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ESCAP Economic and Social Commission for Asia and the Pacific | HACK Hackathon Thailand | UNDP | unesco | YECAP | ASIA LEDS PARTNERSHIP | Global Climate Action Partnership regional leadership, global change

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INNOVATIVE SOLUTIONS FOR THE ACCELERATION OF CLIMATE ACTION IN ASIA & THE PACIFIC

Prometheus

Sustainable Energy in daily transports

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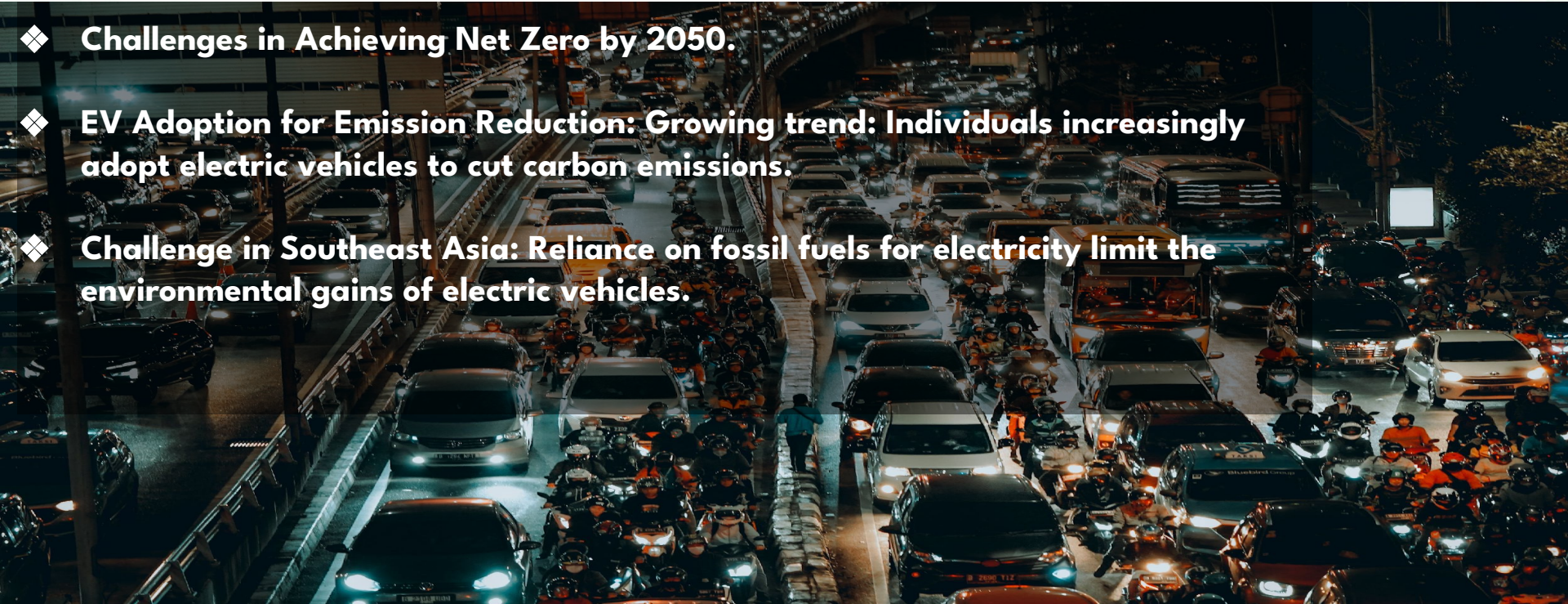
Problem

- Challenges in Achieving Net Zero by 2050.
- EV Adoption for Emission Reduction: Growing trend: Individuals increasingly adopt electric vehicles to cut carbon emissions.
- Challenge in Southeast Asia: Reliance on fossil fuels for electricity limit the environmental gains of electric vehicles.



Proposed solution

Our project aims to maximize the potential benefits for all relevant stakeholders in a holistic manner, similar to a complete loop within the supply chain.

Electricity Distributor

Small fees

Small fees

Solar rooftop owners

Charging station owners

Design an app for managing

Direct power purchase agreement (DPPA)

Selling excess electricity, decrease the payback time.

Commit to Net Zero goal by 2050

+ Long-term lower cost.
+ Selling carbon credits.
+ ESG company (Environmental, social, and corporate governance).

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Cost Considerations

Initial Investment:
Three parties
+ Resident: Solar panel, Converter.
+ Government: Subsidy, lower tax, upgrade grid.
+ Private company: Charging station, install battery (optional).

Joined hand decarbonization

Training:
Create the function app, Workshop.

Ongoing Costs:
+ Battery in charging station (O&M)
+ Staffs

Optimized scenarios simulation for one project (simulate by HOMER Pro)

Scenario	Architecture	Renewable energy fraction	CO2 emission over lifetime	Net Present Cost ($)
1: (PV + Battery + Grid)	PV: 200 kW Battery: 5 MW Converter: 460 kW Grid: 1.32GWh	16.4	1.50 Mt	1.88 M
2: (PV + Grid)	PV: 200 kW Converter: 431 kW Grid: 1.41 GWh	10.5	1.40 Mt	1.25 M
3 (Grid)	Grid: 1.63 GWh	0	1.71 Mt	2.07 M

Environmental Impact

300 charging stations

4500 charging pots

450 M tons CO2

Our objective is to install a total of 300 charging stations equipped with PVs, encompassing both the current charging infrastructure, within the next two years of project implementation, which expecting in over 4500 charging ports (depends on situation of locations) available nationwide in Vietnam. These number will steadily increase as we continue to expand more in the future.

