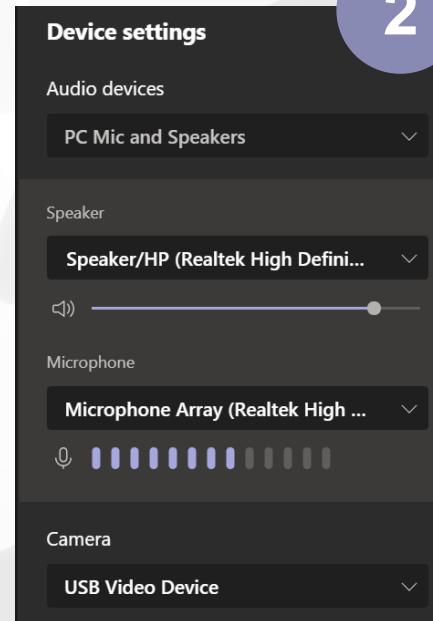
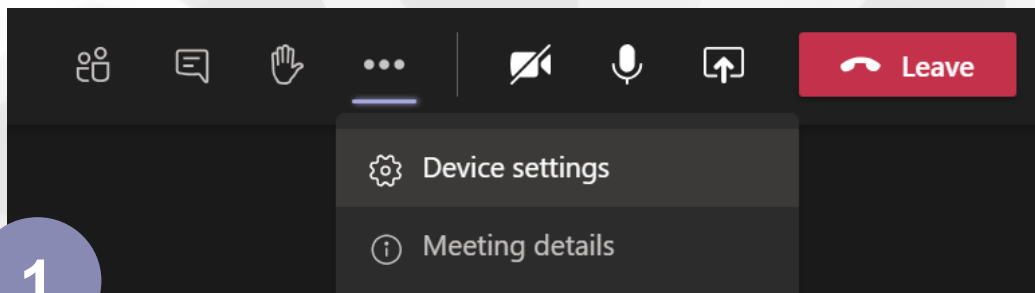


Audio check

Are you able to hear the music? If not, try the following:

- Turn up your volume.
- Click on the three dots on the top right.
- Then click on "Device settings".
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Green Cooling in Public Procurement

Assessing ways to advance procurement of climate friendly and energy-efficient air conditioners in the public sector

16th of December 10:00 – 11:00 AM (CET)



On behalf of:

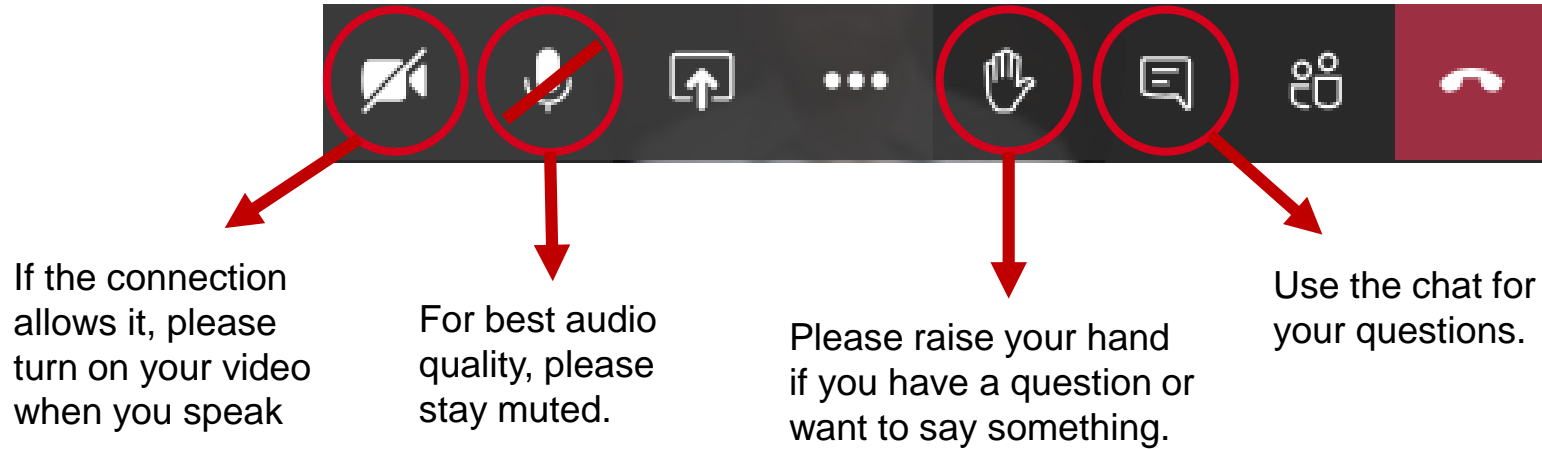


Federal Ministry
for the Environment, Nature Conservation
and Nuclear Safety

of the Federal Republic of Germany



Ground Rules for Online Sessions



- Please **use headphones** or **earphones** in order to prevent echoing-effects
- Use the **saved topics** channel to post topics that might be still missing.

Speakers



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GIZ Proklima
Communications Expert

Agenda

Content	Presenter
<ul style="list-style-type: none">• Introduction and objective of study• Split ACs in public buildings: Relevance and Potential	Philipp Munzinger, GIZ Proklima 
<ul style="list-style-type: none">• Typical Public Procurement Practices Barriers and Enablers for Green Public Procurement – Focus on split Acs	Lukas Kahlen, NewClimate Institute 
<ul style="list-style-type: none">• Admissibility Criteria, Guiding Steps & Country Cases	Lara Teutsch, GIZ Proklima 
Discussion (10 min)	All

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Introduction and objective of study

Philipp Munzinger, GIZ Proklima



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- Promoting and introducing **natural refrigerants and energy-efficient appliances** in the **refrigeration and air-conditioning and foam (RAC&F) sector** since 1995
- Supporting around 40 partner countries in the field of **integrated ozone and climate protection**

Policy Advice

Supporting evidence-based decision making for sustainable sector strategies

Cooling equipment efficiency and safety standards, RAC NDC strategies and sector policies



Capacity Building

Training of >35.000 technicians within the HPMPs
Training of >150 cooling technicians, lecturers and political decision-makers within the Cool Training

