Electric Vehicle Development in Malaysia

10th Public & Private Joint Forum in ASEAN Region

December 4, 2019

Malaysia Automotive, Robotics & IoT Institute
An Agency under the Ministry of International Trade & Industry

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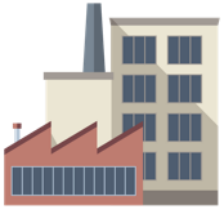
Introduction

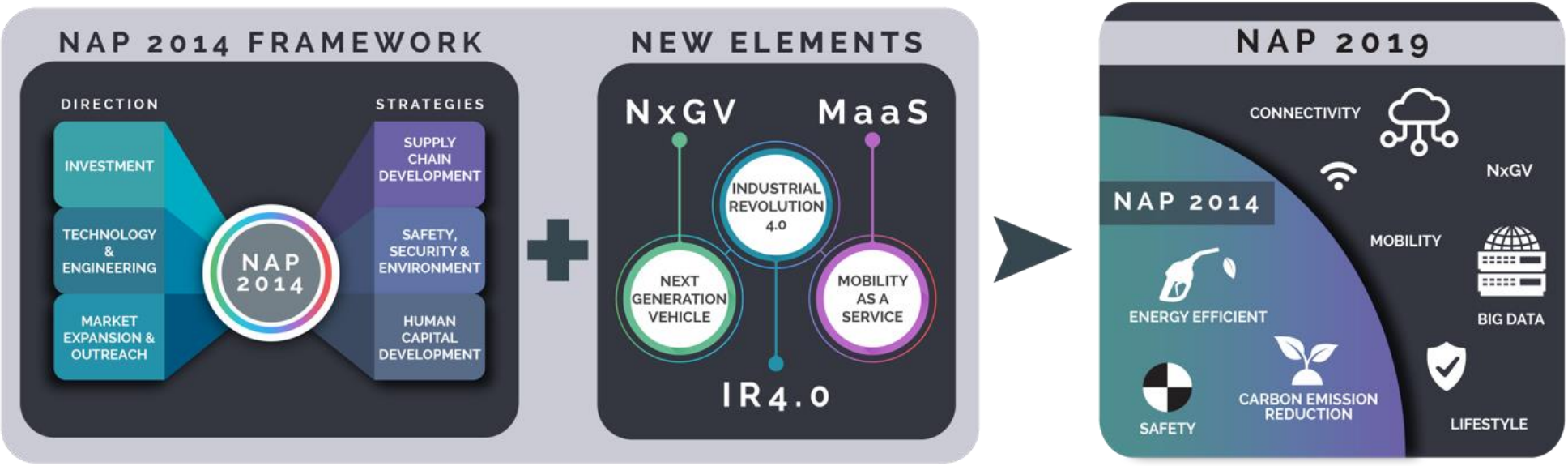
1. INTRODUCTION - Background of NAP

POLICY DRIVEN → **VISION DRIVES POLICY**



SUPPLY CHAIN INTEGRATION	INVESTMENTS PROMOTION	GREEN AND SUSTAINABILITY	CONNECTED MOBILITY
NAP 2006 (2006-2009)	NAP 2009 (2009-2014)	NAP 2014 (2014-2020)	NAP 2019 (2019-2030)
ADOPTED POLICY	REVIEWED	FOCUSED	ENHANCED
Introduced to transform the domestic automotive industry and integrating it into the increasingly competitive regional and global industry network.	Reviewed to enhance the capability and competitiveness of the domestic automotive industry.	Focused on developing Malaysia as the hub for Energy Efficient Vehicle (EEV)	Enhance Malaysia's automotive industry in the era of digital industrial transformation.

