



GOVERNMENT OF INDIA  
MINISTRY OF POWER



# DISCOM COLLABORATION PLATFORM FOR ECONOMIC PROCUREMENT

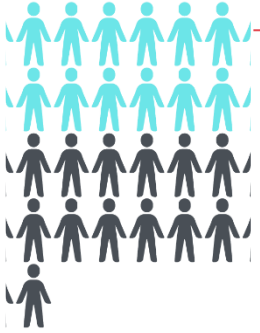
**DISTRIBUTION UTILITY MEET (DUM 2023)**  
**(02.11.2023 TO 03.11.2023)**

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**DIRECTOR GENERAL  
NATIONAL POWER TRAINING INSTITUTE**



# THE INDIAN ECONOMY



**Population over 1.35 billion.**



**Need for elimination of poverty and providing minimum living standards of people.**

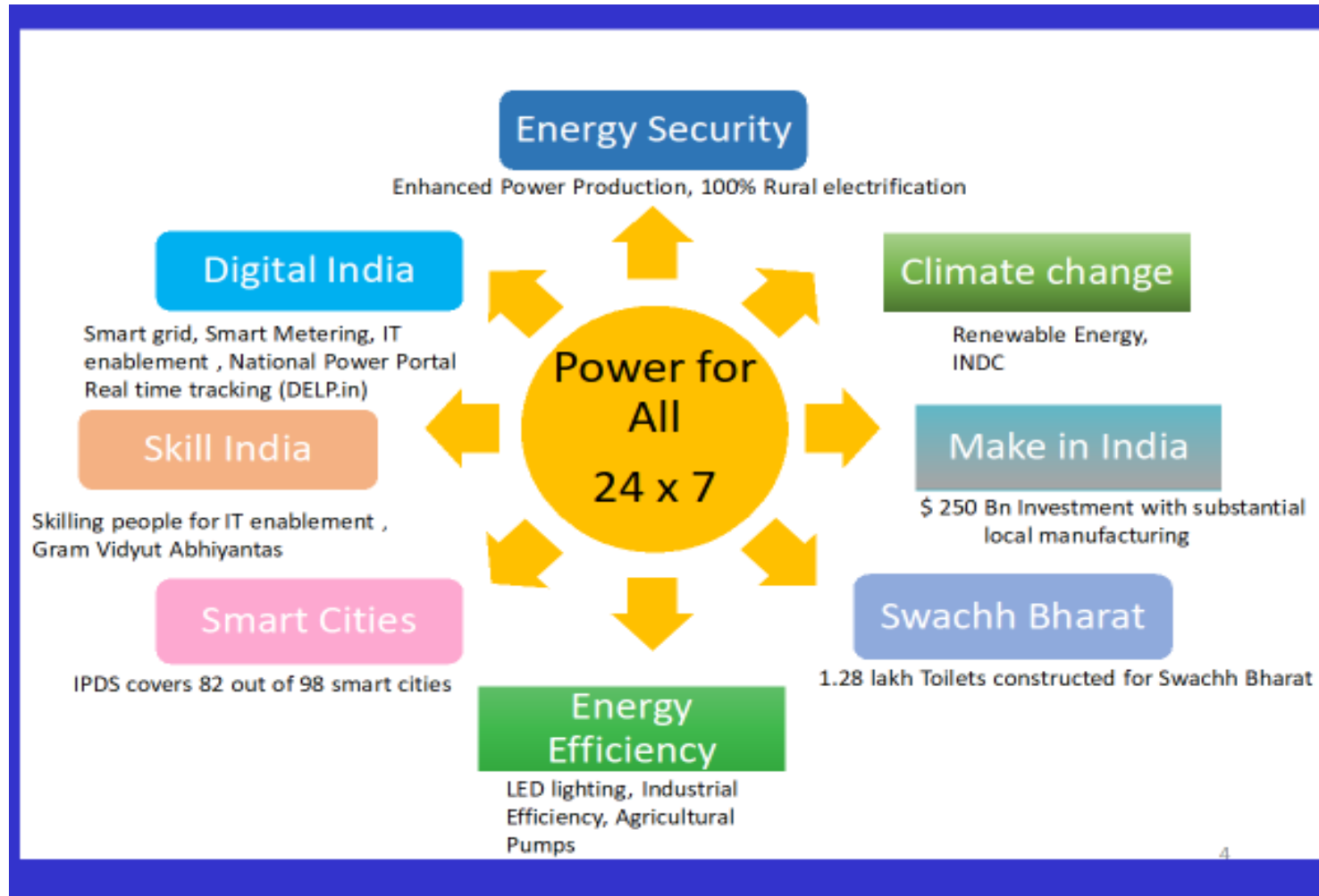


