

OPPORTUNITIES UNDER THE PHILIPPINES

CREVI

Comprehensive Roadmap for the Electric Vehicle Industry

Dir. Patrick T. Aquino, CESO III
Energy Utilization Management Bureau
Department of Energy

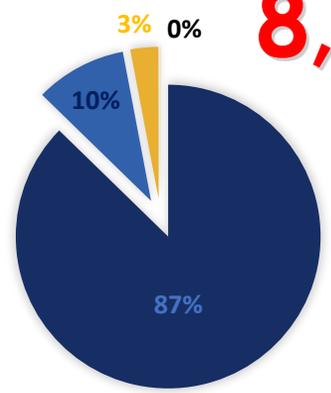


EV Industry Situationer

EVs and EVCS Demand

13,022,483 CONVENTIONAL VEHICLES

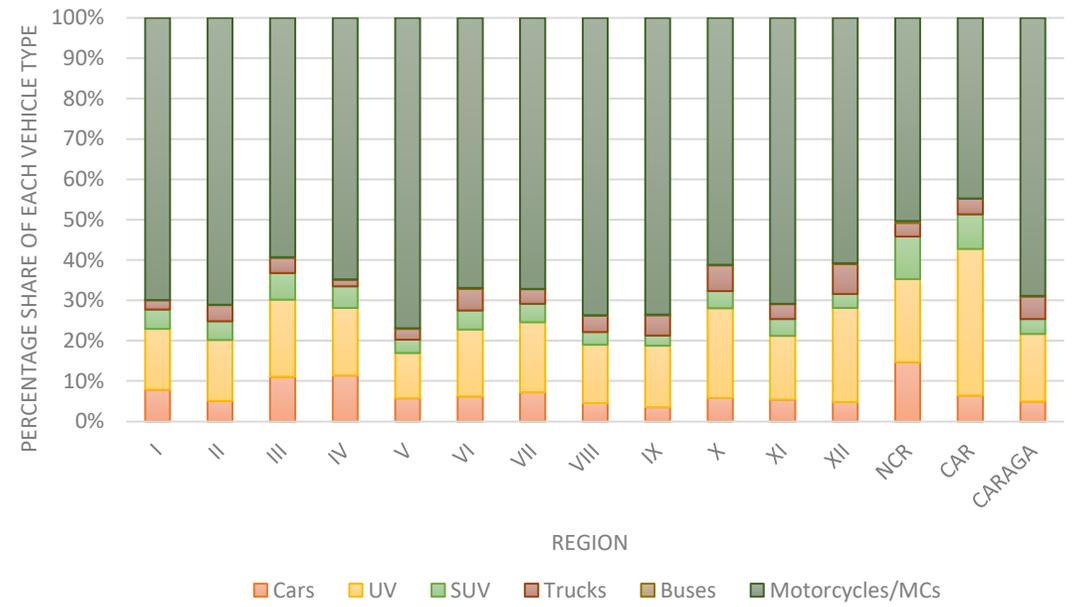
8,593 ELECTRIC VEHICLES



- 7,503** motorcycles tricycles
- 254** cars/sedan
- 834** SUVs & UVs
- 2** trucks & trailer

Based on the LTO data FY 2021

Vehicle Type Breakdown by Region, 2021



Source: DOTr-LTO 2021 Motor Vehicle Registration

Cumulative Numbers of Electric Vehicle Registration from 2014-2022:



Source: DOTr-LTO, Data as of October 2022

Majority Vehicle Registration:

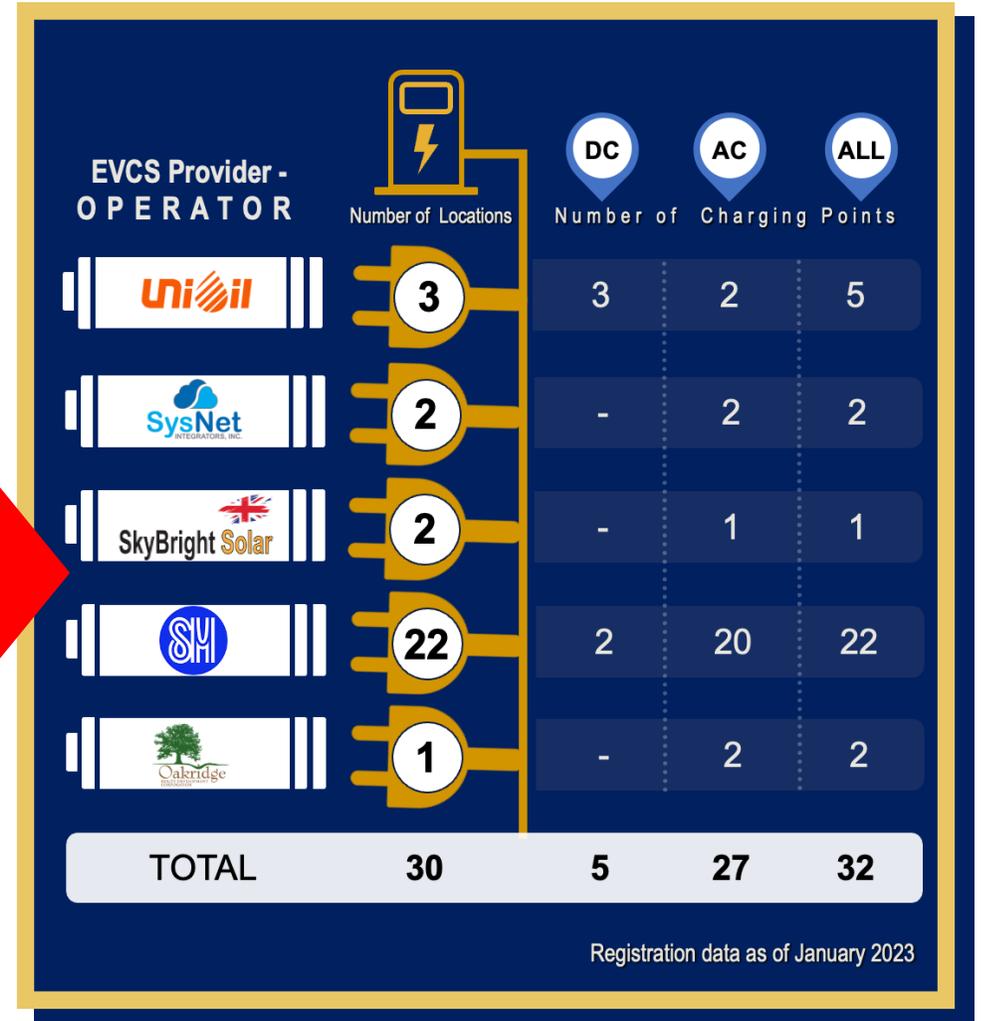
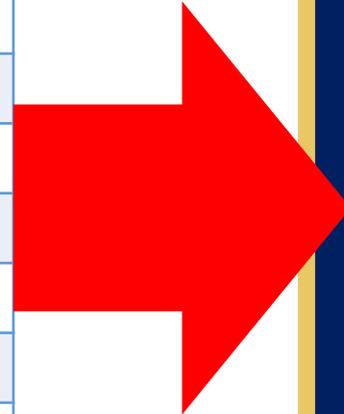
motorcycles & tricycles
cars/sedan
SUVs

EV Industry Situationer

Numbers of EVs and EVCS

Number of EVCS per Region:

| Region | AC chargers | DC chargers | Battery Swapping Stations | TOTAL |
|--------------|-------------|-------------|---------------------------|------------|
| NCR | 141 | 38 | 2 | 181 |
| I | 1 | - | - | 1 |
| II | 6 | 2 | - | 8 |
| III | 12 | 1 | - | 13 |
| IV | 92 | 17 | 1 | 110 |
| VI | 4 | - | 14 | 18 |
| VII | 1 | 1 | 3 | 5 |
| XI | 1 | - | - | 1 |
| XIII | - | - | 1 | 1 |
| TOTAL | 258 | 59 | 21 | 338 |



