MONTREAL PROTOCOL AND ENERGY EFFICIENCY-LINKED INITIATIVES

EARLY EXPERIENCE

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WORLD BANK GROUP
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Working Together on a Triple Win

Montreal Protocol and Energy Efficiency-linked Initiatives: Early Experience

- Early experience under the Multilateral Fund (MLF) for delivering on an MP and EE-linked agenda
- Program for Mainstreaming the Montreal Protocol (MP) into Bank Operations
- HCFC phase-out in the air-conditioning (AC) sector
- AC Manufacturing Readiness for Market Transformation to Energy Efficient AC
- MLF and HFC phase down initiatives

MP and EE-linked Agenda: Early MLF Experience

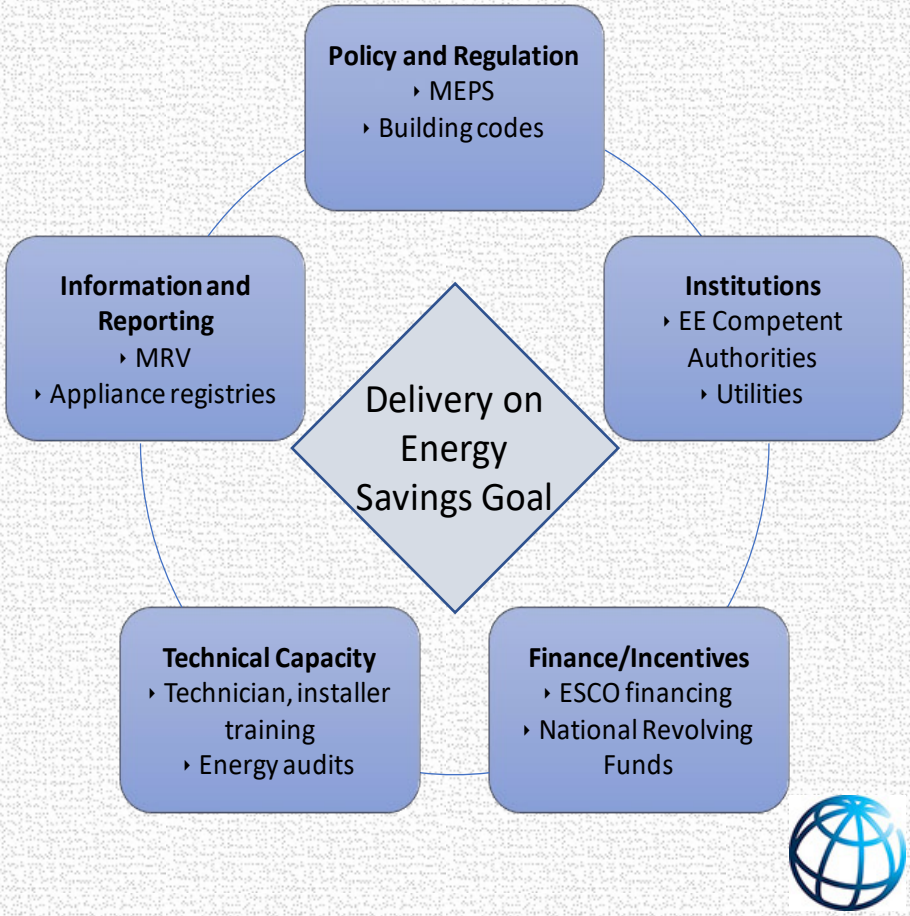
- Ongoing discussions at the level of the MP Parties on what is needed to “enhance and maintain” EE during HFC phase-down. These have centered on:
  - Delivery approaches & mechanisms
  - Cost and financing
  - Technical aspects
- WB study on funding needs and options for climate co-benefits alongside phase-out and phase-down efforts looked at relevant experience up through the Stage I HCFC phase-out period under the World Bank’s MP Program.

