

The Invisible Fuel

Why **Energy Efficiency** is the Real Hero of Our Planet

Dr Satish Kumar

President & Executive Director, Alliance for an Energy Efficient Economy (AEEE)

ABOUT THIS PRESENTATION



What we hope you take away — and how to read the numbers

1

Empower Gen Z & Gen Alpha

Help citizens — especially young people — understand how electricity shapes every part of their lives and what concrete steps they can take to use it wisely.

2

Build a Culture of Energy Efficiency in India

Shift how India thinks and acts — from individual behaviour and daily habits to public policy and the products that businesses design, manufacture and sell.

3

Efficiency Before Renewables

Encourage citizens, organisations and governments to prioritise energy efficiency first — before adding new renewable supply — and to back efficient purchasing and public procurement.



A NOTE ON THE NUMBERS

The figures in this deck are carefully researched but intentionally simplified. They are meant to convey order of magnitude and relationships — not to serve as precise academic citations. Please treat them as informed estimates, not journal-grade data.



WE WANT TO HEAR FROM YOU

Did this presentation change how you think about energy? Do you have suggestions to improve it? Write to us — we read every message.

info@aeee.in | aeee.in

ELECTRICITY IS EVERYWHERE

The Invisible Thread That Connects Your Entire Life



Your Smartphone

runs on it



Your AC and Heat Pumps

cools and warms you



AI & Social Media

powered by vast data centres



Hospitals & Industries

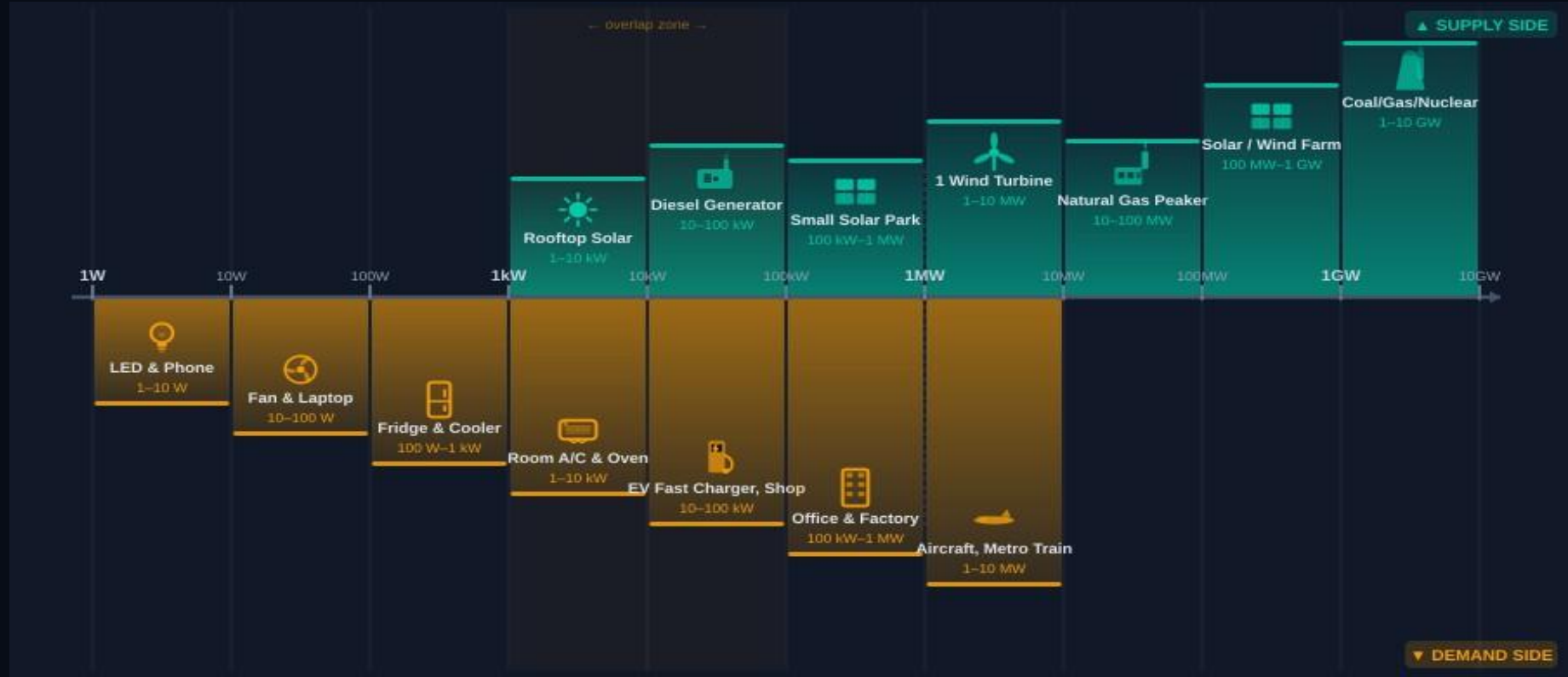
critical systems depend on it

Without electricity, modern civilisation stops -- not in years, not in days, but in hours.

ELECTRICITY AT SCALE: SUPPLY & DEMAND



From a single LED (1 W) to a large power station (10 GW) — all on one log-scale axis



THE SCALE OF OUR ELECTRICITY HUNGER

