

## Energy Efficient Public Procurement Guidelines Training

### Case Study: India experience

# Central government procurement policy & EESL's EE products bulk procurement program

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# Cooling Challenge

## Key Drivers for Rising Cooling Demand:

- Rising Global Temperatures
- Rapid Urbanization
- Increasing Disposable Income

Globally cooling is responsible for close to **10% of all annual GHG emissions**, more than those from air travel and ocean shipping combined.

Space cooling represents a significant proportion of the overall GHG emissions. **50% of the energy consumption in office buildings is due to air-conditioning.**



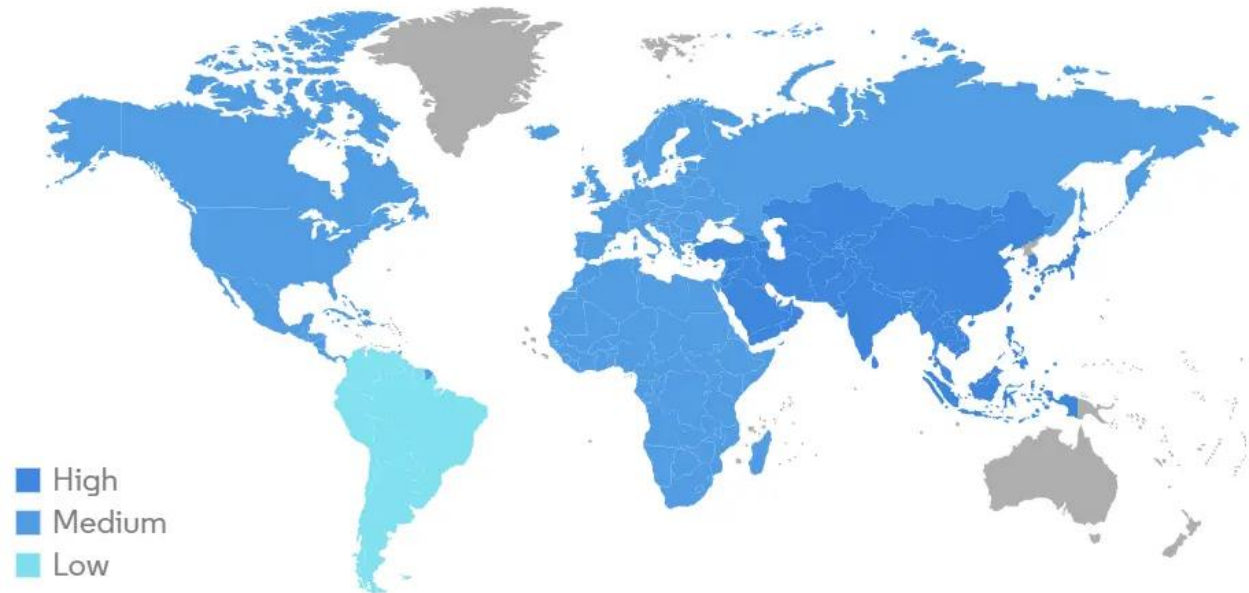
# Escalating Cooling Demand results in growing demand room air conditioners.

Globally, the number of RAC is estimated to be **4.5 billion units by 2050.**

**67% of households across the globe will own ACs by 2050.** → 70% of this demand is from emerging economies.

**Air conditioner sales in India → Annual growth rate 10% - 15% per year.**

**India's cooling-related energy demand from RACs will increase 20-fold** from 94 TWh in 2016 to 1,890 TWh in 2050.



Air Conditioner Market - Growth Rate by Region (2021-2026)

(Source: Mordor Intelligence)

Sources: Shah et. al, Benefits of Leapfrogging to Super efficiency and Low Global Warming Potential Refrigerants in Room Air Conditioning, (2015)

Sachar, Sneha, Iain Campbell, and Ankit Kalanki, Solving the Global Cooling Challenge: How to Counter the Climate Threat from Room Air Conditioners. Rocky Mountain Institute, 2018.



# EESL – BULK PROCUREMENT

## SUPER EFFICIENT AIR CONDITIONING PROGRAM

# EESL

## Super-Efficient Air Conditioning Program

The program was rolled out in 2019 to support India's commitment to Paris Climate Agreement, Kigali Amendment, and India Cooling Action Plan.

Designed on the **bulk procurement model to push the cooling technology markets in India toward competitively priced, high energy-efficient ACs that also use climate-friendly refrigerants.**

# Approach



Extensive, structured research to get the contours of the air conditioning market in India and globally.



Product selection based on growth projection and energy efficiency savings potential



