

Local Government-led Decentralised Energy Planning for Resilience

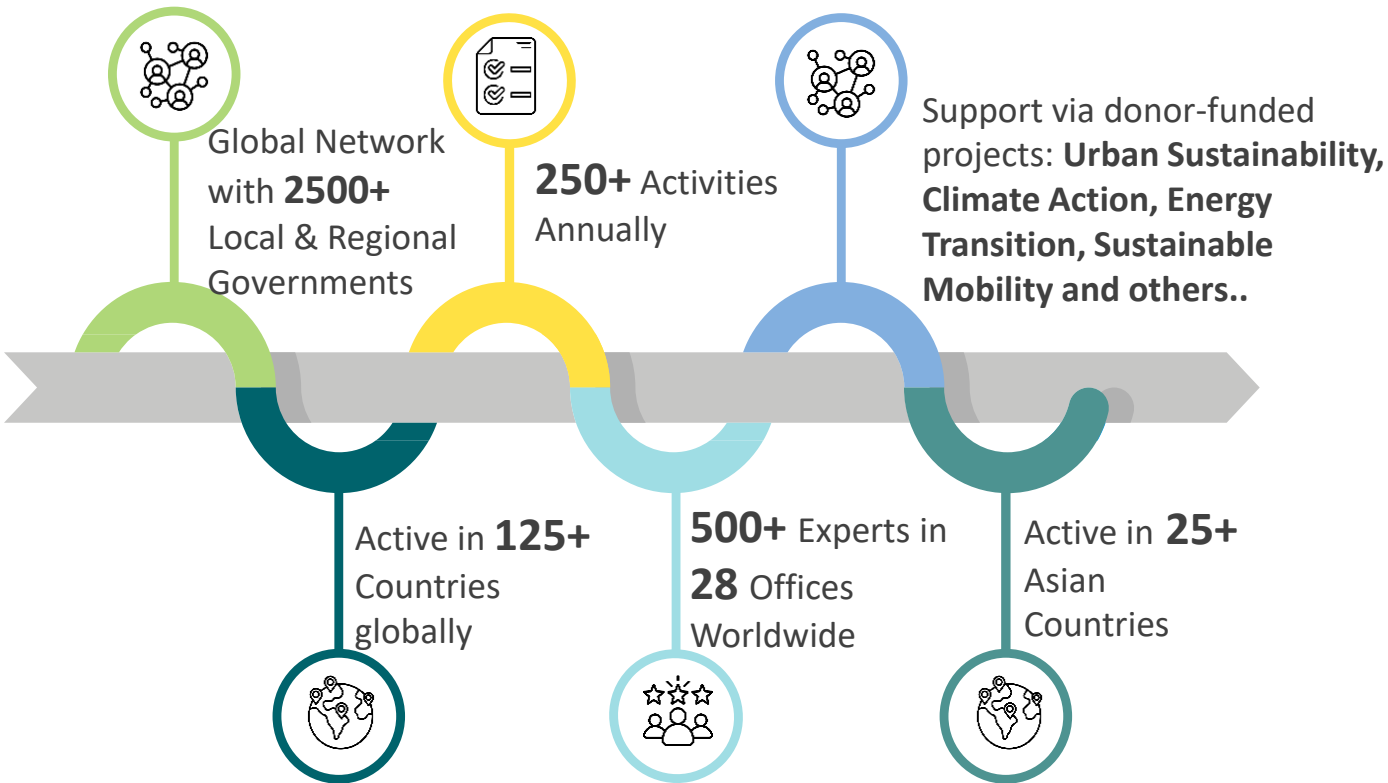
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Asia LEDSPartnership / ICLEI South Asia

Asia Clean Energy Forum 2026
Diversification and Decentralization of Energy Sources
June 9, 2026