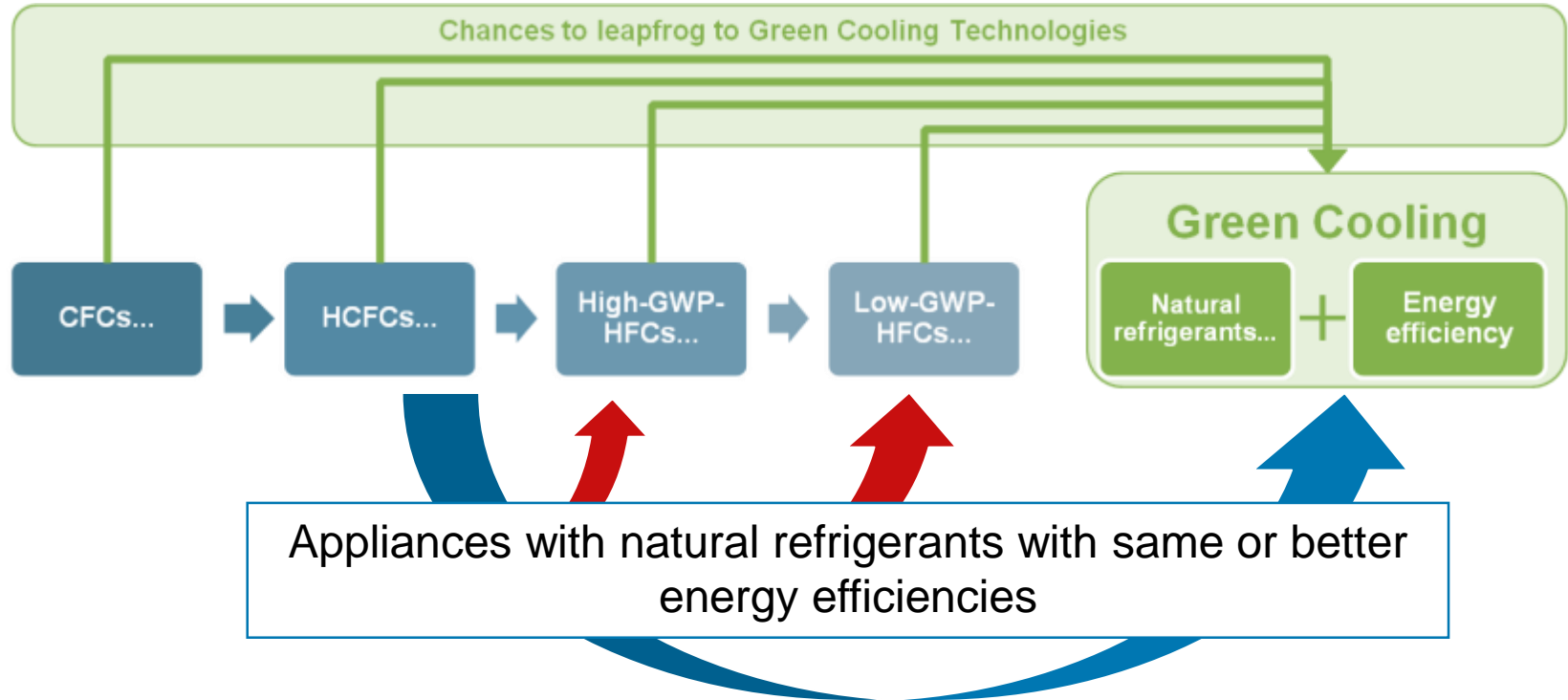


Technology Transfer

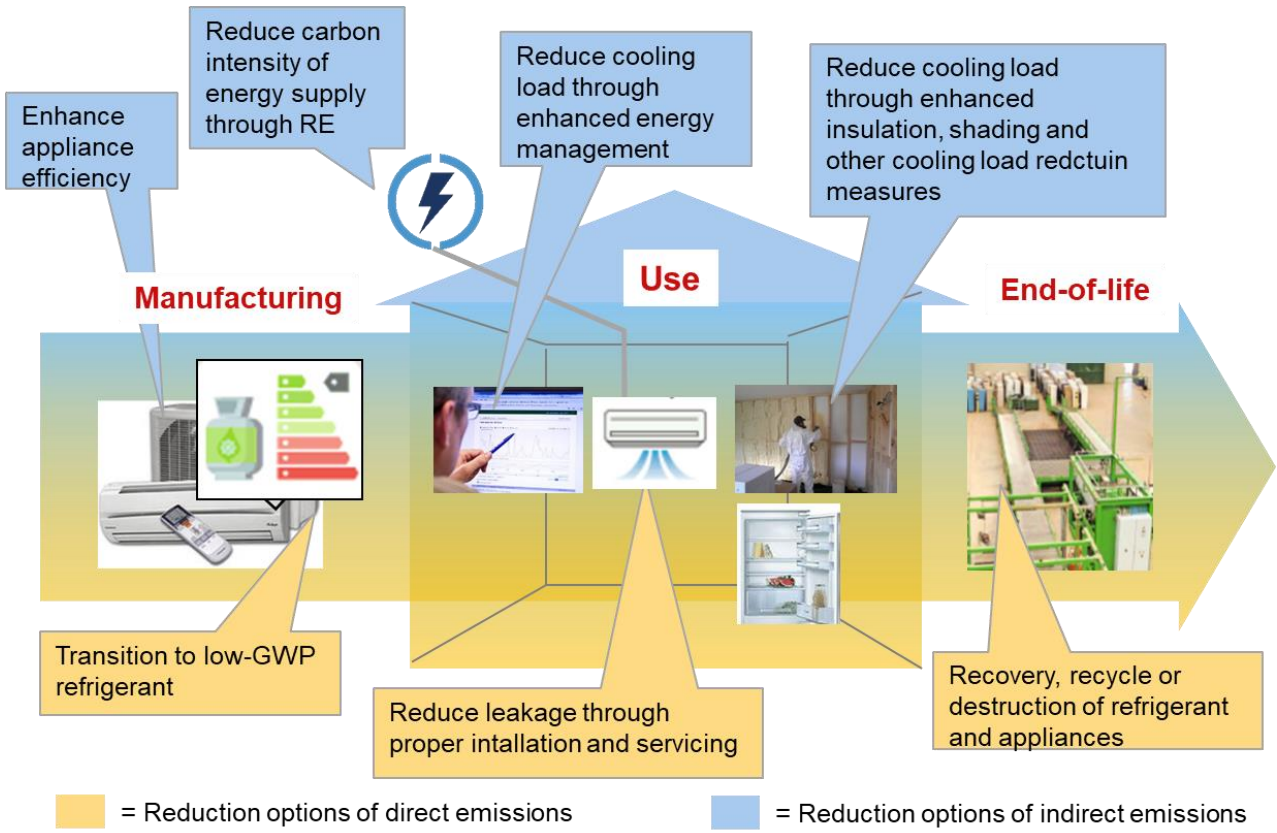
Cooling equipment technology advice to producers and end-users
Example: Conversion of AC production line to high efficient R290 split AC at Godrej & Boyce India



