

Lectures to students of higher educational institutions of Turkmenistan
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SECCA's experience in promoting e-mobility in Central Asia

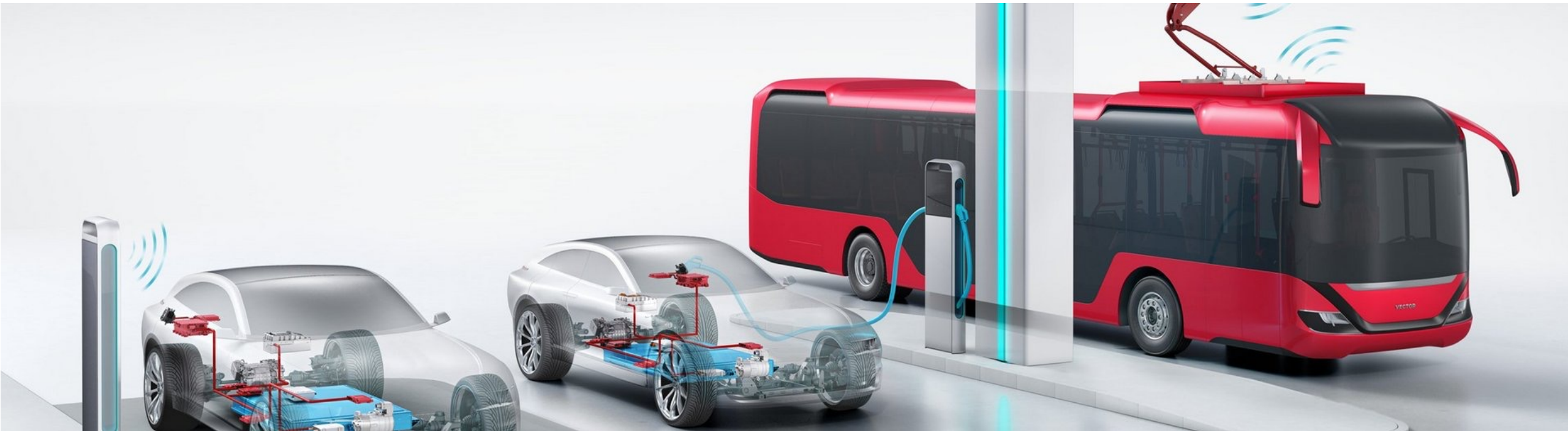
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ELECTRIC TRANSPORTATION AND E-MOBILITY



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Electric transportation and E-mobility

- **Electric transport** refers to trains, trams, cars, buses and bikes which run on electricity
- Electric transport already exists mainly in the form of trains and trams, but electric bicycles and electric cars have appeared on the roads mainly in the last decade
- **Electromobility** or **E-mobility** is the use of **electric vehicles** as well as **electric bicycles, electric motorbikes, electric buses** and **electric trucks**. The common feature for all of them is that they are fully or partially powered by electricity, have energy storage facilities on board and receive their energy mainly from the electricity grid

Electric transportation and E-mobility (2)

Electric Vehicle Types

- **Battery Electric Vehicles** (BEVs) also called "all-electric vehicles" - run solely on electricity and are recharged from an external source. They are driven by one or more electric motors powered by rechargeable batteries
- **Plug-in hybrid electric vehicles** (PHEVs) - also use batteries to power an electric motor and can be recharged from an external power source, but they have a small internal combustion engine that can recharge the battery (or, in some models, directly drive the wheels)
- **Fuel cell electric vehicles** (FCEVs) - hydrogen is converted into electricity that drives an electric motor. The FCEVs are not designed to recharge the battery from an external source. Instead, they are fuelled by compressed hydrogen stored in the vehicle's tank

Electric transportation and E-mobility (3)

Key benefits of e-mobility

- Reduced greenhouse gas (GHG) emissions
 - ✓ About 17-30% lower than the emissions of petrol and diesel cars
 - ✓ The production of electric cars is expected to become more efficient, and the production of electricity cleaner, every year the life-cycle emissions of a typical electric vehicle could be cut by at least 73% by 2050
- Reduced emissions of air pollutants
- Lower operating costs due to lower fuel consumption
- Reduced engine maintenance costs
- Reduced noise and vibration

E-MOBILITY TRENDS



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E-mobility trends

- Electric vehicle sales reached 14 million in 2023, 3.5 million more than in 2022
- In 2023, electric vehicles accounted for about 18% of all cars sold, up from 14% in 2022 and 2% in 2018
- In China, the number of new electric vehicle registrations reached 8.1 million in 2023, up 35% from 2022
- In the United States, the number of new electric vehicle registrations reached 1.4 million in 2023, up more than 40 % from 2022
- In Europe, the number of new electric vehicles in 2023 reached nearly 3.2 million, up nearly 20 % compared to 2022. In the European Union, sales totalled 2.4 million, with a similar growth rate

E-mobility trends (2)