Introducing ICLEI and Asia LEDS Partnership



- **ICLEI – Local Governments for Sustainability** (known as “ICLEI”): Global network association of local and regional governments **committed to sustainable urban development**
- Support across Planning and Policy, on-ground Pilots, Capacity Building, Peer Exchange, Governance



Asia LEDS Partnership (ALP)



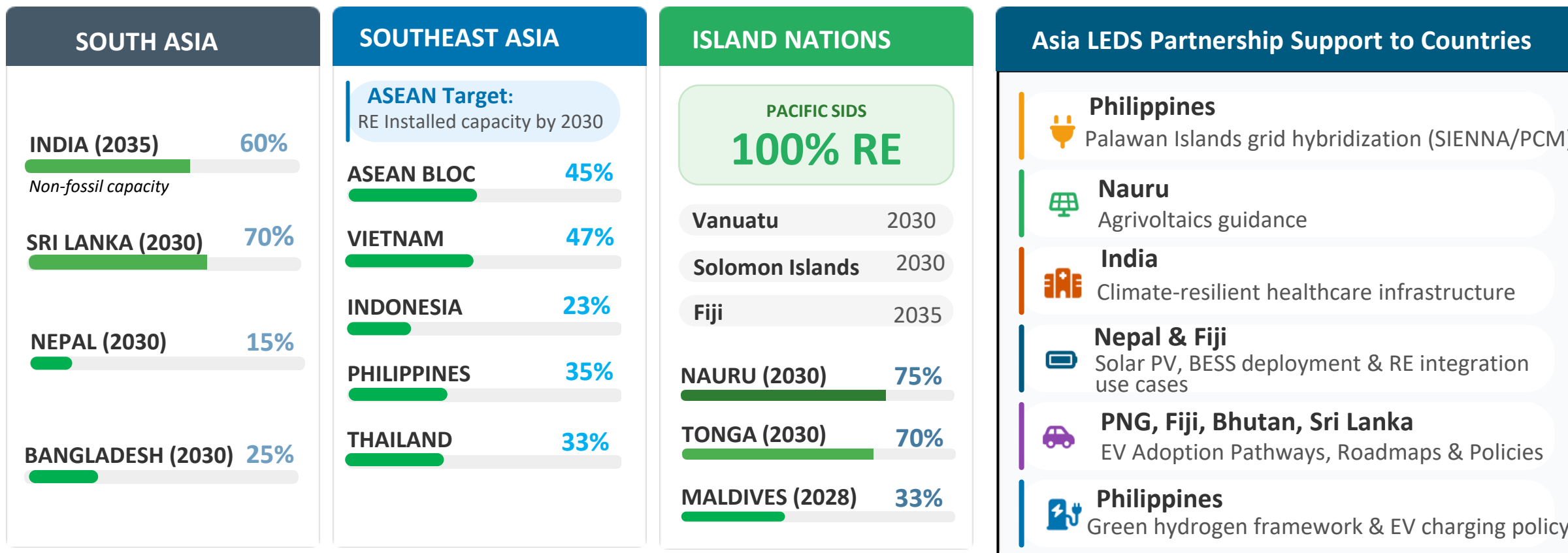
Regional climate action network: ALP is a voluntary regional supporting LTS, LEDS and NDCs in the Asia Pacific region

ICLEI holds the Secretariat of Asia LEDS Partnership to manage and deliver support to **18+ countries**



Asia Pacific's Energy Transition Ambitions

- Fossil fuel import dependency & susceptible to price shocks, supply disruptions – esp. developing economies & SIDS
- Energy transition ambitions support climate commitments and enhance energy security and resilience