MP and EE-linked Agenda: Early Experience

Delivery Approaches & Mechanisms

- Sector plan approach
  - Combines policy and financial incentives for more rapid and coordinated transition of an industrial sector in step with a country's phase-out obligations
  - Includes technical assistance & capacity building support for country implementation and for stakeholders (public, industry and policy-setting and enforcement bodies).
  - Main delivery approach used by the MLF

Categories and examples of elements that promote EE:



MP and EE-linked Agenda: Early Experience

Delivery Approaches & Mechanisms

- With its MP partner countries, WB developed over the years approaches and mechanisms, often market-based to better deliver grant financing (that was limited and/or directed to SMEs)

- Chiller Replacement Projects
  - Thailand, Mexico and Turkey
  - Analytical work (India)
  - Global Chiller Replacement Project

Delivery Mechanisms Tested under the MLF

- Concessional lending
- Special funding windows
- Line of grants
- Financial intermediaries
- Revolving funds and on-lending
- Auctions, vouchers, and other market-based mechanisms

- First to finance EE alongside MP objectives
  - Replace old inefficient, ODS chillers (focus on the demand side)
  - Financed under a special window because of incremental cost savings – to demonstrate how to leverage co-financing for environmental co-benefits (MLF, GEF, etc.)

MP and EE-linked Agenda: Early MLF Experience

Finance

- Coordinating different sources of finance for more comprehensive sector transformation **is complicated** and experience has been limited under the MLF for that reason:
  - Multiple donors with different governance structures
  - Many country stakeholders: ministries for energy, environment, climate and development/finance; national banks, utilities, private sector
  - Series of financial instruments needed depending on the elements/aspects targeted (policy, institutions, technical, implementation
  - Time issue (MLF compliance based)

MLF-WB Chiller Replacement Business Models

- Concessional grants from the MLF and GEF, with the use of a grant subsidy as barrier removal and carbon finance for scale-up
- Concessional loans from the MLF and GEF, with the use of a bank guarantee as barrier removal
- **Revolving fund** with initial MLF and bilateral/ country grants for concessional lending

MP and EE-linked Agenda: Early MLF Experience

Technical

- To address main fear that energy performance would not lead to intended savings was addressed in the original chiller replacement project design:
  - new chillers are equipped with data loggers to record performance,
  - suppliers guarantee performance,
  - owners enter into performance maintenance contracts.

- This was employed to a varying extent in various chiller projects – what was important in all cases was TA and awareness raising (through EPA model, ESCOs, etc.)

Main Elements of the Mexico Appliance Replacement Project

- **Demand-side financial incentives** in the form of vouchers to discount the cost of new AC and refrigerators or as loans – both supported by World Bank credit guarantee;
- **Utility financing** with on-bill credit repayments back to the financier, NAFIN; **increase in energy cost**;
- O**utreach and information** component to create initial demand;
- **Environmental safeguards** that ensured safe disposal of spent appliances and recovery of refrigerants; and,
- **TA**, training and studies (including an MLF-funded study on the potential for carbon credits from CFC destruction in the voluntary carbon market).

Program for Mainstreaming the MP into WB Operations

- CAD$2.2 million from Canada to promote mainstreaming of approaches which integrate: **HCFC phase-out, HFC avoidance and energy efficiency (EE) improvement** in World Bank lending across sectors.
- Assistance helped identify opportunities for HCFC phase-out and HFC minimization / phase-down in WB operations:

