

Hydrofluorocarbon (HFC) regulations in Singapore

Presented at: Singapore Study Tour – ASEAN Cool

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Labelling and Standards Department

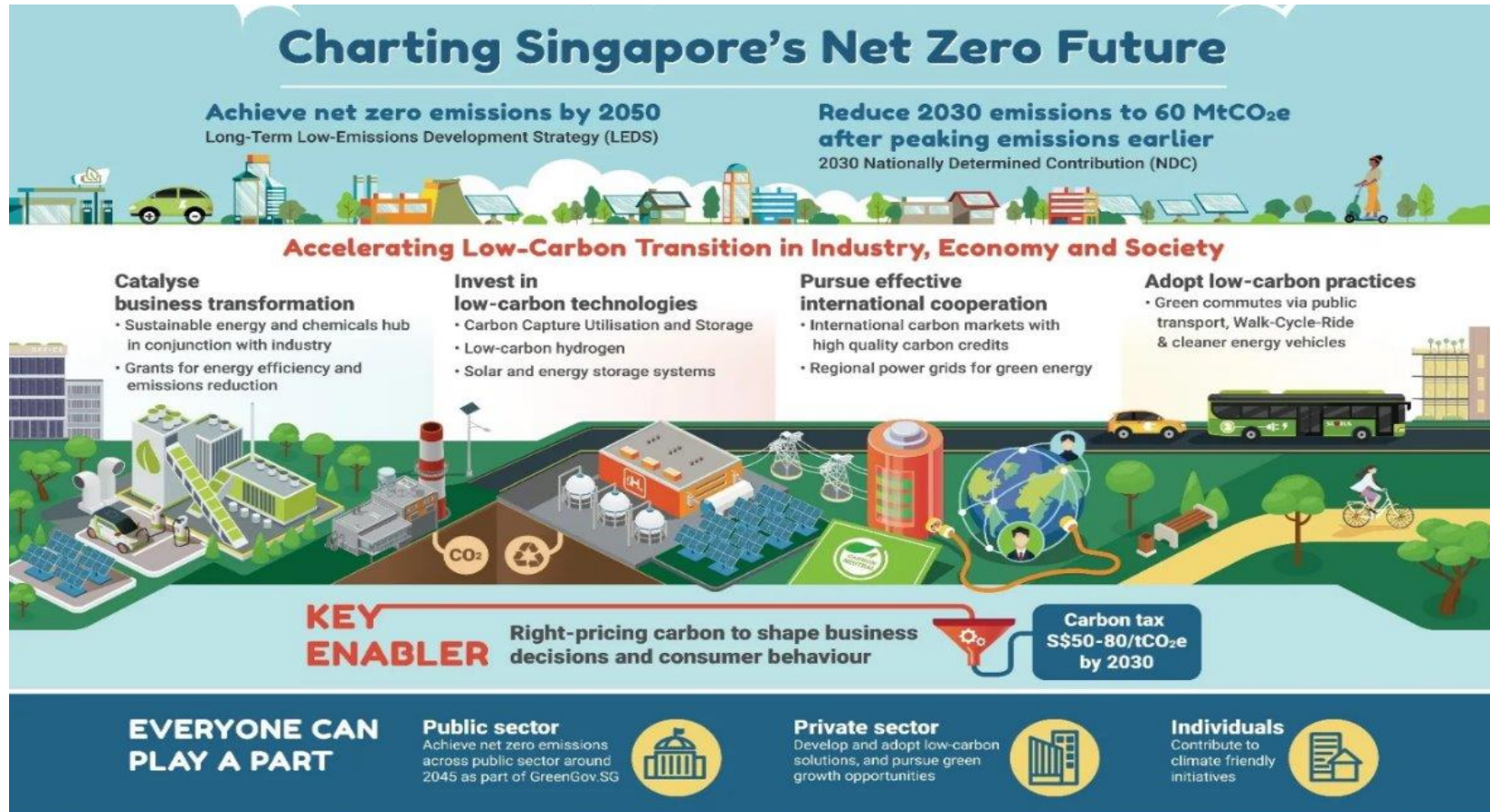
Carbon Mitigation Division

National Environment Agency, Singapore

Background – Commitment

In support of the Paris Agreement, Singapore has ratified its enhanced climate pledge, or Nationally Determined Contribution (NDC) to:

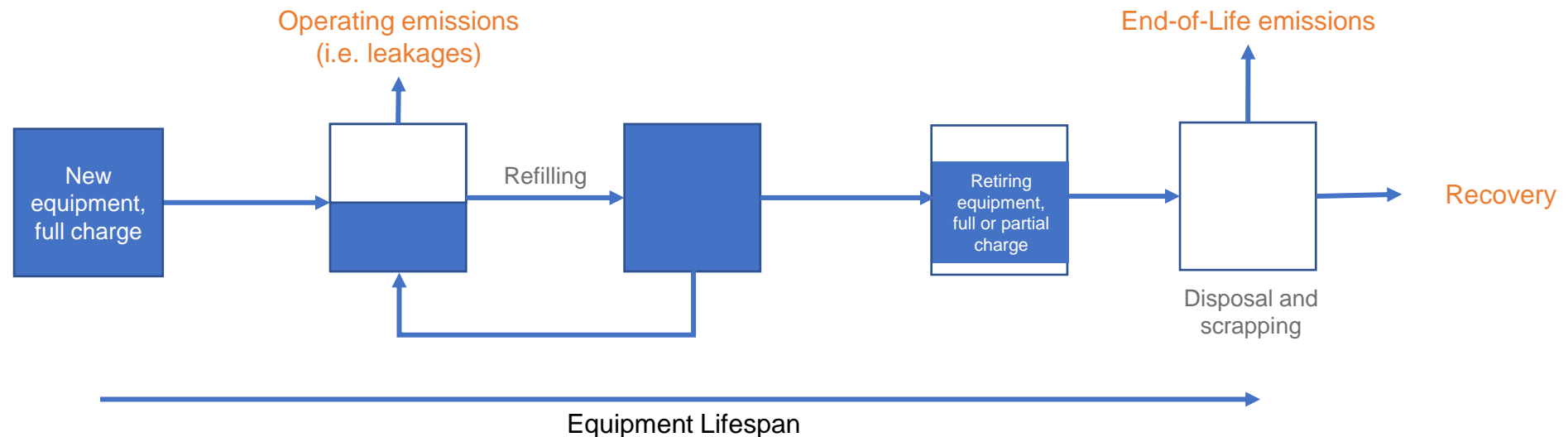
- reduce emissions to around 60 MtCO₂e in 2030, after peaking emissions earlier.
- and achieve net zero emissions by 2050.



Reducing Carbon Emissions from HFC-RAC Equipment

- Hydrofluorocarbons (HFCs) refrigerants used in refrigeration and air-conditioning (RAC) equipment are potent greenhouse gases that contribute significantly to global warming.

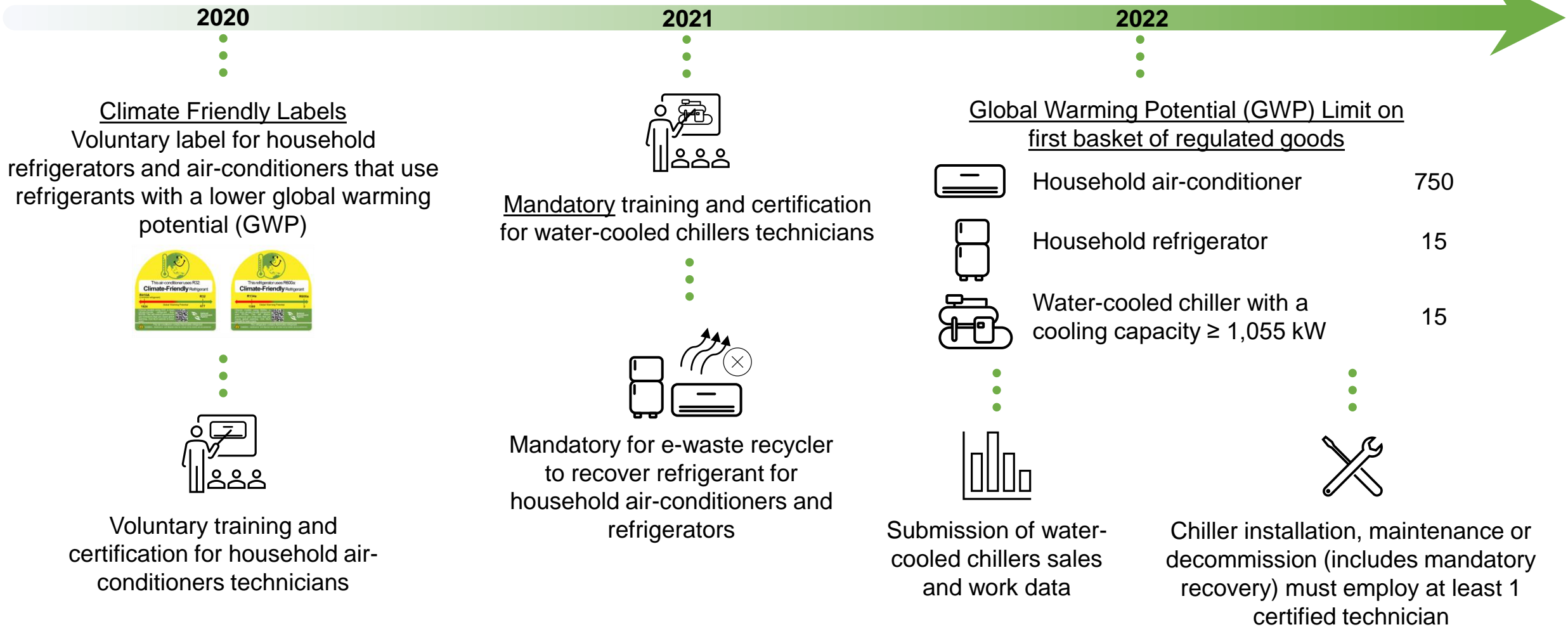
Life cycle of HFC-RAC equipment



- Singapore has implemented measures targeting operating emissions and end-of-life emissions from use of HFC refrigerants in household air-conditioners and refrigerators, and water-cooled chillers¹.

