



# **Transmission Planning in India and Perspectives for clean energy transition and advancing Cross Border Energy Trade in South Asia**

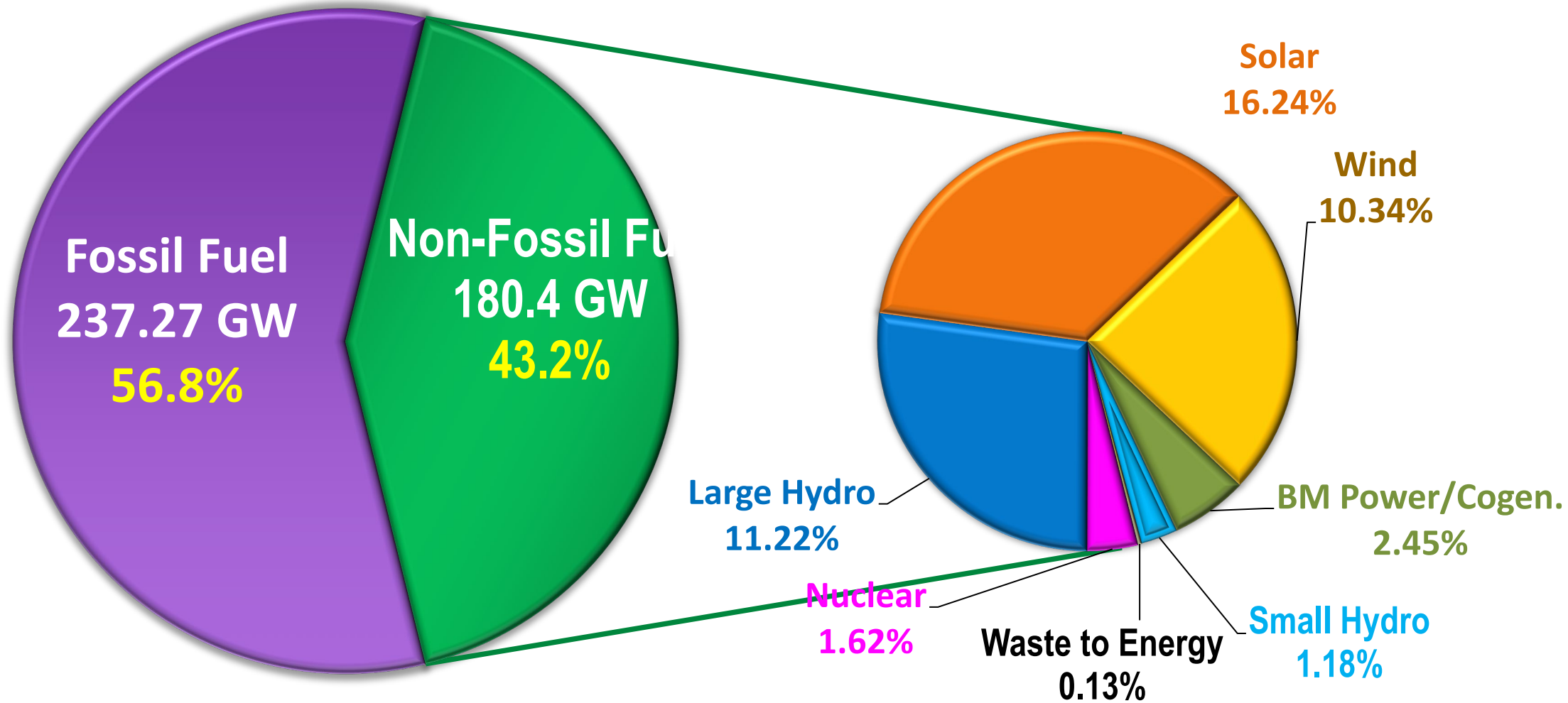
# Transmission Planning Philosophy

- **Transmission planning is driven by:**
  - increase in electricity demand
  - increase in generation capacity
- **Methodology of Transmission Planning:**
  - Different load generation balance scenarios:
    - Peak RE generation with associated electricity demand
    - Electricity demand in evening with low RE generation
    - Off-peak demand at night
  - Planned network under ISTS as well as intra-state
  - The studies have to be carried out considering the criterion/assumptions specified in the “Manual on Transmission Planning Criteria”

# **Transmission Planning & Implementation**

- Central Electricity Authority has been mandated to prepare the National Electricity Plan (NEP) in accordance with the National Electricity Policy and notify such plan once in five years.
- Optimum development of transmission system requires co-ordinated planning of the Inter- State Transmission Systems (ISTS) and Intra-State Transmission Systems (Intra-STS). CEA is coordinating transmission planning process.
- CTUIL prepares the implementation plan of ISTS network.
- The planned transmission system (ISTS) is deliberated in the National Committee for implementation.