Business model and roll-out strategy: Focused on public building retrofit



Developed procurement specifications



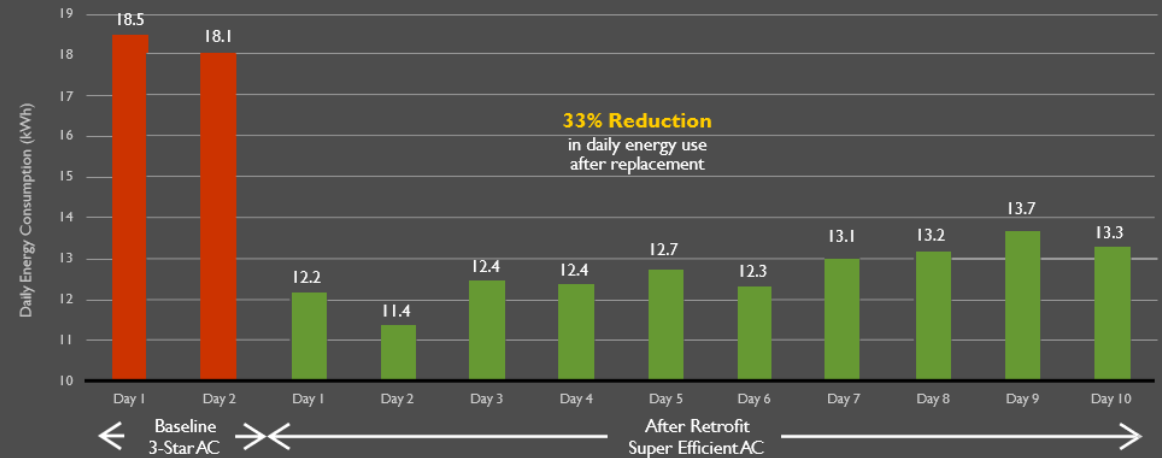
Developed marketing materials and outreach strategy

## EESL Super Efficient AC: Energy Efficiency Potential

### BankATM

Monitored energy use after replacing a 3-Star fixed-speed split AC with a 5.2 ISEER split AC in a BankATM in Mumbai.

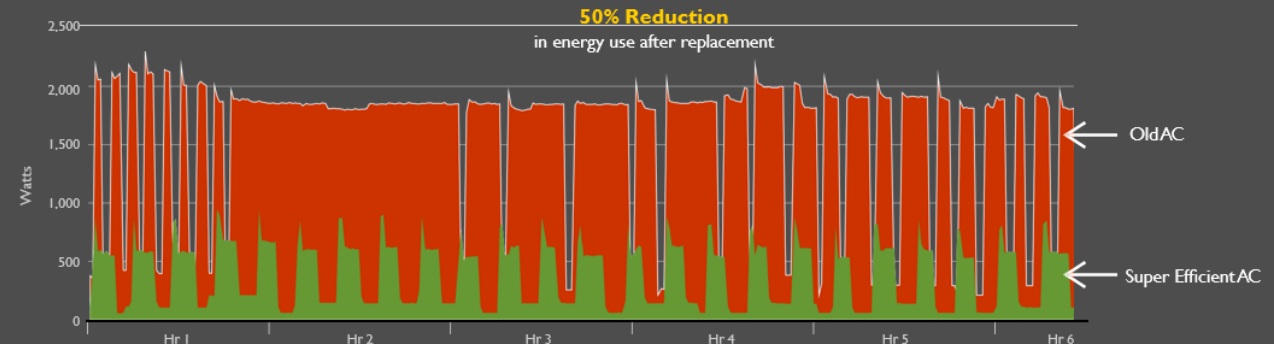
The replacement resulted in 33% reduction in energy use and 3.5% reduction in peak demand. The payback period for this replacement was less than 2 years.



### Private Residence

Monitored energy use after replacing a seven year old AC with a 5.4 ISEER split AC in a private residence in Delhi.

The replacement resulted in over 50% reduction in energy use.



## Approach



Extensive, structured research to get the contours of the air conditioning market in India and Internationally



Product selection based on growth projection and energy efficiency savings potential



Business model and roll-out strategy: Focused on public building retrofit.



**Developed procurement specifications.**



**Developed marketing materials and outreach strategy.**

## Features & Technical Specifications



SUPER EFFICIENT INVERTER AC



ISEER: 5.4 RATING



COMPRESSOR: HIGH EER TWIN ROTARY – BLDC



WIDE OPERATING VOLTAGE RANGE



HIGH AMBIENT COOLING AT 52°C



R-32 ECO FRIENDLY REFRIGERANT GAS



TRIPLE FILTER



100% COPPER



NO DERATING AT 43°C



## Approach

Extensive, structured research to get the contours of the air conditioning market in India and Internationally

Product selection based on growth projection and energy efficiency savings potential

Business model and roll-out strategy: Focused on public building retrofit

Developed procurement specifications

Developed marketing materials and outreach strategy

## Impact



Introduced India's first super efficient ACs - **30% more efficient than the best available in the market.**



**100,000 ACs procured.**



**USD 79 million investment mobilized.**



**Market creation** - New competing super-efficient ACs introduced by other companies, at an even lower cost.

## Learnings



New products need to be tried by the consumers before their interest translates into orders – **factor in time for field testing**



Public procurement is **multilayered and multi-stakeholder approach** is required map the procurement process across the value chain.



