# MODULE 4:
# ENERGY EFFICIENCY DATA ANALYTICS

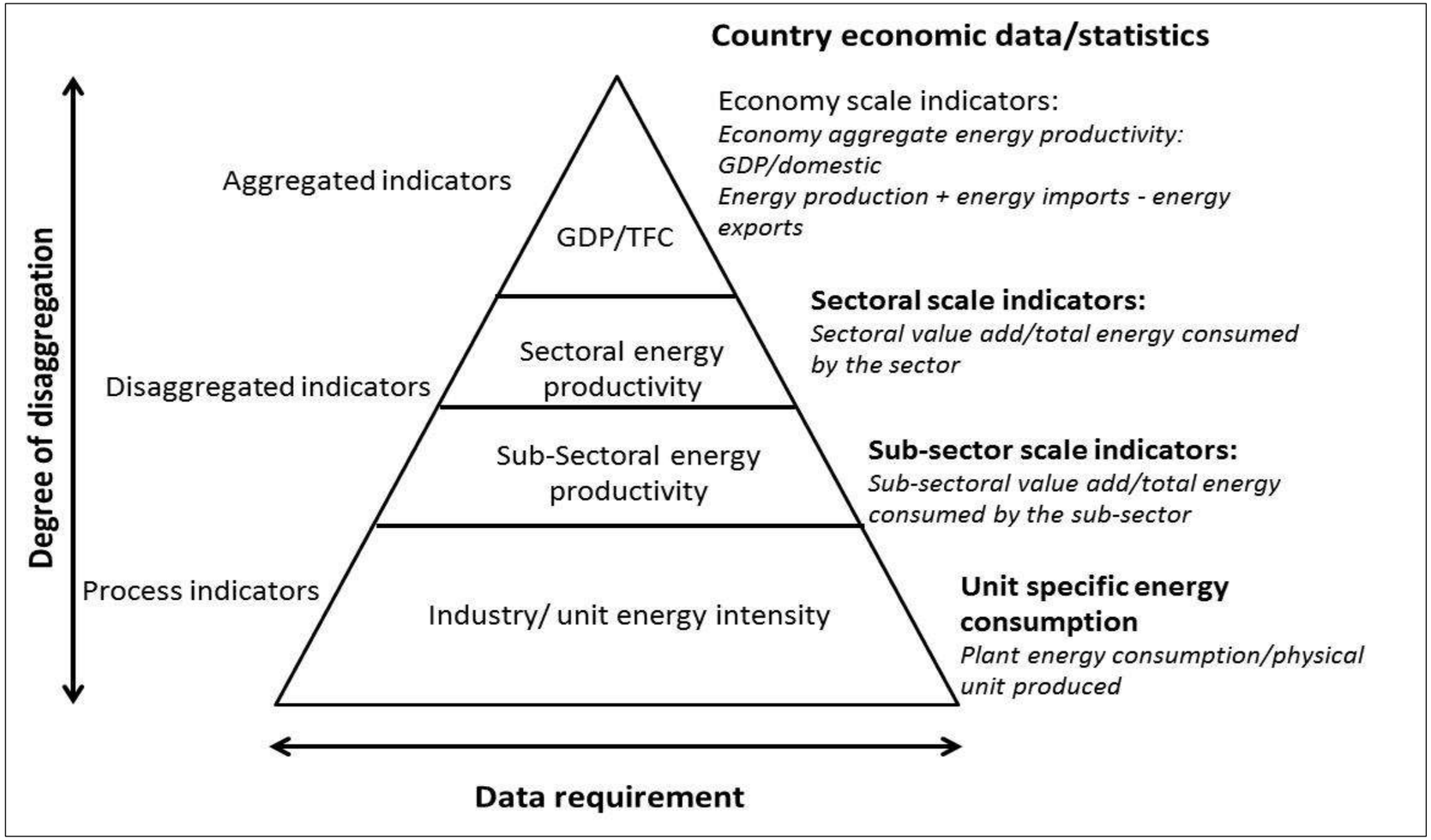

GreenTree
Define . Design . Deliver

# CONTENTS

# ENERGY PRODUCTIVITY INDICATORS

# ENERGY PRODUCTIVITY INDICATORS

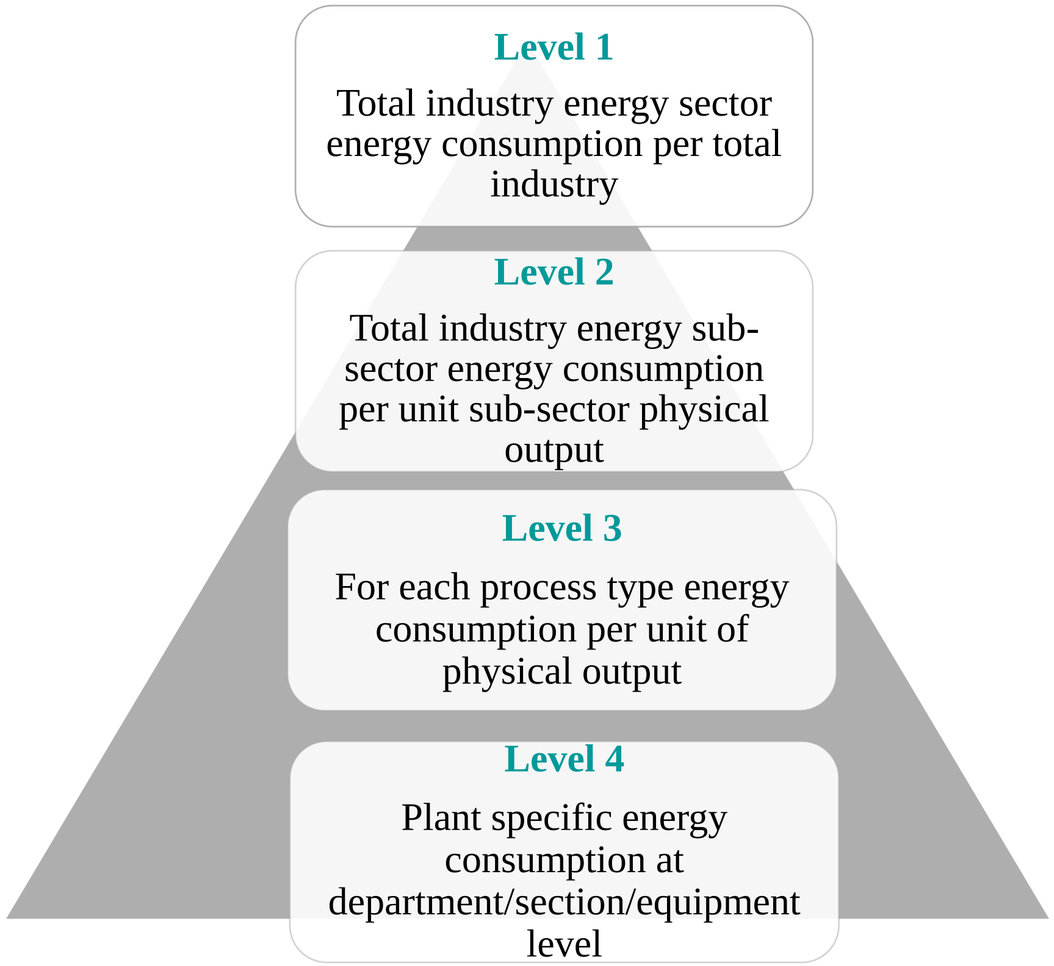
## 1 EE Performance Indicators




GreenTree
Define . Design . Deliver

# ENERGY PRODUCTIVITY INDICATORS

## 2 EE Performance Indicators for Industries



# GAP ANALYSIS

# GAP ANALYSIS

## 1 Prioritisation through GAP analysis

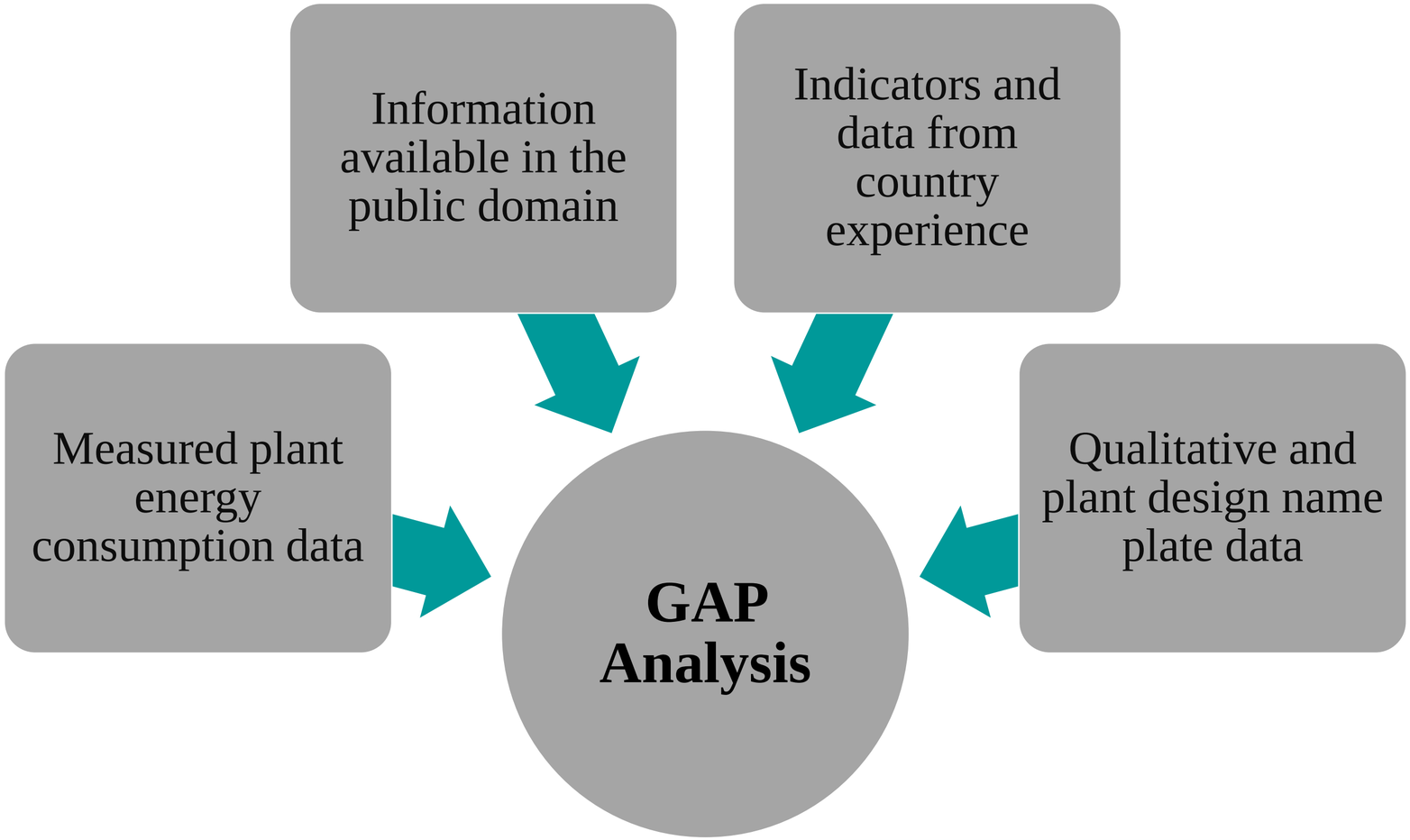
- The priorities should be to focus on improving the performance of inefficient and large energy consuming industries.

- Gap analysis is a benchmarking process that accounts for and compares a plant’s current energy performance with that deploying Best Available Technologies (BAT).