EV Industry Situationer

Manufacturing

7 Local electric tricycle producer and assembler

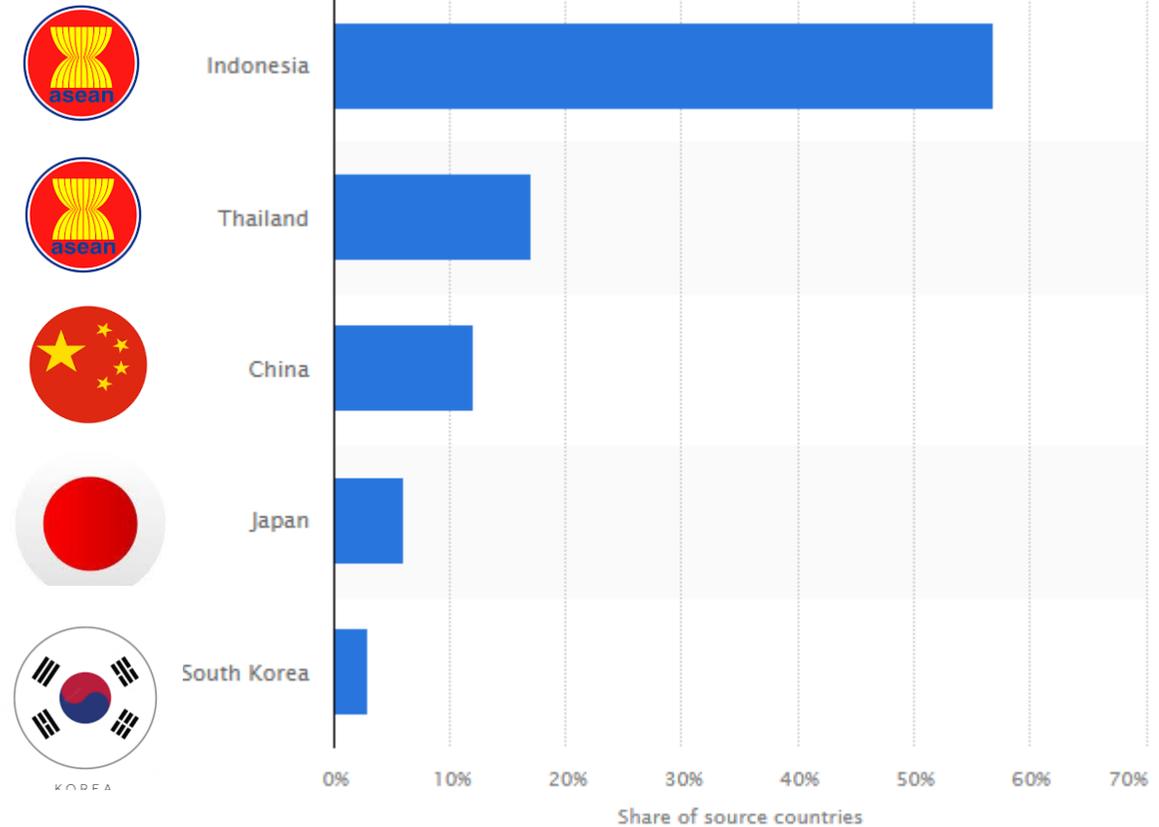
256 Local companies that cater to the domestic automotive market

330 Vehicle parts and components production

8 Local battery manufacturers

Share of Vehicle Imports

Country of Origin



Comprehensive Roadmap for the EV Industry

VISION & INDUSTRY GOALS

VISION

To electrify a diverse range of vehicles and establish a domestic EV industry with strong export potential, with the aim of building a sustainable future, where new electric vehicles and the required infrastructure, are locally robust with reduced environmental impact.