**Address manufacturers' concern** about cannibalizing their existing market with a lower cost and better product – focus on new demand creation



**Consumers may value other features** as much, or more than efficiency – market research should factor this.

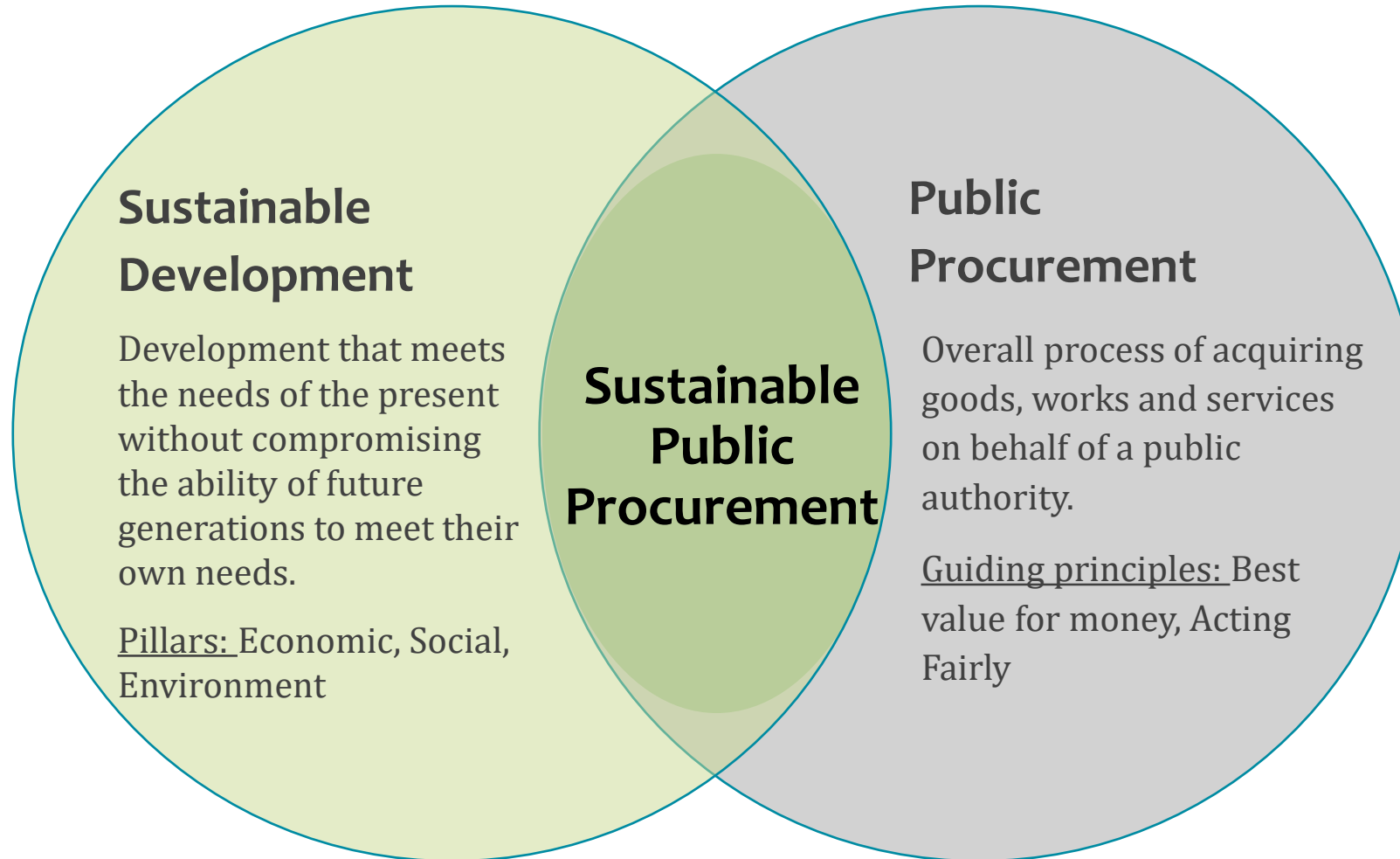




# AIR CONDITIONERS: SUSTAINABLE PROCUREMENT

## PUBLIC PROCUREMENT OF ROOM AIR CONDITIONER

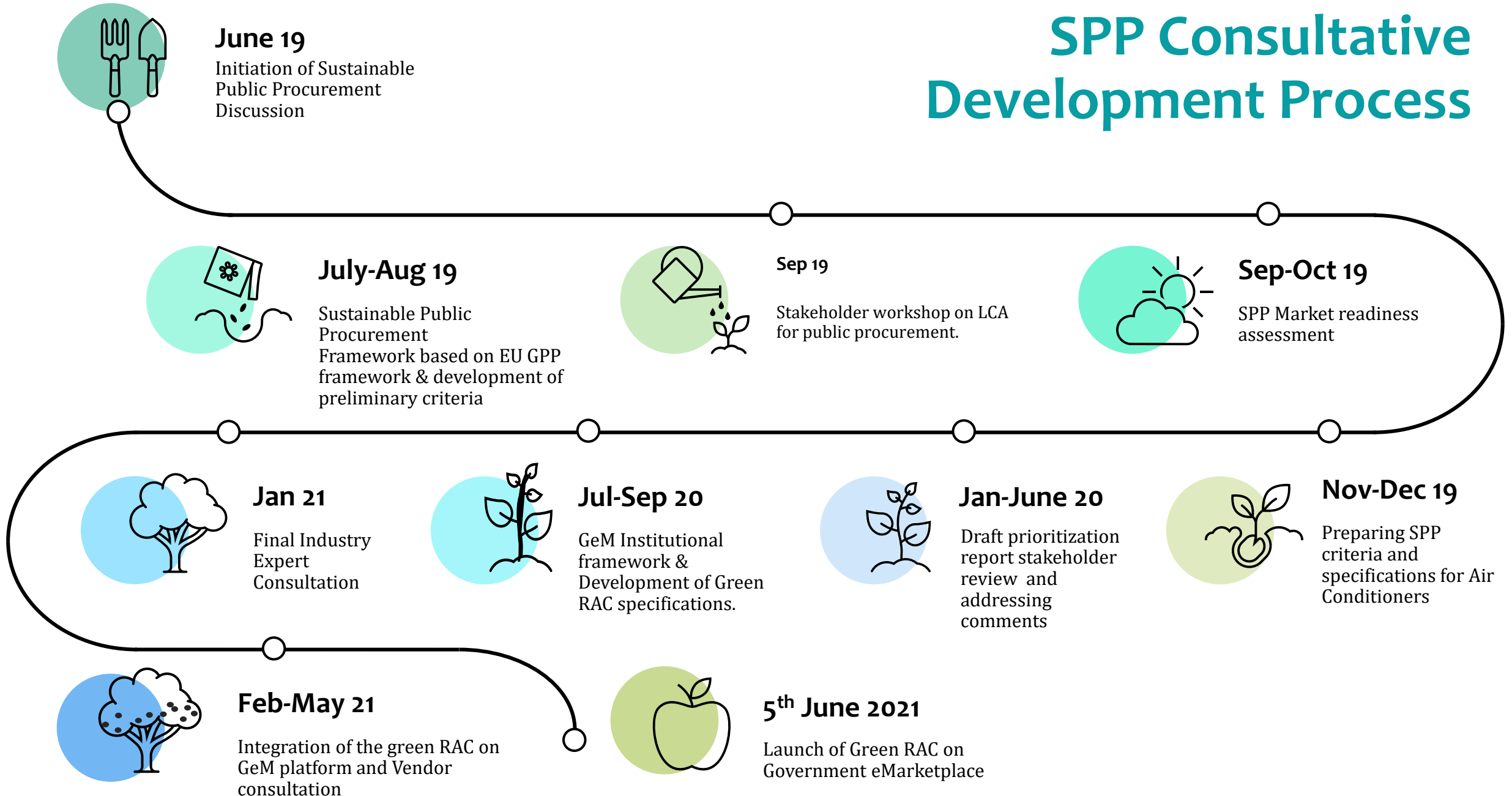
# Sustainable Public Procurement



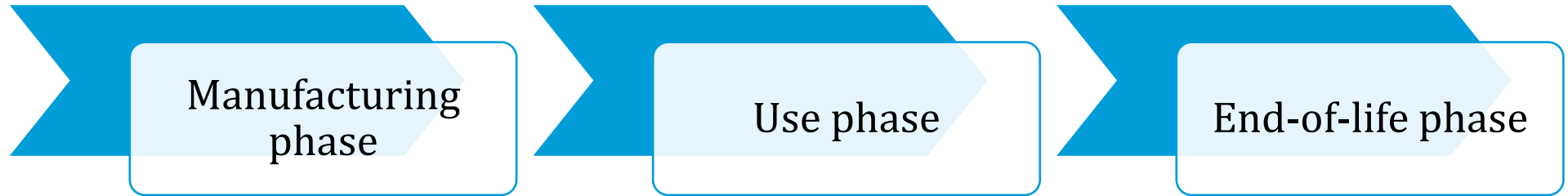
# Public Procurement In India

- 20-22% of GDP is public procurement.
- Procurement at three levels – Centre, State and Municipal.
- Government eMarketplace - online platform for all public procurement in India.
- Key policy instruments:
  - General Financial Rules 2017
  - Manual for Procurement of Goods, 2017.