**India is number third in the world Electricity production (416GW)**



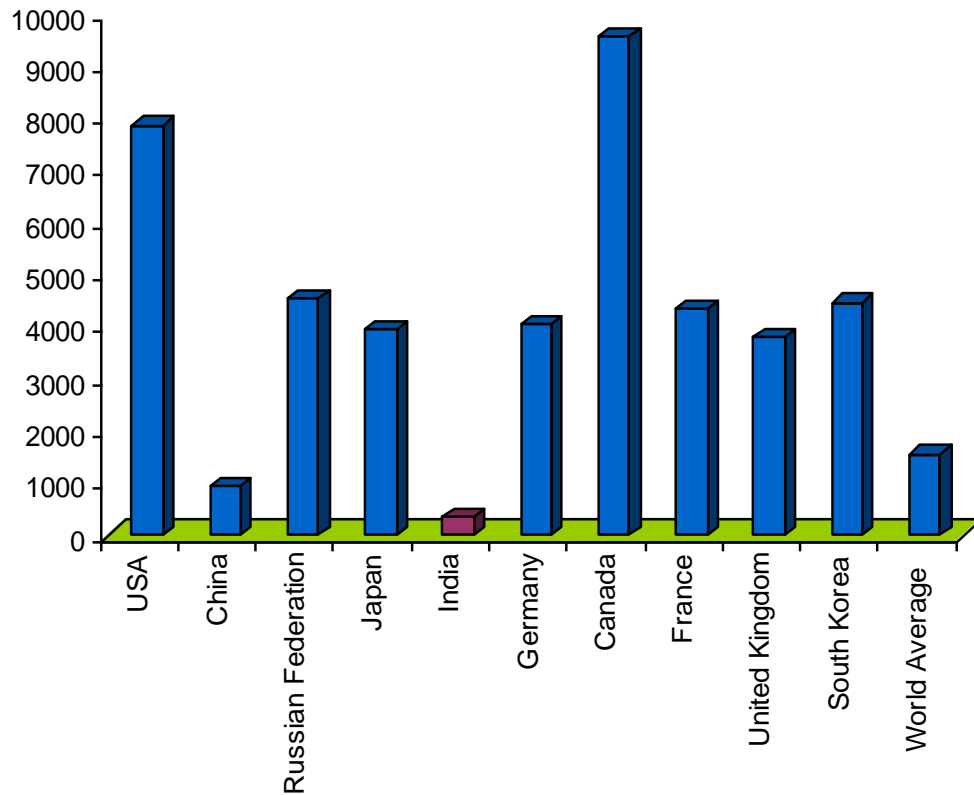
**India stood 3rd in Renewable Energy capacity in the world & is running the world's largest and most ambitious renewable capacity expansion program.**

# Power to All 24x7

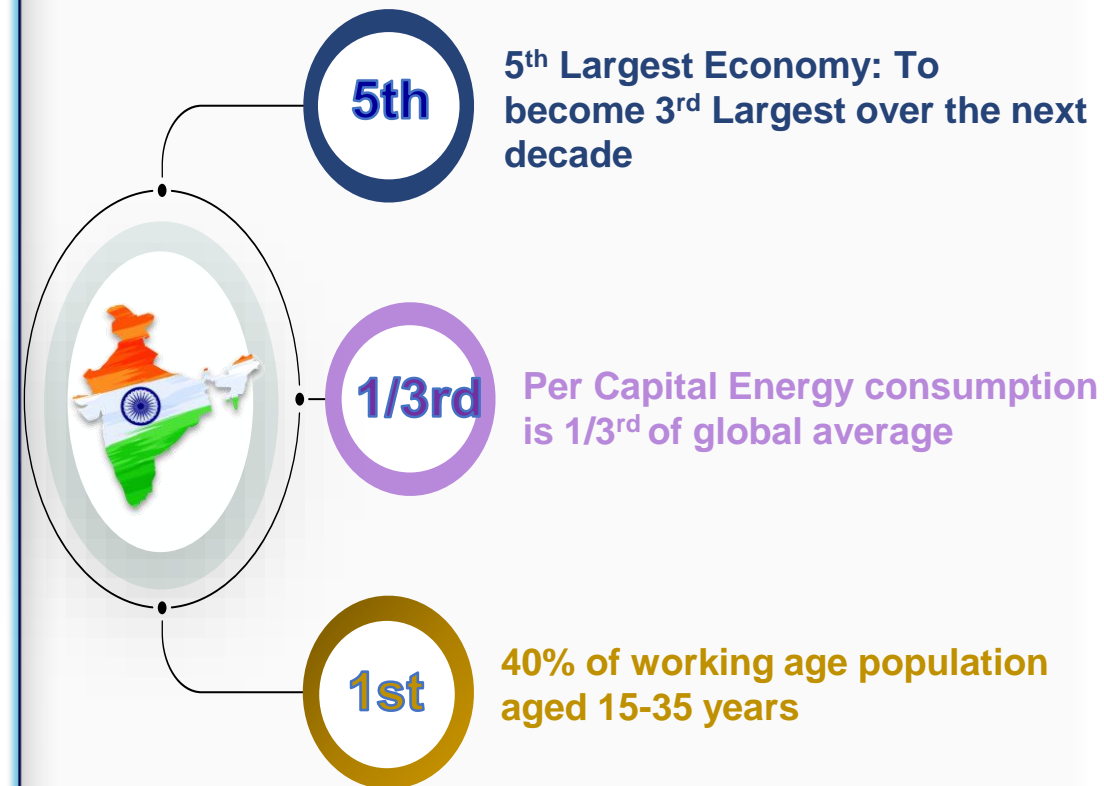


# PER CAPITA CONSUMPTION

Growth in the economy, young population, lower per capita energy consumption...



