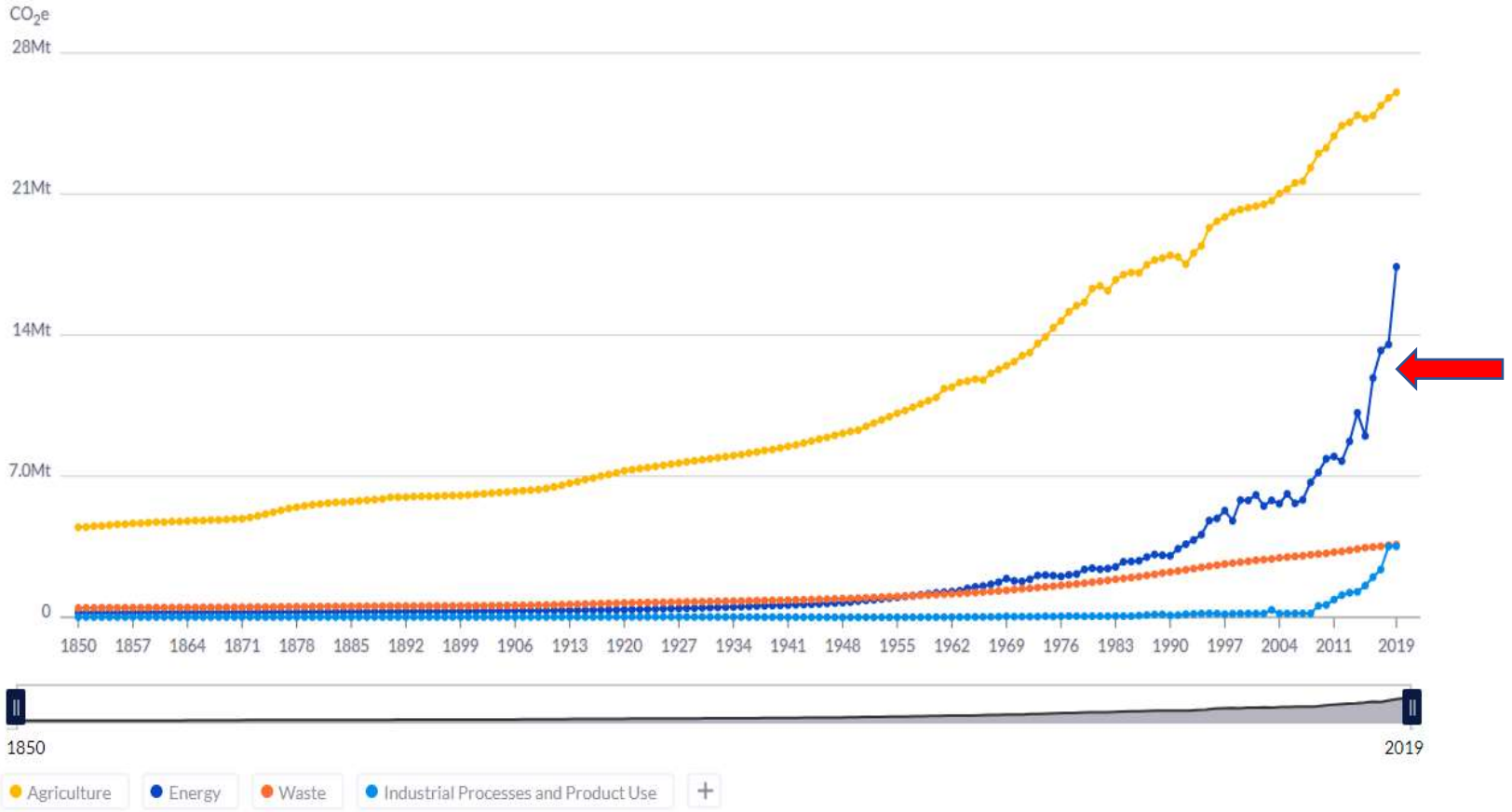
NATIONAL STRATEGY ON ELECTRIFICATION OF PUBLIC TRANSPORT

GHG emissions from Nepal's Transport sector on the rise

GHG emissions from Nepal's Energy sector is rapidly rising

In 2019, 30% of energy related emissions were from the transport sector (Nepal's Long-Term Strategy for Net Zero Emissions, 2021)