# Installed Generating Capacity (As on 31.05.2023)



**ALL INDIA INSTALLED CAPACITY AS ON 31.05.2023: 418 GW**

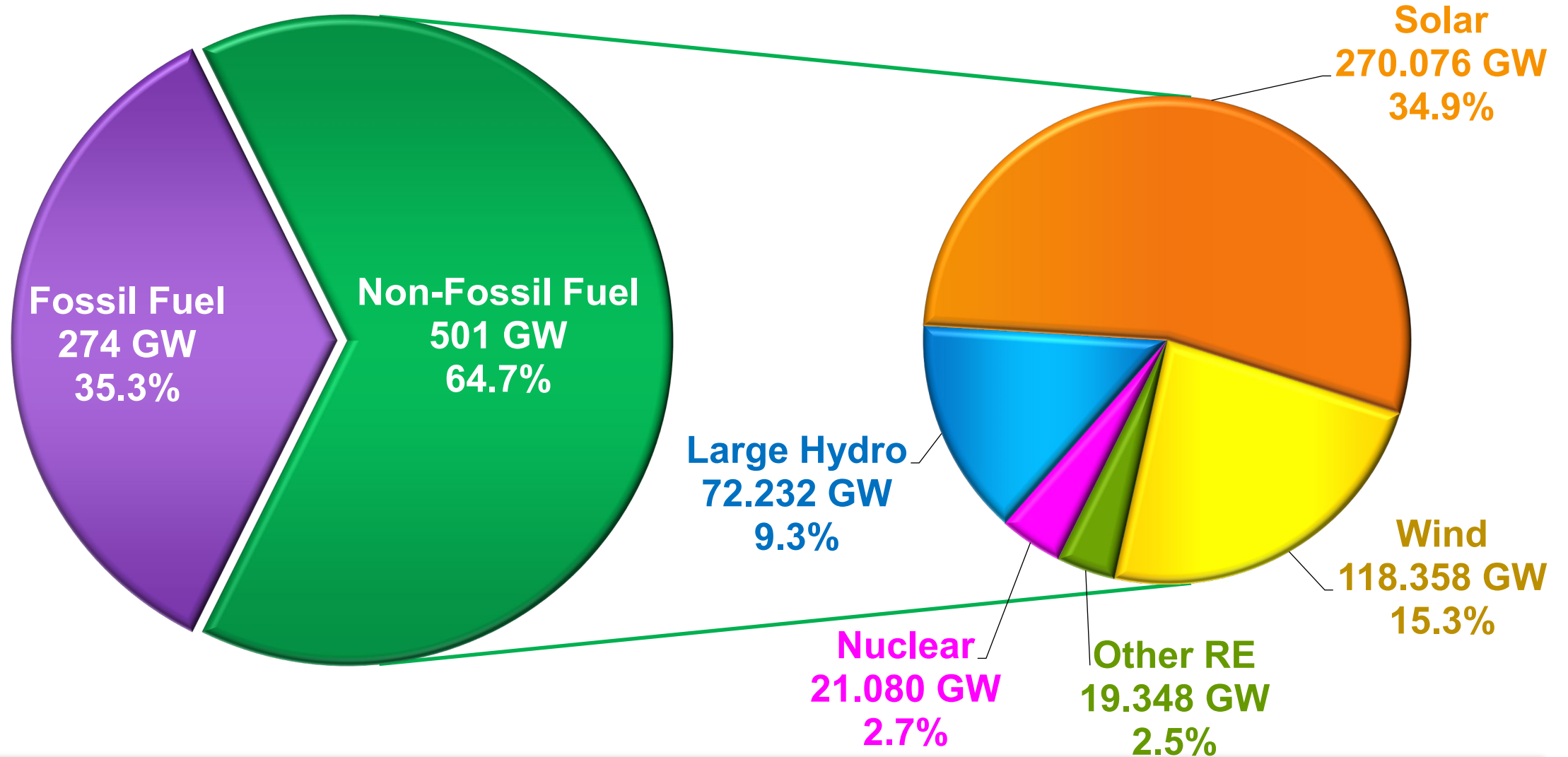
# Transmission Network (31.05.2023)

<b>Voltage</b>	<b>MVA</b>	<b>ckm</b>
<b>765 kV</b>	2,78,200	52,678
<b>400 kV</b>	4,30,573	1,97,893
<b>220 kV</b>	4,47,750	2,02,399
<b>HVDC</b>	33,500	19,375
<b>Total</b>	11,90,023	4,72,345

# Electricity Demand

	<b>2022-23 (Actual)</b>	<b>2029-30 (Projected)</b>
<b>Peak Electricity Demand (GW)</b>	<b>216</b>	<b>335</b>
<b>Electrical Energy Requirement (BU)</b>	<b>1512</b>	<b>2280</b>

# Expected Installed Generating Capacity by 2030



Expected Installed Capacity as on 31-03-2030 : 775 GW.