...will drive growth in India's energy consumption at a faster rate than global

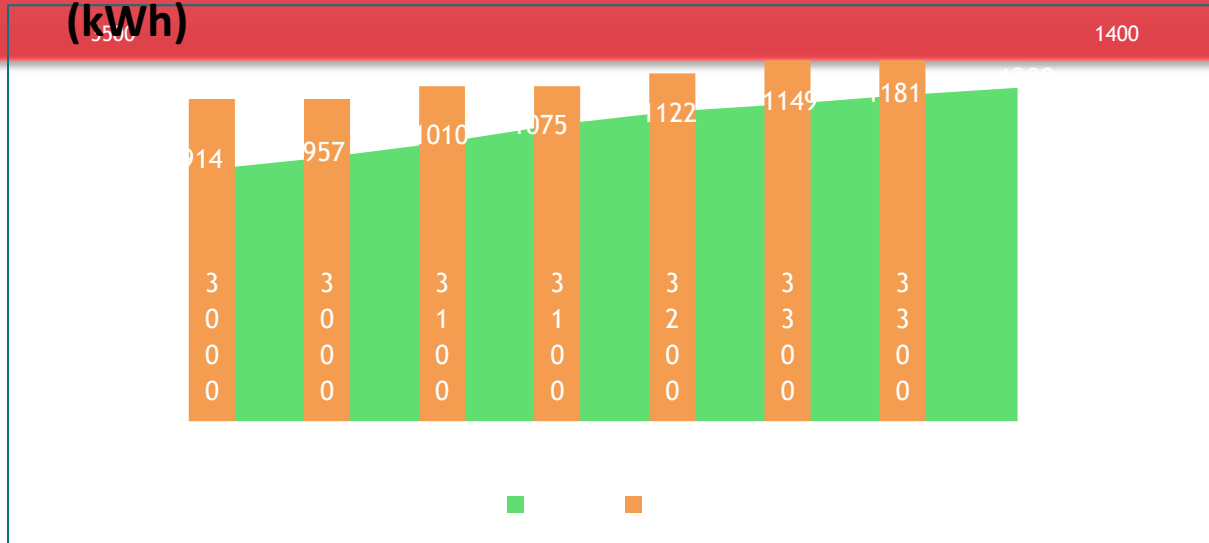


Source: WEF, CEBR, BP Stats

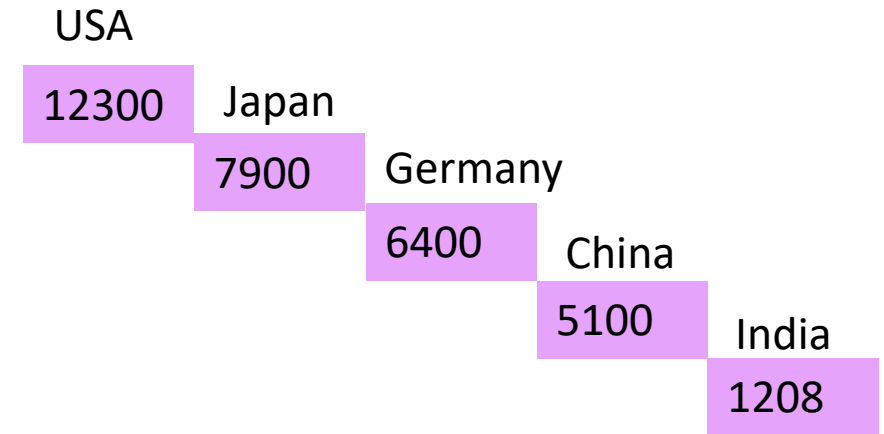
# Per Capita Electricity Consumption Trends

## India's Position and Global Position

### Per Capita Electricity Consumption of India Vs World (kWh)



### Per Capita Electricity Consumption of Major countries in 2020 (kWh)



### Per Capita Electricity Consumption India

2020-21

1161  
kWh

2021-22

1255  
kWh

- India's Electricity consumption is ranked **3<sup>rd</sup>** in the World behind USA and China (FY 2021-22)
- India's per Capita electricity consumption is **1/3<sup>rd</sup>** of **global average consumption** of ~3700 kWh (FY 2021-22)

# Key Sectors to Realize Energy Transition Pathway

## Clean Coal Technologies

Unearthing the efficient utilization of Indigenous Coal Reserves using AUSC, IGCC Plants (High Efficiency)

## CCUS – Carbon Capture, Utilization and Storage

Mitigating the Carbon Emission and GHG Scenario through alternative utilization and storage in Industrial and Energy sector

## Hydrogen (Blue and Green)

Enabling clean fuel opportunity for energy conversion in industrial, as well as mobility sectors

## Methanol & Ethanol

Alternate fuel for clean combustion

## SMR - Small Modular Reactors

Heat & Power generation at captive and replacement sites avoiding emissions and large scale NPP issues. Also for H2 production.