~30,000

TWh

Global electricity consumed annually -- enough to power the sun for 3 seconds

~5×

MORE

Extra electricity India needs to generate by 2050

~40%

of CO₂

of global CO₂ emissions traced back to electricity generation

1 in 8

People

on Earth still have no access to reliable electricity

The Air-Conditioner Paradox

"We are cooling ourselves while warming the planet."

~2 Billion

ACs in the world today -- set to reach 5.6B by 2050

~10%

of all global electricity consumed by air conditioners

~30-40%

energy saved by choosing a 5-star over a 1-star AC

1°C ↑

for every 1°C rise in temperature or setpoint, electricity demand for cooling rises ~3-5%



The Fix?

Buy the most efficient AC you can afford. Set it at 24°C or higher -- each degree lower setpoint adds ~3-5% to your electricity bill.

AI & Social Media: The Silent Power Hogs



"Every time you ask an AI a question, a tiny power plant somewhere sighs." -- anonymous (but very accurate)

Training GPT-4

~60 GWh

~50,000 typical Indian homes powered for a year

1 ChatGPT query

10× power

Electricity used in a ChatGPT vs. a simple Google query

Global data centres

~400 TWh/yr

Consume more electricity than the entire UK

EVERYONE TALKS ABOUT GENERATION. BUT ...



Solar



Wind



Nuclear



Hydro



Energy Efficiency

The INVISIBLE Fuel

Nobody talks about it. But it does the most work.

Why invisible? Because saving a kWh leaves no smoke, no tower, no ribbon-cutting ceremony.

MEET THE FIRST FUEL



Energy Efficiency -- The World's Largest Untapped Energy Source

“Energy Efficiency is the cheapest, cleanest, fastest resource that we have to tackle climate change”

Negawatt

A unit of power saved, not generated.
Coined by Amory Lovins -- a watt you never needed to produce.

First Fuel

Coined by IEA so that efficiency should be the first resource exploited before building any new power plant.