- GAP analysis begins with first collating information from public sources on the pattern of sub-sectoral energy consumption at the regional, country and local levels.

# GAP ANALYSIS

## 1 Data Sources GAP analysis



# GAP ANALYSIS

## 1 GAP Analysis Steps

**Step 1**

Indexing industry units on SEC; high-low analysis to identify GAPs

**Step 2**

Application of sensitivity analysis to contrast units from BAT performance

**Step 3**

Determining overall potential for improvement

# GAP ANALYSIS

## 1 Target Setting

| | |
|---|---|
| **Historic SEC reduction trend** | • Past trends in SEC reduction within industrial units as well as the average performance of the sub-sector as a whole as a result of implementation of energy efficiency measures. This acts as a reference for future phase wise reduction targets. |
| **Target setting with respect to relative performance** | • Unit specifc targets to be provided relative to the current positioning of the unit within the sub-sector. Unit with highest SEC gets largest target and vice-versa. SECs need to be normalized to address extraneous factors, if applicable. |
| **Timelines for energy reduction targets** | • Based on historic data on SEC reductions and gap analysis ( ie.SEC deviation from SEC- BAT) realistic timeline for achievement of energy reduction targets could be taken. |

# GAP ANALYSIS

## 1 Setting Realistic Targets

Past Energy Efficiency Investments (Industry Trends)

GAP in respect to Best Available Technologies

**Realistic Target Setting**

Phase wise reduction targets timelines, instead of annual targets.