  - Public Procurement (Preference to Make in India), Order 2017, stipulates preferences be given to local suppliers in procurement.
  - Public Procurement Policy for Micro and Small Enterprises (MSME)

# SPP Consultative Development Process



# Lifecycle of a typical room air conditioner



## Key Environmental Impacts

1. Finite resources.
2. Pollution (air, water, soil)
3. Bioaccumulation due to hazardous constituents.

1. GHG emissions.
2. Leakage of refrigerants.
3. Health impacts due to noise.

1. Generation of waste materials.
2. Refrigerant disposal.

## Sustainable Public Procurement Approach

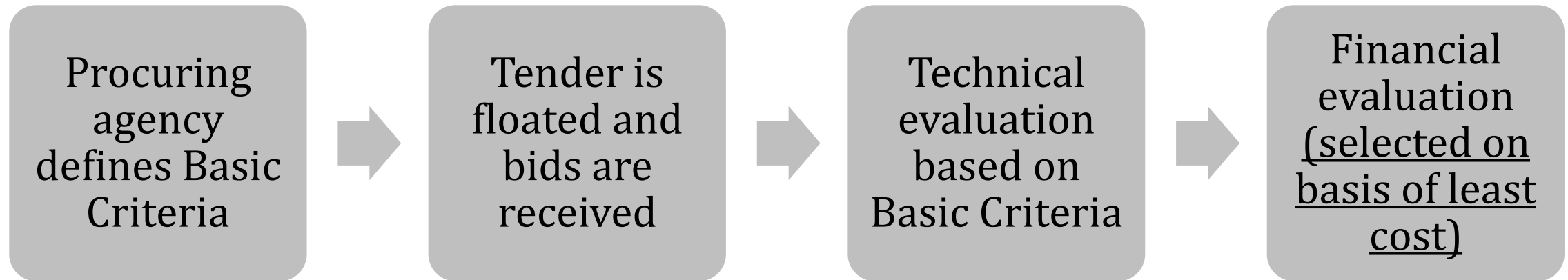
Procurement of RAC's from manufacturers:

1. Use recycled materials
2. Follow relevant environmental protection & waste management rules.

1. Minimize CO<sub>2</sub> emissions.
2. Minimize or eliminate use of refrigerants with high GWP.
3. Minimize product noise.

