

Green Public Procurement of Energy-Efficient Cooling Appliances

Development of Green Public Procurement Criteria for Room Air Conditioners in India

24 March 2022

Ms. Apurva Chaturvedi
Senior Clean Energy Specialist
USAID/India

Ms. Nidhi Gupta
Associate Director
Environmental Design Solutions

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.**



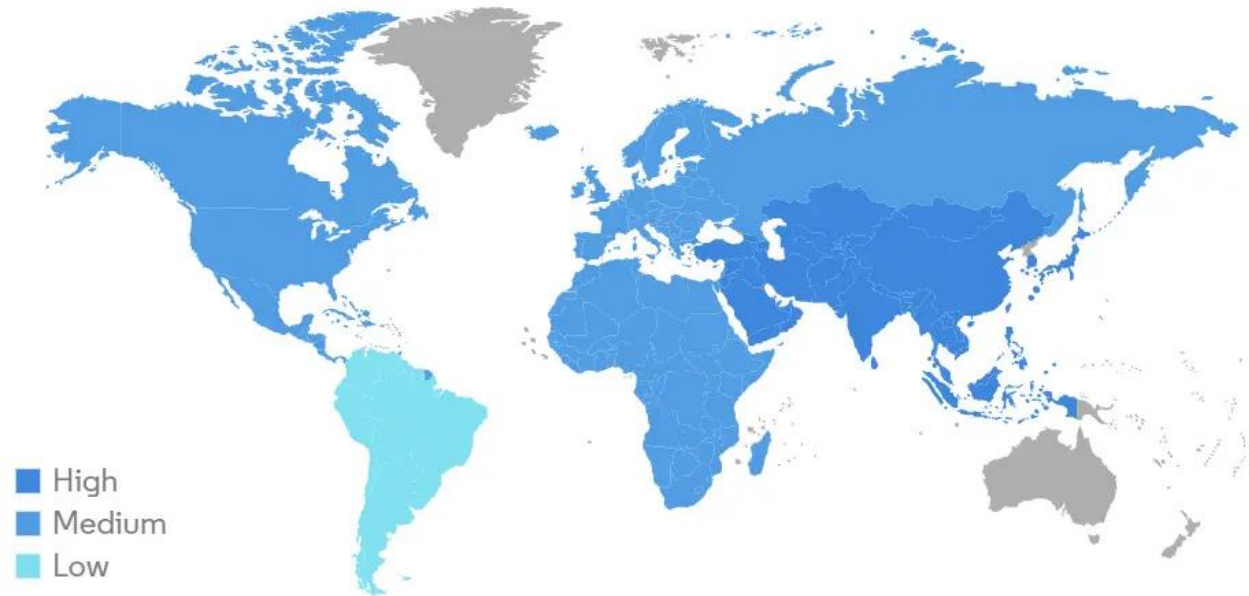
Escalating Cooling Demand results in growing demand room air conditioners.

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)