1. INTRODUCTION - NAP 2019 Framework

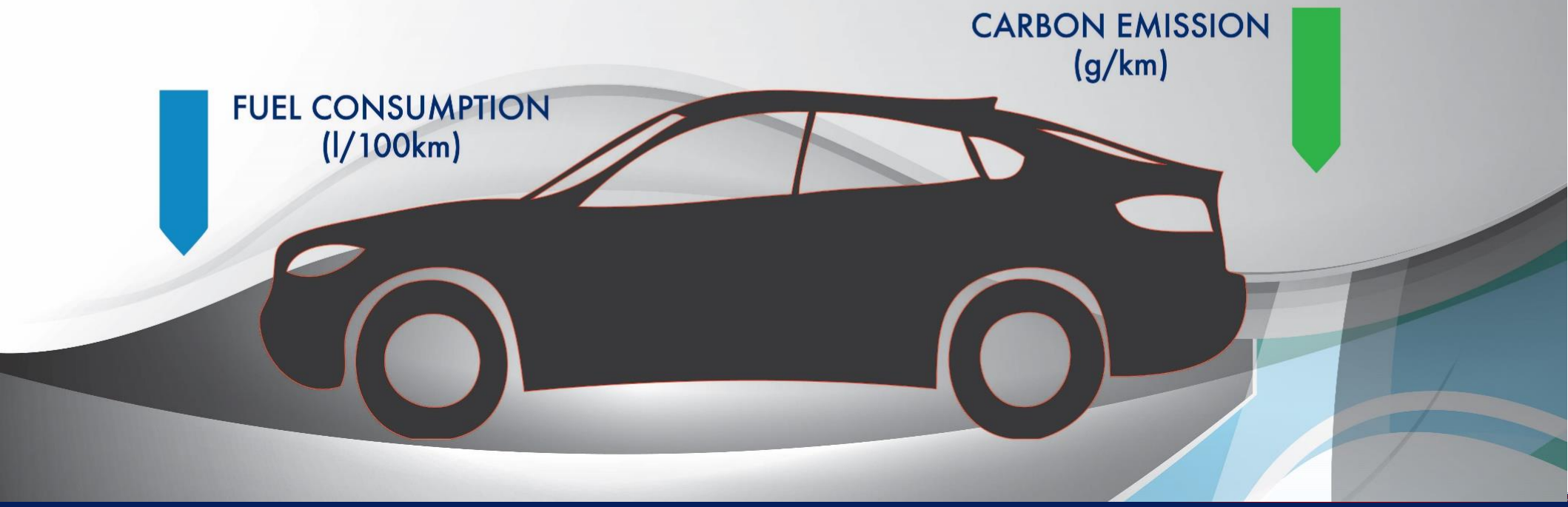


THE FRAMEWORK OF THE NAP IS SUPPORTED BY THE IMPLEMENTATION OF THESE DOCUMENTS:

1. INTRODUCTION - Definition of EEV

DEFINITION OF ENERGY EFFICIENT VEHICLE

EEV is defined as vehicles that meet a set of define specification in terms of carbon emission level (g/km) and fuel consumption (l/100km). EEV includes fuel efficient vehicles, hybrid, EV and alternatively fuelled vehicles e.g. CNG, LPG, Biodiesel, Ethanol, Hydrogen and Fuel Cell.



EV Regulations & Standards in Malaysia

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2. EV Regulations & Standards in Malaysia

- ❑ Passenger Car (Regulated under Road Transport Act) :
  - ✓ United Nations Regulations No. 100

- ❑ Electric Motorcycle :
  - ✓ MS 2413 : Electric motorcycle (>50 km/h)
  - ✓ MS 2688 : Electric moped (25-50 km/h)
  - ✓ United Nations Regulation No. 136

- ❑ Electric Bicycle :
  - ✓ MS 2514 : Electric bicycle (<25 km/h)

- ❑ EV Battery & Chargers :
  - ✓ MS IEC 62196 : EV Connectors & Inlet
  - ✓ MS IEC 61851 : EV Conductive Charging System
  - ✓ MS IEC 62660 : Li-Ion Testing for EV
  - ✓ SAE 1772 : EU-Type 2

2. EV Regulations & Standards in Malaysia

- ❑ Public Transport
  - ✓ Electric Bus :
    - ❖ 1 unit under MAI R&D (2018) – MAI own Li-Ion Battery technology
    - ❖ 11 units under NEDO Project in Putrajaya (2016&2017);
    - ❖ 15 units under Sunway BRT Project (2015);
    - ❖ 55 units by Prasarana and Panorama Melaka (2014)
  - ✓ EV Sharing programme : COMOS project launched in year 2014

- ❑ E-Scooters (2017) :
  - ✓ 400 units for delivery fleet by KFC & Pizza Hut; and
  - ✓ 30 units by PDRM

eMobility Development Status in Malaysia

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3. eMobility Development Status

- EV Registration in Malaysia (Current) Passenger Vehicle

	2016	2017	2018	2019*
BEV	32	25	11	39
PHEV	1,779	8,287	9,252	3,737

*as of September 2019

- EV Registration in Malaysia (Current) Motorcycle

	2016	2017	2018	2019*
EV Motorcyle	909	1,224	1,578	1,840

*as of September 2019

Source: Malaysian Green Technology Corporation

3. eMobility Development Status

❑ Powering eMobility (Key Stats as of November 2019)