1. Procurement of RAC's from manufacturers that follow sustainable end of life practices.
2. Minimize or eliminate the use of refrigerants with high GWP.

# Conventional Procurement Tender Process

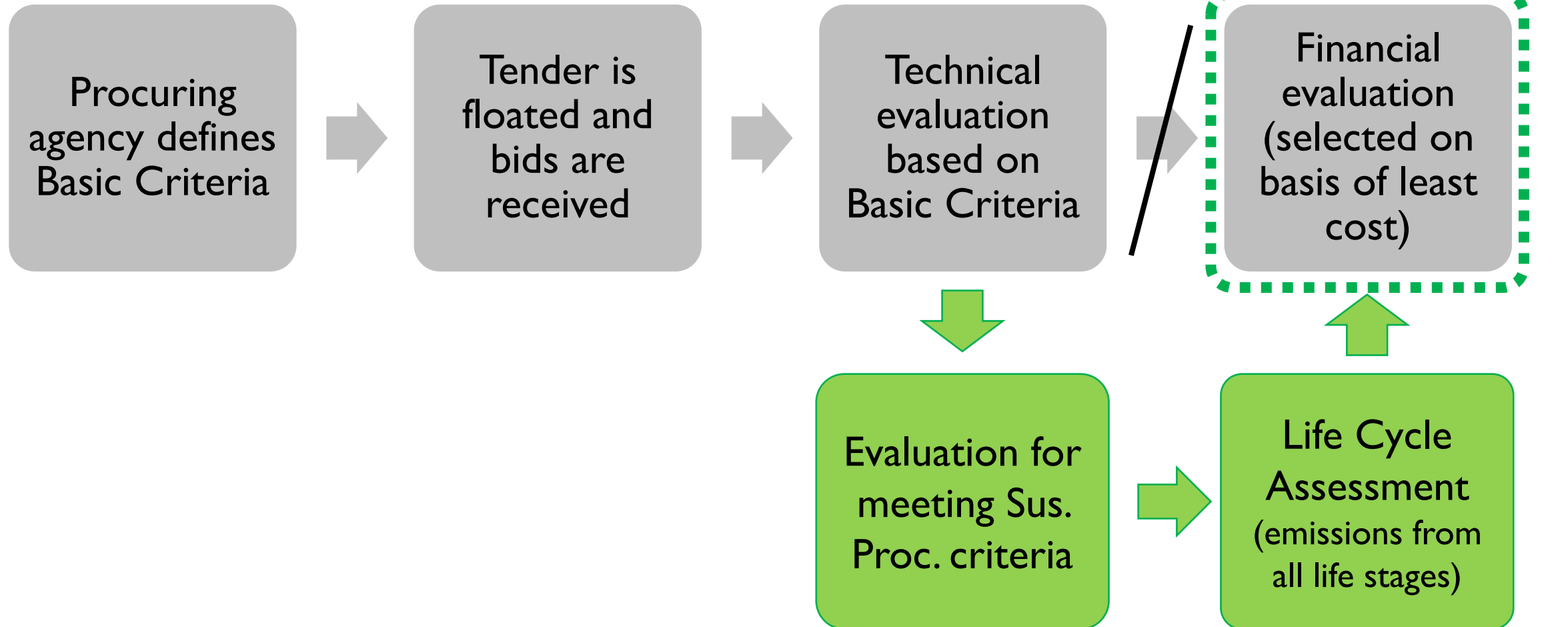


# Sustainable Procurement Tender Process

Sustainable Procurement introduces few additional aspects into the procurement process:

1. Introduction of **Sus. Proc. Criteria**
2. Introduction of **Life Cycle Assessment (LCA)**
3. Redefine costs in terms of **Life Cycle Cost (LCC) and Total Cost of Ownership (TCO)** instead of upfront cost