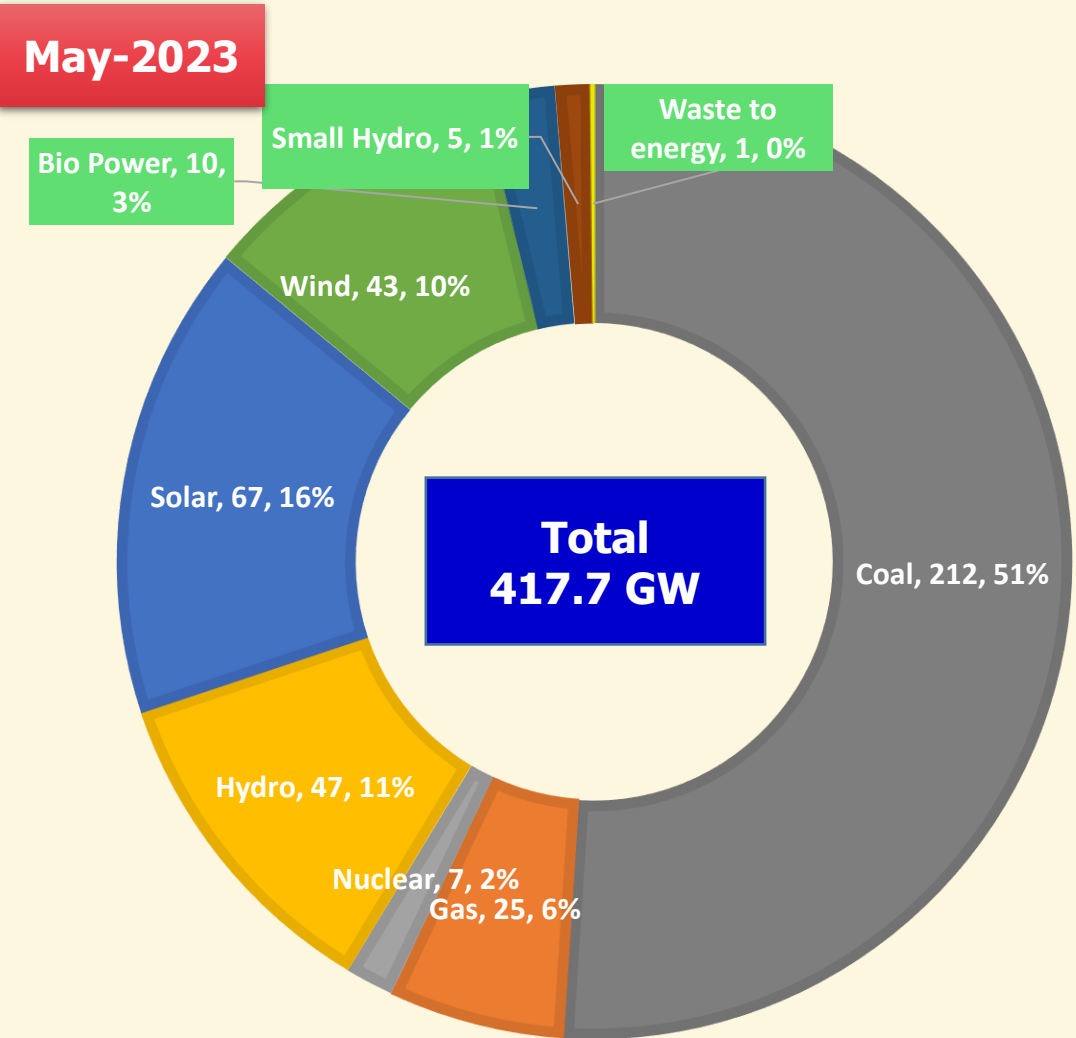
## Mobility

Vehicle Electrification and exploring the opportunities of Hybrids, Fuel Cell and Alternate Fuels

