



ASIA CLEAN ENERGY FORUM 2026

Beyond Transition: Building Secure, Resilient, Inclusive, and Intelligent Energy Systems

8-11 June | ADB Headquarters, Metro Manila, Philippines



Reconductoring to Expand High-Voltage Network Capacity

(Upgrading of single Zebra Double Circuit Mannar – Vavunia 220kV Tr. Line, Sri Lanka)



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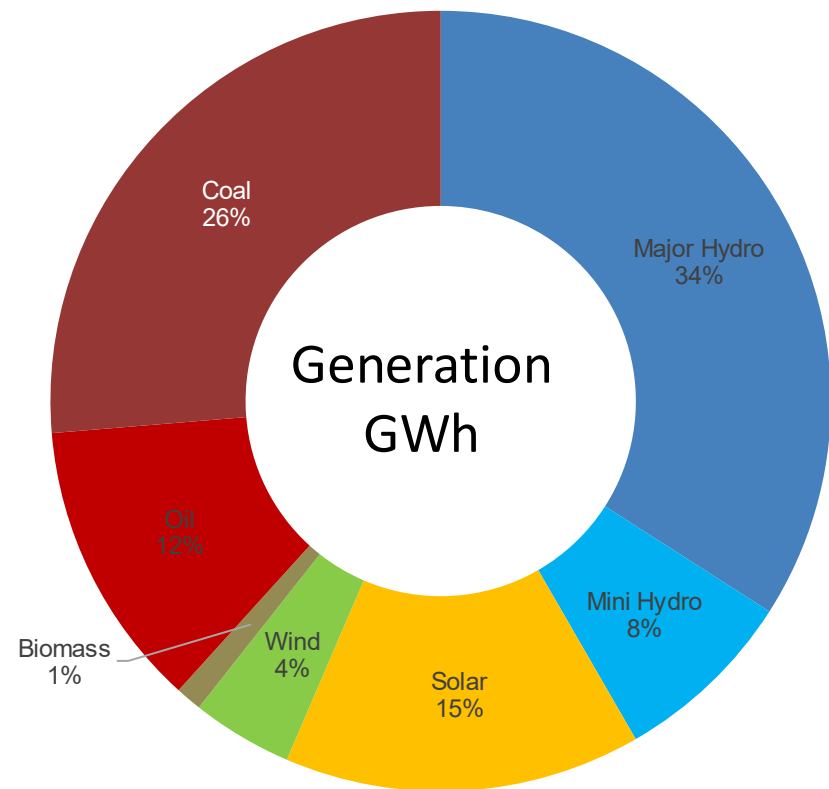
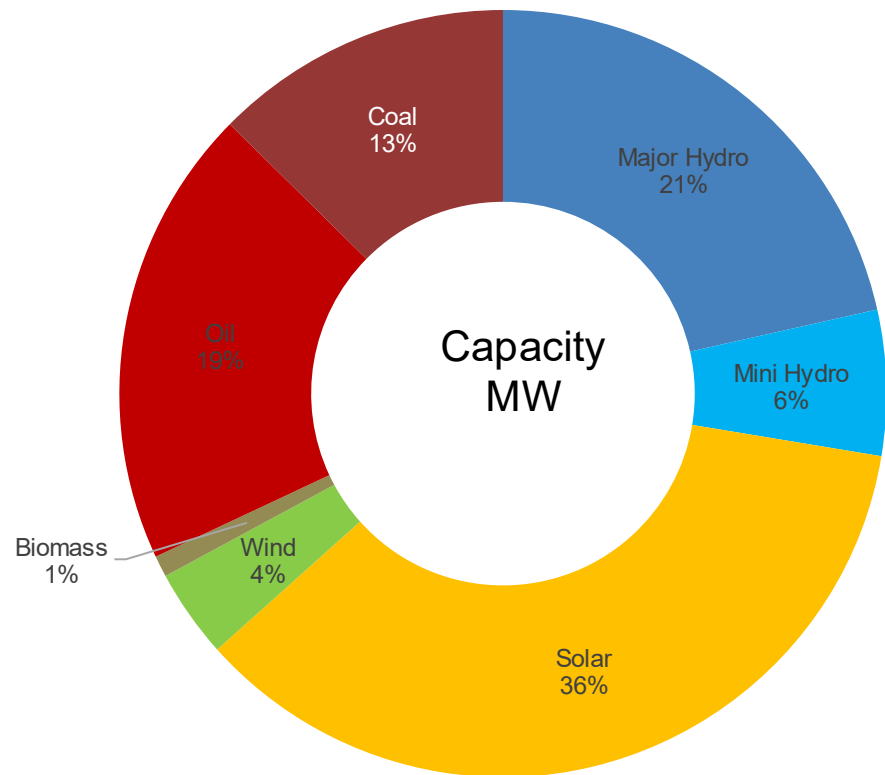
Sri Lanka Power Generation Mix (2025) - Provisional