Green Cooling Approach



Cooling - GHG mitigation options



Strategies to reduce climate impact of cooling in buildings

Avoid	Shift	Improve
<ul style="list-style-type: none">• Building design adapted to the local climate to avoid high cooling demand• Mid- to long-term nature	<ul style="list-style-type: none">• Renewable energy to replace carbon-intensive energy supply• Short- to mid-term nature	<ul style="list-style-type: none">• Efficiency of systems and appliances• Climate impact of refrigerants in appliances• Short-term nature

Objective of the study

Assess ways to advance procurement of climate friendly and energy-efficient air conditioners in the public sector

- to highlight the mitigation potential of space cooling in the public sector through the application of Green Cooling
- Identify and analyse the potential and typical barriers that prevent public entities from Green Cooling, in particular Green AC
- to identify best practices of sustainable and green public procurement
- elaborate ways to overcome these barriers and draw general recommendations on how to advance Green AC public procurement in the public sector.
- contribute to unlocking this huge potential of green cooling in the public sector.



We highly welcome further contributions from further interested public procurement units – please approach Lara.Teutsch@giz.de

20 surveys with procurement officers and facility managers of public buildings in Costa Rica, Grenada, India, Iran and the Philippines

Climate impact of cooling in public buildings

- Without efficiency gains, space cooling energy use could more than double between now and 2040 (IEA)
- According to the EIA, only by transitioning to climate friendly refrigerants could prevent harmful emissions equal to 1,400 coal-fired power stations running for a year
- In many countries, especially in tropical and subtropical areas, space cooling in public buildings accounts for over 50% of building's GHG emissions.
- Public buildings have a huge potential to demonstrate and promote pioneering green cooling solutions, however remains largely untapped.



Ministry of Education in Grenada: space cooling is with 69% by far the largest contributor of building's energy consumption

Split ACs in public buildings: Relevance and Potential

Philipp Munzinger, GIZ Proklima



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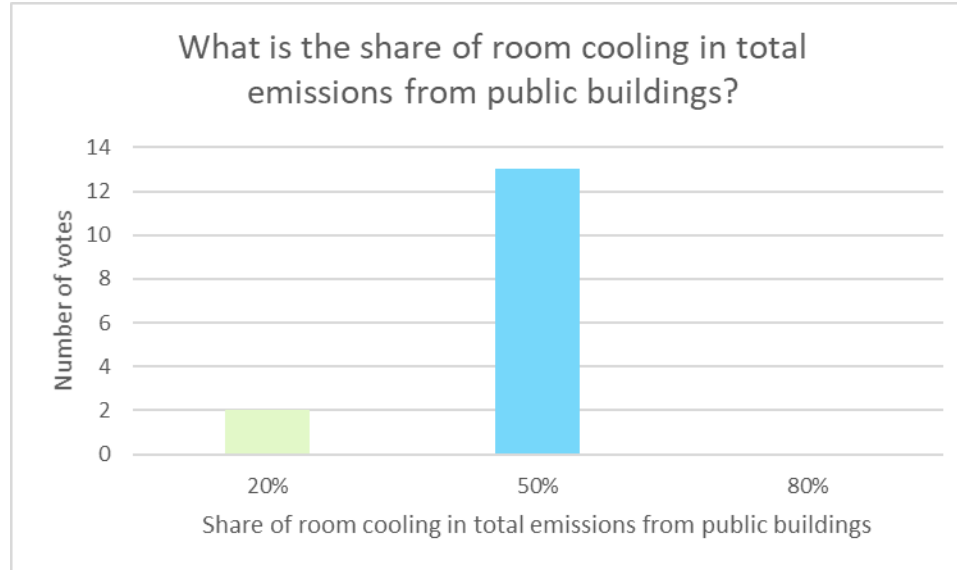
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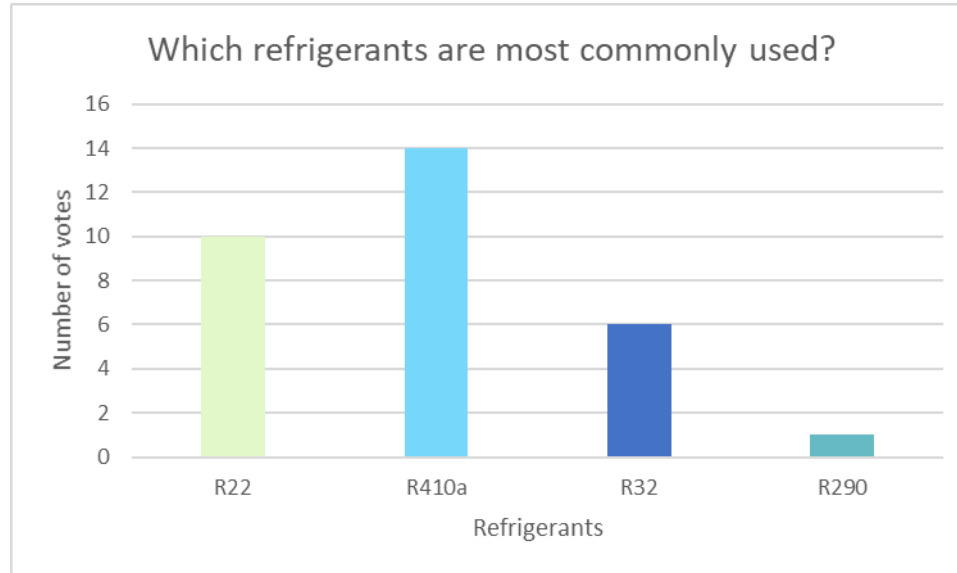
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- What is the share of room cooling in total emissions from public buildings?
- Which refrigerants are most commonly used?