# Sustainable Procurement Tender Process





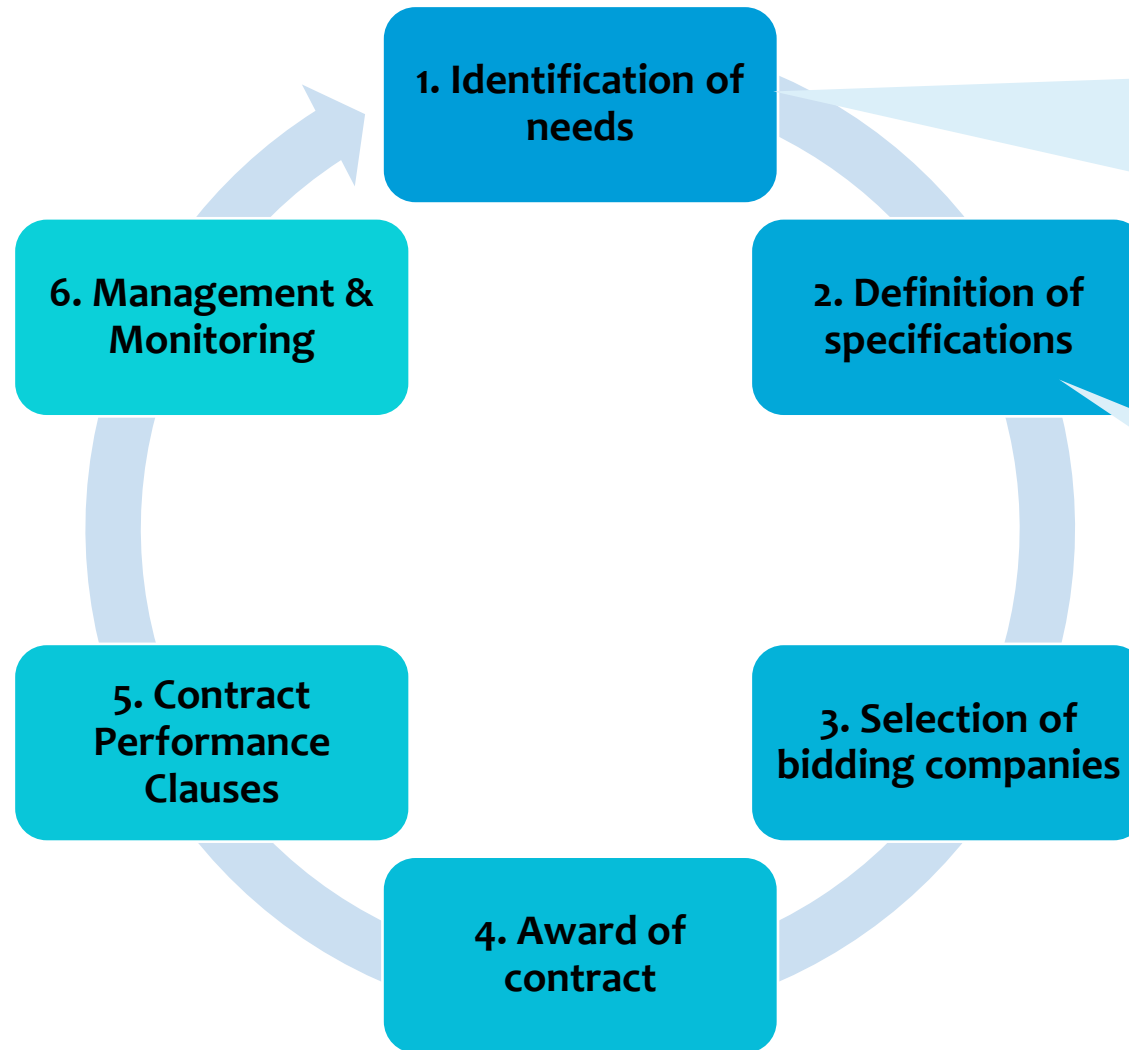
# Sustainable Public Procurement Framework

## Criteria:

**Conventional criteria** → Business as usual practices.

**Core criteria** → are designed to allow for easy application of SPP, focusing on the key area(s) of the environmental performance of a product.

**Comprehensive criteria** → consider more aspects or higher levels of environmental performance. This can be in the form of stringent specifications, method of evaluation for bids and products, etc.



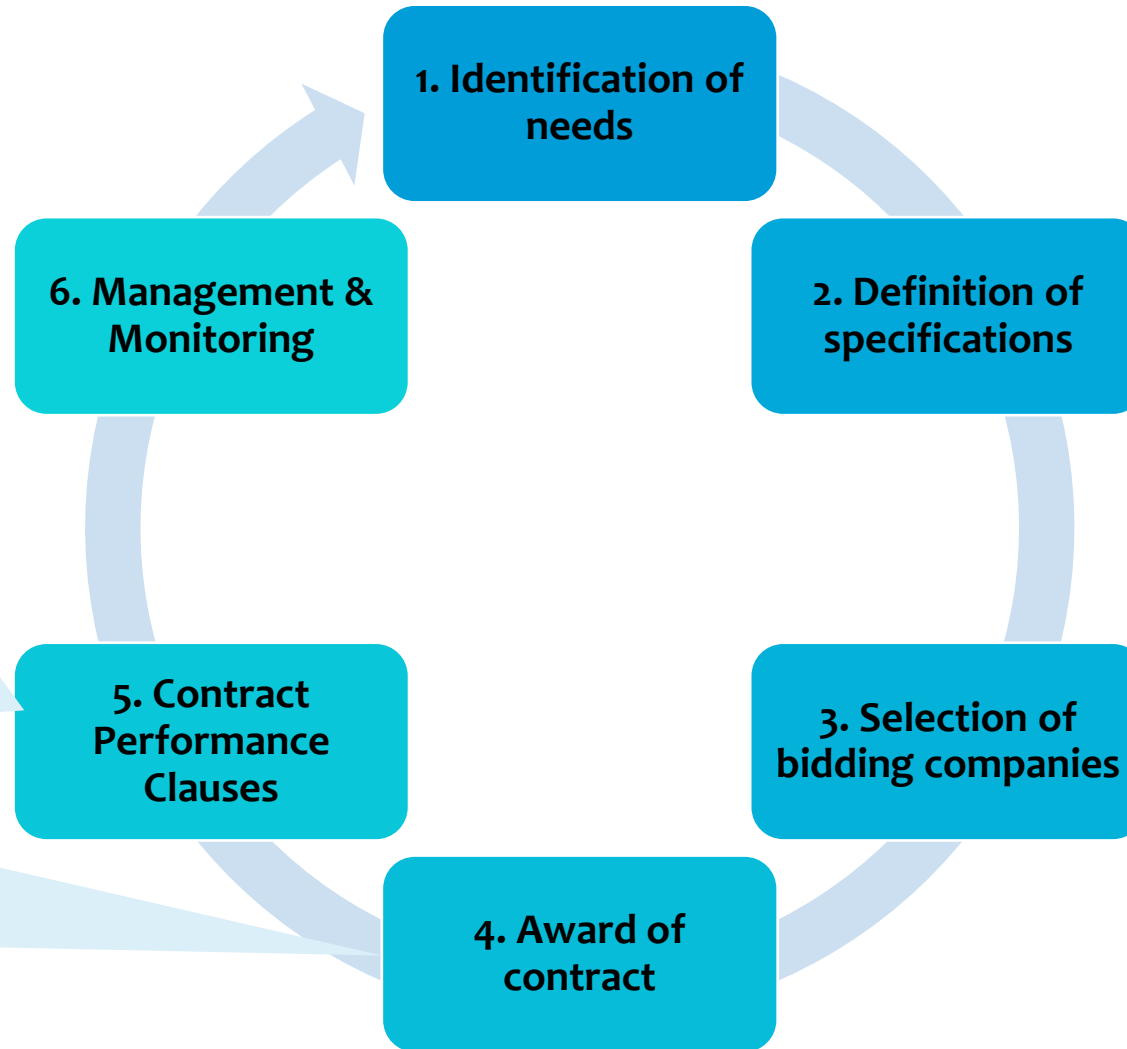
**Identification of need**- Air-conditioner as a product or “Cooling as a Service.”