PUBLIC EV CHARGERS	PUBLIC EV CHARGING	EV CHARGING SESSIONS
271	195	117,294
Stations	Location available in Malaysia	Sessions

ELECTRICITY CHARGED	ESTIMATED ELECTRIC RANGE	ESTIMATED CO2 EMISSIONS AVOIDED
622	4,149,356	296,131
MWh	Kilometres	Kilograms

NO OF SUBSCRIBE MEMBER

6,000

Members and Growing

Electric Vehicle Interoperability Centre (EVIC) Ecosystem

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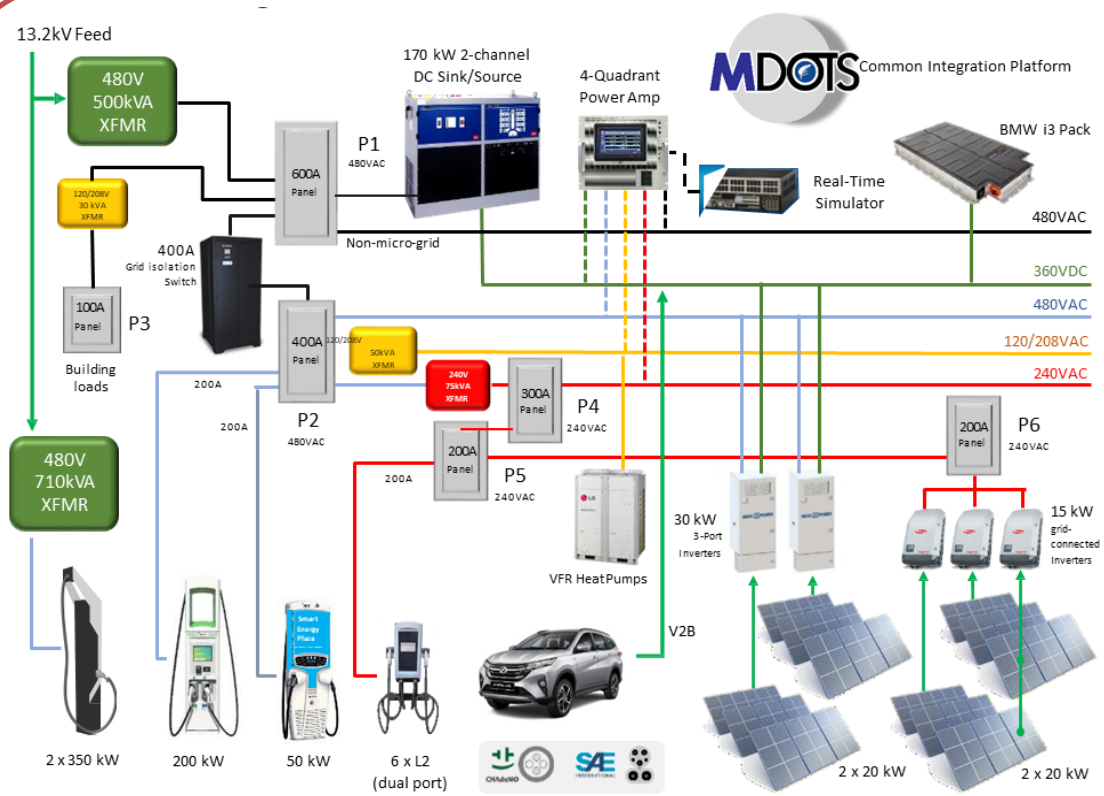
4. Electric Vehicle Interoperability Centre (EVIC) Ecosystem