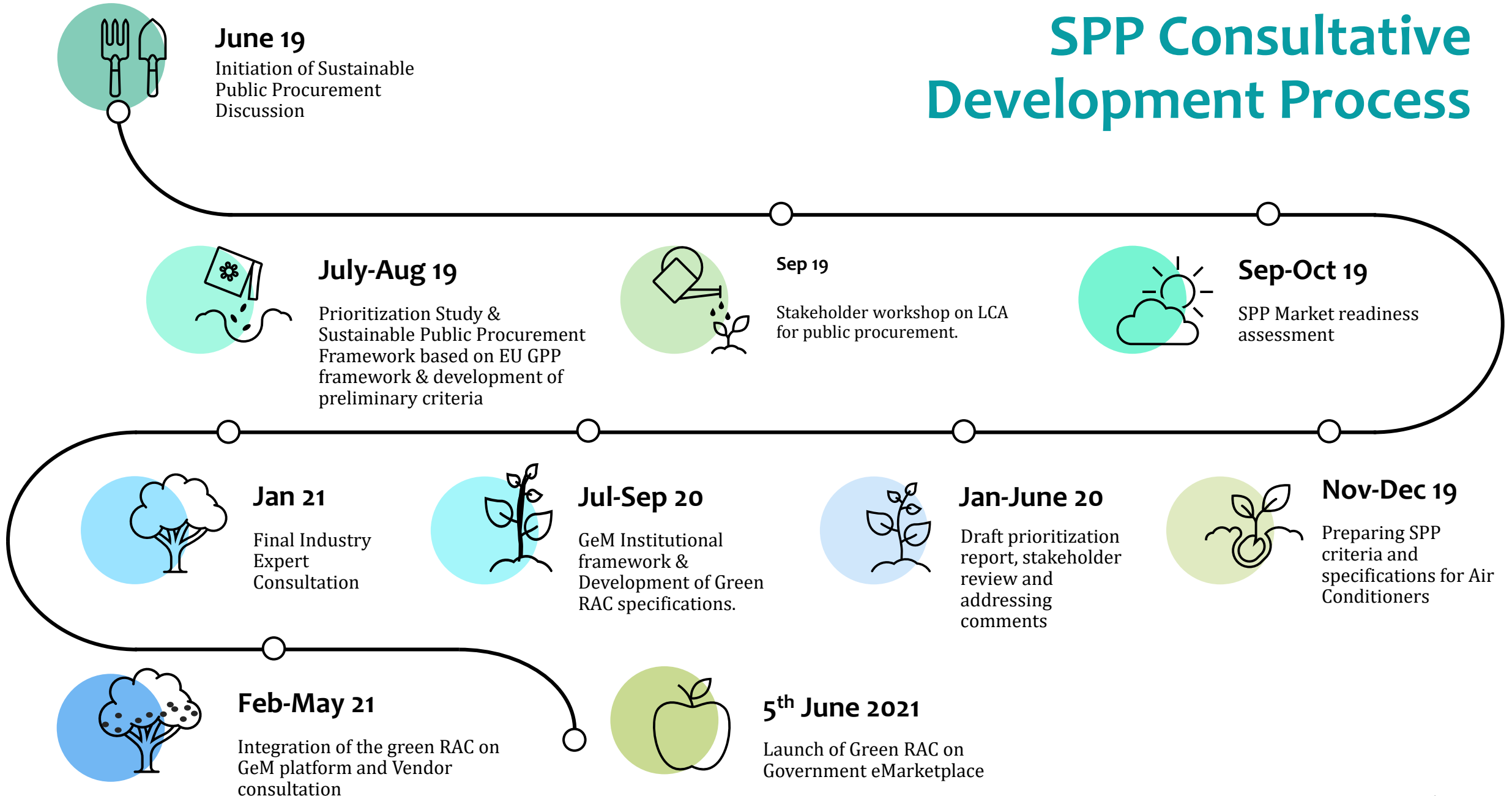
Sources: Shah et. al, Benefits of Leapfrogging to Super efficiency and Low Global Warming Potential Refrigerants in Room Air Conditioning, (2015)

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.