# **Planning of Transmission Network (ISTS) for integration of RE capacity by 2030**

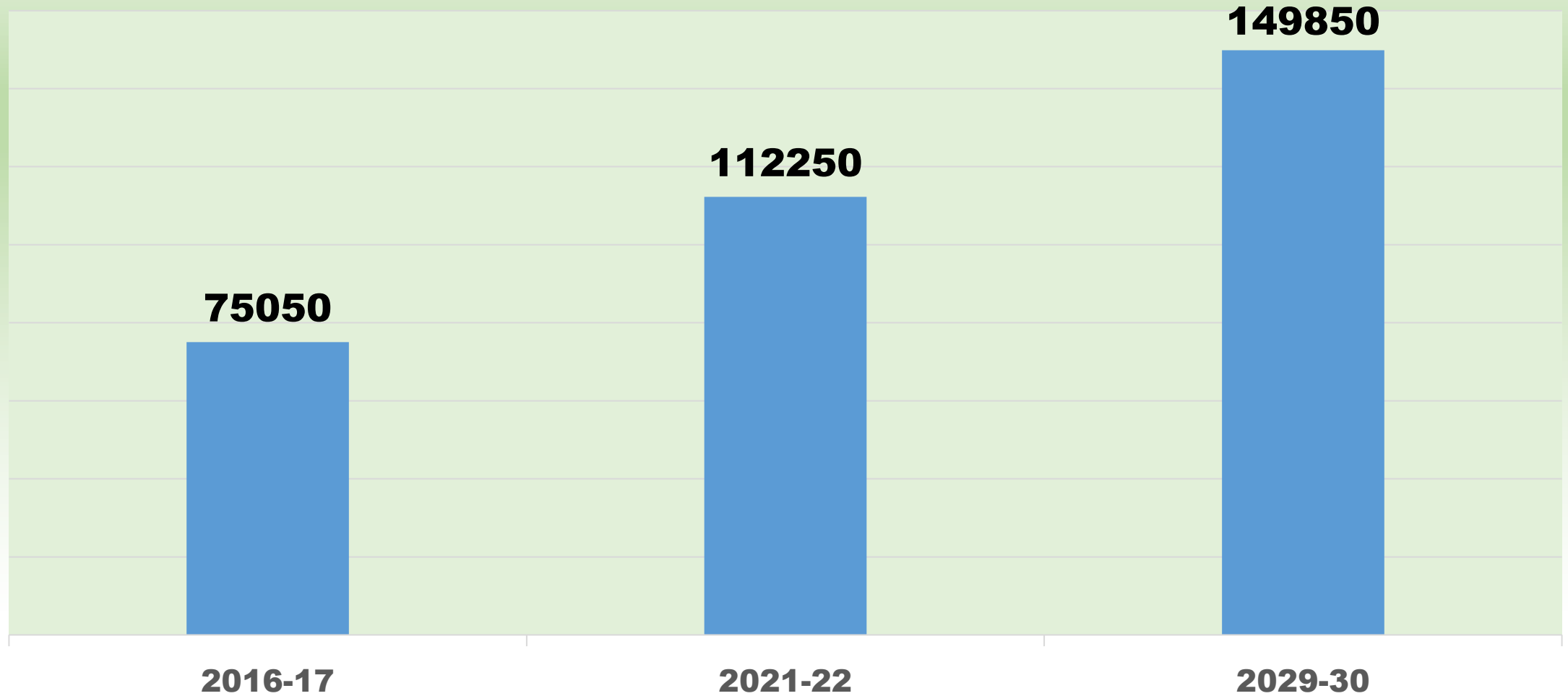
- As a significant step towards successfully achieving the planned RE capacity by 2030, transmission system has been planned for about 537 GW of RE capacity.
- The Plan “Transmission System for Integration of over 500 GW RE Capacity by 2030” launched in December, 2022.
- The plan portrays the broad transmission system roadmap for reliable integration of 537 GW RE capacity by the year 2030.



# **Additional Transmission Capacity (ISTS) Required for integration of RE capacity by 2030**

<b>Voltage</b>	<b>MVA</b>	<b>ckm</b>
<b>765 kV</b>	2,74,500	25,960
<b>400 kV</b>	1,34,075	15,758
<b>220 kV</b>	0	1,052
<b>HVDC</b>	25,000	8,120
<b>Total</b>	4,33,575	50,890

# Inter-Regional Corridor Capacity (MW)



# **Cross Border Import/Export of Electricity in South Asia**

- In South Asia, grid interconnection exists between Nepal-India; Bhutan-India & Bangladesh-India.
- To facilitate import/ export of electricity between India and neighbouring countries, "Guidelines for Import/Export (Cross Border) of Electricity-2018" has been issued. CERC has also issued the Cross Border Trade of Electricity Regulations in 2019.
- Additional interconnections have been planned in South Asia between Nepal-India; Bangladesh-India.
- 1000 MW HVDC link is under discussion between Sri Lanka-India.
- Well defined process of planning of inter-connections- JTT, JWG, JSC.

**Thank You**