INDUSTRY GOALS

- Increase the utilization of EVs in the domestic market
- Deploy a sufficient number of EV charging points across the country between 2023 and 2040
- Position the Philippine EV industry to become a producer and exporter of EVs by 2040.
- Promote sustainable economic growth and just e-mobility transition by protecting employment in the automotive industry and providing capacity-building activities and EV-specific transition programs
- Support research and development in battery research, and EVCS technology, and digitalization to spur technological innovations and strengthen the competitiveness of the local EV industry

Comprehensive Roadmap for the EV Industry

ACTION PLANS

| Key result area | Responsible Stakeholders and Agencies | Short term (2023-2028) | Medium Term (2029-2034) | Long Term (2035-2040) |
|---|--|--|-------------------------|-----------------------|
| Phased Approach to Improve EV utilization | | Adopt a phased approach to develop its EV industry to balance industry growth and efforts to grow the market. | | |
| | | Ensure demand, provide innovative incentives, introduce required technical regulations and standards, and ensure technology competitiveness of the local industry. | | |
| Demonstration and deployment of EVs | DOTr, DPWH LGUs, Corporate/Private Sector, DOE, DILG | Rollout pilot programs for government or private sector led on EV and EVCS use | | |
| | All government agencies and Corporate/Private Sector | | Deploy EVs and EVCS | |
| Refleeting of vehicles for government and the private sector | All government agencies and Corporate/Private Sector | Implement EV refleeting and EVCS programs as mandated by CREVI for the public and private sector | | |
| Monitoring of EV refleeting mandates | All government agencies, Corporate/Private Sector | Continue monitoring and enforcing refleeting mandates through existing mechanisms under RA 11285 and RA 11697 | | |
| Promote the use of EV and EVCS | DOE, DTI, DOTr | Support EV rental/leasing or sharing programs for affordability of e-mobility | | |
| | DOE, DTI, DOTr | Develop and disseminate IEC Campaign materials to highlight benefits and performance of Evs | | |
| | DOTr, DTI, DOE | Revitalized implementation of the PUVMP to generate reliable and sufficient demand for EV manufacturing, consistent with the EVIS | | |

Comprehensive Roadmap for the EV Industry

ACTION PLANS

| Key result area | Responsible Stakeholders and Agencies | Short term (2023-2028) | Medium Term (2029-2034) | Long Term (2035-2040) |
|---|---------------------------------------|--|--|--|
| EV Manufacturing to Improve Competitiveness | | Improve access to the needed processes, parts and components, expertise and technology, and adopt shared platforms and partnerships. | | |
| Improved Manufacturing capability of the Philippines | DTI, DOST, DOTr | Strengthen and expand manufacturing hubs for 2-wheel EVs | | |
| | DTI, DOST, DOTr, NEDA | | Support Manufacturing for 2-wheel vehicles for international markets | |
| | DTI, DOST, DOTr, NEDA | | Strengthen and expand manufacturing hubs for 4-wheeled EVs for domestic and markets through EVIS | |
| | DTI, DOST, DOTr, NEDA | | | Support Manufacturing for 4-wheel EV for the domestic market |
| | DTI, DOST, DOTr, DOLE | Support Manufacturing for EVCS and its components for domestic markets | | |
| | DTI, DOST, DOTr, DOLE, NEDA | | Support Manufacturing for EVCS and its components for international markets | |
| | DTI, DOST, NEDA | Attract foreign investments for export-oriented activities in EV parts and components | | |
| Pilot programs for local manufacturing of EV and EVCS parts and components | DTI, DOST, DOTr, DOLE, NEDA | Support manufacturing and production of batteries for EVs leveraging locally available green metals | | |
| | DTI, DOST | Support and commercialize technologies on EV electronics | | |
| | DTI, DOST, DOTr, DOLE, DOE, DENR | Support and commercialize technologies for mineral refining to purify nickel reserves and other minerals for battery production | | |
| | DTI, DOST, DOTr, NEDA | Conduct pilot programs for EV battery manufacturing | | |