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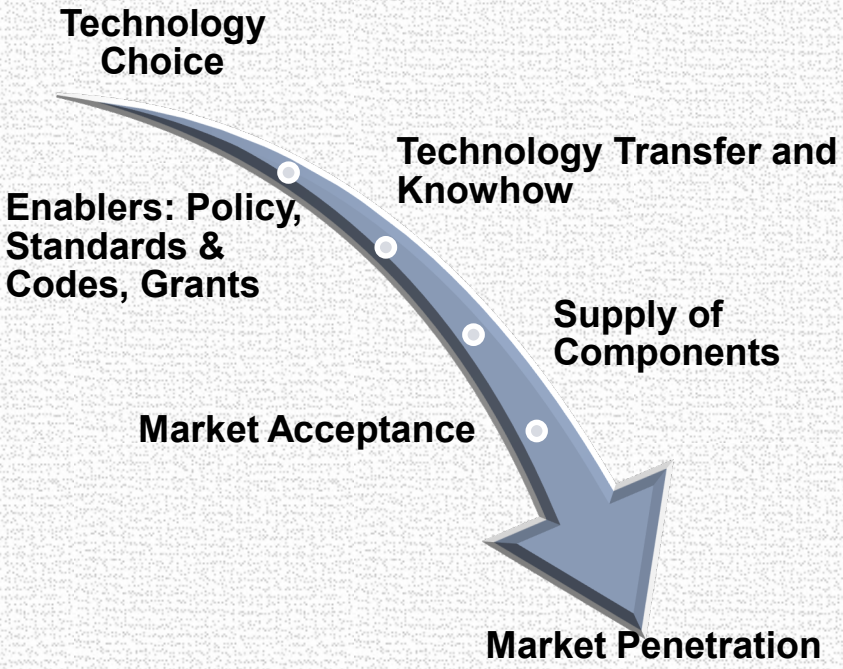
Analytical Work	Technical Work	Awareness Raising/Tools
• Maximizing ozone & climate benefits in the cold chain/ food and seafood processing (Vietnam, Comoros, Madagascar, Indonesia) • Promotion of EE, low-GWP room AC (Pakistan) • Analysis and dialogue on district cooling options (Mexico, Colombia) • Review of WBG EHS guidelines (safeguards)	• TA and transfer of know-how to sole locally-owned compressor manufacturer (Thailand) • EE benchmarking in food processing industry (Vietnam) • Pre-feasibility assessment – District Cooling (Philippines) • Introduction of refrigerants in the IFC EDGE building tool	• COOL community of practice created • Technical guidance notes by sector for avoiding ODS and HFCs • “MP Climate Co-benefit Calculator” to promote low-GWP refrigerants in WBG investments related to refrigeration and AC equipment • Infographics and brochure

HCFC Phase-out in the AC Sector

- Focus on the “supply” side, i.e. conversion of manufacturers.

- Success of Standards & Labelling programs and policies in AC manufacturing countries thus far is largely attributed to the ability of governments to secure industry buy-in. Eventually, both cost and technology become limiting factors and resistance to more ambitious MEPS increases.

- Thailand AC Conversion to R-32 (fixed speed AC):
  - Require synchronized action on several fronts.
  - Critical mass, leadership and coordinated efforts needed to convince component suppliers to fill gap and produce R-32 compressors in larger size range.



- Inverter AC highly competitive and technology and know-how not easily accessed by small companies.

AC Manufacturing Readiness for Market Transformation to EE AC

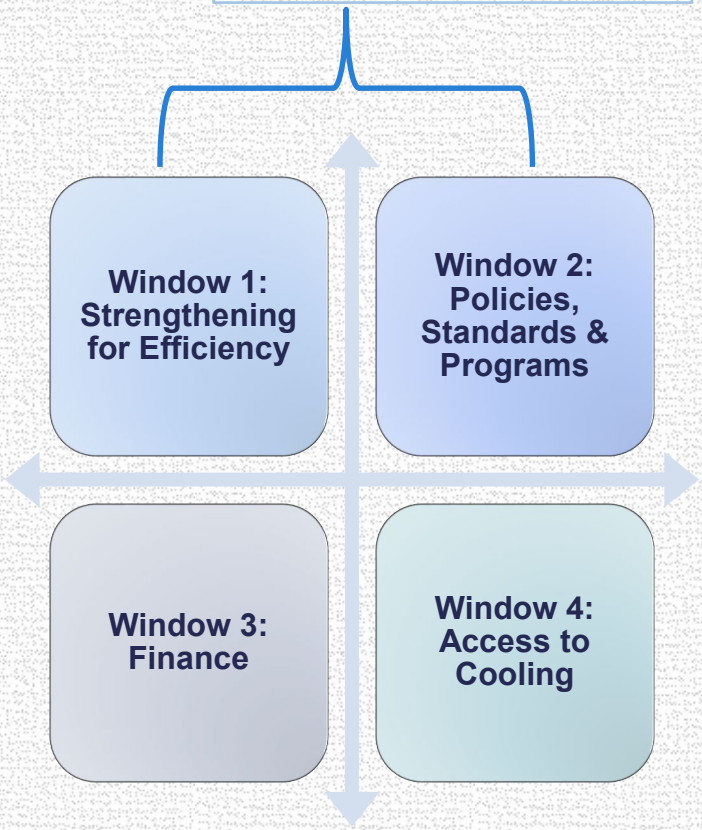
US$2.8 million allocated by K-CEP under Windows 1 & 2

Objective

- Support readiness for longer-term transformation of the market towards lower GWP, high EE residential AC products in three S. East Asian countries