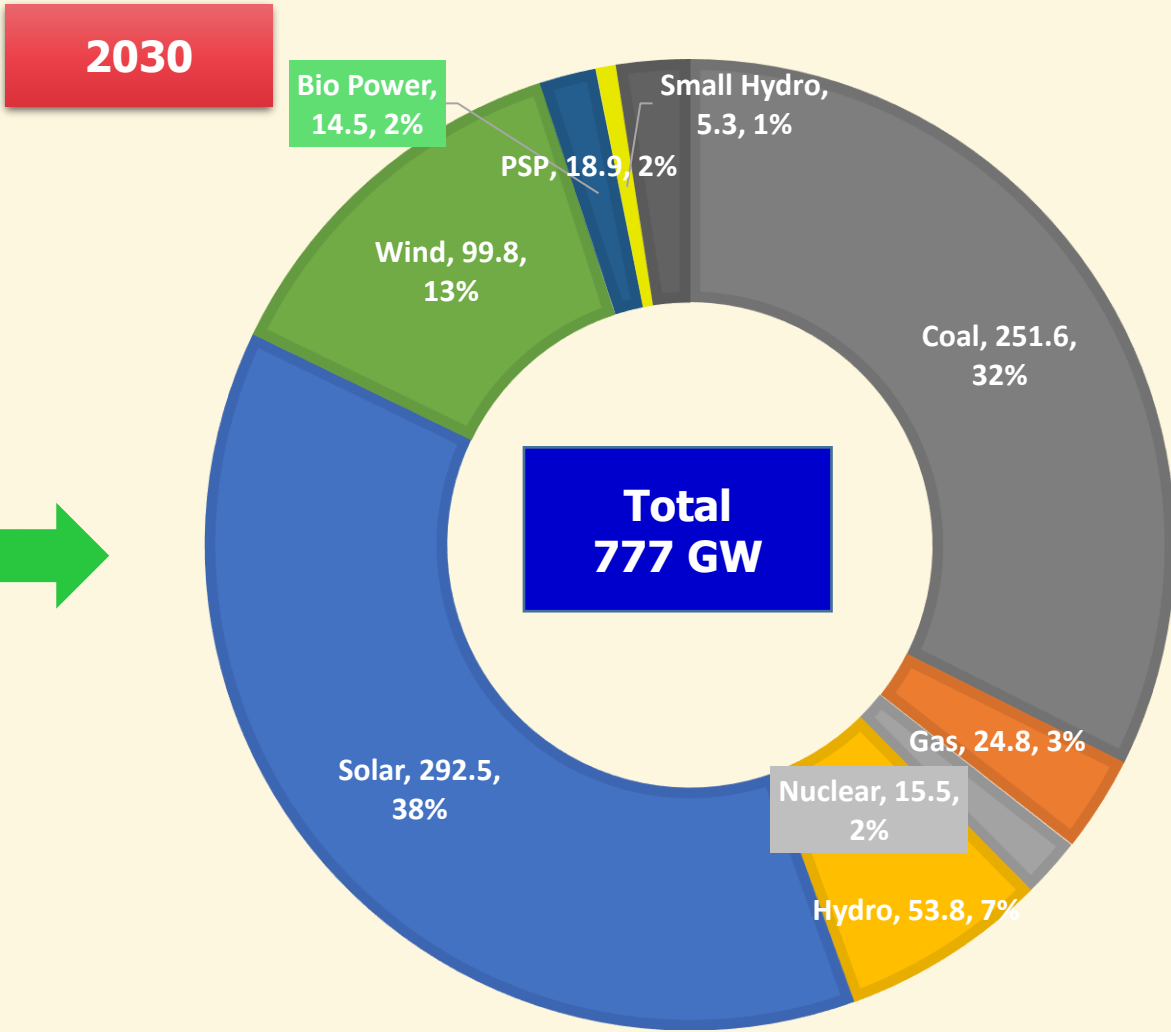
## Renewable Energy and Storage Systems

Wind, Solar, Ocean, Biomass, Pumped Storage Power Plants, Li-ion, Na-ion, Flow Battery technologies with indigenous approach

# India's Installed Power Capacity



Installed Capacity, GW



Installed Capacity GW

Source: <https://powermin.gov.in/en/content/power-sector-glance-all-india>

Source: Report on Optimal Generation Capacity Mix for 2029-30 Ver 2.0  
April 2023

## Distribution Sector

- Most Important
- Highly inefficient
- RDSS



## COMMON EQUIPMENT SPECIFICATION-KEY FACTOR

- Standardization improves operational performance, reduce cost through decreased process of errors, facilitates communication and also increases profits from expert knowledge
- Standardization avoids any unpleasant surprises. Processes (inputs & outputs) become predictable, and Efficient planning can be done.
- Standardization acts as a control mechanism to help DISCOMS comply with all the rules, regulations, and requirements.

## CONT...

- Standardization is a prerequisite for Purchase of Distribution Sector Equipment's.
- Standardization of key equipment in the sector will ensure smooth operation and maintenance of the distribution infrastructure for achieving the target of Minimum AT&C losses .
- As our conventional grid infrastructure transitions into a Smart grid infrastructure, it becomes more important to set standards of key equipment related to this infrastructure.

# COMMON EQUIPMENT SPECIFICATION-KEY BENEFITS

- There lies an immense potential of cost savings if equipment is manufactured with standards.
- Standardization allows companies to continue manufacturing a high product variety, in spite of reduced parts diversity. At the same time processes are streamlined and production time is reduced.
- Possibility of scalability also increases in case of expansion of present Grid and future Grid infrastructure.
- The Standardization will ultimately benefit DISCOMs as it allows them to purchase equipment from any manufacturer

## CONT....

- Standardization ensures that the equipment is interoperable with the existing infrastructure or future infrastructure with minor modifications.
- Interoperable equipment gives DISCOMs the freedom to choose any vendor for purchasing and expanding grid.
- As an example, adoption of smart metering on a large scale will require interoperability standards for seamless integration of different equipment and flow of data.
- Equipments detailing in Standard Bidding Document (SBD) of SCADA installation in DISCOMs / Equipments detailing in Standard Bidding Document (SBD) of AMI & SMART Metering for DISCOMs.

# PUBLISHING EQUIPMENT COSTS-INDICATIVE FACTOR

- Cost of generic parts of an equipment may be standardized based on their specification to ensure justified expenditure with items wise i.e Software/Hardware and Specially for Critical Equipments to safeguard them from Cyber attack and Make them Cyber Hygiene.
- Publishing cost of equipment will also create a healthy competition among equipment manufacturers.
- Specifications of equipment must be clearly defined to avoid any legal challenges and disputes after award of contract.
- Regular engagement with the all stakeholders including DISCOMs representative for legitimate revisions in documents with various Revision -

# PUBLISHING EQUIPMENT COSTS-KEY BENEFITS

- DISCOMs can make well informed decisions while procuring equipment and if any query, that can also be address.
- An elaborate cost analysis can be done based on the standardized cost of equipment against required specifications.
- This practice will present huge cost saving potential for the DISCOMs and Cost Saving will make DISCOMs More and More Financial Viable.
- It will also help DISCOMs in financially planning expansion of existing grid As per the future Grid Requirement keeping RE Penetration, EV & Modern Grid Infrastructure Requirements.
- The Process of Procurement will Become More Transparent and Successful Rollout . It will also streamline the process of audits.

# TESTING NORMS FOR STANDARDIZED

- Uniformity in norms in testing methods is necessary to perform testing on a uniform and consistent basis including Test at Site, Pilot Testing, Factory Acceptance Test, Site Acceptance Test, Manufacturing Test, Field Inspection Test as per the Guide Lines specified.
- They represent written directions of the criteria needed for a specific product, process, test, or procedure in more details.
- As part of Total Quality Monitoring quality and process control, regular testing will help ensure manufacturing process of equipment is in control, thus avoiding product defects and costly warranty claims.

## CONT...

- Standard Testing Process of All IT/OT Infrastructure has be done to make safe and Secure installations at site because rolling of Smart Meters, SCADA, RTU,RMU, FPI etc. is required Cyber Audit and Security Checks for Installations as per Govt. Guidelines.
- Standardized testing creates a fair playing field for all equipment manufacturers and ensures accountability.
- Testing is a vital component of materials research and product improvement. When used properly, it can provide useful data for ranking material attributes.