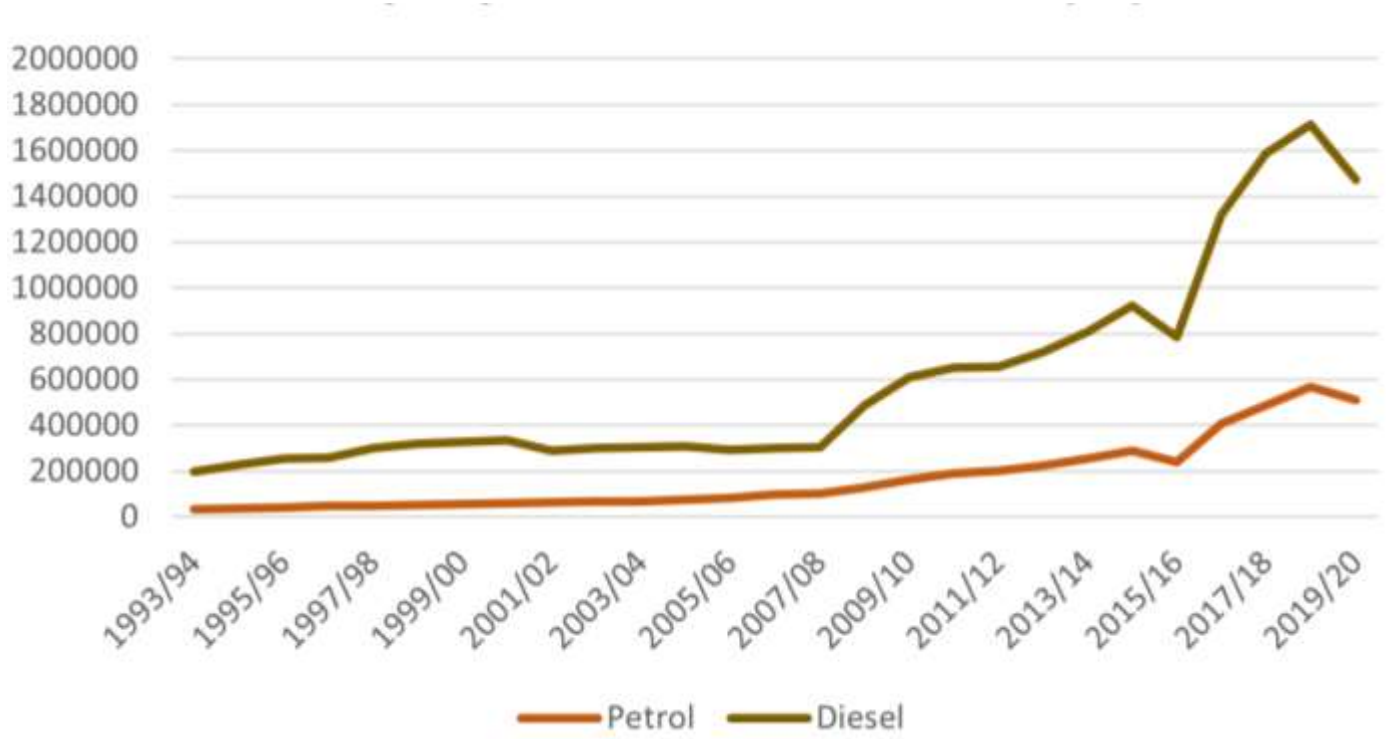
Historical GHG emissions of Nepal by different sectors

Source: CLIMATEWATCH; Data source: PIK; Location: Nepal; Sectors/Subsectors: Total excluding LULUCF; Gases: CH4, CO2, N2O; Calculation: Total; Show data by Sectors.

Transport sector consumes majority of the petroleum imports

Import in 2020/21 (NOC)
Petrol: 591700 KL
Diesel: 1696202 KL

Emission from transport sector is highest because that is where majority of petroleum is used.



Yearly Import of Petrol and Diesel (KL)

Why do we need EVs?

Mitigate emissions

The Nationally Determined Contribution (NDC) submitted by the government identifies EVs as the tool to cap GHG emissions from the transport sector. EVs have zero emission in final energy consumption.