Comprehensive Roadmap for the EV Industry

ACTION PLANS

| Key result area | Responsible Stakeholders and Agencies | Short term (2023-2028) | Medium Term (2029-2034) | Long Term (2035-2040) |
|---------------------------------|---------------------------------------|---|---|-----------------------|
| Research and Development | | Prepare the readiness of an electrified and cleaner transport system through research and development of EV and EVCS critical parts and components and the utilization of clean energy sources in the operation of EV ecosystem | | |
| Battery Storage | DOST, DOE, EV stakeholders | Conduct research and viable studies on battery storage to ensure efficiency and cost effectiveness | | |
| | DOST, DOE, EV stakeholders | | Commercialize battery storage | |
| Battery Manufacturing | DOST, DOE, DENR, EV stakeholders | Conduct researches on alternative battery components | | |
| | DOST, DOE, DENR, EV stakeholders | | Commercialize the utilization of indigenous minerals for alternative battery component production | |
| EV Manufacturing | DOST, DOE, DOTr, EV stakeholders | Conduct researches and viable studies for technologies for manufacturing rail, air, sea transport vehicles | | |
| | DOST, DOE, DOTr, EV stakeholders | | Commercialize the adoption of electrified transport system in rail, air, and sea transport | |
| | DOST, DOE, EV stakeholders | Conduct researches to develop locally available lightweight and high strength materials for EV frames, components and parts | | |
| | DOST, DOE, DOTr, EV stakeholders | | Commercialize the utilization of locally available lightweight and high strength materials for EV | |

Comprehensive Roadmap for the EV Industry

ACTION PLANS

| Key result area | Responsible Stakeholders and Agencies | Short term (2023-2028) | Medium Term (2029-2034) | Long Term (2035-2040) |
|---|---------------------------------------|---|-------------------------|-----------------------|
| Human Resource Development | | Prepare and capacitate the EV Industry through support technical programs and trainings to ensure ready support services for EV and EVCS operation, maintenance, repair, emergency response and among others. | | |
| Capacity Building for EV and EVCS manufacturing and maintenance | TESDA, DOST, DTI, NEDA | Strengthen/Expand and implement training and educational standards for EV Maintenance and Manufacturing | | |
| Promote entrepreneurial models for the local businesses in the local EV supply chain | DTI, LGUs, DOST, DENR, DOLE, NEDA | Conduct training and shared services facilities for business owners, cooperative or groups with collective action and professionals with successful models of enterprises in the EV supply chain (from supply to after sales service) | | |
| | DOLE, TESDA, DTI | Conduct training for vehicle rental/sharing business models | | |
| | DOLE, TESDA, DOST, DTI, DOTr, DOE | Develop standards and safety practices for EV conversion | | |
| | DOLE, TESDA, DOE, DOTr | Train workers for EVCS operation, maintenance and installation | | |
| | DOLE, TESDA, DTI, DOE, DENR | Develop standards and safety practices/application for EV battery recycling | | |
| | DOLE, TESDA, DTI, DOE, DENR | Train workers for EV waste management (eg. battery recycling) | | |
| | DOLE, TESDA, DOE, DPWH, DTI | Develop guidelines to perform EV and EVCS inspections based on mandated quality and safety standards | | |

Comprehensive Roadmap for the EV Industry

ACTION PLANS

| Key result area | Responsible Stakeholders and Agencies | Short term (2023-2028) | Medium Term (2029-2034) | Long Term (2035-2040) |
|---|---|---|---|-----------------------|
| Capacity Building of the deployment of EVs and EVCs at the local level | All government agencies including LGUs, NGOs, CDA | Conduct training programs for the private and public sectors, NGO and cooperatives for EV and EVCS deployment | | |
| Delivery of efficient and safe technical support services | DOLE, TESDA, DTI, DOE, DOTr | Train and certify personnel for safety servicing of EV and EVCS | | |
| | DOLE, TESDA, DTI, DOE, DOTr | | Strengthen/Expand services shops to cater EV maintenance and repair | |
| International Partnerships | DOE, DOST, DTI, DOTr, NEDA | Conduct knowledge exchange programs and from countries that have EV deployment and develop partnerships for technical capacity building | | |