Correct
answer: 50 %



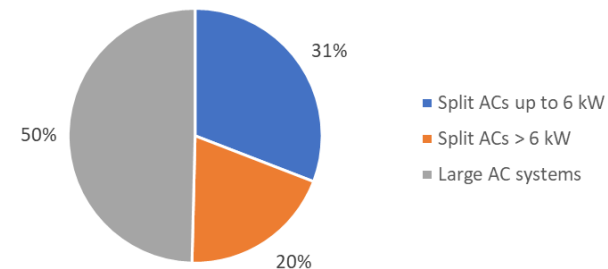
Correct answer:
R410a, R22

Split ACs in public buildings

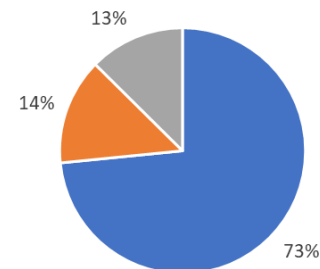
Criterion	Baseline AC	Green AC
Cooling capacity (kW)*	5.05	5.05
Energy efficiency ratio (W/W)*	3.33	4.3
Annual operating hours (h)*	2,534	2,534
Lifetime (years)*	15	15
Refrigerant type*	63% R22 35% R410A 2% R32	R290
Average GWP	1,796	<u>3</u>
Initial refrigerant charge (kg)*	1.49	0.34
Annual refrigerant leakage (in-use, in relation to initial refrigerant charge)*	20.1%	20.1%

*results from the survey

Share of total cooling capacity by AC type




Share of total installations by AC type




Split ACs in public buildings: Mitigation Potential

annual electricity savings of 650 kWh



Criterion	Baseline AC	Green AC
Annual energy consumption (kWh)	2,882	2,232
Direct annual GHG emissions (kg CO ₂ eq)	538	0.21
Indirect annual GHG emissions (kg CO ₂ eq)	1,332	1,032
<u>Total annual GHG emissions (kg CO₂eq)</u>	1,870	1,032

45% less emissions



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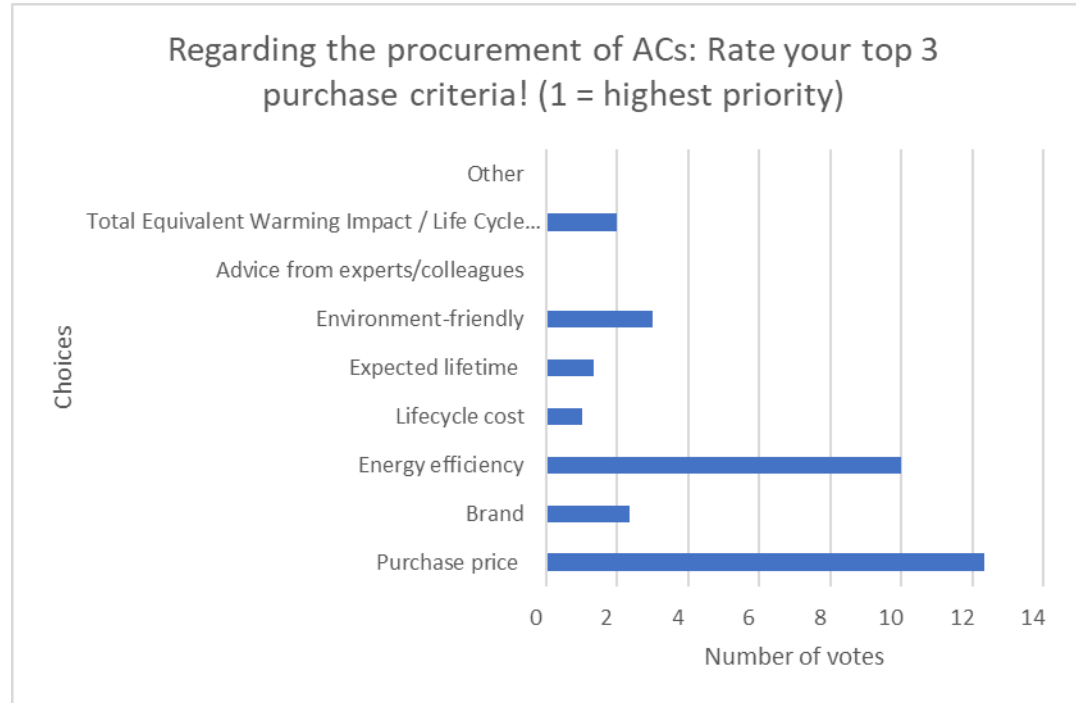
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Regarding the procurement of ACs:
Rate your top 3 purchase criteria!
(1 = highest priority)



Q: What of the following priorities does your organisation define as being part of public procurement with regards to the procurement of ACs?									
Statement		Strongly Disagree	Disagree	Neutral	Agree	Strongly agree	I do not know	Does not apply	Score
Purchase based on economically most advantageous tender		0	1	0	4	6	0	0	15
Purchase based on good product service (maintenance, spares availability, product warranty)		0	0	1	3	6	1	3	15
Purchase from suppliers/local representatives with good reputation		0	1	1	2	6	3	0	13
Procurement from suppliers with safety standards (safe operations, etc.)		0	0	3	4	3	1	0	10
Purchase based on highest energy efficiency		0	0	0	4	3	1	1	10
Purchase of environmentally friendly products / services		0	1	0	5	3	0	1	10
Purchase from local / national sources / suppliers		0	1	2	3	3	0	1	8
Purchase from environmentally friendly suppliers		0	1	1	4	2	0	1	7
Procurement of innovative products / services		0	1	2	5	1	0	0	6
Purchase based on lowest life cycle costs		0	0	2	2	2	1	2	6
Purchase from suppliers with human rights standards (> min. wage, no child labour, etc.)		1	1	2	3	2	1	0	4
Purchase from suppliers with diversity standards (share of minorities, female workers, etc.)		1	2	3	1	2	0	0	1
Purchase of branded products		2	0	4	3	1	0	0	1
Reduce purchase needs (buy less, extend product use, etc.)		2	0	3	0	2	0	0	0