Need for Urban Energy Resilience



50%+ of world's urban population in Asian cities

Dense load centers & volatile peak demand

Livelihoods, energy access & affordability

City climate & sustainable energy targets

Improved grid flexibility & reliability

Rising renewables & EV penetration



KEY APPROACHES TO RESILIENT URBAN ENERGY SYSTEMS

1 Building Energy Resilient City Infrastructure

2 Climate-Proofing Critical Services & Emergency Systems

3 Integrating Energy Resilience into Urban & Climate Planning

1

Building Energy Resilient City Infrastructure



- DRE & distributed energy storage at urban scale - C&I consumers, municipal services & clean mobility
- Decentralised generation for municipal clusters & institutional campuses to support grid reliability & resilience
- Community & institutional microgrids to reduce impact of grid failures in dense urban networks

INTERVENTIONS

Captive & Rooftop Solar PV



Grid-connected solar for municipal infrastructure assets and clusters

RE-Powered Transit Hubs



Solar-powered EV charging for public transport stations & depots



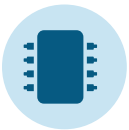
Solar-powered on-route charging facility for public E-buses at Ahmedabad, India

1 Building Energy Resilient City Infrastructure



INTERVENTIONS

Smart Microgrids



Community & institutional microgrids with innovative DISCOM–consumer business models

Demand-Side Management



Peak-hour DSM & seasonal demand management to reduce grid congestion & improve reliability

Energy Efficiency



To reduce energy demand and operational costs in municipal operations

Policy & Regulation



Local policy frameworks & regulatory studies for smart microgrid deployment & distributed energy storage integration



Bio-methanation Plant at Udaipur, India



Captive Solar PV at Water Treatment Facility at Rajkot, India



Floating solar PV at Coimbatore, India

2 Climate-proofing Critical Services & Emergency Systems



- Energy dependent urban systems exposed to climate risk: water supply, wastewater management, mobility & emergency response
- Enhance resilience of emergency infrastructure & energy systems against flood, heat & storm hazards
- Extend reliable energy supply and backup to informal settlements & vulnerable population groups

INTERVENTIONS



Solar + BESS for Emergency Infrastructure

Hospitals, emergency shelters, telecom & early warning systems — shift from diesel power backup dependency



BESS for Flood & Storm Infrastructure

Automated flood gates, barriers, and stormwater pumping stations — ensuring uninterrupted power during extreme climate events



Solar PV with Li-ion battery in Healthcare Centre at Narayanganj, Bangladesh

2 Climate-proofing Critical Services & Emergency Systems



INTERVENTIONS



Climate-protection Enhancements for Local Power Infrastructure

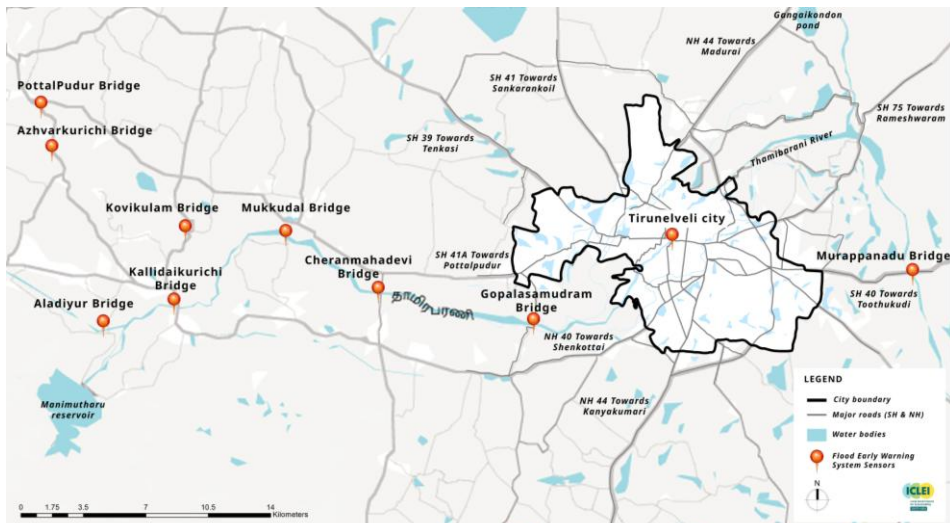
Flood-proofing substations, elevated electrical equipment, underground cabling in flood-prone zones, heat-resilient transformers