Comprehensive Roadmap for the EV Industry

ACTION PLANS

| Key result area | Responsible Stakeholders and Agencies | Short term (2023-2028) | Medium Term (2029-2034) | Long Term (2035-2040) |
|---|--|--|---|--|
| Policy and Credit | | Implement technical regulations geared towards ensuring the harmonized adoption, sustainable operation, energy efficiency, quality and safety, accessible investments of EVs and EVCS supplied and manufactured to the public. | | |
| | Integrate EVCS with clean energy sources | DOE, DTI, DILG, DPWH, LGUs, NEDA | Encourage the utilization of renewable energy sources to power EVCS | |
| | | DOE, DTI, DILG, DPWH, LGUs, NEDA | | Mandate 50% utilization of renewable energy sources to power EVCS |
| Align the EVIS with the priority targets of the CREVI Standardization of EVCS and EV | DOE, DTI, DILG, DPWH, LGUs, NEDA | | | Mandate 100% utilization of renewable energy sources to power EVCS |
| | DTI, NEDA, DOF | Issue EVIS and supporting policies to provide incentives for EVs and EVCS | Implement and enforce issuances | |
| | DOE, DOTr, DTI, ERC | Issue relevant policies for EVCS and EV classification including but not limited to minimum energy performance, labeling, safety, and quality | | |
| DOE, EV stakeholders | Standardization and harmonization of charging protocol of EVCS | | | |

Comprehensive Roadmap for the EV Industry

ACTION PLANS

| Key result area | Responsible Stakeholders and Agencies | Short term (2023-2028) | Medium Term (2029-2034) | Long Term (2035-2040) |
|--|---|--|---------------------------------|-----------------------|
| Standardization EVCS Installation/Construction Open and Public Data for EVCs and EV Implement Fiscal and Non-Fiscal Incentives Strengthening of Government Agencies Concerned Promote utilization of EVs in the locality and tourism sector Research Agenda Financing Support Waste Management, Recycling, and Reuse of ICE vehicles and EVs Transport policy | DOE, EV stakeholders | Standardization and harmonization of charging protocol of EVCS | Implement and enforce issuances | |
| | DPWH, DOE, DILG, LGUs | Issue uniform policies on issuance of permits and construction and installation for EVCS | | |
| | DOE, DOTr, DICT, DTI | Develop a uniform database for EVCS and EV data that is accessible to the public observing common APIs to integrate the internet of things for the EV industry | | |
| | BOI, DTI, DOTr, DILG, LGUs, DOF, BIR, BOC, NEDA | Continue implementation/ imposition of additional incentives for EVCS and EV manufacturing | | |
| | DOE, DOTr, LGUs, DBM | Support strengthening and capacity building for government agencies | | |
| | DOE, DOTr, LGUs, DILG, DOT, DPWH, MMDA, NEDA | Issue relevant policies for the adoption of EVs including but not limited to dedicated parking slots, loading and unloading stations for EVs, segregated lanes for LEVs and green routes, fast charge networks for major thoroughfares/highways. | | |
| | DOST, DOE, DOTr, DTI, DENR, DILG, DPWH, NEDA | Development of research agenda for the development of EV and EVCS critical parts and components. | | |
| | LGUs, GFIs, BSP, NEDA | Continue and formulate financing models to support EV and EVCS stakeholders | | |
| | DOST, DENR, DTI, LTO | Issue policies on recycling/reusing ICE vehicles and EVs and their components through EV conversion kits, retrofitting, and other initiatives to promote a circular economy | | |
| | DOTr, DTI, DOE, DILG, LGUs | Integrate transport policy with industrial policy to ensure a concerted and coordinated effort in generating demand that can be leveraged by manufacturers to boost domestic production and export EVs | | |



EV Targets
311,700 EVs



7,400 EVCS

| | |
|-------------|-------------|
| Cars: | 81,500 HEV |
| | 13,600 PHEV |
| | 13,600 BEV |
| Tricycle: | 37,500 BEV |
| Motorcycle: | 164,900 BEV |
| Bus: | 600 BEV |

Business-as-Usual

SHORT - TERM

Clean Energy Scenario



EV Targets
2,454,200 EVs



65,000 EVCS

| | |
|-------------|---------------|
| Cars: | 415,000 HEV |
| | 69,000 PHEV |
| | 69,000 BEV |
| Tricycle: | 419,000 BEV |
| Motorcycle: | 1,480,000 BEV |
| Bus: | 2,200 BEV |