# STANDARDIZED TESTING NORMS

- Quality control is concerned with the control of quality of the product during the process of production. It aims at achieving the predetermined level of quality in a product.
- Quality control is essential to building a successful business that delivers products that meet or exceed customers' expectations. It also forms the basis of an efficient business that minimizes waste and operates at high levels of productivity.
- Well defined standards minimize delays, correspondence, etc., resulting from inaccurate or incomplete specification of materials or products

# SHARING EQUIPMENT PERFORMANCE

- Sharing of equipment performance data will help DISCOMs based on their critical reviews about the on site performance of the equipments. DISCOMs are facing the challenges to access the data retrieval from Many equipments and Inputs from them is very Important.
- This also ensures that defective and under performing equipment are not used in practice and in future how Successful Replacement of the equipments can be done for Optimal Utilization of Distribution Assets.
- Feedback & Peer review of the data can help manufacturer in improving their products.

## SHARING EQUIPMENT PERFORMANCE

- Collaboration with testing labs and standardization agencies can be done to get detailed views on equipment performance. Testing Capabilities also need to be increase keeping with the future requirements of DISCOMs. Pilot Testing of Equipments is also Essentially to Check the equipments performance.
- Areas of potential improvement can be easily identified by sharing performance data of equipments from Manufacturere.
- Promotion based on Make in India Based is also need to be promoted as much as possible to attaract the local vendor creation and make them ready for Delivering Complete Supply chain of DISCOMs Assest to Make “ATMA NIRBHAR BHARAT”.

# ADVANTAGES OF SHARING EQUIPMENT PERFORMANCE DATA

- Learning of Equipments Performance at One DISCOMs can be used in other DISCOMs during the Tender Preparation and Equipments Finalizations.
- Based on the key Finding at One DISCOMs other DISCOMs can also adopt the same in their DISCOMs. This Will Reduce the time in Rollout of Tender, Award and Execution of different works.
- Data Findings and Key measure can also shares between the DISCOMs to Optimize the system performance and make them Ready for Future Distribution Grid Requirement.
- Best Practices of One DISCOMs can be adopted for Other DISCOMs to Improve the financial Viability.

## EXAMPLES OF COLLABORATIVE PERFORMANCE MONITORING

- Equipments Performance Can be Monitored Collaborative and Based on the previous learning, it can be modified in the upcoming in Next work Phase. Eg. Indore has Roll out Smart Metering System in Phase-1 & Phase-2, Based on the Learning of Phase-1, Phase-2 Rollout Process takes minimum Time and Smooth Executions.
- DISCOMs are Sharing Their inputs Regularly to the NODAL agency for required Change in the Standard Bidding Process (SBD) and NODAL agency taking them and after the necessary approval, they changed the same in the SBD.
- IIT Kanpur is Monitoring SCADA Implementation in Kanpur City (KESCO) and Based on the Technological Challenges they are supporting KESCO day to day basis for Successful SCADA & Smart Grid Implementation in KESCO.

# POTENTIAL FOR BENCHMARKING AND IMPROVEMENT THROUGH SHARED INSIGHTS

- It is Imperative, That DISCOMs are now going to face Major Challenges during the Penetration of RE, EV, Smart Assets Installation and They have to prepare to adopt the same.
- It is Journey from Classical Distribution Grid to Modern Distribution Grid Infrastructure and DISCOMs Required Support to make them ready to adopt these changes very fast.
- Sharing of Learning and findings of One DISCOMs to other DISCOMs is key Bench Marking.
- Technological Selection at one DISCOMs can be adopted at other DISCOMs based on the Site Requirements.
- DISCOMs need to adopt Technological Changes very fast based on Smart Assets Creation from Consumer House to Distribution Control Center (DCC) and To make them cyber Hygiene also.

## ELECTRIFICATION

Critical to long-term carbon goals and will be a relevant distributed resource

### Key technologies:

Electric vehicles, vehicle to grid/home, smart charging, heat pumps



## DIGITALIZATION

Allows for open, real-time, automated communication and operation of the system



### Key technologies:

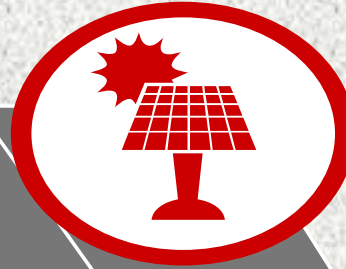
Network technologies (*smart metering, remote control and automation systems, smart sensors*) and beyond the meter (*optimization and aggregation platforms, smart appliances and devices, IoT*)