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

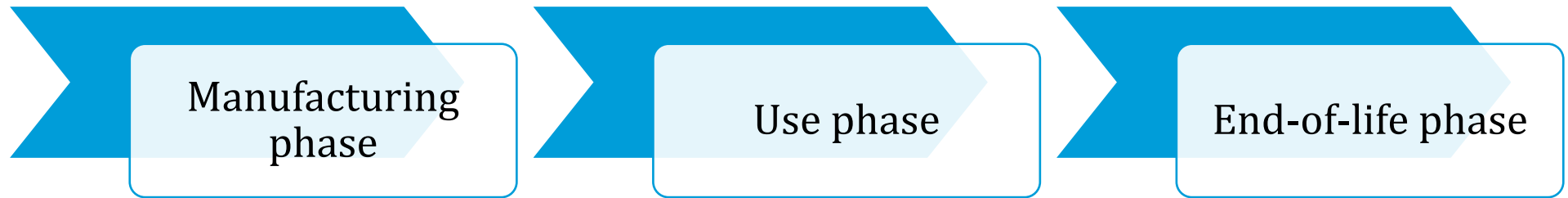




AIR CONDITIONERS: SUSTAINABLE PROCUREMENT

Development of Green Public Procurement Criteria

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

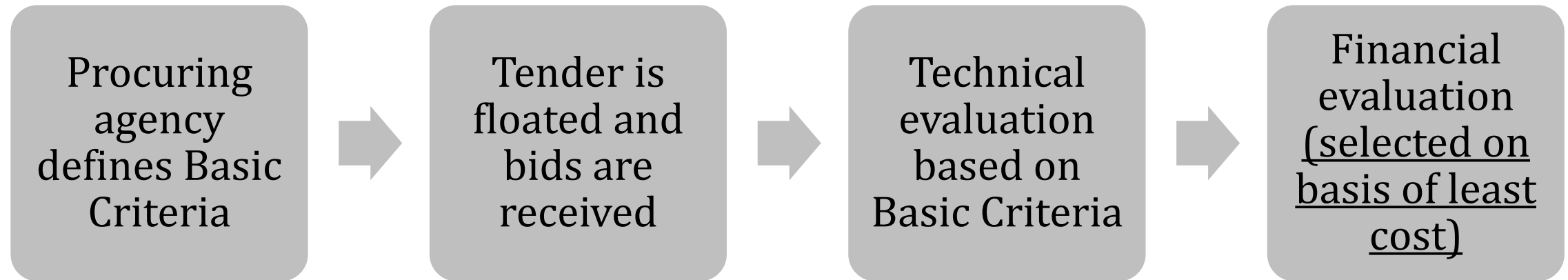
Procurement of RAC's from manufacturers:

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

1. Minimize CO₂ 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

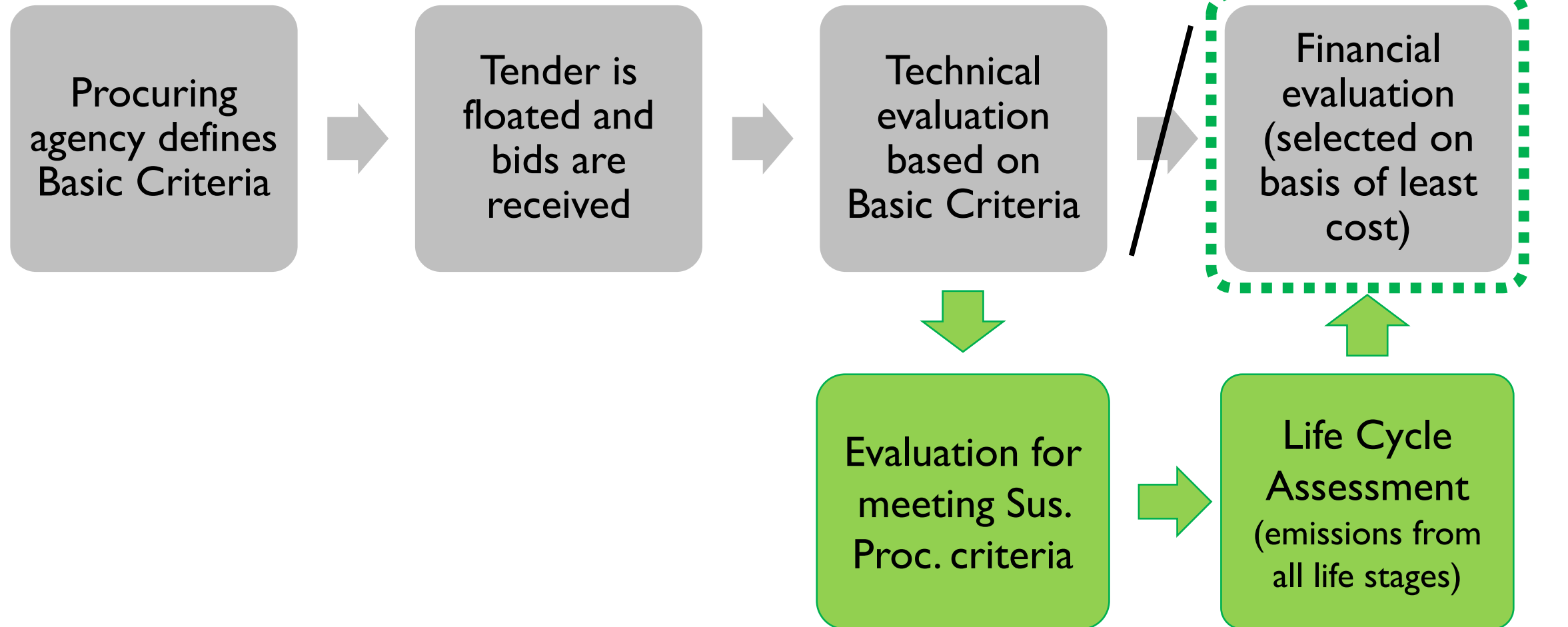


Sustainable Procurement Tender Process

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



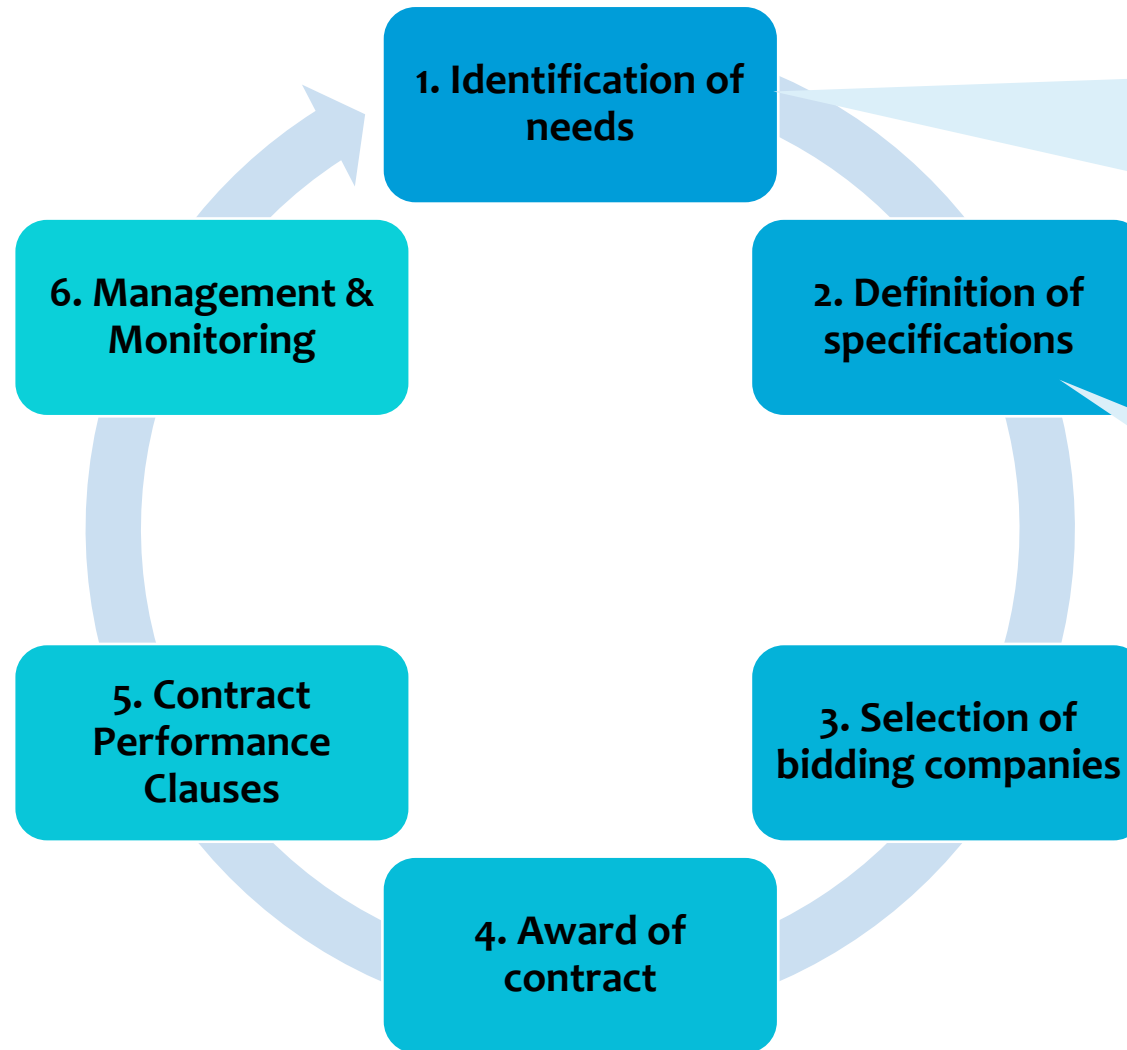
Sustainable Public Procurement Framework