By

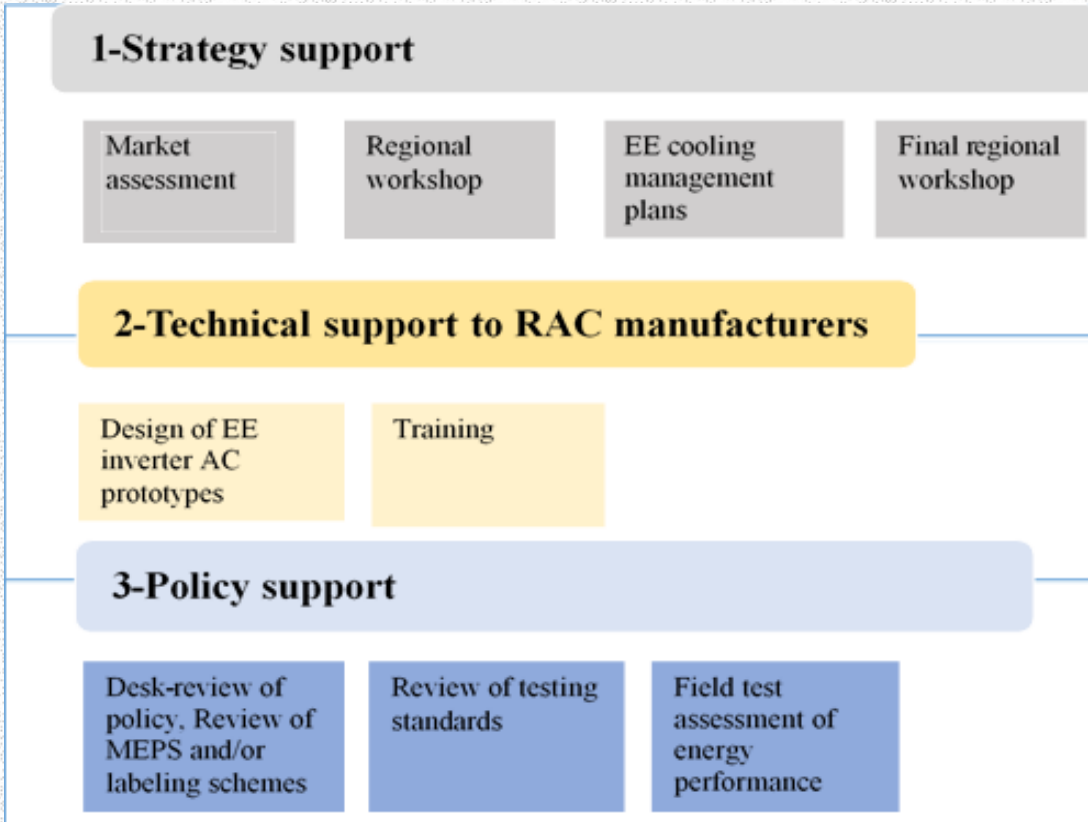
- Creating an enabling environment for the supply and demand of high EERAC with lower GWP refrigerants in domestic markets;
- Strengthening local RAC industry by improving technical capacity to design efficient AC using **inverter technology** and,
- thereby increase the confidence of government regulatory bodies to raise product minimum standards;
- Catalyzing a market shift to more efficient AC with minimized increased costs to help pave the way for an economically viable market.



SOURCE: K-CEP - ECO

Manufacturing Readiness: Approach and Components

- Inverter A/C technology provides superior energy performance and therefore allows for higher energy savings and climate benefits
- Because of slow start-up of inverter A/C, electrical surges are avoided, reducing peak electricity demand
- Consumer demand for high EE AC in developing countries is there but higher prices prevents greater market penetration
- Access to inverter technology is a major challenge for most local manufacturers



Manufacturing Readiness: Approach and Components

Technology transfer modality

Project to replicate modality employed successfully by the MP community: focus on the product "supply" side instead of demand side. Similar to refrigerant conversion of single speed AC supported by the MLF

Direct beneficiaries are local AC manufacturers; indirect beneficiaries: Government (policy buy-in) and Consumers (lower EE AC cost in a competitive market)