- While much of the demand for charging is currently met by home chargers, publicly available chargers are increasingly required to provide the same level of convenience and accessibility as conventional car charging
- At the end of 2022, there were 2.7 million public charging points worldwide, more than 900 000 of which were installed in 2022, out of which:
 - More than 600 000 public slow charging points
 - About 300 000 publicly accessible fast chargers

ESSENTIALS FOR E-MOBILITY DEVELOPMENT



Essentials for e-mobility development

Recommendations of the International Energy Agency (IEA)

- ***Support for electric vehicles***
 - ✓ As the e-vehicle market matures, reliance on direct subsidies should diminish and eventually end
 - ✓ Neutral budget programmes that tax inefficient conventional vehicles to finance subsidies for the purchase of low-emission or e-vehicles can be a useful transitional policy tool
- ***Launch of the heavy-duty vehicle market***
- ***Promoting deployment in emerging and developing economies***
 - ✓ Electrification of road transport in emerging and developing economies should prioritise two/three wheelers and city buses, as these types of vehicles are the most cost competitive

Essentials for e-mobility development (2)

- ***Expanding E-mobility and smart grid infrastructure***
 - ✓ Governments should continue to support the deployment of publicly available charging infrastructure, to ensure equal access to charging for all population groups
 - ✓ Coordinated plans for grid expansion and modernisation, including the use of digital technologies to enable two-way communication and pricing between electric vehicles and the grid, are needed to ensure that electric vehicles become a challenge for grid stability

Essentials for e-mobility development (3)

- ***Ensuring reliable, sustainable and stable supply chains for e-vehicles (EV)***
 - ✓ Governments should attract private investment in sustainable mining of essential metals for batteries and ensure clear and fast authorisation procedures to avoid potential supply bottlenecks
 - ✓ Innovative technologies that require fewer essential minerals, as well as extensive battery recycling, can reduce demand
 - ✓ Encouraging battery “optimization” and a shift to smaller cars could also reduce demand for critical metals
 - ✓ Governments should ensure traceability of key EV components and monitor progress towards ambitious environmental and social development goals at every stage of the battery and EV supply chain

Essentials for e-mobility development (4)

EU approach for E-mobility to reach mass market

Resilient supply chain

- Encourage investment in domestic production of raw materials by incentivising companies to mine cobalt, lithium and/or nickel on European territory in order to reduce dependence on imports and have full control over the environmental standards applied
- Promote recycling, sustainability and responsible mining, taking into account environmental and social impacts through international co-operation
- Support research and development (R&D) on alternative battery technologies to reduce dependence on critical minerals, improve battery efficiency and performance and ultimately reduce the overall cost of EV production

Essentials for e-mobility development (5)

Clean and Green Power

- EVs will become the biggest buyers of clean electricity
- According to the Revised Renewable Energy Directive EU/2023/2413:
 - ✓ The share of energy from RES in the gross final consumption of energy in 2030 should be at least 42.5% (23% in 2022)
 - ✓ EU Member States shall collectively endeavor to increase the above share to 45%

Accessible charging infrastructure

Essentials for e-mobility development (6)

Smart grid technologies

- Time-of-use (ToU) tariffs to incentivise EV owners to charge their vehicles at off-peak hours (at the end of 2021, 139 ToU tariffs and services were available across Europe, specifically for EV smart charging)
- Bidirectional charging technologies – including smart charging and vehicle-to-grid technology
- Consumer and fleet management incentives to encourage them to share their charging status

SECCA'S EXPERIENCE IN PROMOTING E-MOBILITY IN CENTRAL ASIA



SECCA's experience in promoting e-mobility in Central Asia

At the request of the Ministry of Energy and Water Resources (MoEWR) of the Republic of Tajikistan, SECCA is assisting in the development of e-mobility. The assistance includes:

- Analysis of legal & regulatory (L&R) framework related to e-mobility and elaborated recommendations for its improvement
- Market study for e-mobility
 - ✓ Review and analysis of the current market including e-vehicles, charging stations, private and public sector players, etc.
 - ✓ Analysis of existing and potential demand/supply patterns
- Development of a draft concept of e-mobility development

SECCA's experience in promoting e-mobility in Central Asia (2)

Current state of e-mobility in Tajikistan

- Since 2021, over 1.4 thousand EVs were imported in Tajikistan including 709 during January-June 2023
- As part of the Green City programme, the Dushanbe authorities purchased 104 wireless trolleybuses and several electric buses
- The Dushanbe city administration has decided to replace 500 regular buses with electric buses by 2028, upgrading all public transport in the capital
- The EBRD allocated \$4.5 million to Tajik taxi companies to purchase taxis (EMs) and install charging stations

SECCA's experience in promoting e-mobility in Central Asia (3)

Next steps of SECCA assistance (discussion with the key stakeholders is ongoing)

- Support the MoEWR in establishing the Inter-ministerial Working Group (IWG) to incorporate the concept of e-mobility into Tajikistan's legislation (laws and by-laws)
- Support the MoEWR in identifying the institutional body responsible for issuing licenses for the installation of charging stations for e-vehicles
- Supporting the necessary regulatory changes to clarify tariffs for e-vehicles

**THANK YOU
FOR YOUR
ATTENTION!**