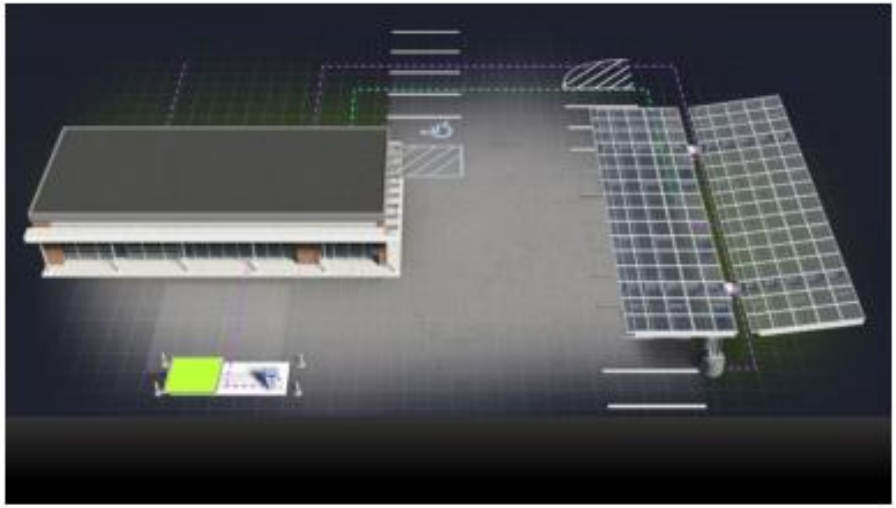
- **Multiple AC and DC voltages, sources and power levels**
- **Incompatible interfaces**, standards and protocols
- **Latency** in communication and processing
- **Variety of use cases**, i.e., operational scenarios
- **Infrastructure constraints**: installation and operations
- **Cybersecurity concerns**: accessibility, vulnerabilities and consequences

- The EVIC will be able to perform the testing for vehicle-grid interoperability, cybersecurity and safety of the communication in the EV ecosystem;
- The EVIC will be leveraging on the MDOTS-BDA to provide insights and reporting throughout the whole ecosystem.

4. Electric Vehicle Interoperability Centre (EVIC) Ecosystem Benchmarking: Argonne Interoperability & Grid Integration, US

Modular design

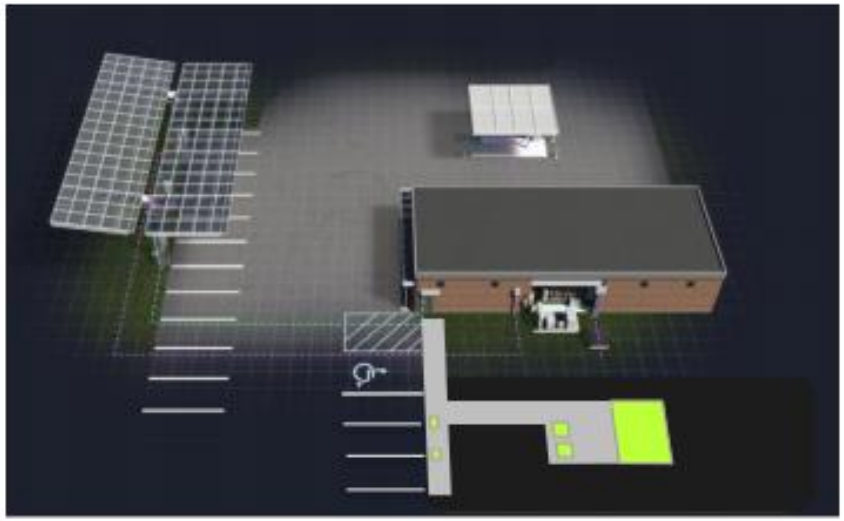
Max Charge Power – 200kW
Charge Voltage – 200-920V
Max Charge Current – 500A
Number of Charge Points – 2
Connectors – CCS Combo 1, CHAdeMO



4. Electric Vehicle Interoperability Centre (EVIC) Ecosystem Benchmarking: Argonne Interoperability & Grid Integration, US