We will gather annual data on the charging capacity of electric vehicles at our stations to measure the reduction in CO2 emissions from their engines, that expect to get tons annually.

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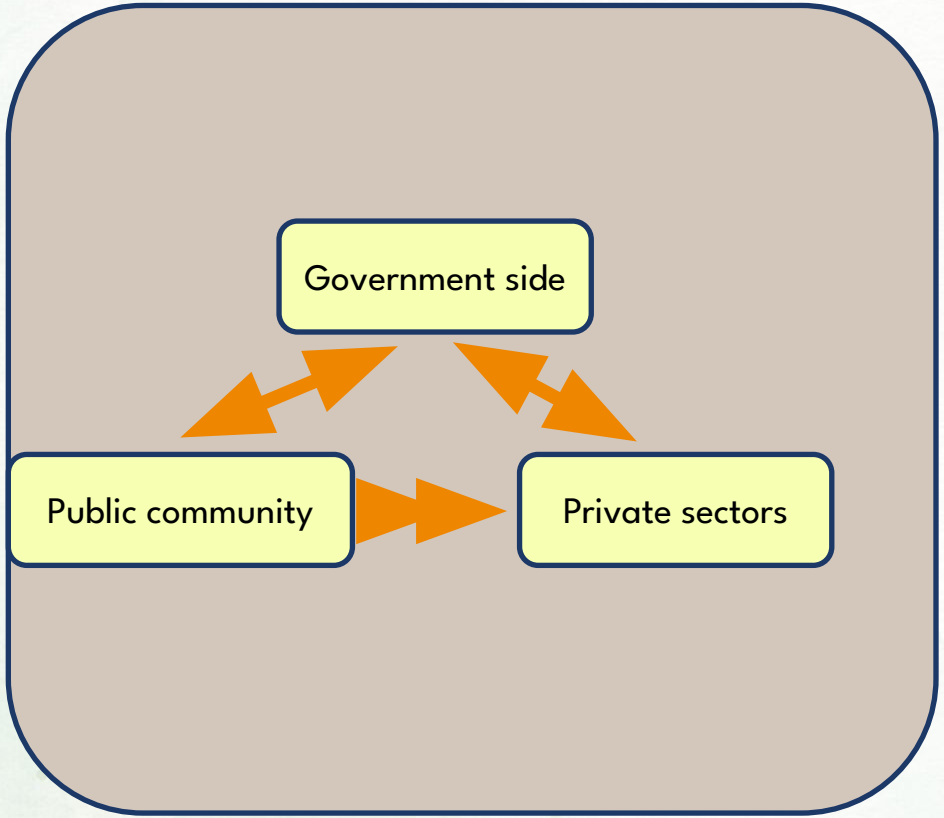
Social Impact



Transitional pave the way for a viable livelihood

Our project creation play as a key role for:

- **Public community**
  - Provide additional green jobs
  - Assist residents, households, and building owners in increasing their income
- **Private Sectors**
  - Discover the opportunity for private enterprises to attract additional partners and investors in the solar industry especially from wealthy countries.
  - Enhance the recognition that enables them to increase their net worth.
- **Government Side**
  - Drive the promotion of the rooftop solar development strategy.
  - Aim for achieving a carbon-neutral state by striving towards the ultimate objective of attaining a net-zero target.

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Team Members

Dang-Chuong TA

Role: Project Leader, Methodology and Technically Manager
Education: Bachelor in Thermal Energy Engineering
Experiences: Research intern at VIET SE

Anh-Duc NGUYEN

Role: Business Development Manager
Education: Bachelor in International Business Economics
Experiences: Senior Hub Specialist for Lazada Logistics

Chim Thyda

Role: General Manager
Education: Bachelor in Energy Engineer
Experiences: PV system designer, green mobility transportation project officer, Energy Efficiency Engineer

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Appendix: Summary data input

1. Location and load profile

Address: 431 Hoang Van Thu Street, Ward 4, Tan Binh District, Ho Chi Minh City, Vietnam

Latitude: 10.798087 Longitude: 106.659477

Load profile: 15 DC charging points (30 kW for each). Assumed capacity factor is 40%. Average daily load is 4320 kWh. On average, this station has a high consumption of electricity at 10 AM and 7 PM.

2. Power components

Table 1: Power components description

Component	PV	Battery	Grid	Converter
Parameters	Name: Canadian Solar Max Power CS6X-325P Abbreviation: CS6X-325P Power capacity (kW): 0.325 CAPEX ($/kW): 876 [1] O&M ($/kw/year): 13.2 [1] Replacement cost ($/kW): 442.38 [2] Lifetime (year): 25	Type: Generic 1000kWh Li-ion Abbreviation: 1MLI Nominal voltage (V): 600 Nominal capacity (kWh): 1000 Power capacity (kW): 1000 Nominal capacity (Ah): 1670 CAPEX ($/kWh): 482 [3] O&M ($//kW/year): 9 [4] Replacement cost ($/kWh): 222.43 [2] Lifetime (year): 15 [3]	Source: Vinh Tan coal thermal power plant Emission (kgCO2/kWh): 1.06 [4] Carbon emission penalty ($/ tCO2): 8.08 [5] Average Cost ($/kWh): 0.0753 [6]	Type: Dynapower IPS - 500 Abbreviation: Dyn500 CAPEX ($/kW) 21.86 [7] O&M ($//kW/year) 8.74 Replacement cost($/kW) 13.12 Lifetime (year): 15

3. Economic indicators

In Vietnam, nominal discount rate is 10% [35] and expected inflation rate is 4.49% [36].

Link of reference:

https://docs.google.com/spreadsheets/d/147DPSQqXAIGGPYUXYSce8w9yeplD0GsM0_cVTEENVs/edit?usp=sharing