Electric Mobility, Asia-Pacific
Renewable Energy Outlook and
Thailand’s Energy Transition

Michael Williamson, Section Chief, Energy Division
United Nations Economic and Social Commission for Asia and the Pacific (UN ESCAP)

Regional Meeting on Just Transition to Low Carbon Mobility in Asia and the Pacific
And Joint Workshop on Electrification of Public Transport
11 Aug 2022
1. Putting Electric Mobility, EVs and Energy in Context
2. Electric Mobility and SDG 7 – Interlinkages
3. EV Policy Considerations – How to Maximize Contribution to SDG 7
4. Asia-Pacific’s and Thailand’s Renewable Energy Transition Pathway
5. Spotlight on Thailand – Renewable Energy Growth and Prospects
1. Putting Electric Mobility, EVs and Energy in Context

What is electric mobility? A family of technologies on slightly different trajectories.

Technologies
- Hybrid vehicles, including plug in hybrids
- Battery electric vehicles (pure EVs)
- Hydrogen fuel cell vehicles (also hybrid hydrogen with battery storage)

Applications
- Private cars
- Buses
- Trucks
- Motorbikes
- Bicycles
- Marine transport e.g. ferries
Electric mobility can offer energy and climate benefits over the lifecycle:

- Energy efficiency improvement – higher drivetrain efficiency, regenerative braking, lower ancillary energy use.
- Substitution of fossil fuels (petrol, diesel, LPG) with renewable energy in electricity supply. Low-cost way to introduce more RE into the mix.
- Opportunities for better grid management – smart charging, vehicle to grid, enabling higher efficiencies and more renewable integration.

Other SDG benefits; impacts on poverty, inequality, pollution and trade - lowering the marginal cost of mobility and freight; reducing air pollution, resource use and energy imports.
3. EV Policy Considerations – how to maximize contribution to SDG 7

1. In parallel, enhance renewable energy grid contribution.
2. Leverage energy efficiency gains from public transport EVs.
4. Support the bottom of the pyramid – 2 wheelers, 3 wheelers, bicycles.
5. Promote indigenous manufacture to drive down costs.
6. Charging infrastructure vital - needs coordination with grid management.
7. Address embodied energy/materials – rare earth supply, end of life management plan, particularly for rare earth content.

All require cooperation with the private sector!
Focus on lifecycle impacts - *Thailand's efforts to build waste recycling capacity*

- Pollution Control Department has issued draft 2022-2026 action plan for WEEE, proposing to collect and recycle 5% or more of solar cells and EV batteries, establishing recycling plant.
- EGAT and DIW joint study on recycling and recovering valuable metal from solar panels and batteries to establish the code of conduct and on the development of Thailand’s solar panel and battery waste management plant model.
- ACE Green Recycling (ACE) announces plans to build and operate a new lithium-ion battery recycling facility in Thailand.
Thailand EV Access and Promotion Innovations

• EVme app offers digital EV rental and buying platform that allows users to test out EV models. Launched by PTT Group.
• Asia's biggest coal miner, Banpu, entered EV sector by partnership with Thai car-sharing operator Haupcar offering electric tuk-tuks and e-scooters.
• MovMi app for electrical tuk-tuks launched in 2019.
• Banpu has released a green electric ferry and tourism boats.
EVs offer Low-Cost Abatement:
ESCAP SDG 7 Road Map for Bhutan – EV marginal cost of abatement
Some Additional Observations:

- Eventual phase out of ICE vehicles in favour of EVs inevitable (we can argue on the timeframe).
- Full benefits of EVs realized over time as renewables increase market share in grids.
- Battery improvements (energy density and materials efficiency) can enhance benefits over time.
- **Sleeper issue** – how do we fund roads if fuel tax receipts decline?
4. Powering EVs Sustainably – Thailand and Asia Pacific’s Renewable Energy Pathway

Understanding renewable energy and its forms

➢ Traditional biomass (e.g., fuelwood, dung, crop residue) – used for cooking, in decline

➢ Modern renewable energy (e.g., solar, wind, geothermal, hydro) – for electricity and heat production, rising

➢ Renewable electricity – (e.g., solar photovoltaics, wind turbines) – rising
(a) Total renewable energy production (modern and traditional)

Renewable Energy Production, 1990-2019

Source: ESCAP based on data from the International Energy Agency (IEA), Renewables Information Statistics
Chart generated from Asia Pacific Energy Portal (asiapacificenergy.org)
(b) Share of modern renewable energy

Modern Renewable Share of Total Final Energy Consumption, 1990-2018

Source: IEA, UNSD, IRENA
Chart generated from Asia Pacific Energy Portal (asiapacificenergy.org)
Renewables % of Electricity Generation, 1990-2020

Thailand's renewable electricity share growing much faster than regional average!

Source: ESCAP based on data from the International Energy Agency (IEA)
Chart generated from Asia Pacific Energy Portal (asiapacificenergy.org)
Which Asia-Pacific countries offer high RE in the electricity mix?

Renewables % of Electricity Generation, 2019

Higher environmental benefits from EV adoption

Source: ESCAP based on data from the International Energy Agency (IEA)
Chart generated from Asia Pacific Energy Portal (asiapacificenergy.org)
Where does this data come from?....

The Asia-Pacific Energy Portal: asiapacificenergy.org
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➢ Offered in two languages
➢ Open data in one-stop online shop for up-to-date energy statistics, policy documents and infrastructure
➢ Largest spatial database specializing in energy infrastructure in Asia-Pacific

Online hub for energy statistics, energy policies and energy infrastructure maps for 58 economies in Asia and the Pacific. The portal is open source, has a user-friendly interface and provides interactive data visualizations that help member States make data-driven decisions around SDG 7.
5. Spotlight on Thailand – Renewable Energy Growth and Prospects

➢ Strong policy framework for renewables, RE in electricity reached 16% in 2020

➢ Excellent solar resource, but also has biomass, wind and hydro.

➢ Innovative RE applications – floating solar.

➢ Opportunities for rooftop solar-EV charging integration.

Favorable conditions for EV adoption with positive climate impacts