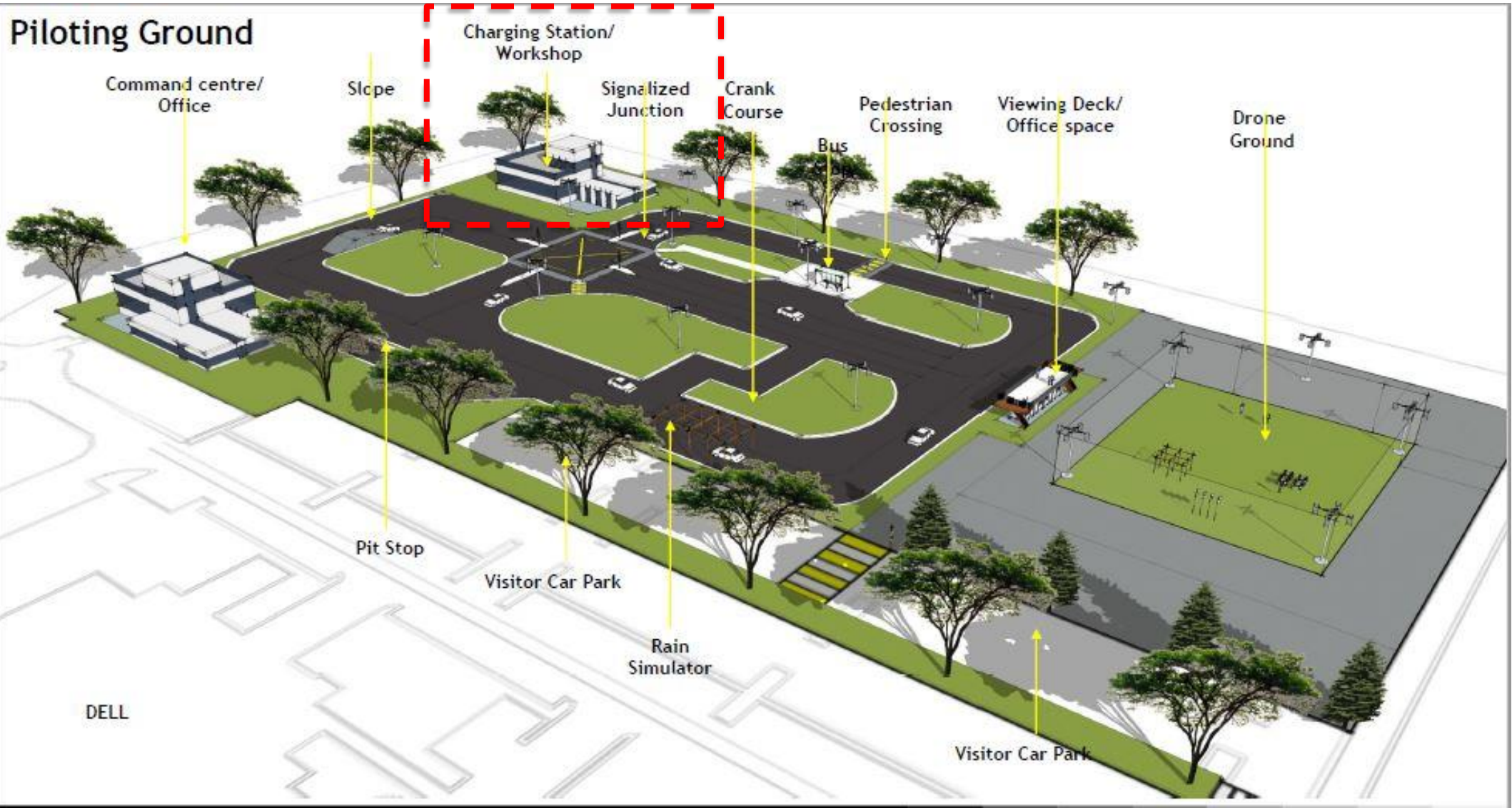
Site-specific design

Max Charge Power – 350kW
Charge Voltage – 200-920V
Max Charge Current – 500A
Number of Charge Points – 2
Connectors – CCS Combo 1