Community Solar for Vulnerable Groups

Renewables in informal settlements for basic cooling/heating, community healthcare, and public water points — improving energy access and reducing climate shock impacts

Flood Early Warning and Monitoring System at Tirunelveli, India



Groundwater recharge solution to address waterlogging at Rajkot, India

Greenfield city of Amaravati, India: Building Energy and Urban Climate Resilience from the Ground-up



Area
217.23 sq. km



Development timeline
Year 2058



Population (2058)
3.9 Million



Power demand (2058)
2,700+ MW



Located on the banks of River Krishna in Andhra Pradesh state and features several water bodies



Energy resilience is central to flood resilience
High-capacity pumps for flood control in cities are reliant on uninterrupted power supply

Energy and Urban Resilience Interventions



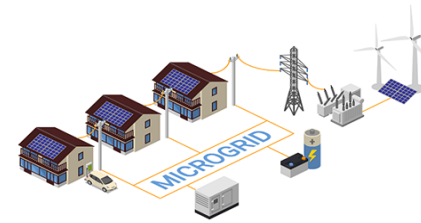
Ambitious **sustainable energy targets** and measures set out linked to urban planning



City design and flood control measures to enhance preparedness to **high-intensity rainfall**



Integrating **climate-proofing measures** into utility infrastructure designs in flood-prone areas



Micro grids



Mandates for RE integration



Underground utility network



Higher plinth levels

Climate Risk assessment methodology per IPCC AR5 guidance

CLIMATE HAZARD



Extreme events impacting people, infrastructure & natural environments (e.g., floods, heat, sea-level rise)



EXPOSURE

People, infrastructure, & natural systems that could be adversely affected by climate hazards



VULNERABILITY

Extent to which people, systems & assets are harmed by climate impacts and their ability to adapt