~ 7,200 MW

~18,500 GWh
Annual Generation

62%
RE Share

38%
Thermal Share





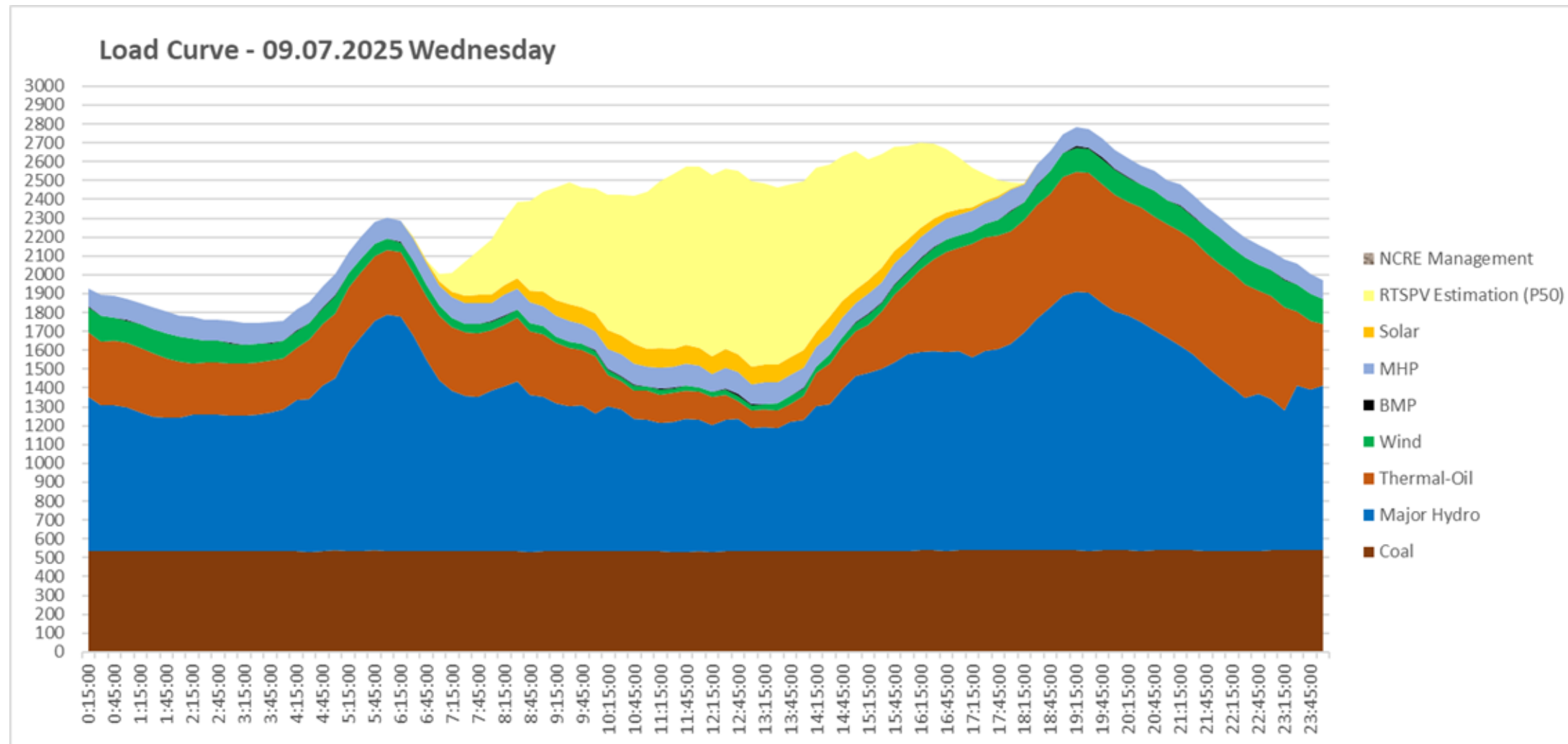
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Daily Demand Variation in Sri Lanka