4. Electric Vehicle Interoperability Centre (EVIC) Ecosystem

Proposal for EVIC Test Bed in Malaysia



4. Electric Vehicle Interoperability Centre (EVIC) Ecosystem

Proposal for EVIC Test Bed in Malaysia

- Buildings with EV charging stations

- Solar powered buildings for EV charging stations

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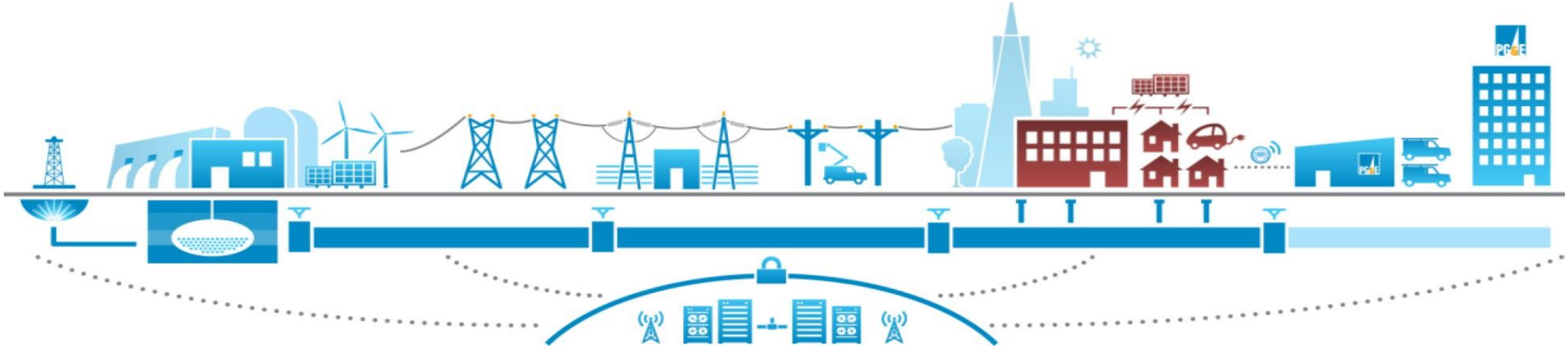
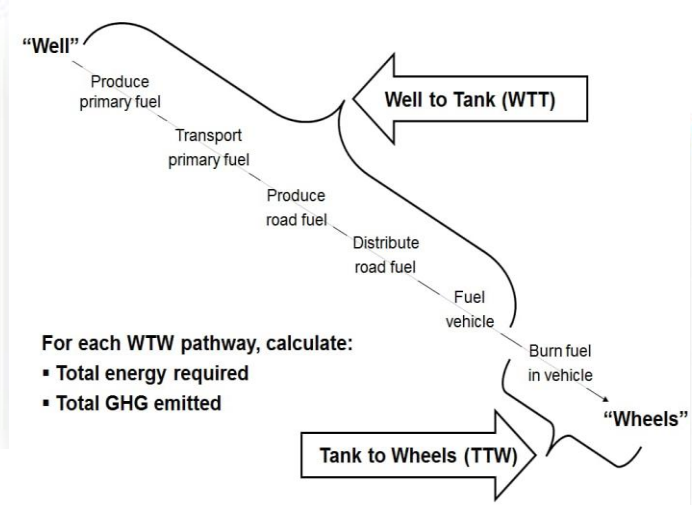
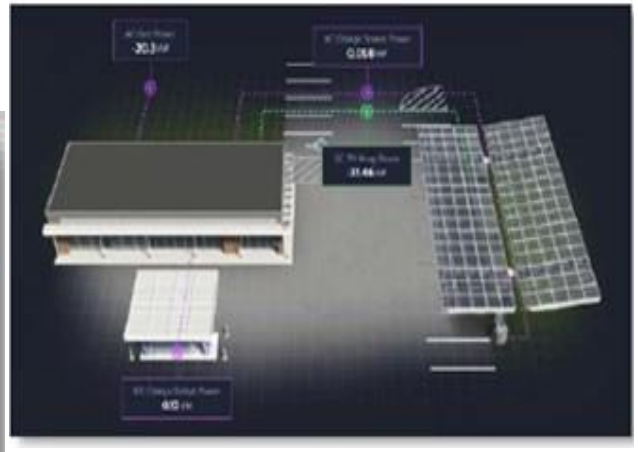
Proposal for EVIC Test Bed in Malaysia