¹ With a cooling capacity of 1,055 kW or more that is used to produce chilled water for space cooling

Timeline of Singapore's HFC Emission Control Measures



Singapore is studying feasibility of introducing measures to cover more RAC equipment.

Singapore's Regulatory Framework for Water-cooled Chillers

Registration with NEA as a GHG entity

Registration of water-cooled chiller models (GWP <15 for capacity ≥1055kW)

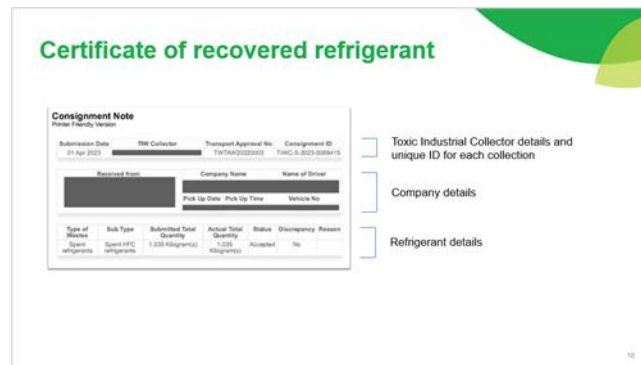
- Test report/ Technical data sheet of water-cooled chiller models in accordance with AHRI 551/591 standards
- Photo of Chiller and Nameplate



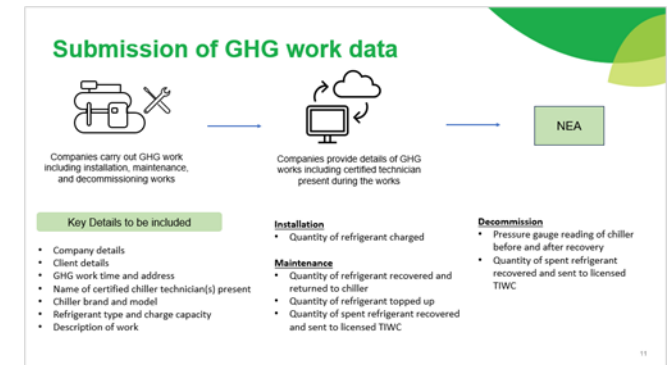
At least one certified chiller technician during installation, maintenance, and decommissioning works (GHG works)

- Must complete the Refrigerant Handling for Chillers course conducted by Temasek Polytechnic and pass an assessment test.

Recovery of spent refrigerants with GWP of more than 15 and sent to a Toxic Industrial Waste Collector (TIWC) authorized by NEA



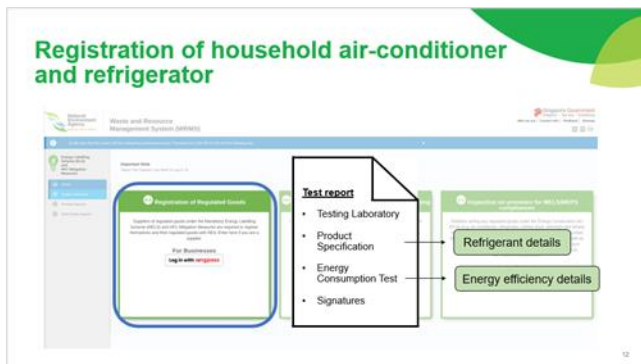
Maintain and submit proper records of regulated GHG works.



Singapore's Regulatory Framework for Household Air-conditioners and Refrigerators

Registration of company and regulated air-conditioner (GWP <750) and refrigerator (GWP <15) models

- Registration is done in together with the MELS and MEPS requirement
- One registration for both HFC and EE regulations



Voluntary* courses to upkeep competency of technicians

Institute of Technical Education offers the following courses:

- Certificate of Competency in Residential Air-Conditioning System (Refrigerant)
- Air-Conditioning – R32 Safety Awareness Training

*These courses are mandatory for installation / maintenance of R32 air-conditioners under SCDF's [regulations](#) for fire safety

Mandatory recovery of household RAC equipment

- E-waste recyclers, who take in household RAC equipment for recycling, are prohibited from venting spent refrigerants.
- Spent refrigerants are collected by a Toxic Industrial Waste Collector (TIWC)

Feasibility Study to Develop Mitigation Measures for other HFC Applications

HFC Applications Covered

- Commercial refrigeration
- Mobile Air-conditioning
- Industrial refrigeration
- Non-regulated chillers
- Variable refrigerant flow air-conditioners (VRFs)
- Refrigerated transport units
- Fire suppression systems



Approach

- Review HFC mitigation measures in other jurisdictions
- Consultations with industry stakeholders (e.g. equipment suppliers, refrigerant recovery companies, major equipment users)
- Information collection on equipment sales, costs (e.g. for low GWP refrigerants and equipment, recovery of refrigerant), availability

Thank you!

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