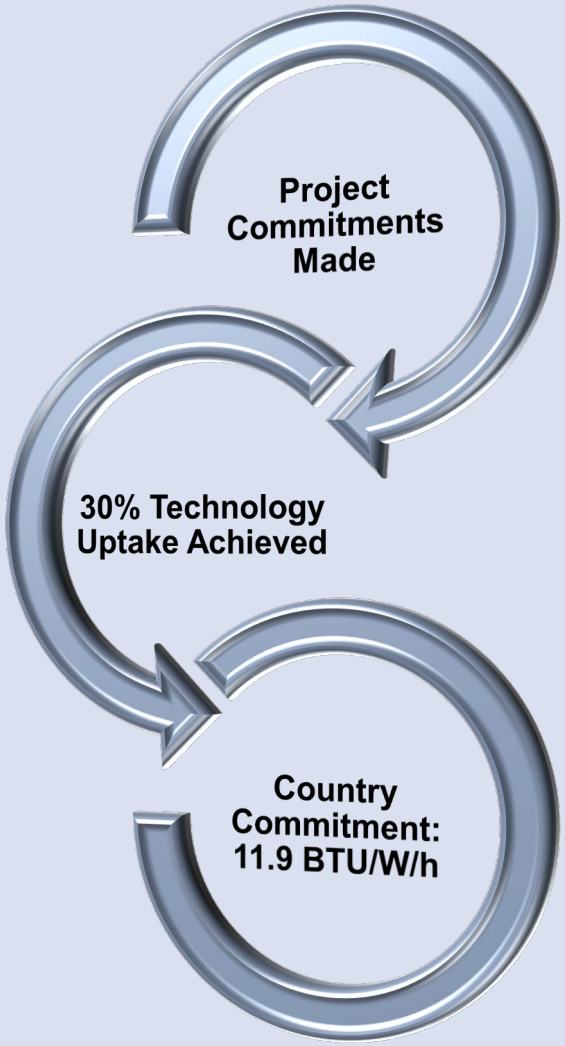
Competitive selection of technology provider. Betting on a provider stepping up that sees a benefit in a more competitive higher EE AC market.

Tech transfer to transformation – how and who benefits?

- If a critical mass of local manufacturers have inverter technology, component pricing in the Region will go down.
- Wider breadth for policy reform (higher MEPS, energy pricing, etc.)

Expected Results: Policy Targets

- Target tentatively set by each country to increase the SHINE MEP of **9.9 BTU/W/h (2.9 W/W)** by 20%.
- Upper level target: to aspire to 5.5 W/W.
- Plans prepared for revision of MEPS and/or energy rating labeling schemes for AC according to levels to be reached by local AC manufacturers.
- Local AC manufacturers start / complete conversion from R-22 thru MLF HCFC Phase-out Management Plans.
- Upon completion of project's technical support component…if **30% of local manufacturers in the country are capable to manufacture climate friendly RAC** using inverter technology and lower GWP refrigerant, then….
- **Governments agree to implement revised MEPS target** and this is reflected in the final cooling plans.



Expected Results

Component	Outcomes
1	(1) Increased stakeholder awareness of EE opportunities in residential AC sector (2) Enhanced readiness for AC market transformation through knowledge of the level of ambition for standards and labels based on expanded industry capacity (3) Strengthened coordination and collaboration on MP and EE between the three countries.
2	(4) Skills improved of staff and technicians from the local AC manufacturing industry. (5) Increased market demand and access to climate friendly cooling equipment. (6) Increased private sector investment in climate-friendly RAC manufacturing
3	(7) MEPS and labeling policies with higher EE levels integrated into EE cooling management plans

Multilateral Fund and HFC Phase-down

- MLF grant funding for HFC phase down to date:
  - MLF core funding
    - Ozone depleting substances alternative surveys
    - Low-GWP alternative technology demo projects
  - $27 million Fast-Start contribution
    - HFC enabling activities
    - Investments that demonstrate approaches/technologies for faster HFC phase-down

- Despite the Kigali Amendment decision that the MLF shall be the main source of grant financing for MP implementation, there is not only a push but also more of an acceptance of the need to look elsewhere for financing most EE initiatives.