VISAKHAPATNAM, INDIA



Geographical Setting
Coastal City



Area
618 sq. km

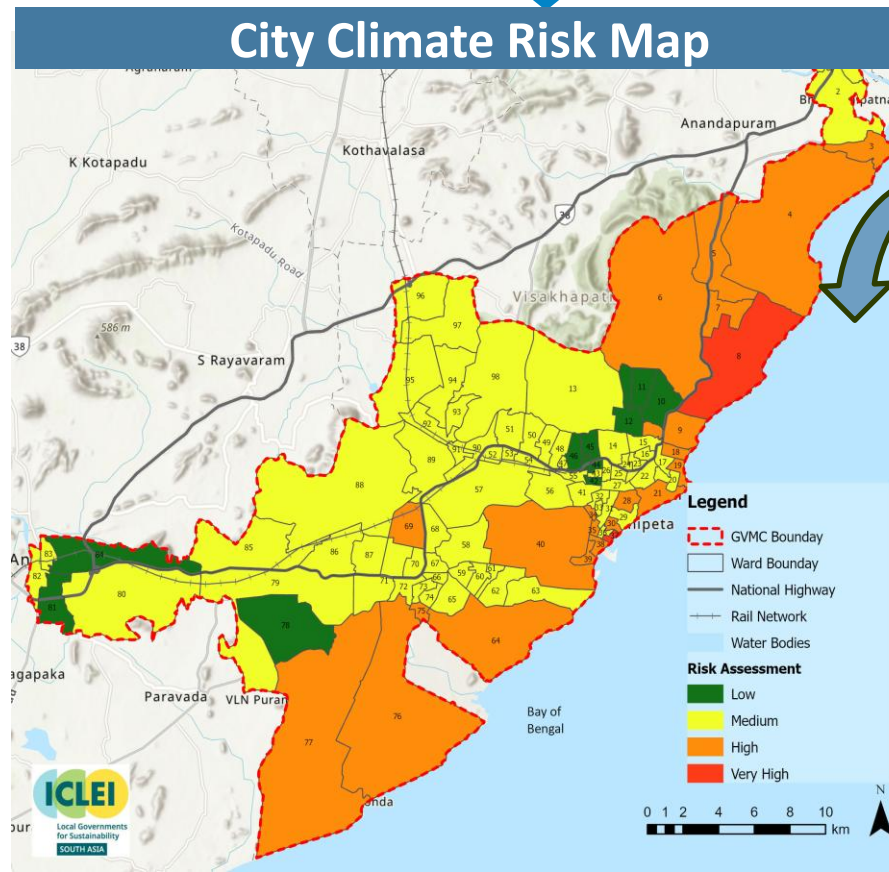


Population (2025)
2.6 Million



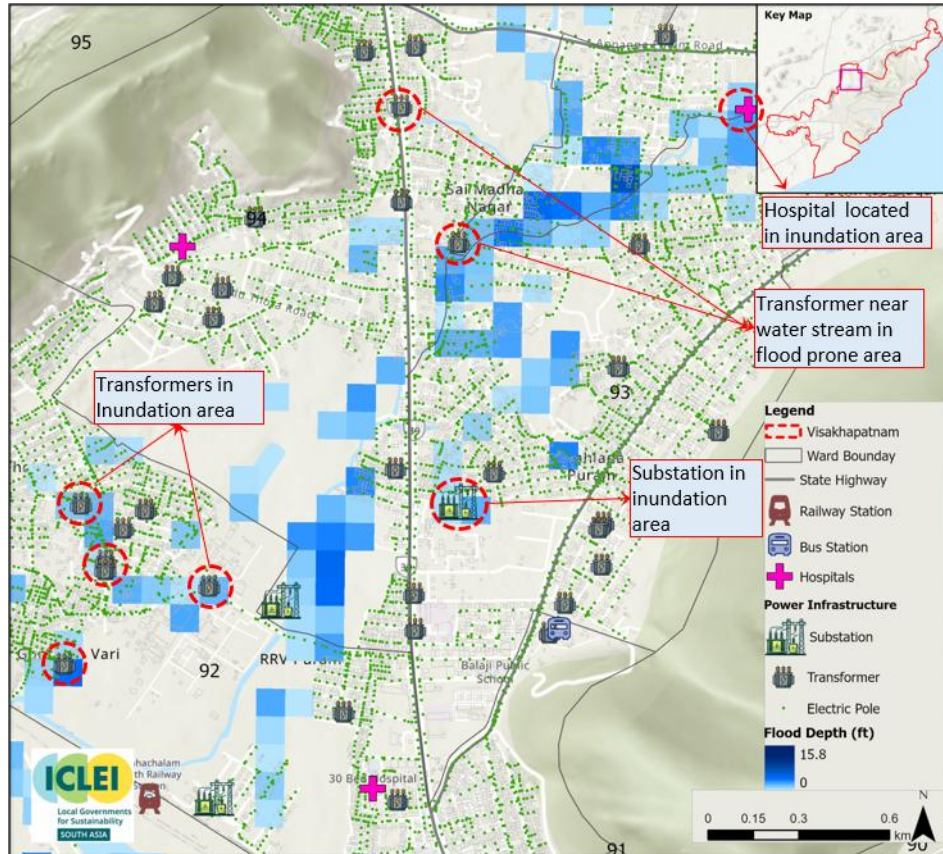
Economic Drivers
Port & Logistics,
Industries, IT, Tourism