Well-to-Wheel Ecosystem

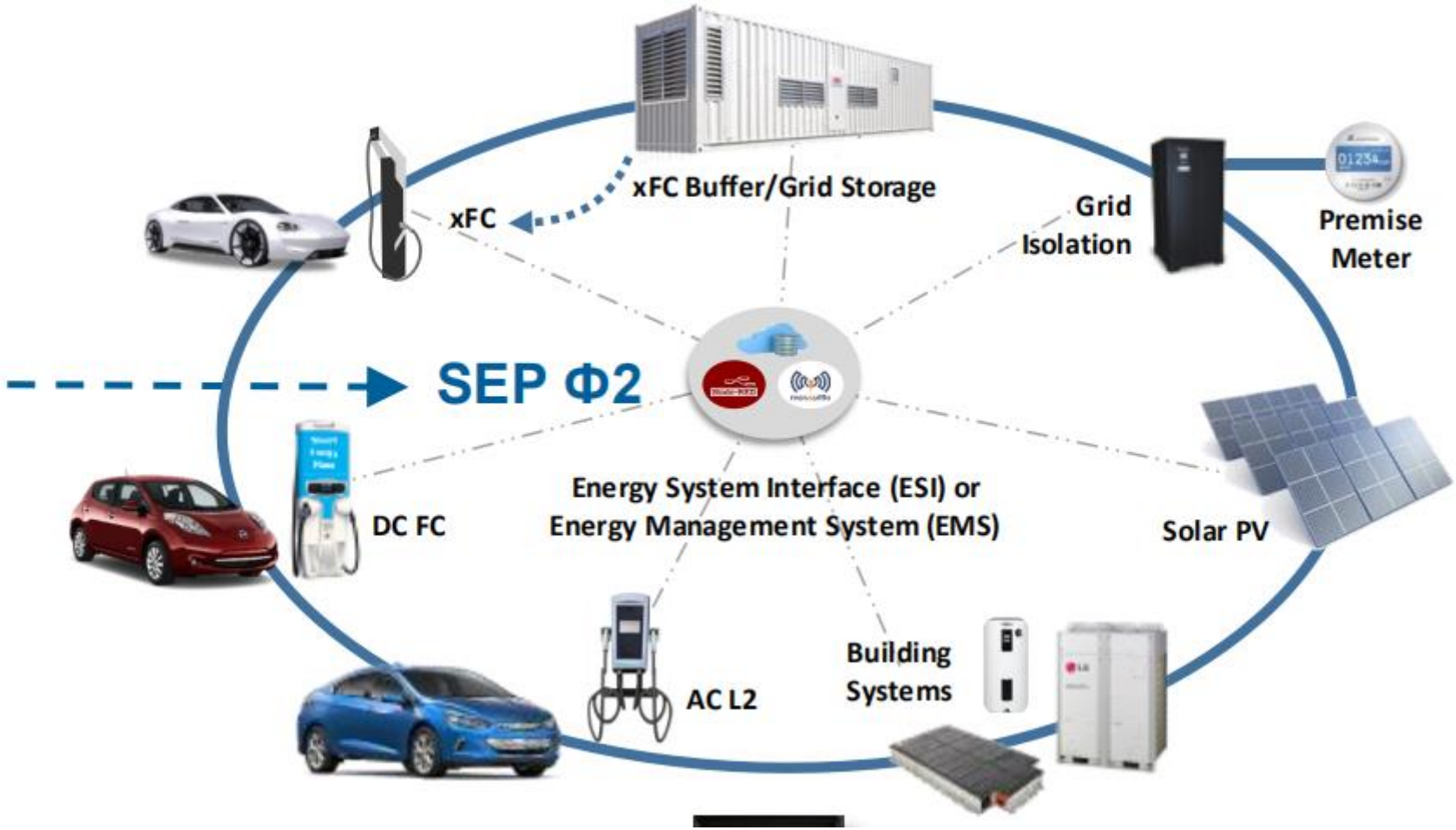


Smart Grid Integration – AI & BDA embedded solution



Energy Farming & Management

4. Electric Vehicle Interoperability Centre (EVIC) Ecosystem
Proposal for EVIC Test Bed in Malaysia



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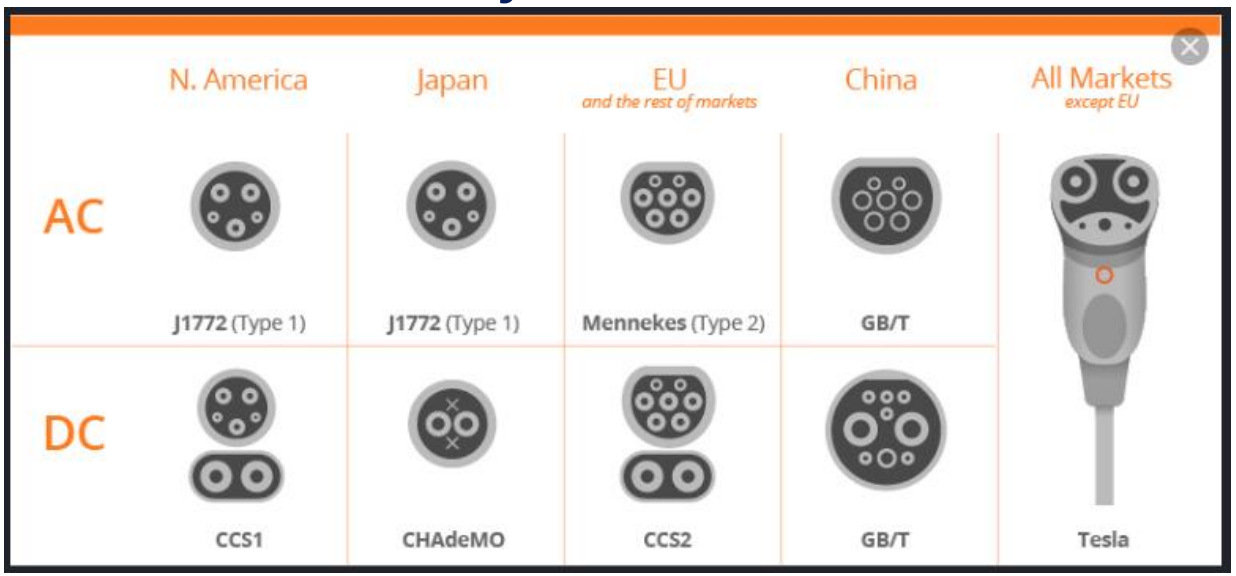