Typical Public Procurement Practices

Lukas Kahlen, New Climate

Typical procurement practices

Scope of Green Public Procurement

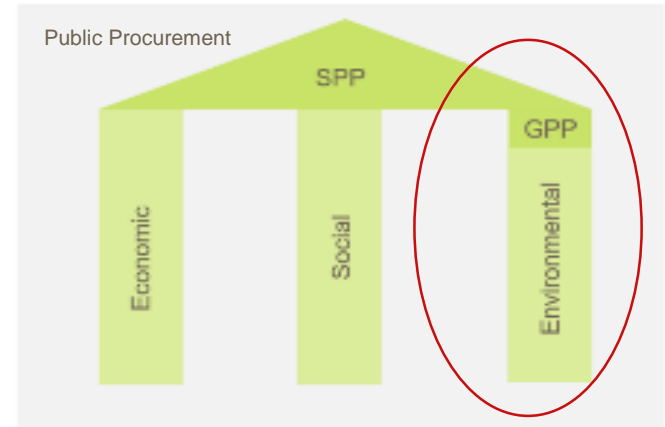
Public Procurement Acquisition of goods and services by governments or public sector organisations through a public contract

Sustainable PP Integration of socio-economic & environmental criteria

Green PP Focus on environmental pillar

“A process whereby public authorities seek to procure goods, services and works with a reduced environmental impact throughout their life cycle when compared to goods, services and works with the same primary function that would otherwise be procured”

≥ 30% of GDP in LIC



Typical procurement practices (cont.)

Benefits of GPP

GPP...



Environmental benefits

- allows public authorities to **achieve environmental targets**
- **sets an example** to consumers and private sector
- **raises awareness** of environmental issues



Economic benefits

- provides **incentives** to the industry to **innovation**
- can **reduce prices** for environmentally-friendly technologies
- **saves resources** when life-cycle costs are considered



Political benefits

- demonstrates the **public sector's commitment** to environmental protection and to sustainable consumption and production

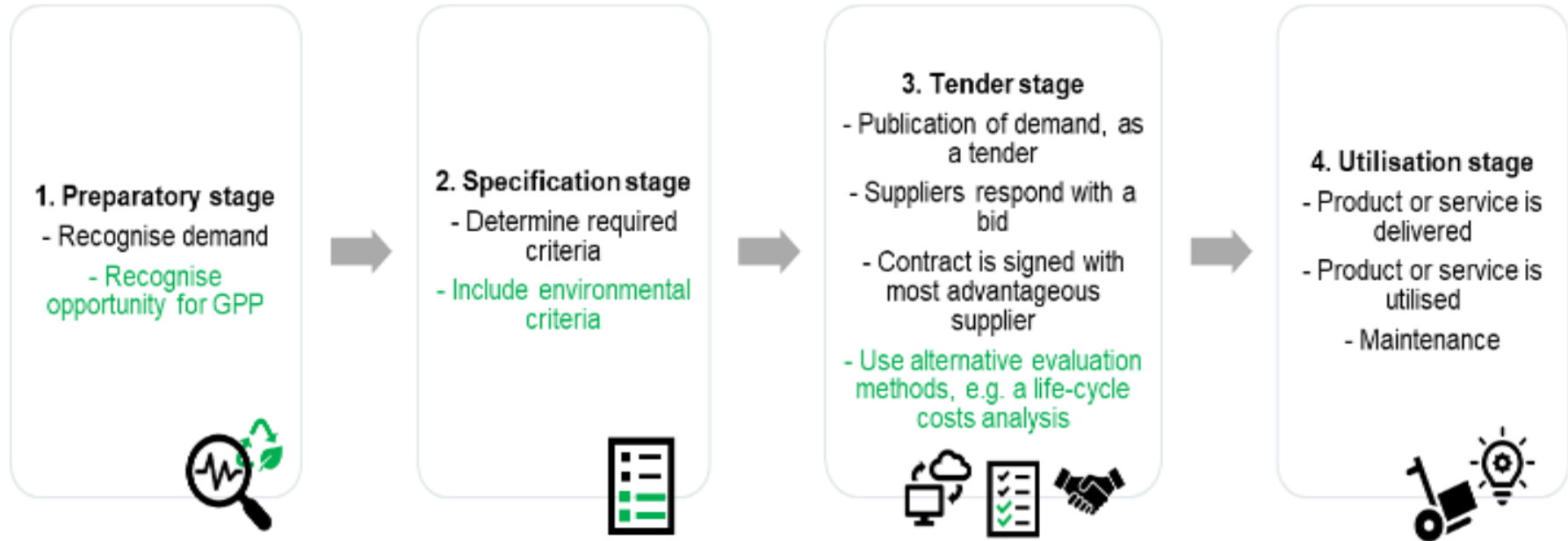


Social & health benefits

- improves **quality of life**
- helps establish **high environmental performance standards** for products and services

Typical procurement practices (cont.)

Green public procurement procedure



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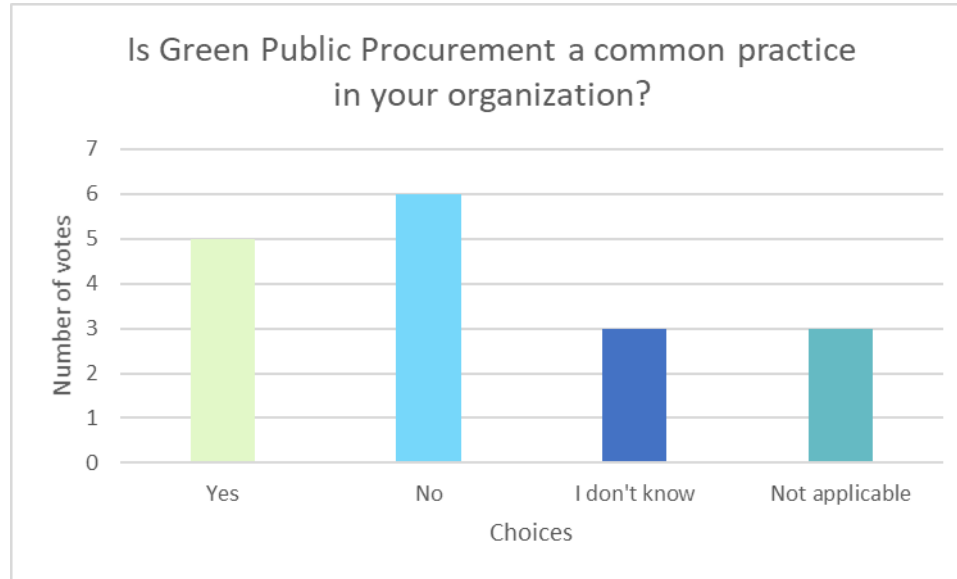
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Is Green Public Procurement a
common practice in your
organization?