City Climate Risk Map

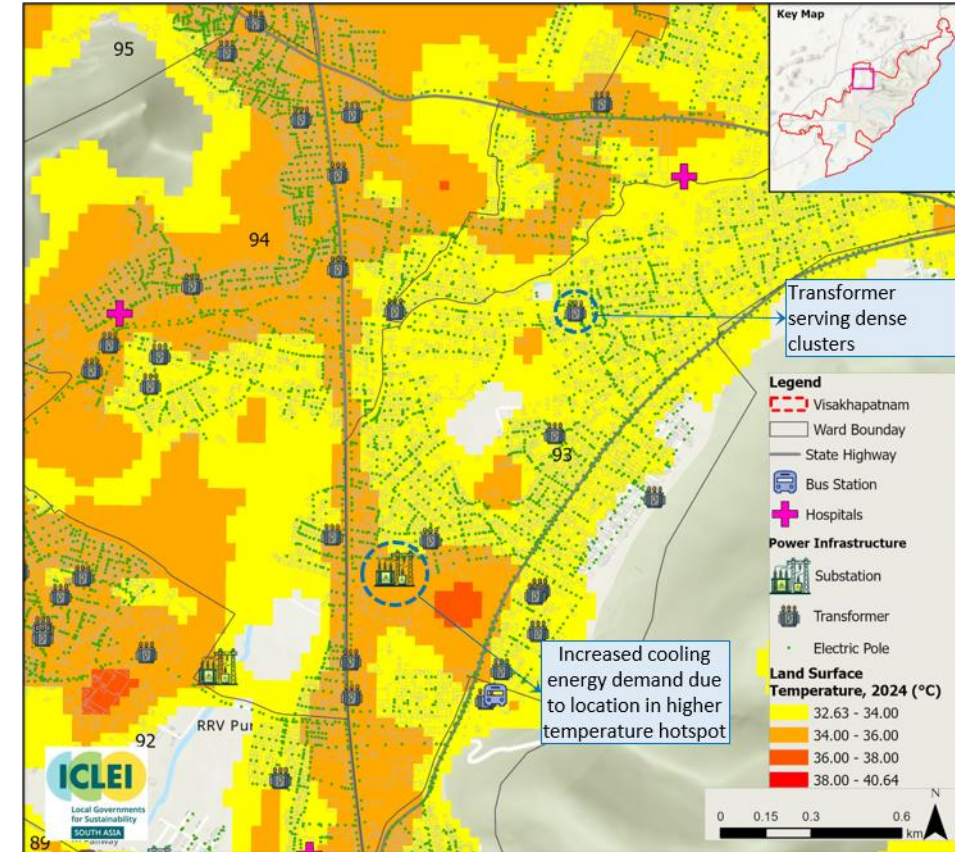


Overlaying geo-spatial information on power distribution infrastructure and urban facilities can strengthen climate proofing and support energy planning

Mapping Climate Risk onto Energy Infrastructure



Existing power infrastructure in flood-prone areas –Visakhapatnam



Existing power infrastructure in heat hotspots– Visakhapatnam



Substations
1 of 3



Transformers
7 of 30



Electric Poles
174 of 6323



Substations
2 of 2



Transformers
29 of 30



Electric Poles
5775 of 6463

3 Integrating Energy Resilience into Urban & Climate Planning



- Need to **bridge Urban-Energy Planning Gap** to help realize the potential of Urban Energy Transition and Resilience
- Establish **coordination mechanisms and frameworks between city government & power distribution utility**
- Supports **judicious planning and siting of city-scale energy networks and solutions** in sync with urban infrastructure development & growth patterns and climate risks

Climate Risk Integration into Energy Infrastructure Planning



Link climate risk assessments to substation/feeder siting and planning. Develop strategies for exposed assets

Digital Solutions for Decision-Support



Deploy SCADA, IoT, AI and digital twins for city service facilities/infrastructure to model energy needs, simulate energy disruptions, and enable real-time decision support

Data-Driven Governance Frameworks



Governance frameworks for critical and emergency infrastructure for rapid, evidence-based decisions during energy disruptions

Integrating Energy-Urban-Climate Resilience can deliver Multiple Benefits





ASIA LEDS
PARTNERSHIP

Advancing low-emission,
climate-resilient development across Asia

Thank you!

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Asia LEDSPartnership

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