EV Targets
580,500 EVs



14,000 EVCS

| | |
|-------------|-------------|
| Cars: | 49,000 HEV |
| | 24,600 PHEV |
| | 123,000 BEV |
| Tricycle: | 71,000 BEV |
| Motorcycle: | 311,800 BEV |
| Bus: | 1,200 BEV |

Business-as-Usual

MEDIUM - TERM

Clean Energy Scenario

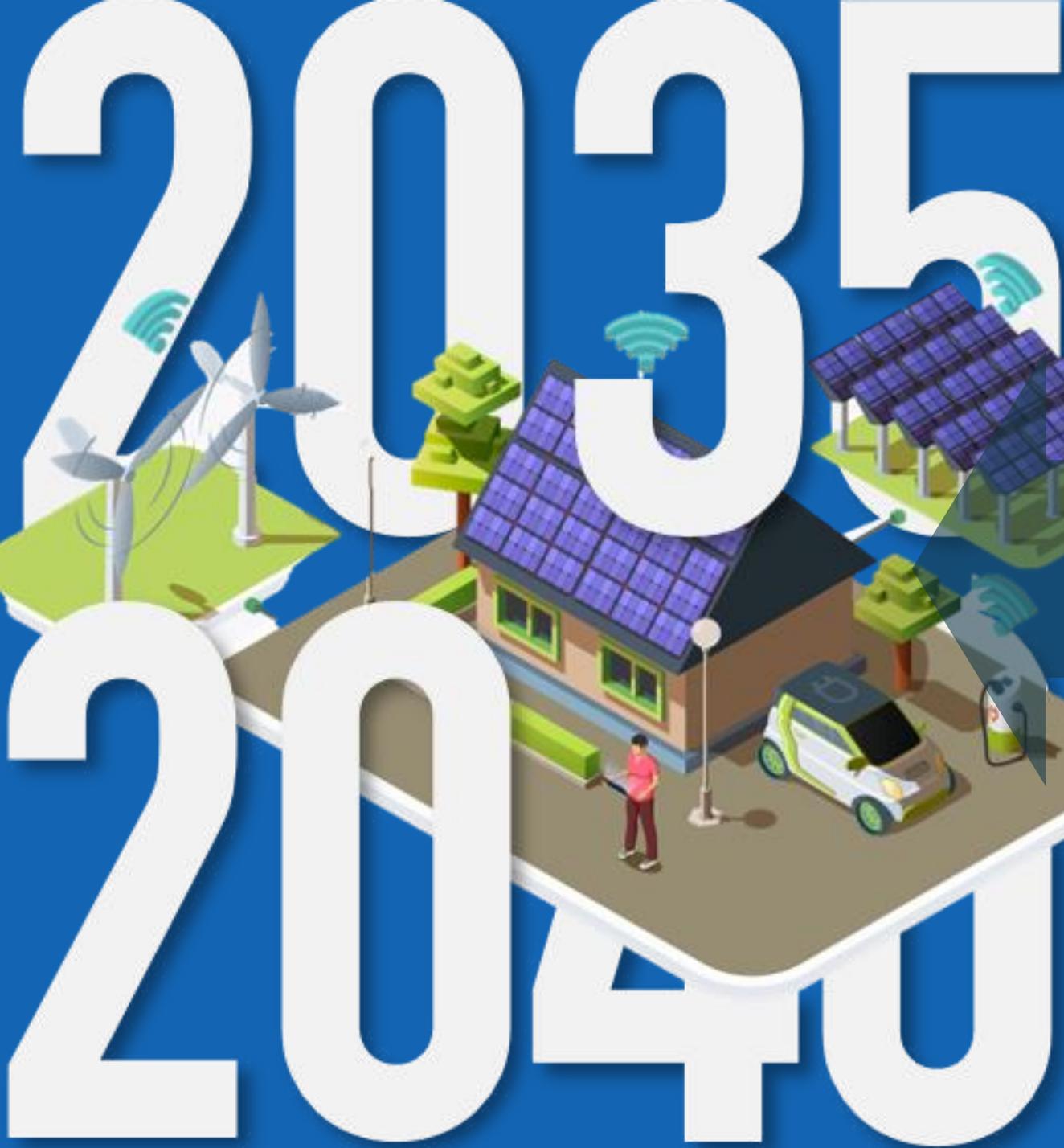


EV Targets
1,851,500 EVs



42,000 EVCS

| | |
|-------------|-------------|
| Cars: | 234,000 HEV |
| | 80,000 PHEV |
| | 327,000 BEV |
| Tricycle: | 262,000 BEV |
| Motorcycle: | 947,000 BEV |
| Bus: | 1,500 BEV |