**Requirements** - Quantity, type of air conditioner, capacity, nature of service -replacement or new procurement.

**Support phase out of in-efficient products** – Specify variable speed instead of fixed speed air conditioners.

**Specify technical and functional performance specifications related to product criteria** – Safety and performance, Product noise, Energy performance (EER), Refrigerant (Global Warming Potential, Ozone Depletion Potential), Recycled plastic component percentage, Paint and Packaging

# Sustainable Public Procurement Framework



## Green clauses for Safe Disposal

Option 1: Include True Cost of end-of-life strategy.

Option 2: “Buy-back” or “take back”

## Evaluation Criteria -

Option 1: Total Cost of Ownership (TCO)

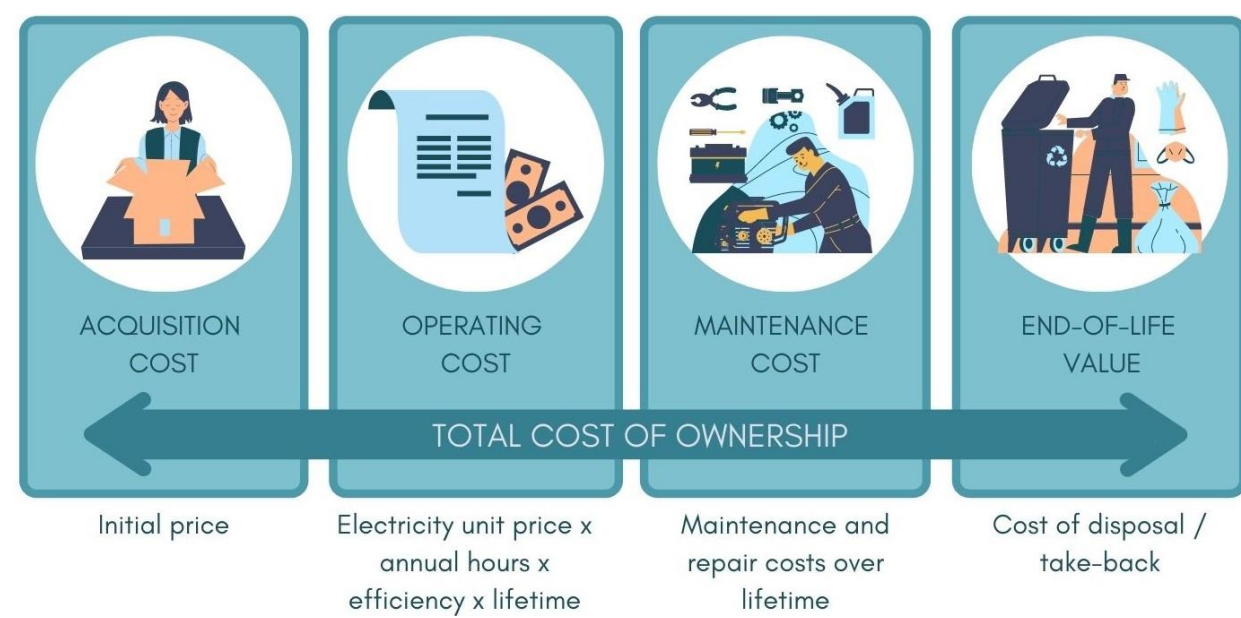
Option 2: Life Cycle Based Evaluation - Climate Performance (LCCP) or Direct Emissions due to refrigerants

**Organization criteria** – Adherence to Laws and Regulations such as Hazardous substance management, Noise Pollution, Ozone Depletion, Environmental Management Systems (EMS) Certification, Corporate Social Responsibility