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Wind Power Development in Mannar (Utility Scale)



Mannar Phase I-Ext. (50 MW)
(Mannar Island) - **Dec 2026**

Kondachchi WF (150 MW)
(Mannar Mainland) - **Nov 2028**
(TA from ADB)

Mullikulam WF (2x 50MW)
(Mannar Mainland) - **Dec 2027**

Modaragam Aru WF (35 MW)
(Mannar Mainland) - **Jun 2029**





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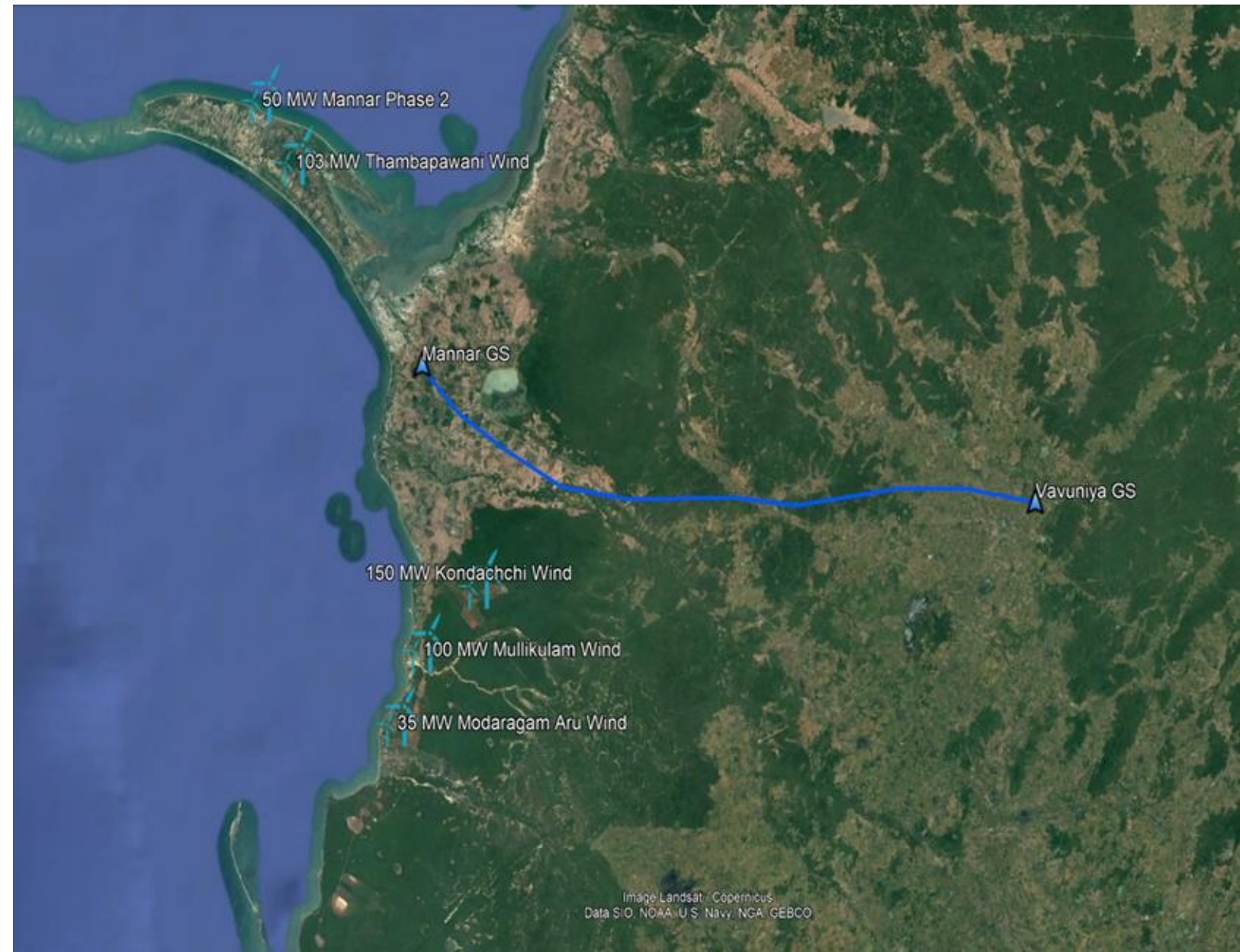
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Why reconductoring of Mannar – Vavunia 220 kV Tr. Line (71 KM)?