Reduce air pollution

Vehicular tailpipe emissions among the chief cause of air pollution as seen from research. EVs have zero tailpipe emissions.

Massive electricity generation targets

EVs can utilize the excess energy generated in Nepal.

National Trade Deficit

Petroleum import alone surpasses the total export of Nepal

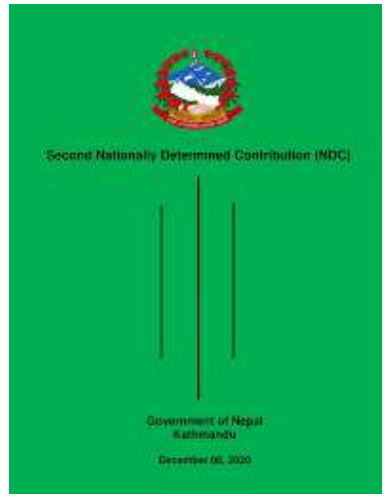
Why focus on public passenger vehicles?

- Public passenger and freight vehicles cover the highest annual mileage in Nepal
- 2% of Nepal's transport fleet but have >40% of transport sector emissions
- The technology to replace petroleum public passenger vehicles are tried and tested.

Current Status of EVs in Nepal

- **Sajha Yatayat:** 3 buses have arrived, 37 more to come.
- **Sundar Yatayat:** 4 operating in the valley.
- **Safa Tempo:** Around 350 out of 714 running in the valley.
- **E-rickshaws:** 36,294 assembled or imported by mid-March 2021
- **Long route electric buses:** >40 microbuses in Kathmandu – Sindhuli route, Kohalpur-Surkhet route
- **LMC Ward 3:** One free shuttle service running for locals

Strategy's Alignment with National Policies



International commitments

- Sustainable Development Goals (Target 11.2 and other indirectly related targets)
- Kyoto Protocol
- Paris Agreement
- Nationally Determined Contribution (NDC)
- Nepal's Long-term Strategy for Net-zero Emissions, 2021

National policies

- 15th Periodic Plan (2019/20-2023/24)
- Bagmati Province Periodic Plan
- Environment-Friendly Vehicle and Transport Policy, 2014
- Five Year Strategic Plan for Transport Infrastructure, 2073-78
- Nepal Action Plan for Electric Mobility

And so forth

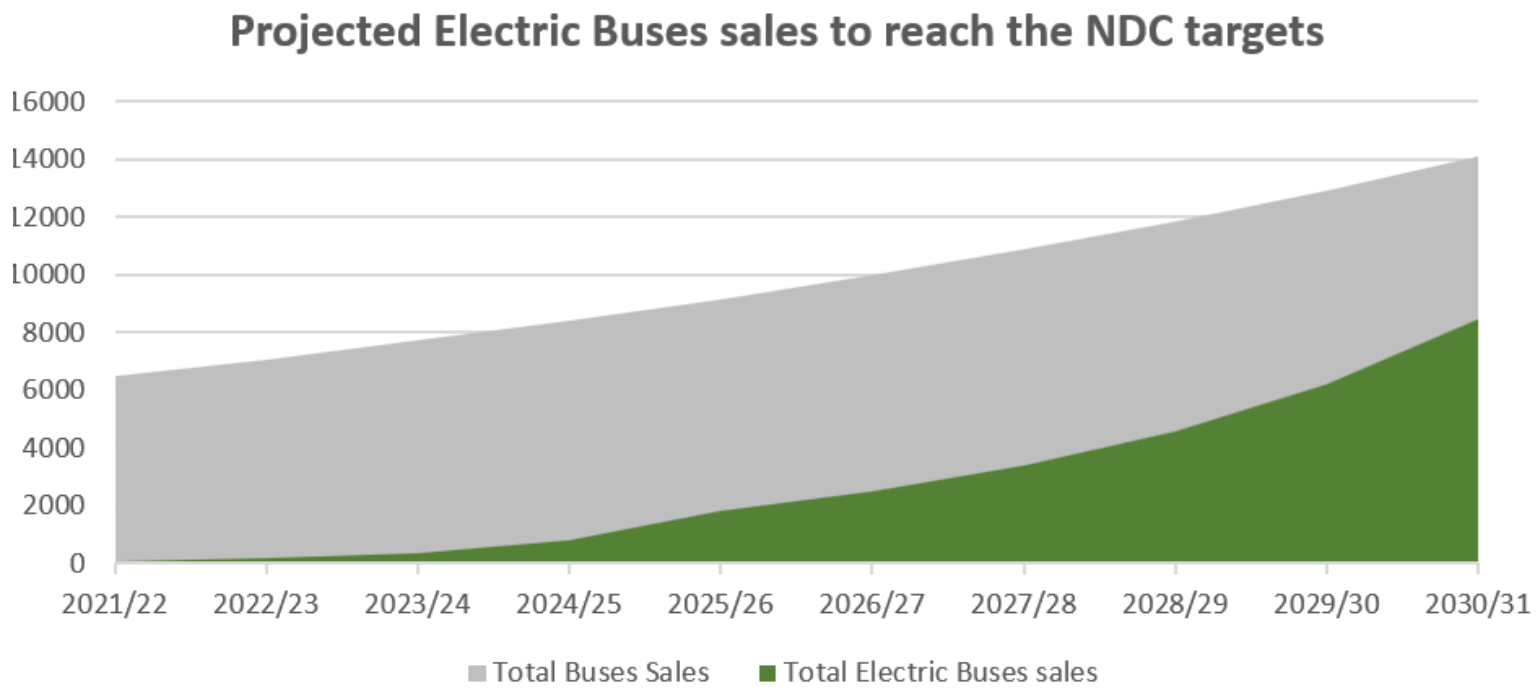
Projection of electric bus penetration based on NDC targets