Barriers and Enablers for Green Public Procurement – Focus on split ACs

Lukas Kahlen, NewClimate Institute

Typical barriers to GPP – An overview



Financial barriers

- High initial investment costs
- Slow return of investment
- Perception of higher costs



Institutional barriers

- Lack of cooperation
- Lack of management support
- Resistance to change
- Perception of lower quality



Technical barriers

- Lack of established environmental criteria
- (Perception of) limited product availability



Regulatory & political barriers

- Lack of strong policy commitments
- Lack of regulatory action plans
- Lack of monitoring policies



Informational & capacity-related barriers

- Lack of practical tools
- Lack of knowledge & legal expertise



Structural barriers

- GPP as unrecognised tool
- Split incentives
- GPP not a priority for support
- Fear for complexity & increased costs
- GPP is new for many countries

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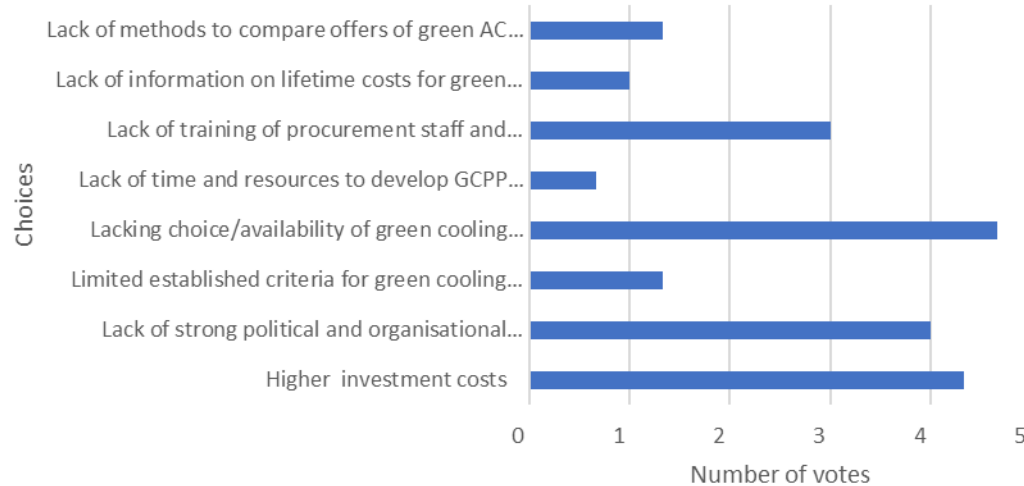
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What are the main barriers in the procurement of Green ACs?
Rate your Top 3 barriers!
(1 = highest barrier)

What are the main barriers in the procurement of Green ACs? Rate your Top 3 barriers! (1 = highest barrier)



Barriers to GPP of cooling appliances*

To what extent do you agree or disagree with the following barrier to purchase Green AC through public procurement?

Statement		Strongly Disagree	Disagree	Neutral	Agree	Strongly agree	Score
Green AC are more expensive		0	0	3	5	3	11
Lack of strong political and organisational leadership on GCPP		0	0	2	3	4	11
Limited established (uniform) criteria for green cooling technologies		0	0	3	4	3	10
Lack of methods to compare offers of green cooling technologies		0	1	1	6	2	9
Lack of information on lifetime costs for green cooling technologies		0	1	3	5	2	8
Lack of training of procurement staff and adequate tools on GCPP		1	1	2	3	3	6
Lack of supportive policies, regulations and incentives for GCPP		2	0	2	2	4	6
Lack of time and resources to develop GCPP criteria		2	0	2	3	3	5
Lacking choice/availability of green cooling technologies (incl. trained technicians)		0	3	1	4	2	5

* Based on survey responses from procurement professionals

Typical **enablers** for GPP – An overview



Informational & capacity-related enablers

- Increase awareness on GPP
- Build capacity & increase legal expertise
 - Develop applicable tools
- Interaction & consultation with market



Financial enablers

- Consider lifecycle costs
- Eliminate financial hurdle



Technical enablers

- Establish clear policies & guidelines for GPP
- Establish clear definitions of GPP
- Increase availability of green products



Regulatory & political enablers

- Develop common understanding of best practices in policies
- Improve planning, strategies & goal-setting



Institutional enablers

- Increase collaboration within and between institutions
 - Joint public procurement
- Leadership in favour of GPP