Maturity and cost of deployment of Best Available Technology (Process and Equipment's); Normalization factors

GreenTree
Define . Design . Deliver

# GAP ANALYSIS

## 1 Normalization

| Primary Energy Input | Secondary Energy Input | Capacity Utilization Factor | Raw material and product output | Environmental Standards |
|---|---|---|---|---|
| • Fuel quality<br>• Use of biomass as fuel<br>• Use of byproducts as fuel<br>• Non-availability of fuel | • Grid power purchase<br>• Captive power generated<br>• Waste heat recovered<br>• Export to grid<br>• Use of renewable energy | • Impact of market demand<br>• Non-availability of raw materials<br>• Quality of power supply | • Quality of raw materials<br>• Change in output product mix<br>• Change in inputs | • Change in product standards<br>• Change in Government Policy<br>• Force Majeure issues |

# ENERGY INFORMATION MANAGEMENT AND ANALYTICAL SYSTEMS

## 1 Introduction

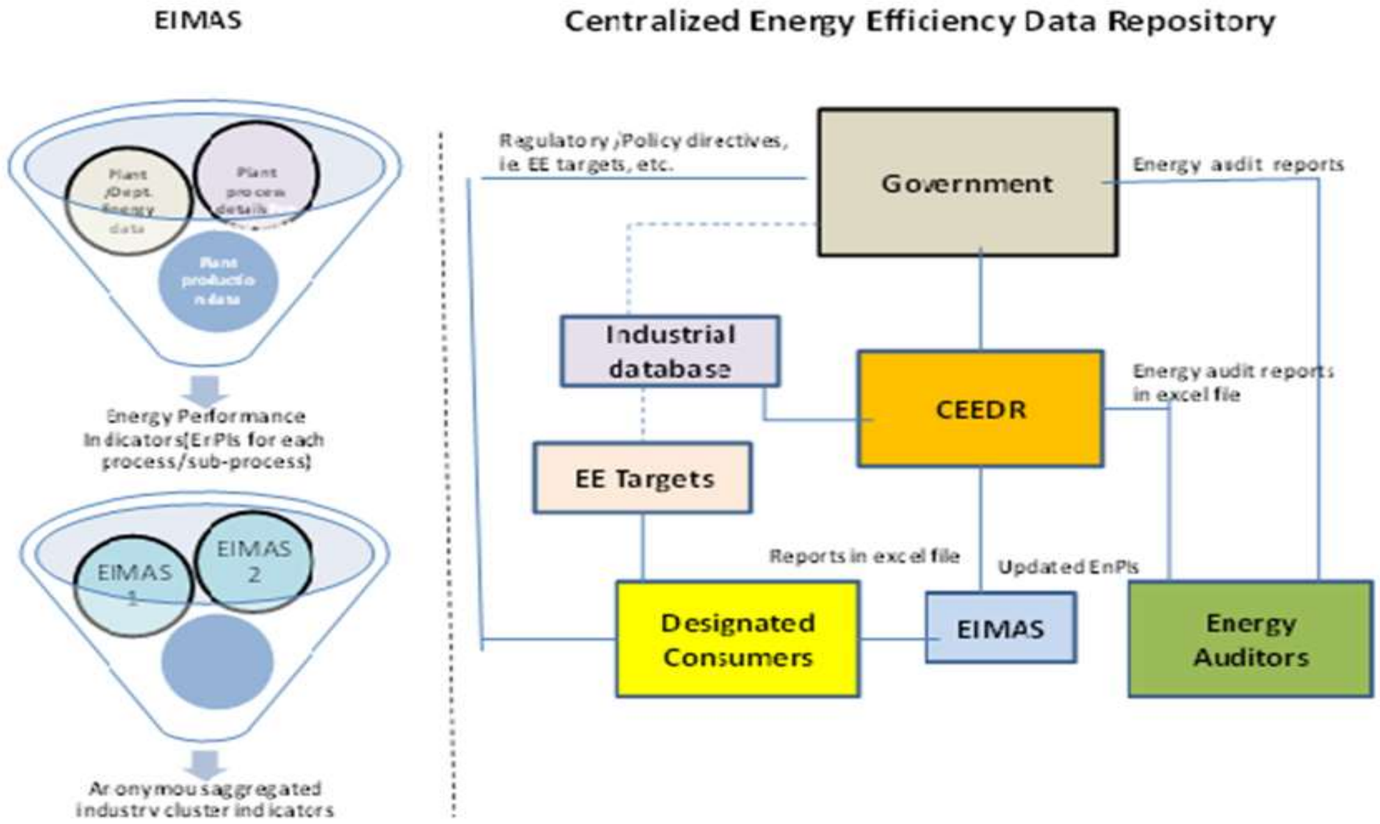
- EIMAS could be a powerful tool to measure and compute energy performance indicators (EnPIs) that drive industrial energy efficiency projects and programs and should be a key focus area for industrial companies to establish.
- **The EIMAS offers the following benefits to its users:**
  - Access to centralized data, and strengthened and effective management information system.
  - EnPI-driven information and performance analysis.
  - Useful insights and predictive analysis to serve as metrics that improve shop floor energy performance and productivity.
  - Real-time management and optimized use and control of end-use energy in utilities and process departments.
  - Easy, quick, and timely reporting of energy performance.