EV Targets
850,100 EVs



20,300 EVCS

| | |
|-------------|-------------|
| Cars: | 36,600 HEV |
| | 36,600 PHEV |
| | 219,400 BEV |
| Tricycle: | 103,400 BEV |
| Motorcycle: | 454,400 BEV |
| Bus: | 1,800 BEV |

Business-as-Usual

LONG - TERM

Clean Energy Scenario



EV Targets
2,001,600 EVs



40,000 EVCS

| | |
|-------------|--------------|
| Cars: | 107,000 HEV |
| | 107,000 PHEV |
| | 641,000 BEV |
| Tricycle: | 223,000 BEV |
| Motorcycle: | 922,000 BEV |
| Bus: | 1,600 BEV |

Opportunities

Manufacturing

EVIS

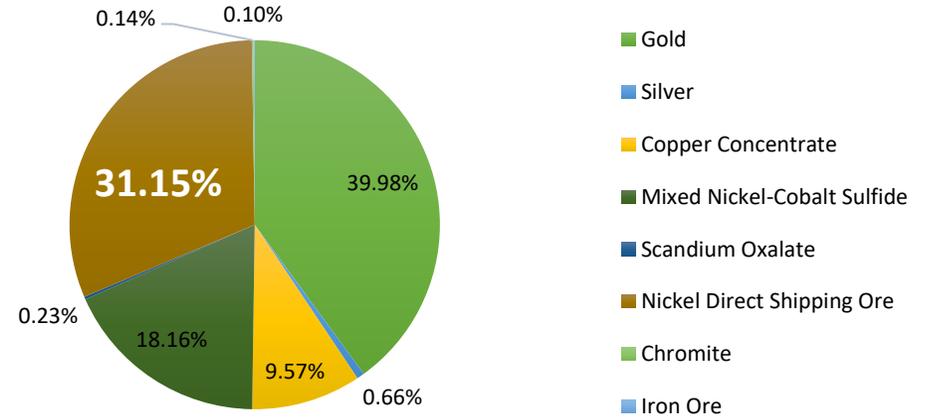
EV Incentive Strategy

Fiscal Incentives for Manufacturing included in Strategic Investment Priority Plan (SIPP)

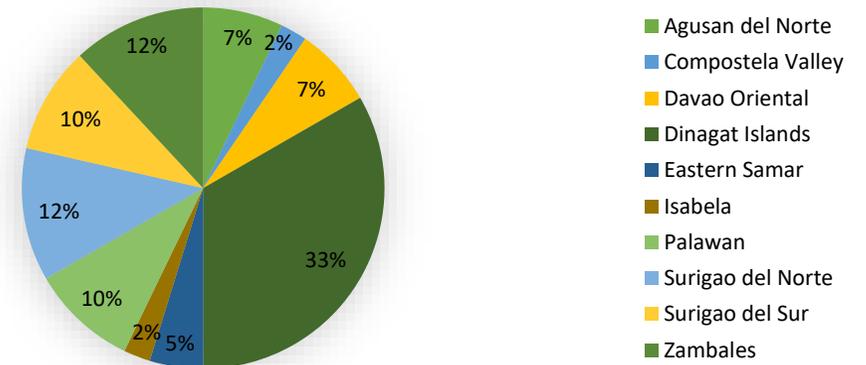
Development of a Comprehensive Automotive Resurgence Strategy (CARS) for EV

Potentials for EV battery production

Annual Value of Production of the Philippine Metallic Minerals



Percentage of Total Operating Nickel Mines by Province





THANK YOU



EVIDA



EVIDA IRR



CREVI