- Evacuate 400 MW Wind Capacity in Mannar
- Constraints for new line corridor
- Impact on Environment and right of way
- Increase power transfer without constructing a new line





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Why HTLS Conductors?

- HTLS Types (TACSR, GTACSR, ZTACIR, ACSS, ACCC etc.)
- Higher current carrying capacity
- Low sag at high temperatures (at 180 C)
- No new line corridor (negligible impact on environment)
- Fast implementation than a new line
- Cost Effective

Parameters	Zebra	HTLS
Current Carrying Capacity (CCC)	800 A (at 75C)	1600 A (at 180 C)
UTS	130kN	160kN
Conductor weight per km	1621kg	1623kg
Overall Diameter of the Conductor	28.62mm	28.62mm
Allowable Temperature	75C	180C
Sag-Tension Characteristics		
-Tension at Min. Temperature-Full Wind	52,399N	49,492N
-Sag at Max. Temperature-No Wind	10.42m	9.85m



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Why HTLS conductors are strategically important for uprating existing lines

The value is not only lower sag: HTLS converts existing or new corridors into higher-capacity, clearance-compliant, faster-deliverable transmission assets.

Strategic design message

For Sri Lankan transmission projects, the highest-cost constraints are often corridor acquisition, tower strengthening, outage windows and clearance compliance. HTLS directly addresses these constraints.



1

1. Uprating existing lines

Increase transfer capacity using existing towers and corridors where structure checks permit. Avoids full new-line acquisition and reduces social/environmental delay.

2

2. Clearance compliance at high load

Higher operating temperature normally increases sag. HTLS controls thermal elongation, preserving ground/road/crossing clearances during emergency and peak loading.

3

3. New project optimization

For new lines, HTLS can reduce tower height pressure, improve span flexibility, support future N-1 loading and defer parallel circuits.

4

4. Grid integration value

Useful for renewable evacuation and contingency loading: more dynamic capacity from constrained corridors, with faster implementation than building a new route.

Recommendation: include HTLS (ACCC, ACPR, TACSR, GTACSR etc.) as a major technical option for reconductoring of existing lines for integration of more renewables avoiding / defer the construction of new line — subject to tower, fitting, vibration and loss/cost studies.



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Benefits and Implementation Challenges

Benefits

- Increased evacuation of renewable energy in Mannar
- Enhanced grid flexibility and reliability
- Reduced transmission bottlenecks
- Deferred investment in new transmission corridors
- Supports Sri Lanka's clean energy transition

Implementation Challenges

- Maintaining system operation during construction (Live Line Stringing)
- Outage planning and coordination
- Conductor installation techniques
- Importance of detailed engineering studies



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Conclusion

- Reconductoring is a practical solution for increasing network capacity.
- HTLS technology enables significant capacity enhancement using existing infrastructure.
- The Mannar - Vavunia Reconductoring Project demonstrates how utilities can integrate more renewable energy quickly and cost-effectively.
- Good solution for future grid expansion in the World (including Sri Lanka).



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Thank You