## DECENTRALIZATION

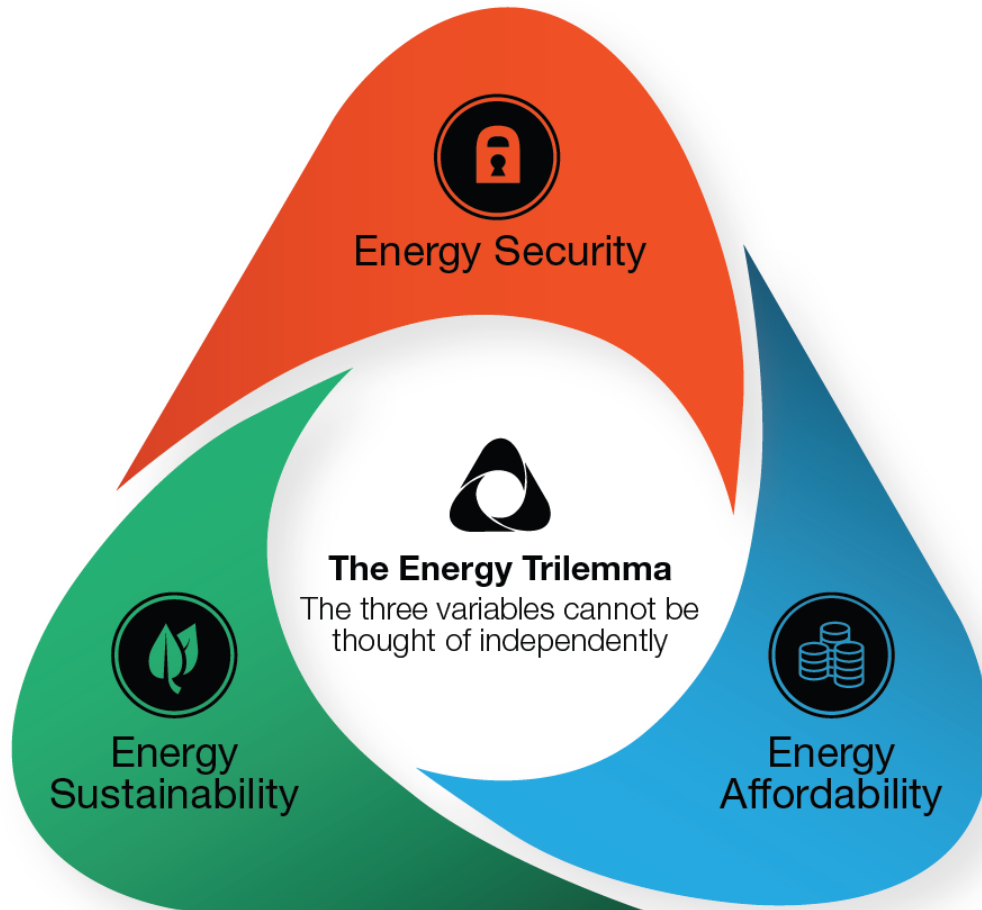
Makes customers active elements of the system, though requires significant coordination