**Social Criteria** – Adherence to Labour laws, Requirements for employee well-being and Gender Inclusivity

# Total Cost of Ownership (TCO)

example for 1.5 TR RAC



## Comparing a 1.5 TR 5-star Split RAC with Green RAC

5-Star RAC initially costs  
₹ 42,000 - ₹ 70,000 (558 – 930 USD)

Green RAC initially costs  
₹ 42,000 - ₹ 75,000 (558 – 997 USD)

On an average, consuming  
890 kWh/year

On an average, consuming  
750 kWh/year

Total Cost of Ownership over 7 years is  
₹ 141,880 (1886 USD)

Total Cost of Ownership over 7 years is  
₹ 122,090 (1622 USD)

GHG emissions over its lifetime  
5,110 kg CO<sub>2</sub>

GHG emissions over its lifetime  
4,300 kg CO<sub>2</sub>

# Green Room Air Conditioner Specifications

Compressor Type	<b>Variable speed</b>
Safety and Performance	Conform to the requirements for quality, safety and performance prescribed in IS 1391 Revised /IEC 60335-2-40 (under preparation) and all requirements specified as under.
Product Noise	Air conditioner noise levels shall be as notified under the Environment (Protection) Act, 1986, and as per BIS (IS 1391 Revised).
Energy Performance	3517 W to 5240 W (1-1.49 TR) <b>ISEER greater than or equal to 5.8</b> 5275 W to 6682 W (1.5-1.99 TR) <b>ISEER greater than or equal to 5.4</b>
Refrigerants	Refrigerant should have <b>Zero ODP.</b> <b>Global warming potential (GWP) not exceeding 700 (100 years)</b>
Recycled Plastic Components	Product shall be designed to promote recycling Utilizing at least <b>80% by weight of plastics for recycled plastic components</b>
Paint	Paints used in the product shall not contain heavy metals or their compounds include mercury (Hg), lead (Pb), cadmium (Cd) and hexavalent chromium (Cr).
Packaging	The air conditioner packaging shall be made of recycled or biodegradable materials. Plastic packaging shall not contain halogenated hydrocarbon.
Green Disposal	<b>Take-back or buy-back option is available with the manufacturer.</b>

# 12,000 Green RACs procured so far.

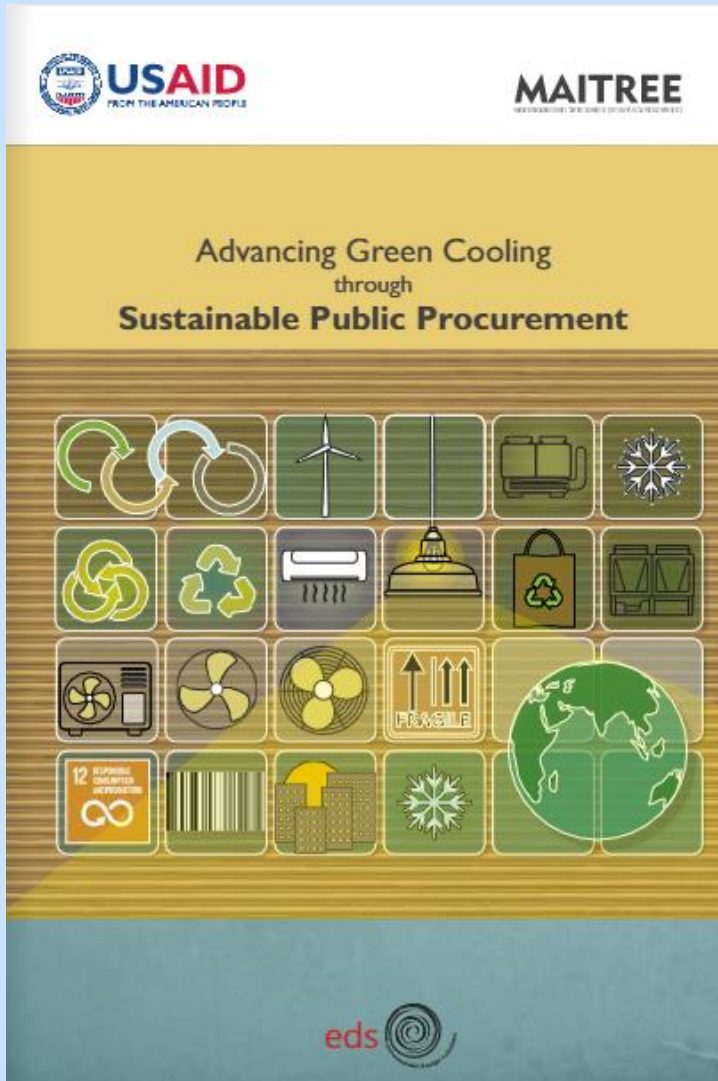


# RECAP: Key highlights of the specified criteria

- Includes organizational & social criteria in addition to product-specific sustainability criteria.
- Shift from fixed speed → Variable speed room air conditioners
- Higher Energy Efficiency (ISEER) – Better than BEE 5-star requirements.
- Low GWP
- Encourages Sustainable Packaging
- Contract clauses include – “take-back” / “buy back” options
- Product evaluation is based on “Total cost of ownership”



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# Thank You

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[https://bit.ly/MAITREE\\_AdvancingGreenCooling\\_SPP\\_Whitepaper](https://bit.ly/MAITREE_AdvancingGreenCooling_SPP_Whitepaper)