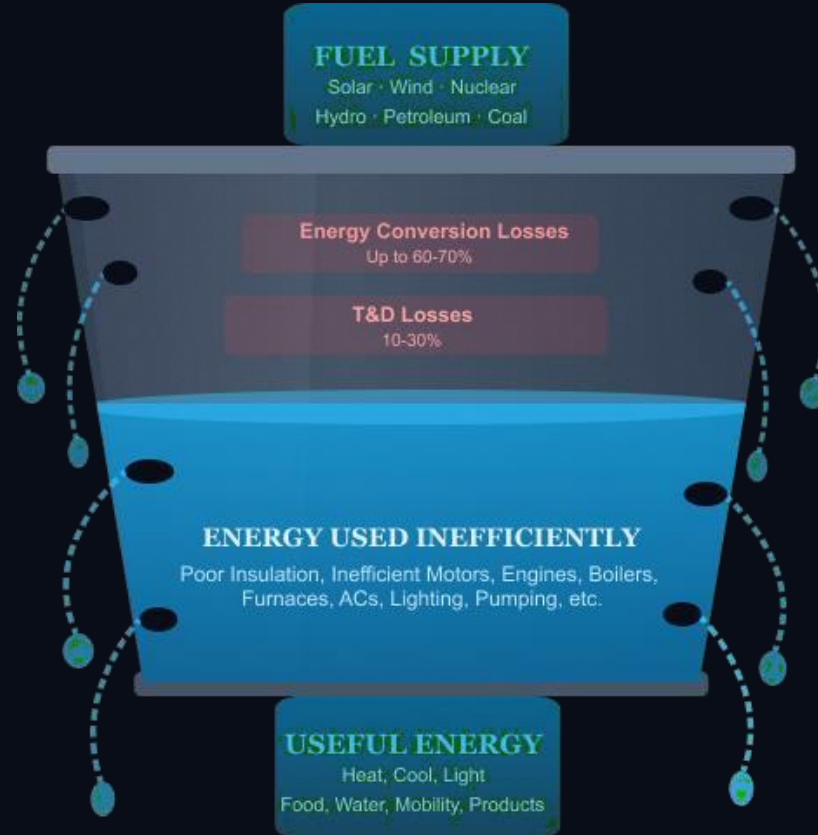
Scale Effect

1% global improvement in efficiency = eliminating ~290 power plants worth of capacity overnight.

PLUG THE LEAKS FIRST



Would you keep pouring water into a leaky bucket? Fix the holes before adding more supply.



Energy efficiency = plugging the holes. Fuel Sources = Water. Both matter — but order matters more.

FROM FUEL TO USEFUL WORK: THE BRUTAL TRUTH



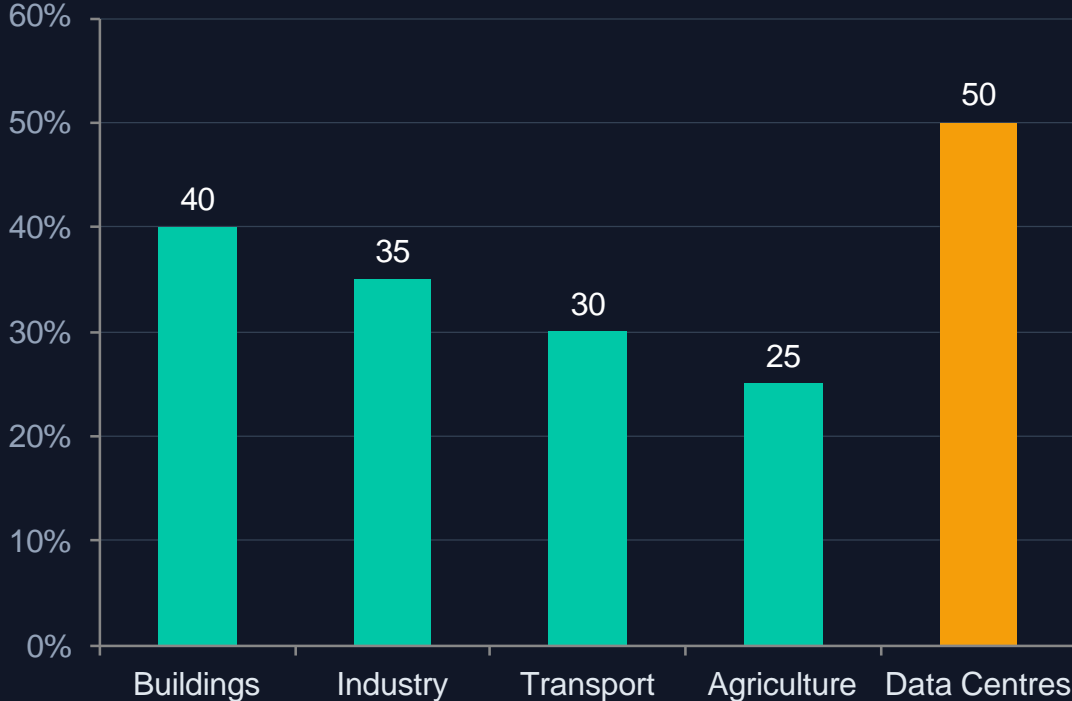
Of every 100 units of coal burned at a thermal power plant, only ~14 units reach you as useful work.