- Nonetheless…MOP Decision XXX/5 requests the MLF to consider flexibility in approved HFC enabling activities to direct part towards EE policy and training support as related to the phase down of HFC such as:
  - developing and enforcing policies and regulations to avoid market penetration of energy inefficient refrigeration, AC and heat-pump equipment
  - promoting access to EE technologies in these sectors
  - training on certification, safety and standards, awareness-raising and capacity-building

HFC Enabling Activities and WBG Overall Approach

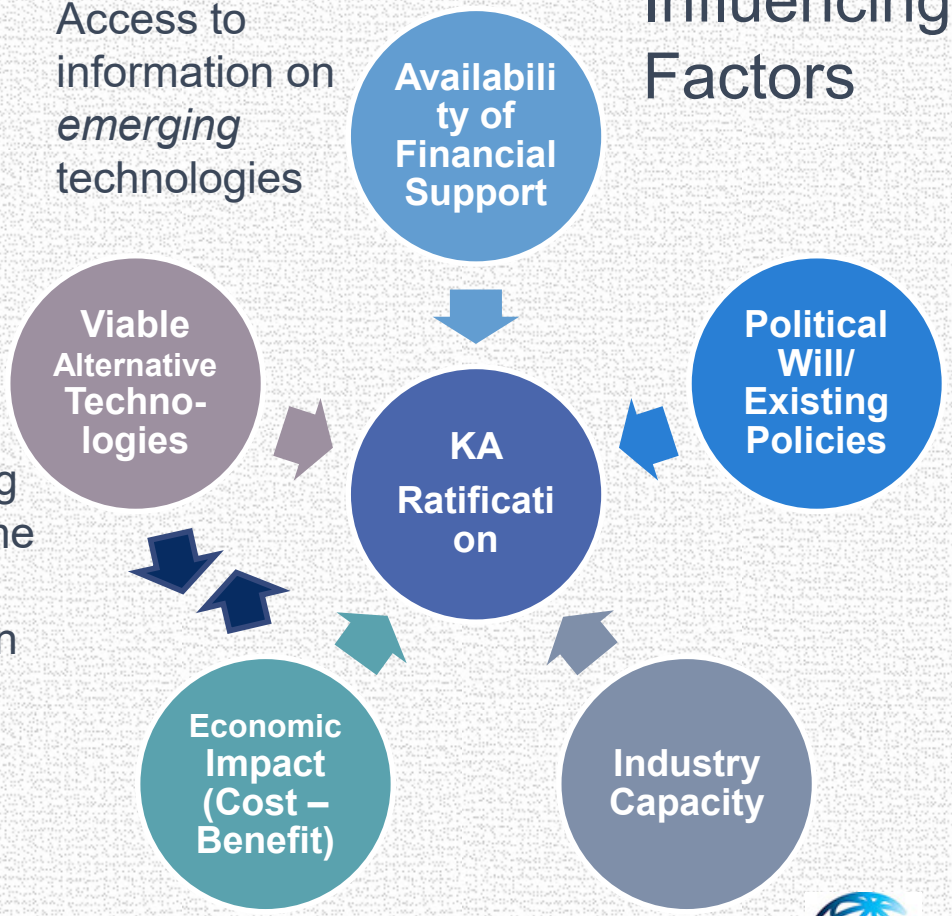
Main Objective

- Development of a technology pathways to identify commercially and economically (cost-competitive) viable HFC phase-down scenarios taking into account actual and projected state of alternatives and alternative technologies for relevant applications/ subsectors

- This will inform 1) development of country strategies on regulatory, policy and any voluntary measures needed for KA ratification and 2) priority sectors to target in implementation.