### Key technologies:

energy efficiency, solar PV, distributed storage, microgrids, demand response,



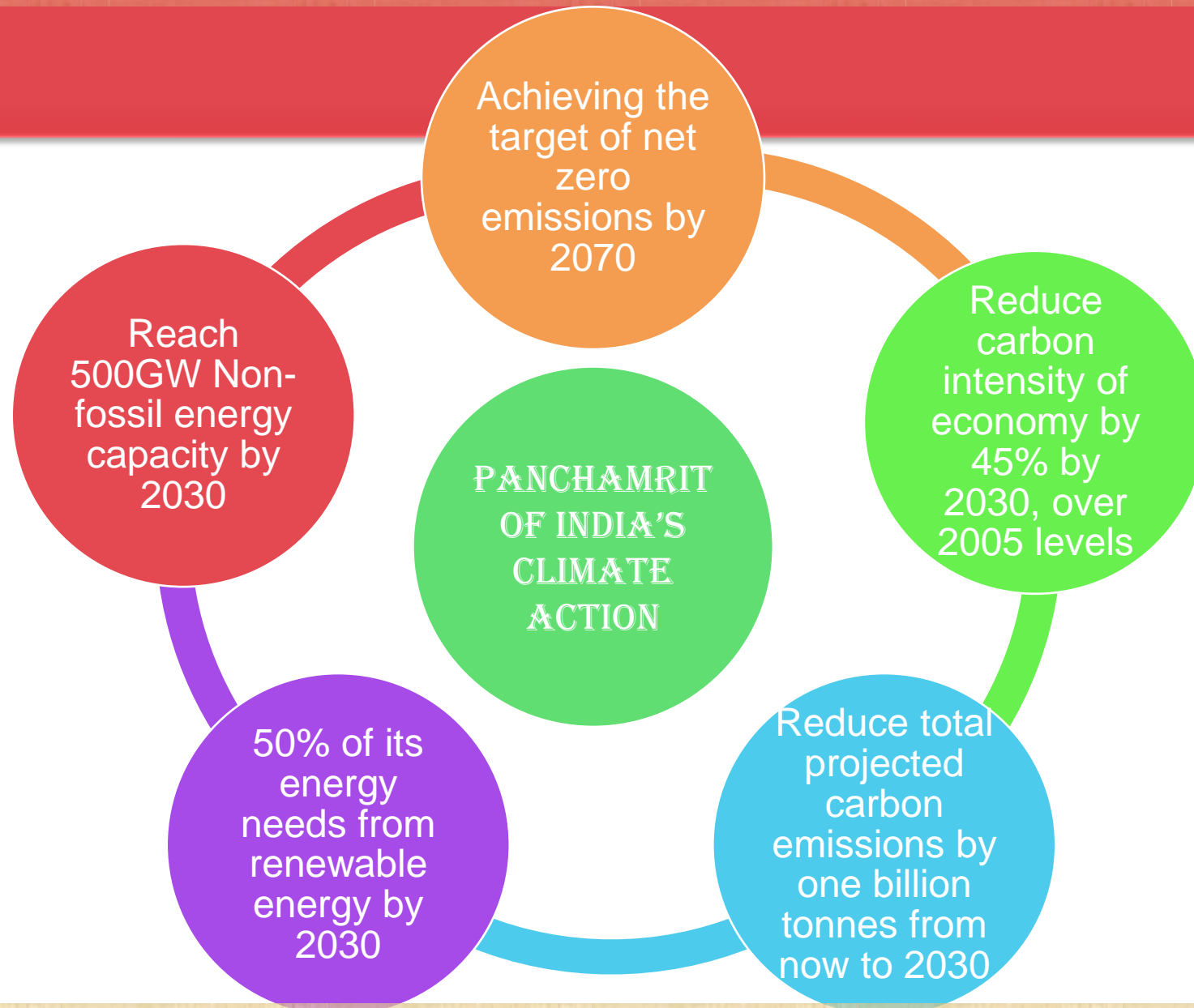
# The Energy Trilemma



**Solving the Energy  
Trilemma: Key to a Sustainable  
Future**



# INDIA'S COMMITMENT IN COP26



# LiFE is an environmental campaign launched by Prime Minister Shri Narendra Modi at COP 26 to promote sustainable lifestyles

"This word is LiFE, which means 'Lifestyle For Environment'. Today, there is a need for all of us to come together and take Lifestyle For Environment forward as a campaign. This can become a mass movement towards an environmentally conscious lifestyle."

Prime Minister Shri Narendra Modi at COP 26



“The world today admits that lifestyle has a major role in climate change. I propose one word movement before all of you. This word is LiFE which means Lifestyle for Environment.”

Prime Minister Narendra Modi









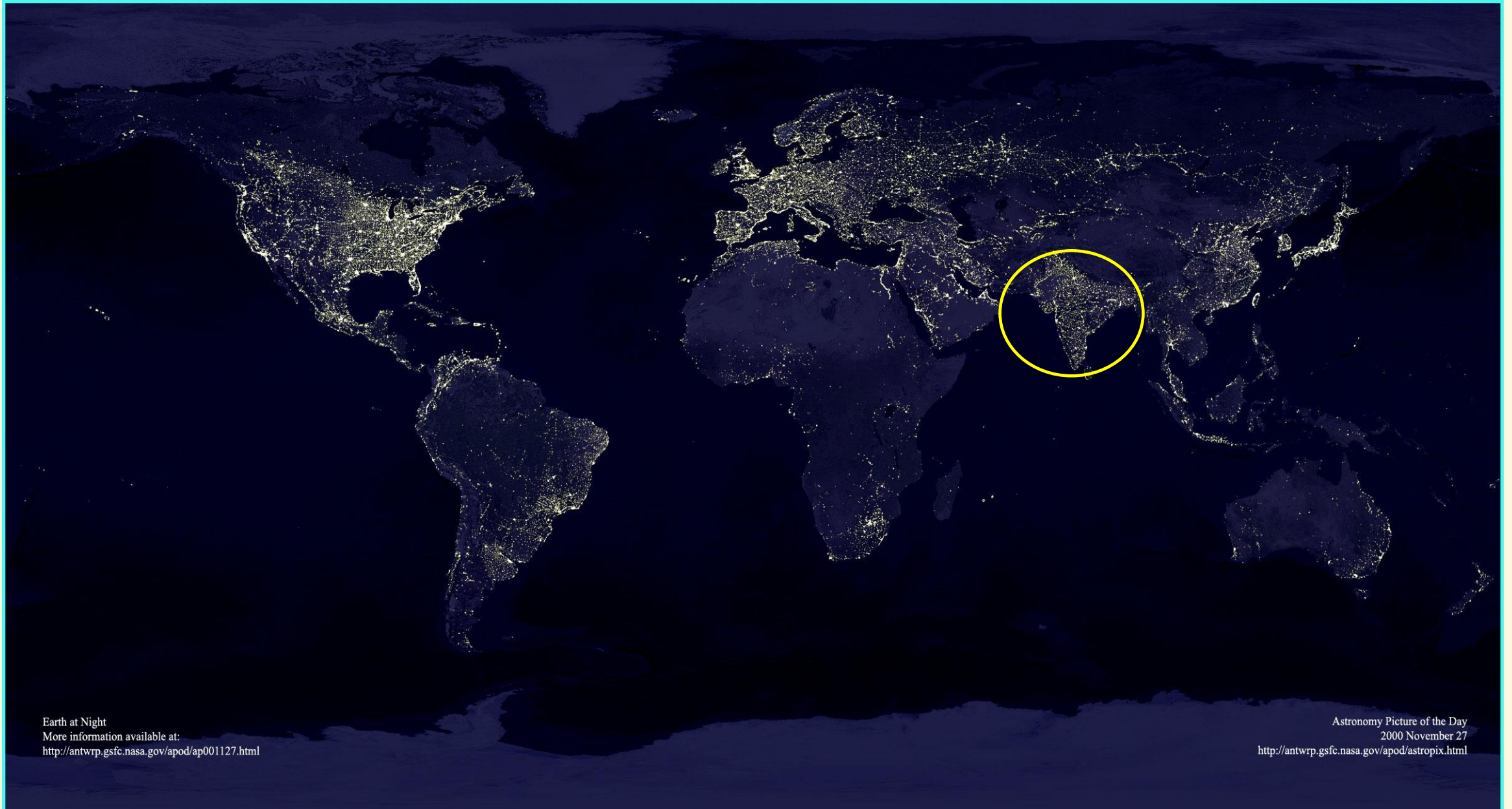
# EARTH AT NIGHT



Earth at Night  
More information available at:  
<http://antwrp.gsfc.nasa.gov/apod/ap001127.html>

Astronomy Picture of the Day  
2000 November 27  
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# Thank You