1 unit saved at the plug = avoid burning ~7 units of fuel

THE EFFICIENCY OPPORTUNITY

Global potential energy savings by sector -- if best available technology is adopted today



50%

Data centres alone

could halve their energy use with smarter cooling & hardware

40%

Buildings

better insulation, LEDs, smart HVAC -- no compromise on comfort

35%

Industry

motor efficiency + heat recovery = massive savings

EFFICIENCY IN YOUR EVERYDAY LIFE



You don't need a solar panel or a wind farm. You just need smarter choices.



Switch to LED bulbs

75% less electricity vs. incandescent



Set AC to 24°C, not 18°C

Saves ~20-30% cooling electricity



Unplug devices on standby

Standby power = 3-5% of home electricity



Buy BEE 5-star appliances

5-star fridge uses 30-40% less than 1-star



Reduce unnecessary AI queries

1 million queries = ~1 MWh saved



Prefer video calls over flights

1 video call \approx 0.1 vs. 200 kg CO_{2eq} flying

WHY EFFICIENCY ALWAYS WINS



Build a Solar Plant

- ✗ Takes 3-5 years to construct
- ✗ Costs ₹5-7 crore per MW
- ✗ Needs land, permits, grid connection
- ✗ Generates power only in daylight
- ✗ Still needs a fossil backup

VS

Invest in Efficiency

- ✓ Savings begin on Day 1
- ✓ Often costs ₹0 (behaviour change) to low capex
- ✓ Works everywhere, any time, 24/7
- ✓ Reduces demand -- shrinks the problem
- ✓ The only energy source with no pollution

YOUR GENERATION IS THE TURNING POINT



Gen Z and Gen α will make the energy decisions that define the next 50 years.

01

NOTICE

Look at your electricity bill. Understand what each appliance consumes.

02

CHOOSE

Every purchase is a vote. Pick the most energy-efficient option available.

03

ADVOCATE

Ask your school, your home, your city to adopt energy efficiency policies.

04

INNOVATE

Build apps, design products, pursue careers that make energy efficiency non-negotiable.



CC BY-NC-SA 4.0

Creative Commons License

FREE TO USE, SHARE & ADAPT

This presentation was created by the Alliance for an Energy Efficient Economy (AEEE) and is licensed under the Creative Commons Attribution - NonCommercial - ShareAlike 4.0 International License (CC BY-NC-SA 4.0).

SHARE

Copy and redistribute in any medium or format

ADAPT

Remix, transform, and build upon the material

FOR FREE

For non-commercial advocacy and education

ATTRIBUTION

Credit AEEE, link to original source, note any changes made

NON-COMMERCIAL

May not use for commercial purposes without AEEE permission

SHARE-ALIKE

Adaptations must be released under the same CC BY-NC-SA license

A large, dark green silhouette of a leaf is positioned behind the main text, with its stem pointing towards the top left.

"Nurturing Nature begins with energy efficiency"

The sun doesn't stop shining. The wind doesn't stop blowing. But the fastest path to a greener planet is the energy we never had to use in the first place. That's the invisible fuel. That's your fuel.



Alliance for an[™]
Energy Efficient
Economy

37 Link Road, Ground Floor,
Lajpat Nagar III, New Delhi, 110 024

+91-11-4123 5600

info@aeee.in

www.aeee.in

Alliance for an Energy Efficient Economy
AEEE India

THANK
YOU