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.



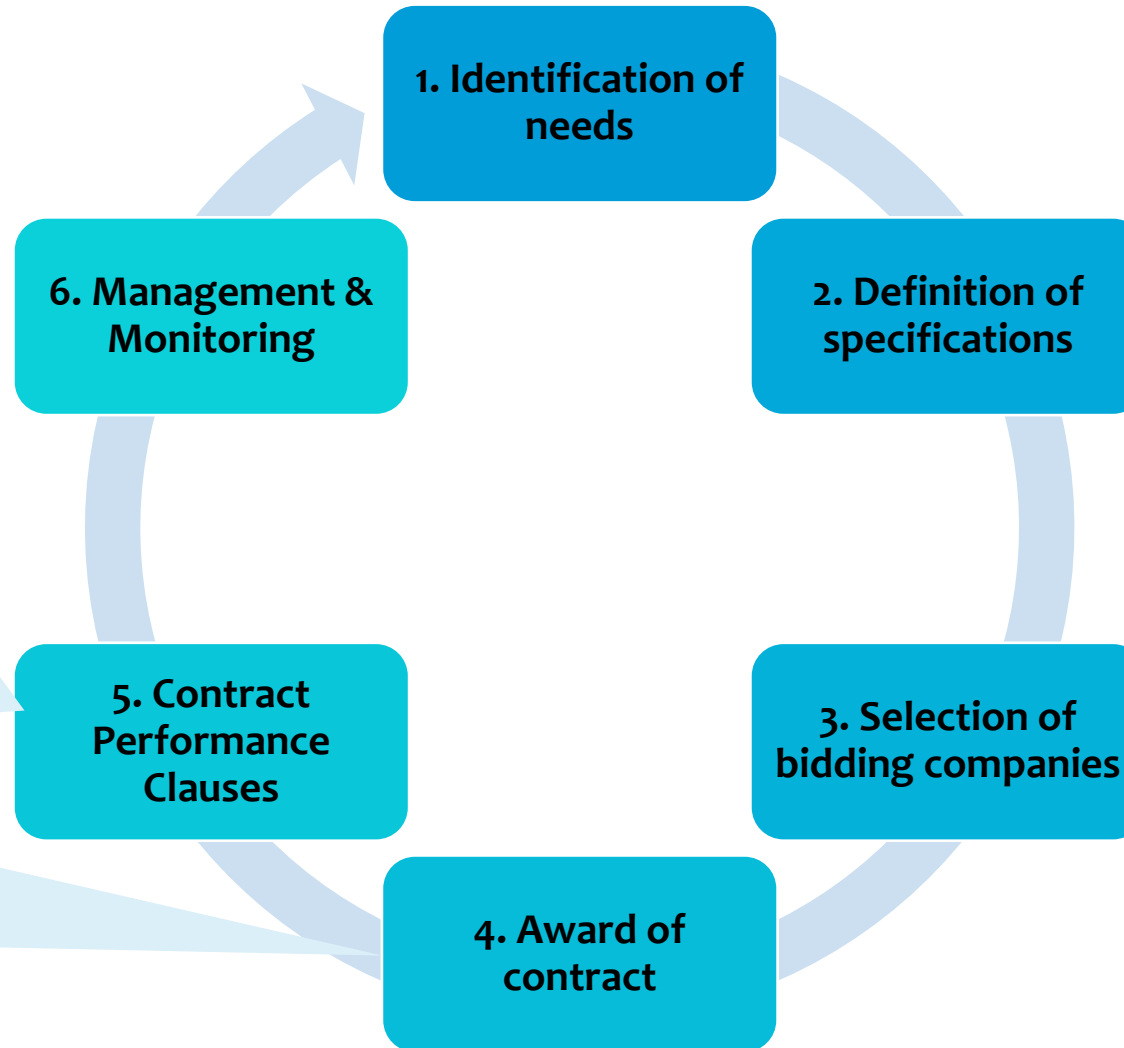
Identification of need- Air-conditioner as a product or “Cooling as a Service.”