Future market analysis and modelling tasks are essential components of planning

Action plans and roadmaps should be based on robust analyses

NDC Scenario:

- 20% of four-wheeler public vehicles sold in 2025 to be electric
- 60% of four-wheeler public vehicles sold in 2030 to be electric



Electric vehicle sales requirement for replacement and augmentation and the charging requirements for the existing electric buses

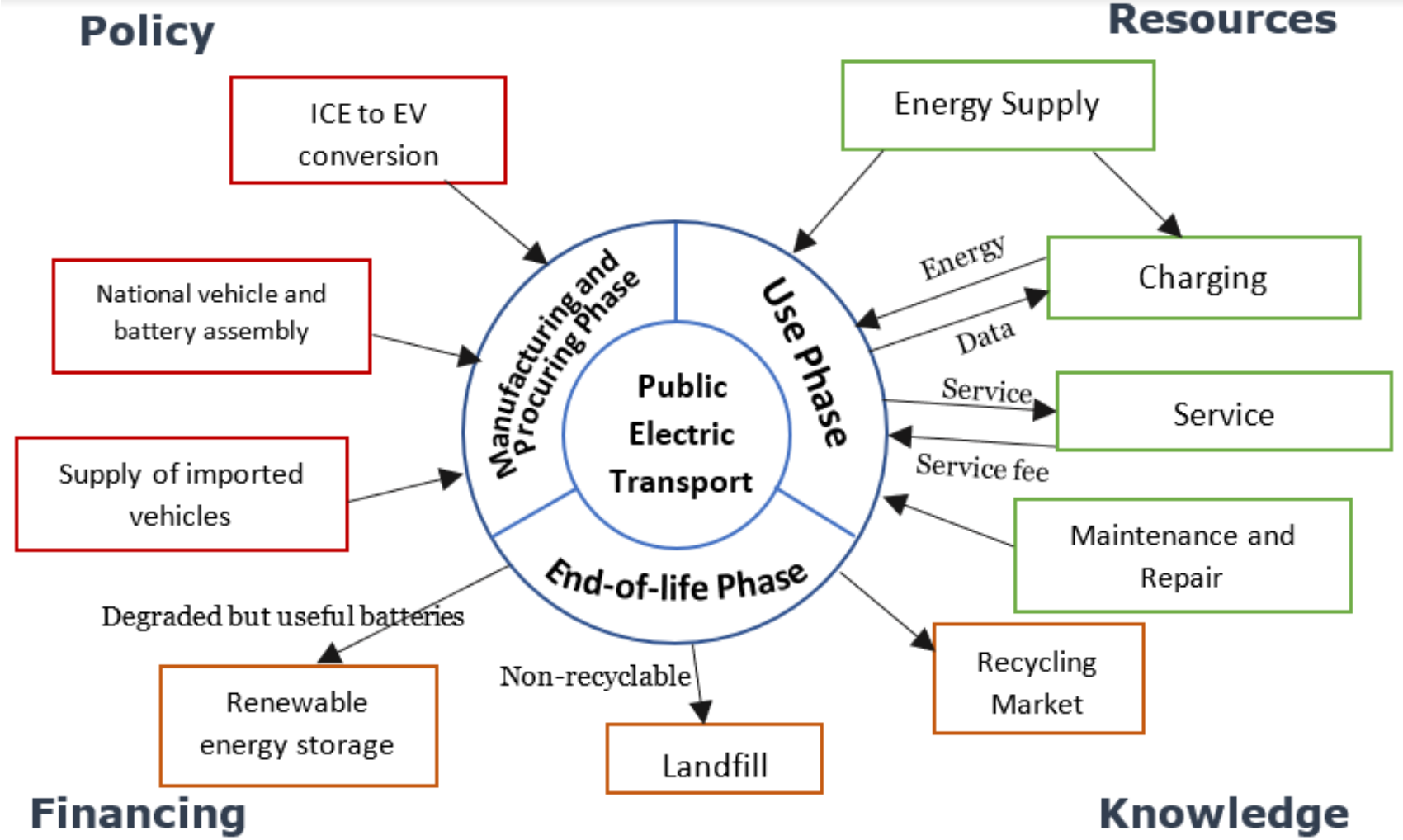
Necessary condition for Electric Buses in NDC scenario	Unit	2025/26	2030/31
Vehicle sales (Electric buses)	#	1,800	8,400
Total electric buses on the road	#	3,300	28,500
Total area required for charging	Sq. m	334,000	2,851,000
Total daily energy consumption	GWh	0.4	3.7
Number of charging stations (minimum)	#	160	1,357