Challenge: Access to information on *emerging* technologies

Determining the right time for HFC phase down

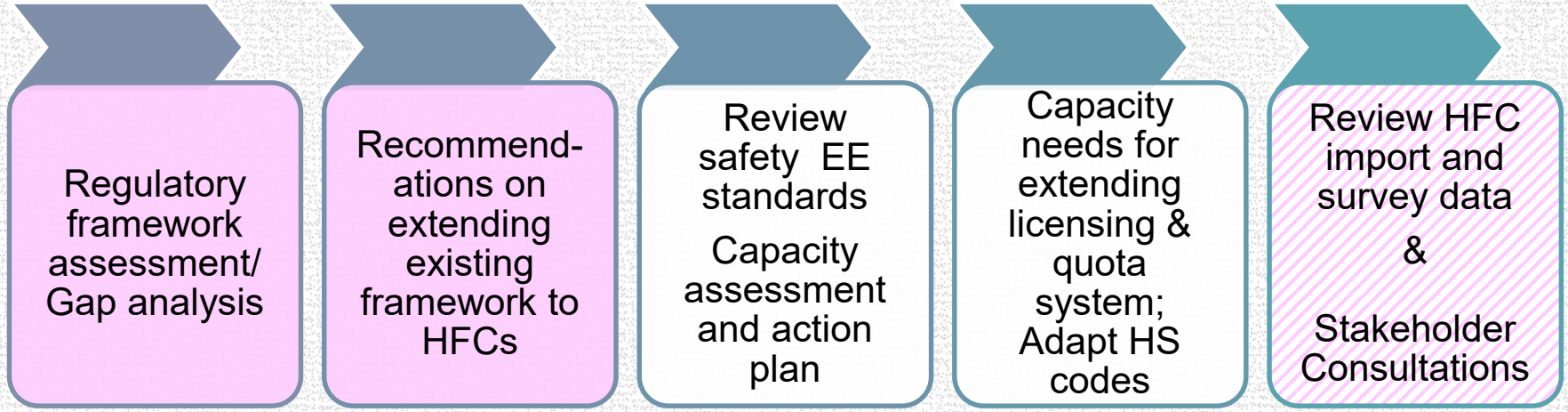


HFC Enabling Activities and WBG Overall Approach

- Series of initiatives including analytics, technical support and consultations

- Ground Work Needed (done in some cases)
  - HFC consumption and production data by sector;
  - Growth scenarios in order to project what the country's baseline might be; and
  - Understanding of the regulatory framework (MP, energy, climate), key stakeholders (private and public) including from the energy /urban sectors

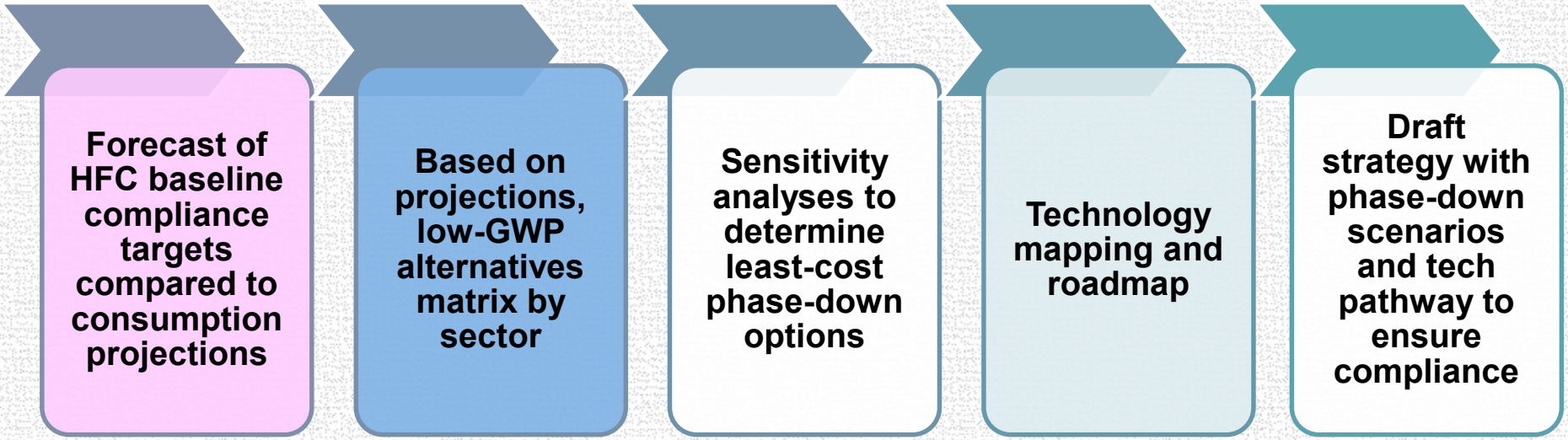
Track 1



HFC Enabling Activities and WBG Overall Approach

- Assessment of the implication of the KA on a country's economy and industry
- Determination of timing to proceed with ratification
- Identification of policy and regulatory actions that enable country to comply with initial HFC phase-down obligations
- Prioritize actions for proceeding with stepped HFC phase down in an economically viable and, advantageous manner…

Track 2



- What's next?
  - Need to see how the MOP decision is addressed next week; revisit overall enabling activity approach, discuss with each country and determine revisions if any to TORs