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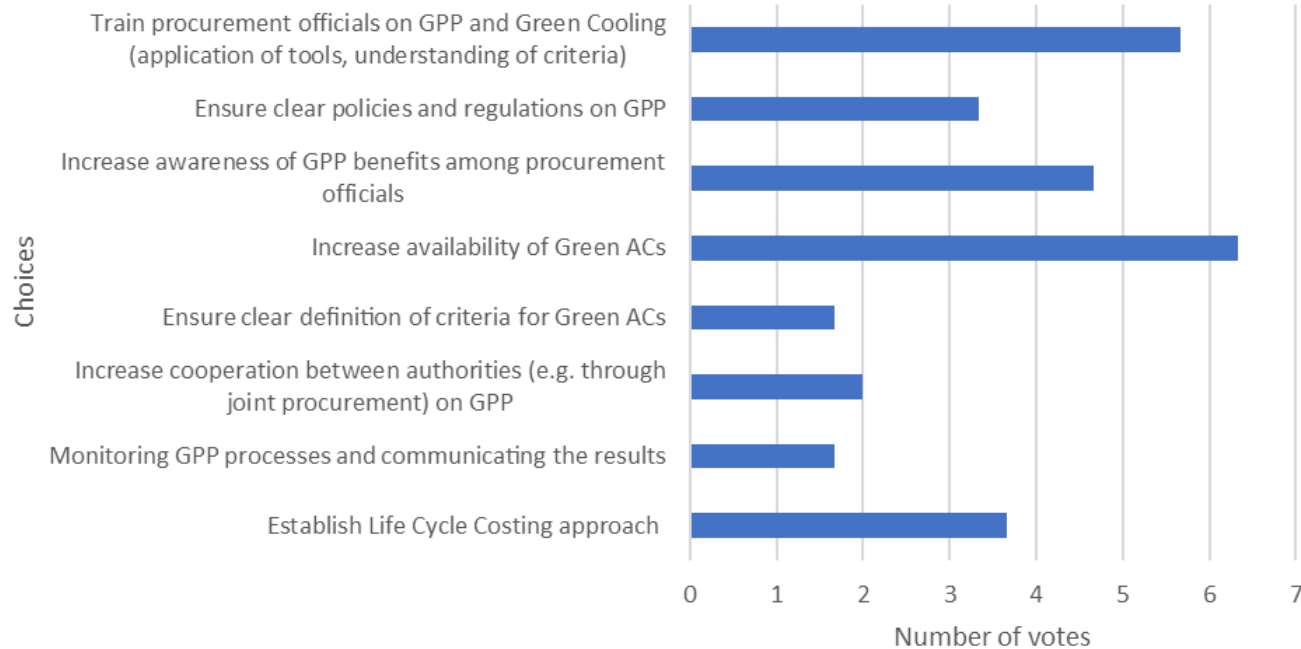
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What are enablers specifically for
Green Cooling technology?
Choose your Top 3 priorities.
(1= highest priority)

What are enablers specifically for Green Cooling technology? Choose your top 3 priorities. (1 = highest priority)



Enablers for GPP of cooling appliances*

To what extent do you agree or disagree with the following enablers for purchasing Green AC through public procurement?

Statement		Strongly Disagree	Disagree	Neutral	Agree	Strongly agree	Score
Train procurement officials on GCPP (application of tools, understanding of criteria)		0	0	1	5	4	13
Increase awareness of GCPP benefits among procurement officials		0	0	3	2	5	12
Ensure clear policies and regulations on GCPP		0	0	2	2	5	12
Ensure consideration of a Life Cycle Costing approach for green cooling technologies		0	0	1	7	2	11
Increase availability of green cooling technologies		0	1	3	0	6	11
Increase cooperation between authorities (e.g. through joint procurement) on GCPP		0	0	3	2	4	10
Ensure clear definition of criteria for green cooling technologies		0	1	3	2	4	9
Monitoring GCPP processes and communicating the results		0	0	4	4	2	8

* Based on survey responses from procurement professionals



Thank you

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Admissibility Criteria, Guiding Steps & Country Cases

Lara Teutsch, GIZ Proklima



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Performance criteria for cooling equipment

	Technical Performance	Life-Cycle-Cost performance	Environmental performance
Features	<ul style="list-style-type: none"> - Energy-efficiency - reliability (lubricant and materials compatibility, service life) 	cost of purchase, transport, installation, maintenance, operation, and retirement (recycle of material, recovery and reuse or destruction of ozone-depleting or GHG refrigerants)	<ul style="list-style-type: none"> - Lifetime GHG emissions of product - Other environmental impacts of hazardous substances
Metric	<ul style="list-style-type: none"> - Energy Efficiency Ratio (EER) - Seasonal Energy Efficiency Ratio (SEER) - Coefficient of Performance (COP) - Warrenties 	<ul style="list-style-type: none"> - Life Cycle Cost Analysis (LCCA) 	<ul style="list-style-type: none"> - Life Cycle Climate Performance (LCCP) - Total Equivalent Warming Impact (TEWI)

Assessing TEWI and LCC of Green ACs – Exemplary Case

Criterion	Baseline AC	Green AC
Cooling capacity (kW)*	5.05	5.05
Energy efficiency ratio (W/W)*	3.33	4.3
Annual operating hours (h)	2,534	2,534
Lifetime (years)	15	15
Refrigerant type*	63% R22; 35% R410A; 2% R32	R290
Average GWP	1,796	3
Initial refrigerant charge (kg)*	1.49	0.34
Annual refrigerant leakage	20.1%	20.1%
Annual energy consumption (kWh)	2,882	2,232
Grid emission factor	0.467 kg CO ₂ /kWh	0.467 kg CO ₂ /kWh
Direct annual GHG emissions (kg CO ₂ eq)	538	0.21
Indirect annual GHG emissions (kg CO ₂ eq)	1,332	1,032
TEWI (Total annual GHG emissions (kg CO₂eq))*	1,870	1,032




* Information to be submitted by contracting partner. TEWI can be conducted by contracting authority or require contractor to calculate TEWI

Life-Cycle Costs	Baseline AC	Green AC
Purchase Costs	900€*	990€**
Installation Costs*	500€	500€
Repair and maintenance costs*	8.5€/a	8.5€/a
Operating costs resulted from electricity consumption (annual electricity consumption x electricity price***)	865 €/a	670 €/a
Uninstalling costs *	250€	250€
Total / LCC	14,753 €	11,918 €

*Based on [UBA, 2018](#)

**Based on [c_2020_6637_en.pdf \(europa.eu\)](#)

*** 0.3 €/kWh ([Öko-Institut, 2016](#))



20 % cost-savings
Without taking into account
increasing HFC prices

Guiding Steps



- 1. Assess the Green Cooling potential in your public building / in the public sector**
 - Inventory of cooling technologies in use and assessment of technology options
 - Analysis of GHG, energy and cost saving potential
 - GIZ Proklima can provide guidance and reference on Best Available Green Cooling Technologies
- 2. Secure commitment and define Green AC procurement target**
 - Implement detailed sustainability or environmental-related procurement laws.
 - Budget to cover higher upfront finance
- 3. Formulation / review of Green Public Procurement guideline**
 - Define admissibility criteria on AC equipment performance
 - GIZ Proklima is currently developing model criteria and scoring template
- 4. Update public procurement procedures and documents**
 - Procurement catalogues, tender and evaluation forms
 - Centralize procurement processes and use bulk or joint public procurement
- 5. Train procurement officers and related officials**
- 6. Identify best-practices in procurement within the organization (e.g LED Lights)**