## 2 Centralized Energy Efficiency Data Repository

**Benefit**

- An integrated assessment of the energy performance of the sector.
- An effective tool for monitoring and verification of energy performance trends (for example, a specific energy consumption metric, such as a unit (kilowatt-hour) per kilogram of production) at the sector, subsector, unit, department, process, and equipment levels.
- Based on normalized EnPIs, different units are ranked and compared, and gaps in specific energy consumption are identified.
- Useful in planning future policies to improve the energy efficiency of the sector as a whole.

## 2 Centralized Energy Efficiency Data Repository




EnMS at the Organisational level and Centralized EE benchmarking at the Industry sub-sector level

# CONTRIBUTION BY

## Bureau of Energy Efficiency

- Mr. Abhay Bakre, Director General, Bureau of Energy Efficiency
- Shri Pankaj Kumar, Secretary , Bureau of Energy Efficiency
- Mr. Saurabh Diddi, Director, Bureau of Energy Efficiency
- Dr. Ashok Kumar, Director, Bureau of Energy Efficiency
- Mr. S. K. Khandare, Director, Bureau of Energy Efficiency
- Shri Sameer Pandita, Director, Bureau of Energy Efficiency
- Ms. Rajini Thompson. Coordinator (Exam), Bureau of Energy Efficiency

## Industries

- Anant Shukla, ASEAN-German Energy Programme (AGEP), GIZ GmbH
- H. Ragavendra Prabhu, National Productivity Council (NPC)
- Idhayachander Ravichandran, National Productivity Council(NPC)
- J. Nagesh Kumar, National Productivity Council (NPC)
- Joel Franklin Asaria, National Productivity Council(NPC)
- K.V.R. Raju, National Productivity Council (NPC)
- M. J. P. Varun, National Productivity Council (NPC)
- M Narayanan, Energy Management Centre
- Padu S Padmanabhan, Water, Environment Expert
- P. Chitra, National Productivity Council(NPC)
- P. Dharmalingam, ENSAVE Consultancy and Training Pvt. Ltd.,
- P. Kanagavel, National Institute of Wind Energy (NIWE)
- R.K. Khilnani, Energy Tech Consultants Pvt. Ltd.
- R. Kumar, Energy & Sustainability,
- R. Suryanarayanan, National Productivity Council (NPC)
- Satyanarayan Seshadri, Aspiration Energy
- Sreenivasulu Deverapalli,, National Productivity Council (NPC)
- S. Srinivas, CII-Sohrabji Godrej Green Business Centre
- Suryanarayanan, National Productivity Council (NPC)
- T. Sankaranarayanan, National Productivity Council (NPC)
- Velayutham V , National Productivity Council(NPC)
- V G. Sandhya, National Productivity Council (NPC)
- V.S. Deshpande, Transparent Cogen Systems Pvt. Ltd.,

# Thank You

**Presentation Prepared by:**

M/s GreenTree Building Energy Private Limited

GreenTree

Define . Design . Deliver