



# USAID CLEAN POWER ASIA

## Key AIMS III and interconnection study results identified

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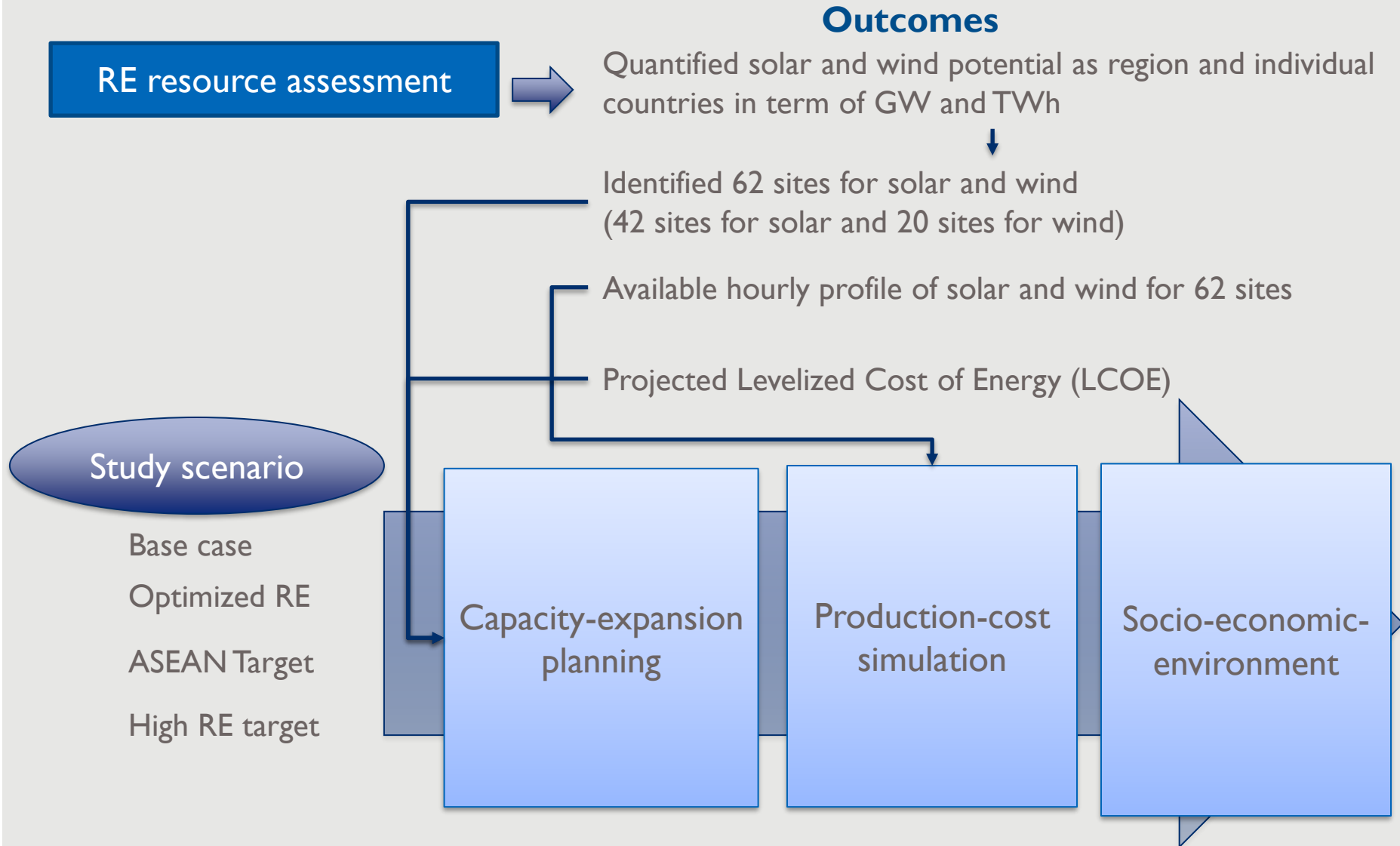
# Agenda

- Recap on study scenarios
- Key results of AIMS III
- Link between RE resource assessment and energy modeling and analysis
- Lesson learned and discussion points
- Link between AIMS results and transmission interconnections identified
- Identified transmission interconnections from the study

# Study scenarios

Cases	Description	Share of VRE
Base case	Represents current energy planning and perspectives, which are comparable with ASEAN Member States PDPs	3-4% share of VRE in total generation by 2020, and 8% by 2040
Optimum RE case	Develop optimized thermal (Coal and NG), VRE and inter-country exchange projections	9% by 2025, and no long-term targets by 2040
ASEAN RE target	Develop optimized thermal and inter-country exchange projections with VRE, which aims to achieve the 23% REmap by 2025	10-12% of VRE by 2025, and 15% by 2040
High RE case	Develop optimized thermal and inter-country exchange projections with VRE, which aims to achieve higher ASEAN RE targets	10-12% of VRE by 2025, and 25-30% by 2040

