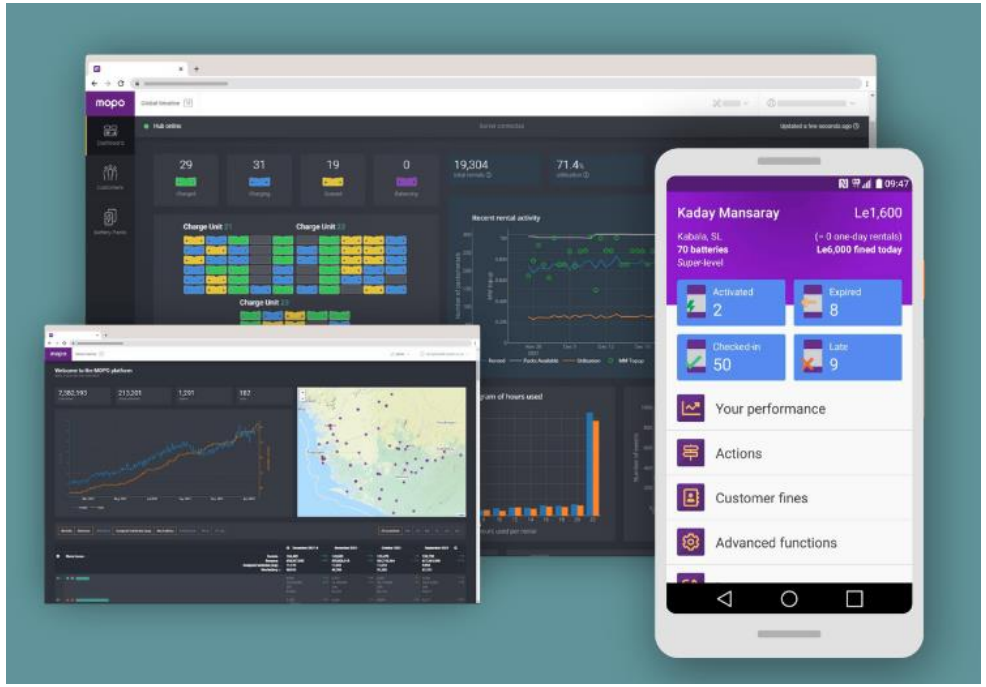


*Figure 3. MOPO platform and mobile app for pay-per-use exploited battery swapping station.*

**Pay-per-use:** is based on paying a daily fee for the vehicle use. No vehicle, battery, maintenance or electricity supply costs for the user.

**Example:** Mobile power, Nigeria.

Both mobile and smaller size stationary batteries are distributed by MOPO agents to users.

# E-mobility business models: Leasing

*Figure 4. Thinkbike e-bike boda boda service in Nigeria.*

**Leasing and/or lease-to-own:** is based on paying on a periodical rental basis. The second option allows to purchase the vehicle after a certain period.

**Example:** ThinkBikes, Nigeria.

Electric cargo bikes are leased to individuals or small businesses.

# E-mobility business models: e-sharing

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**E-sharing, car-sharing or carpooling:** it is based on sharing a set of e-mobility devices, usually by managing it with a digital platform and a user app.