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)

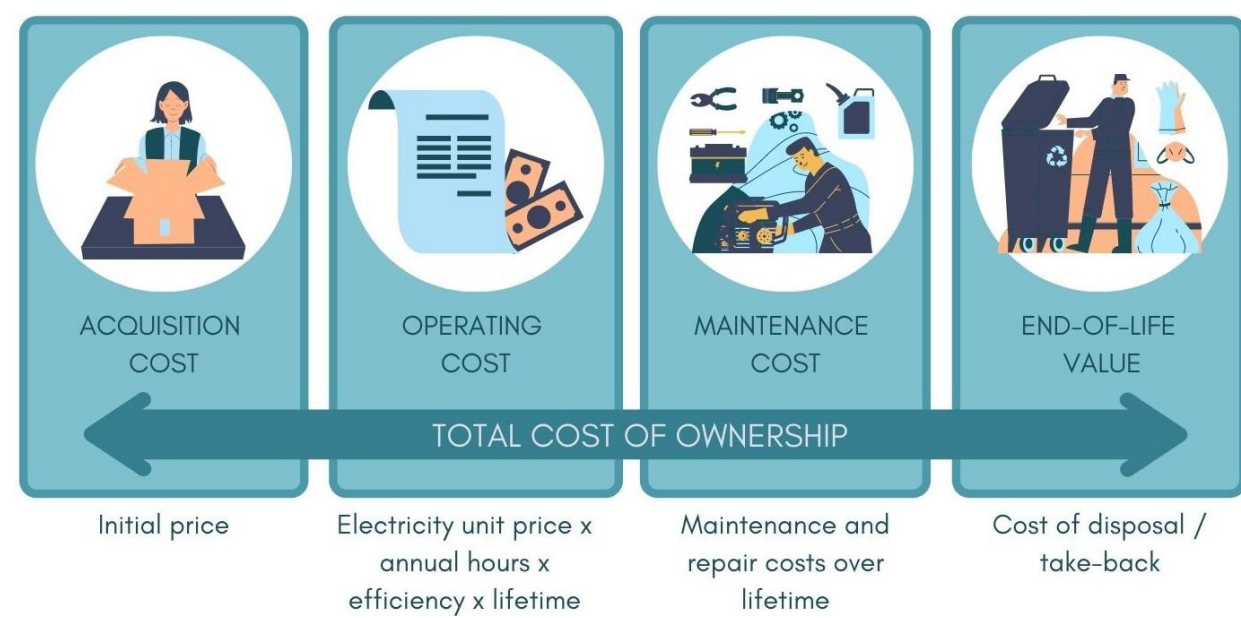
Option 2: Life Cycle Based Evaluation - Climate Performance (LCCP) or Direct Emissions due to refrigerants