Electric Public Transport Ecosystem

Governing factors: Policy, Resources, Financing, Knowledge

Core components (life cycle): Manufacturing and Procurement, End-of-life, Use/Operation

Strengthening and decarbonizing each component of the ecosystem is key.



Barriers to uptake of electric public vehicles

- **Cost:** High CAPEX for the vehicles and the charging stations; Public Transport Operators (PTOs) largely informal; Battery management unplanned
- **Policy Issues:** Implementation, comprehensiveness, inclusive; Making both horizontal and vertical coordination effective
- **Financing:** Financing mechanisms for private operators yet to be established; Informal state of PTOs leading to lack of trust from financial institutions
- **Resources:** Availability of skilled human resources; Support to startups and innovators; market male domination.
- **Knowledge:** Limited data availability and research support; poor knowledge management

Recommended Strategic Actions for Uptake of Electric Public Vehicles in Nepal

Strategic Actions Related to Core Components

Life Cycle:

- Provision of government land as charging spaces in open-space constrained places like Kathmandu;
- Studying and piloting the opportunity and financial viability of manufacturing/ assembly/conversion;
- Strict rules and provision for safe, reliable, inclusive public transport operation;
- Piloting public transport deployment programs;

Strategic Actions Related to Core Components

Policy:

- EV promotion committee in MoPIT and Charging ecosystem development committee in NEA;
- Developing comprehensive technical standards and guidelines;
- Support local government with public transport related tasks;
- Incentivize manufacturing/assembly;
- GESI mainstreaming while developing policies/plans

Strategic Actions Related to Core Components

Financing:

- Explore sustainable financing models;
- Take support of banks and TDF for financing process;
- Prioritize early adopters, women and disadvantaged groups

Resources:

- Technical training on maintenance, assembly, conversion;
- Startup incubation and linking entrepreneurs to investors;
- Prioritizing and encouraging women and disadvantaged groups in capacity building, entrepreneurship

Strategic Actions Related to Core Components

Knowledge:

- Prioritize robust modelling and integrated planning.
- Invest on data collection, management and security
- Implement a robust MRV system;
- Government and private sector should increase priority and funding on research;
- Improve the curriculum of universities to address the pertaining knowledge challenges;
- Center of Excellences for various components of the electric transport ecosystem

Thank You