**Example:** Jumpin Rides, South Africa.

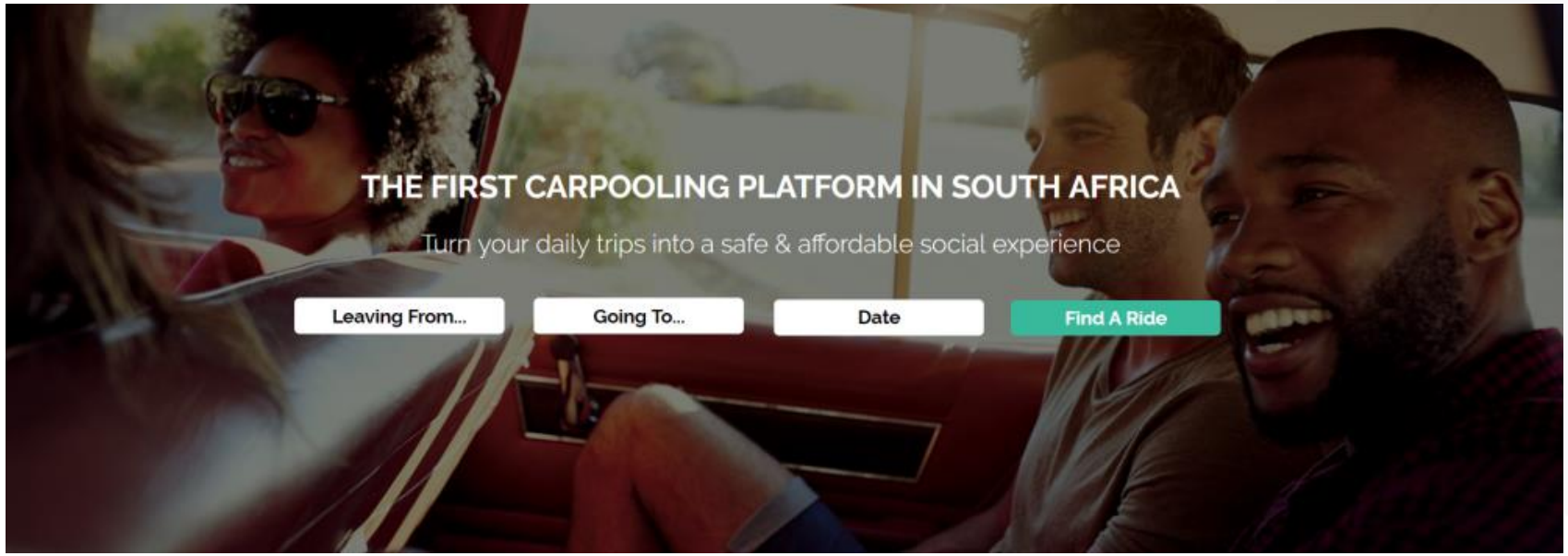


*Figure 5. Car sharing plaftorm interface of Jumpin Rides (South Africa).*

# Battery swapping (I)

**Battery swapping** is a technology based on replacing the used or completely drained battery with a fully charged battery. Moreover, it is a transversal activity to all business models shown and widely used in other sectors.

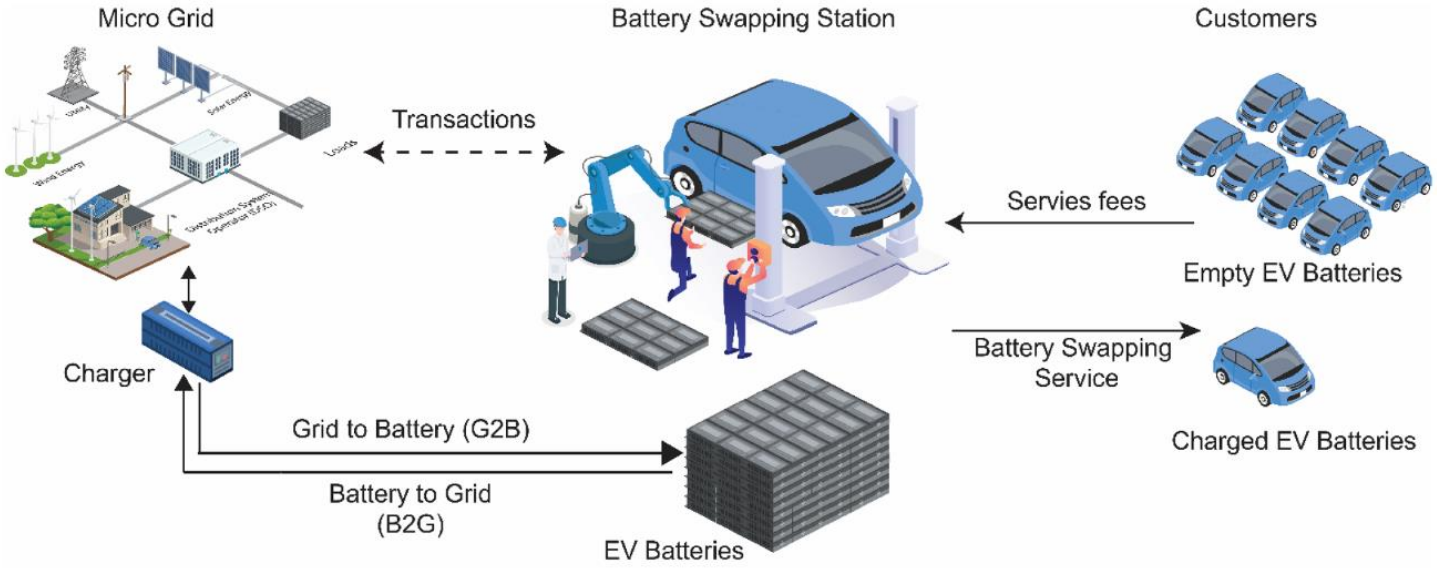


*Figure 6. Battery swapping ecosystem actors and interactions (Lebrouhi et al., 2021).*

## Advantages

- Reduces charging wait-times.
- Batteries can act as an energy reservoir during grid emergency events.

## Disadvantages

- Interoperability of battery pack/ modules needed.
- Lack of regulation.

# Battery swapping (II)

**Key functionalities** for battery swapping stations:

- Standard battery pack dimensions, charging connectors and other relevant components needed.
- Batteries, coupling devices and electrical interfaces must be tested in advance.
- Users should be aware of swapping station location, availability, and real-time pricing, ideally, using a mobile app.
- At all swap stations, the battery charger is plugged direct to the standard AC outlet.
- Specific battery handling and storing systems are needed.
- Swapping stations would have to be connected to off-grid systems like solar PV generators.

**Example:** Mobile Power, South Africa.

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# THANK YOU

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