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 CO₂

GHG emissions over its lifetime
4,300 kg CO₂

Green Room Air Conditioner Specifications

Compressor Type	Variable speed
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) ISEER greater than or equal to 5.8 5275 W to 6682 W (1.5-1.99 TR) ISEER greater than or equal to 5.4
Refrigerants	Refrigerant should have Zero ODP. Global warming potential (GWP) not exceeding 700 (100 years)
Recycled Plastic Components	Product shall be designed to promote recycling Utilizing at least 80% by weight of plastics for recycled plastic components
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	Take-back or buy-back option is available with the manufacturer.

12,000 Green RACs procured so far.

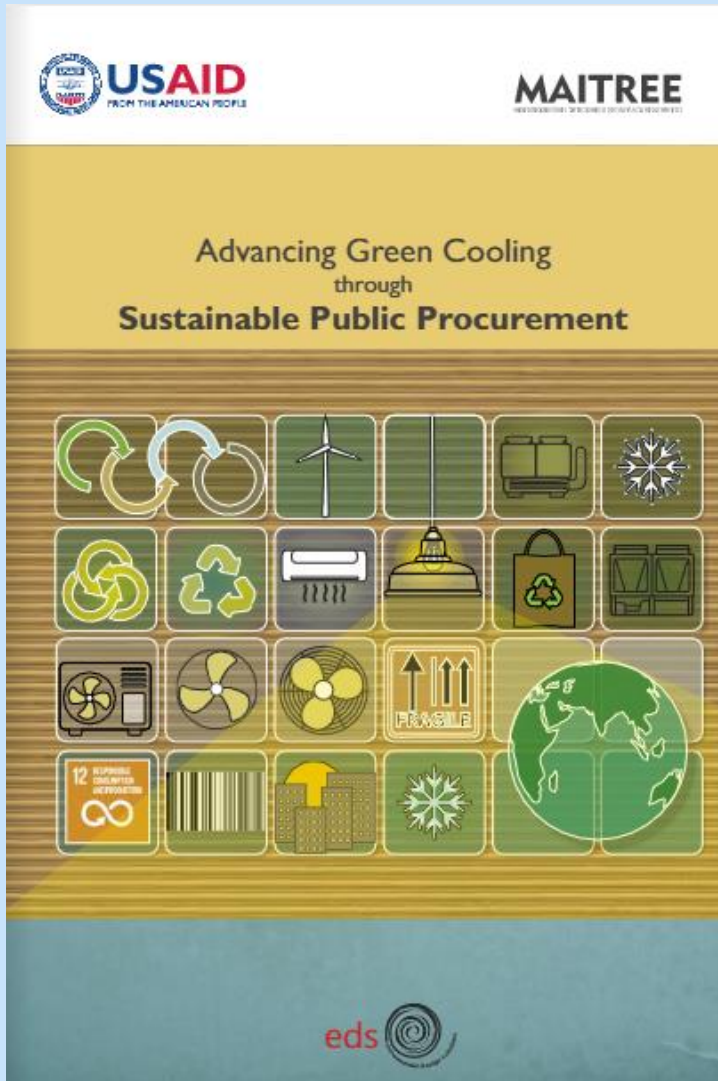


RECAP: Key highlights of the specified criteria

- 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”



USAID
FROM THE AMERICAN PEOPLE



Thank You

Apurva Chaturvedi
achaturvedi@usaid.gov

Nidhi Gupta
nidhi@edsglobal.com

https://bit.ly/MAITREE_AdvancingGreenCooling_SPP_Whitepaper