4. Electric Vehicle Interoperability Centre (EVIC) Ecosystem

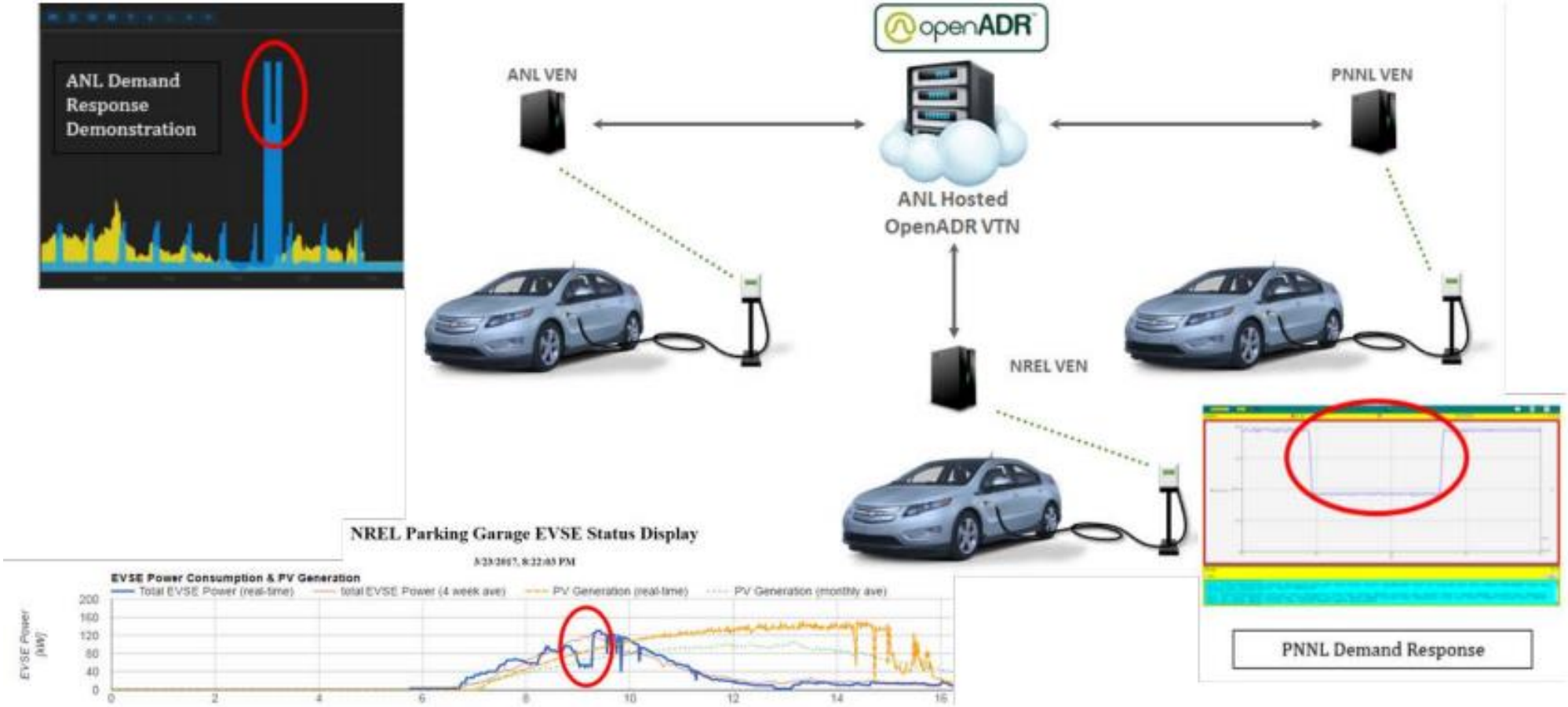
Proposal for EVIC Test Bed in Malaysia

- Global Interoperability test Tools

- EV Fueling Accuracy

4. Electric Vehicle Interoperability Centre (EVIC) Ecosystem

Proposal for EVIC Test Bed in Malaysia



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THANK YOU