Country Case: Costa Rica

- Pioneer in SPP and GPP in Latin America
- Development of legal framework for SPP
- Extensive information material for (green) procurement (e.g Manuel for implementation of green purchase)
- Institutionalisation of GPP through official committees: assignment of advisory GPP bodies and GPP committees to enhance collaboration
- Development of sustainable admissability criteria for various product groups

Success Factors:

- Admissibility criteria for setting clear minimum criteria
- Law enforcement for implementation of GPP
- Enhanced collaboration between procurement staff and technical staff
- Verification and Monitoring



Country Case: India

Bulk Procurement of 100,000 energy-efficient (min. 5.2 ISEER) split ACs for residential & public institutions by EESL

- to accelerate the market penetration of top efficiency cooling appliances
- 40% of the bids went towards a low-GWP refrigerant.
- 687 \$ per Unit

Lessons Learned














- Lower costs through bulk procurement
- Acceleration of sustainable refrigerant market development in line with HFC phase-down
- Take into account both: life cycle costs and climate impact rather than focusing on purchase price

Success Factor: Bulk Procurement

Tender Specifications

- 1.5 TR
- Window or split
- ISEER 5.2 or greater
- 1 (+2) year warranty
- Additional component warranty - 5 years warranty on condenser/evaporator coil and 10 years warranty on compressor
- Design, manufacture, supply, Installation and after-sales services
- No mention of Low-GWP refrigerant requirement

Other best practice cases for GPP

Country	Product	Procuring organisation	Key success factors	Related to category of barriers & enablers	
South-Korea ^a	LED Lights	National Health Insurance Service	Country-wide legal mandate to purchase environmentally friendly products	Regulatory & political	
			Establishment of Internal Green Procurement Guidelines	Regulatory & political	
			Inclusion of LED lights in the internal energy saving initiative	Regulatory & political	
Japan ^a	Ballpoint pens	Japanese ministries	Institutionalised legal framework for green procurement, which mandatory for all central government organisations, in order to enhance GPP	Regulatory & political	
			availability of information about eco-labelled products. Ministry of Environment had facilitated awareness raising on this	Informational and capacity-related	
Denmark ^b	Indoor and outdoor lighting	City of Kolding	Division of tender into three sub-groups, to allow SMEs to bid as well as larger suppliers.	Technical and/or institutional	
			Creativity in award criteria and scoring: - Life-cycle costs (55%), of which Purchase price (35%), lifetime (35%) & operating costs (30%) - Energy efficiency (25%) - Light quality (20%)	Informational and capacity-related and/or regulatory and political	 
			Before procurement process started, dialogues with a number of potential suppliers, to obtain knowledge about possible sustainability aspects.	Institutional	
United States ^c	Various cooling appliances	Various US departments	Sector-specific fact sheets and websites on HFC use & feasible alternatives	Informational and technical	 
			Case study to explore possibilities	Informational and technical	 

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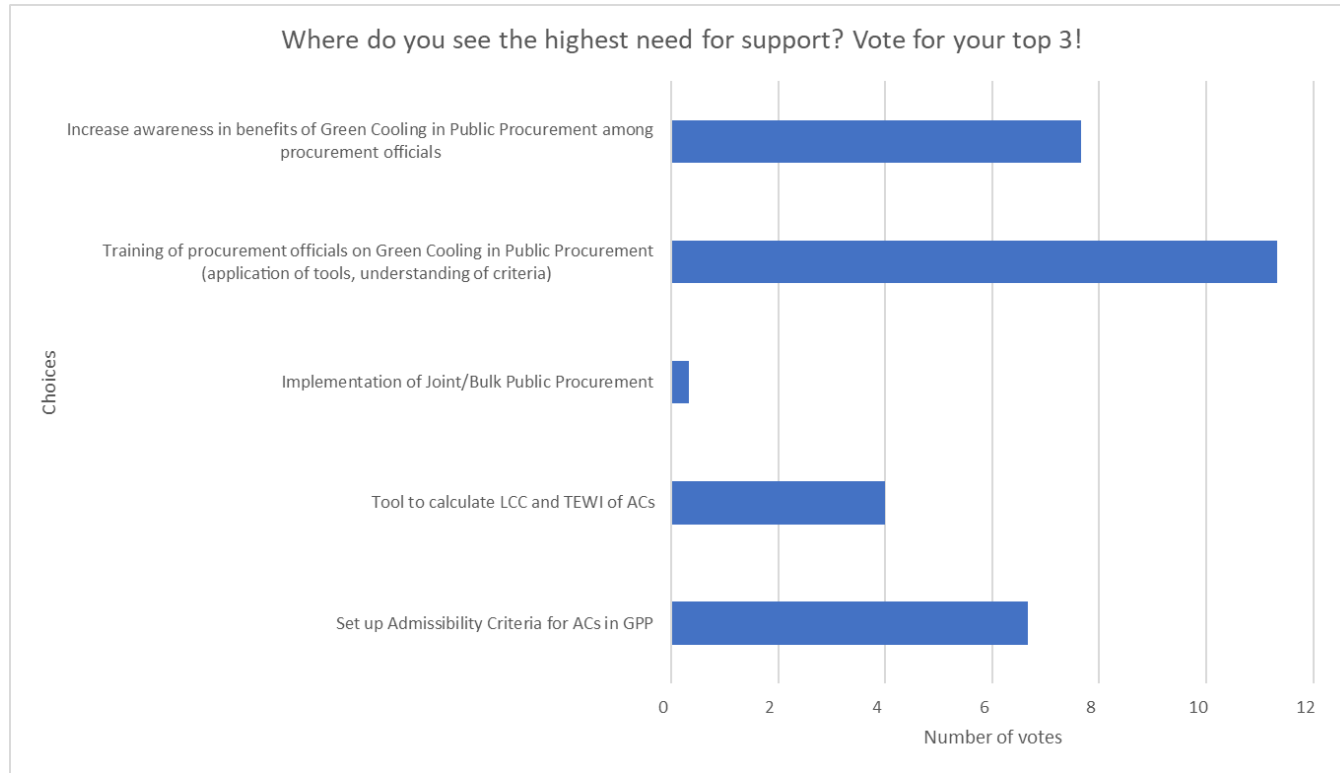
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Where do you see the
highest need for support?
Vote for your top 3!





Do you have any
questions for Philipp,
Lukas or Lara?

Any remarks regarding
the study?

Contact



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