# Link between RE resource assessment and energy modeling and analysis



# Key results of AIMS

- Potential to lower system costs, higher RE investment, social benefits and reduced GHG emissions
- It is possible to set and achieve higher RE targets for ASEAN (with VRE accounting for ~25-30% of generation mix) by 2040.
- Highest RE scenario utilizes only 1% of the wind and solar technical potential
- High RE scenario provides lowest system cost compared to other cases
- All interconnections to facilitate power trades feasible with little impact on reliability and stability
- Identified 62 potential sites for solar and wind projects
- Additional benefits of the scenarios in this regional modeling are:
  - Utilizing and sharing unused reserved margins in each country
  - Shifting and flattening of the peak demand of the entire region which increases utilization of power plants
  - VRE available in different time zones enables its utilization at different times of the day

# Outcomes and Gaps

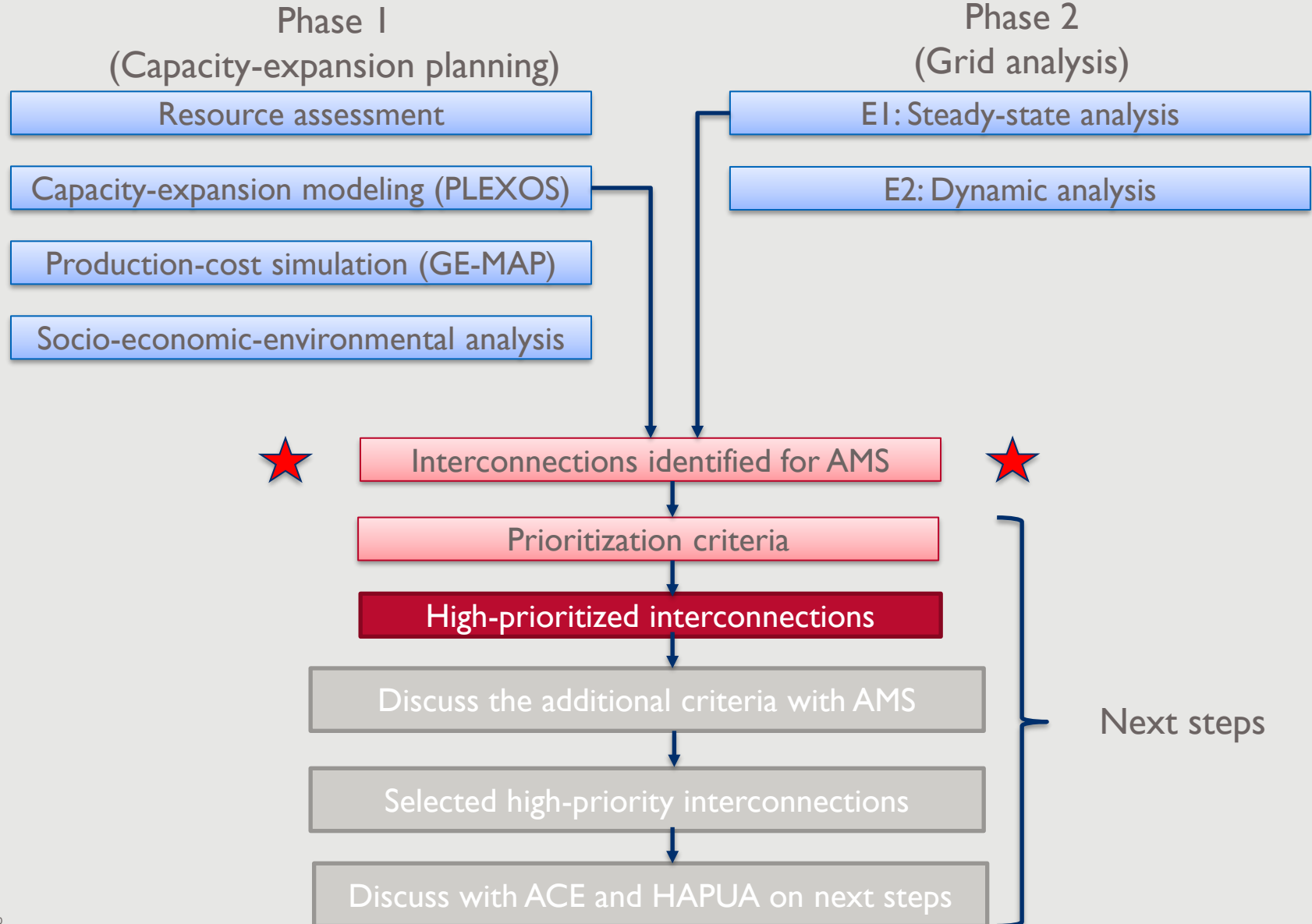
## Outcomes:

- Demonstrated the usefulness of the Southeast Asia RE Data Explorer tool in power sector planning
- Better understanding of region's solar and wind technical potential
- Provides an opportunity to adjust/increase RE targets

## Gaps:

- No official long-term power sector RE targets for ASEAN at the regional level, and in some countries
- No decision made on determining long-term RE targets and selecting scenario to be implemented (both AIMS III and AEO6)
- Not clear about process and approval/agreement to set long-term RE targets for ASEAN and how to allocate them at a country level

# Link between AIMS results and transmission interconnections identified



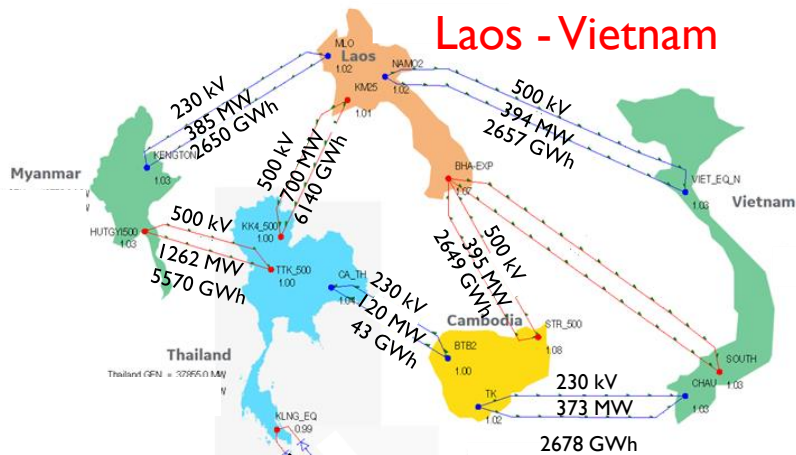
# Features of identified interconnections

S. No.	Interconnection Between	Shortlisting Criteria 1	Shortlisting Criteria 2	Shortlisting Criteria 3
		Earliest year the line is built suggested by PLEXOS Model (ASEAN RE Target Scenario)	Percentage Utilization over Short Term (2025)	Total Cumulative Additions in ASEAN RE Target Scenario over Study Horizon (MW)
1.	Thailand & Lao PDR (NR)	Firm. No Additions further	100%	0
2.	Lao PDR & Cambodia (NR)	2025	99%	319
3.	Lao PDR & Myanmar (NR)	2021	99%	318
4.	Lao PDR & Viet Nam (NR)	2021	99%	318
5.	Viet Nam & Cambodia (NR)	2021	93%	1025
6.	Thailand & Myanmar (NR)	2021	69%	343
7.	Thailand & Cambodia (NR)	2021	1%	964
8.	Sumatera & Singapore (SR)	2021	99%	290
9.	Peninsular Malaysia & Singapore (SR)	Firm. No Additions further	99%	0
10.	Sumatra to Peninsular Malaysia (SR)	2021	95%	1063
11.	Sumatera & Java (SR)	2021	74%	2057
12.	Sarawak & Brunei (ER)	2021	98%	38
13.	Philippines & Sabah (ER)	2021	90%	49
14.	Sabah & Kalimantan (ER)	2021	80%	16
15.	Sabah & Sarawak (ER)	2021	85%	21
16.	Sarawak & Kalimantan (ER)	2026	80%	547
17.	Thailand & Peninsular Malaysia (NR-SR)	2029	87%	743
18.	Java & Kalimantan (SR-ER)	2025	0%	426
19.	Peninsular Malaysia & Sarawak (SR-ER)	2022	0%	631



# Resulting interconnections identified and key observations

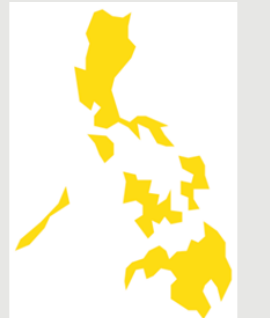
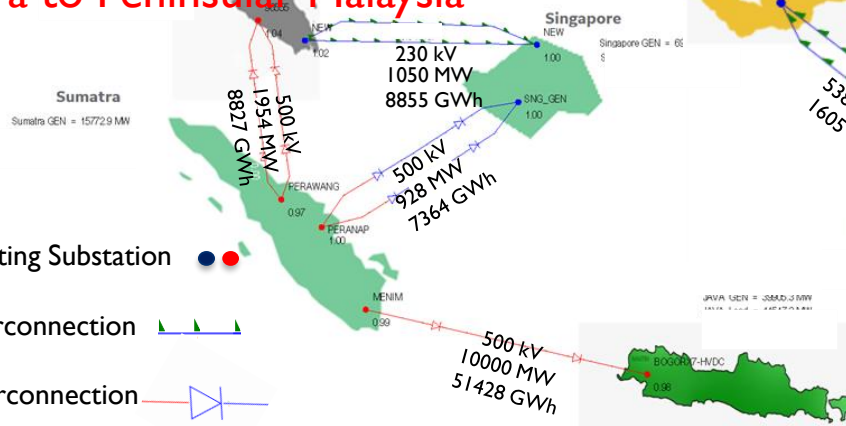
## Laos - Vietnam



## Sabah & Sarawak



## Sumatra to Peninsular Malaysia



Philippines

- Interconnecting Substation ● ●
- HVAC Interconnection —▲—▲—
- HVDC Interconnection —▶—▶—

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