

sheccoBase global policy update



ATMOsphere Asia
Bangkok, 6 September 2017

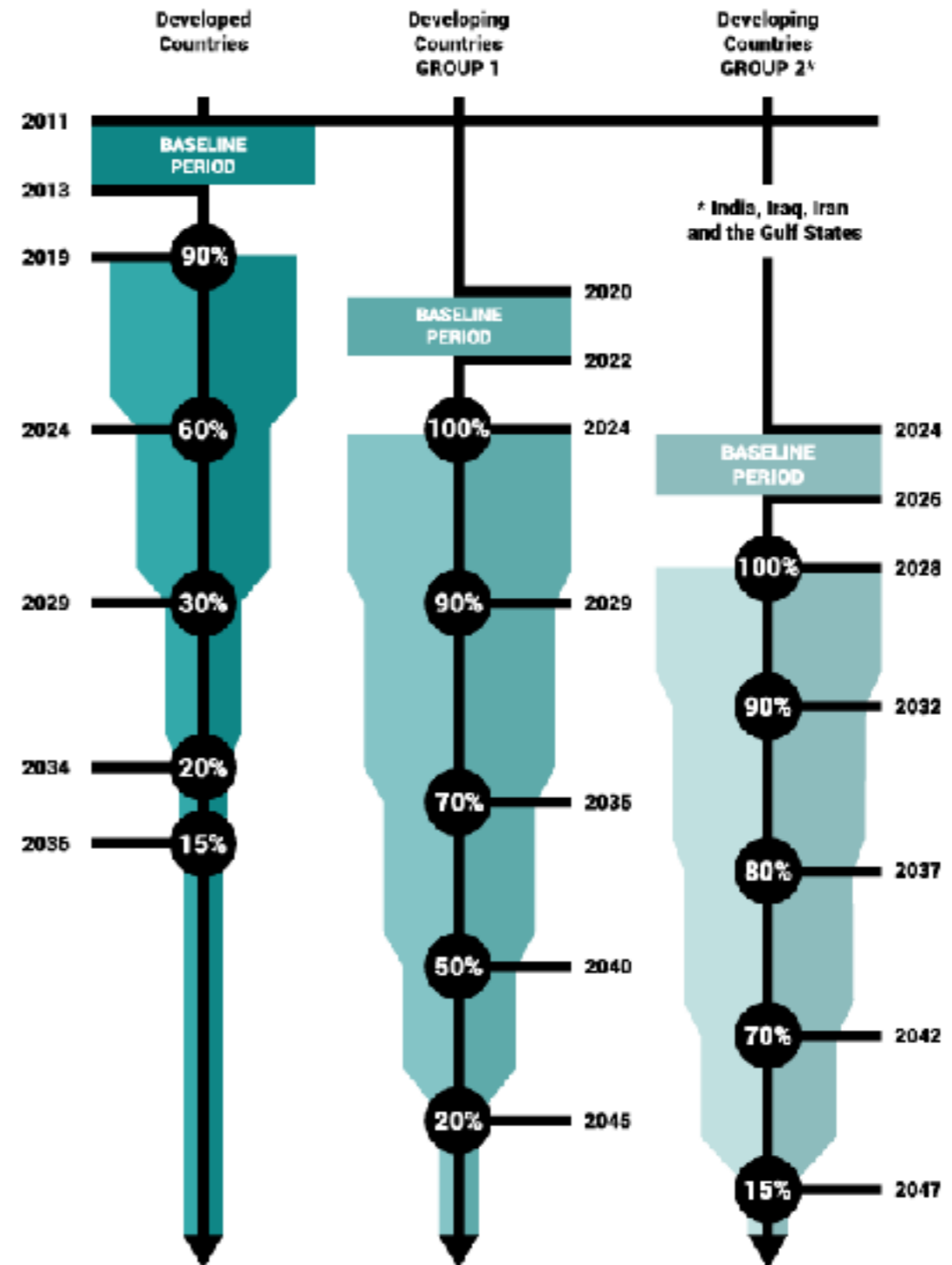
Alvaro de Oña, group COO, shecco

POLICY TRENDS - INTERNATIONAL



KIGALI AMENDMENT: GLOBAL DRIVER FOR CHANGE

- Global phase-down of HFCs by **85% by late 2040s** - first reductions by developed countries as of 2019, by most developing countries as of 2024
- Phase-down schedules by groups of countries under Montreal Protocol
- Based on baseline period, against which reductions are measured
- **Entry into force:** 1 January 2019 if 20 or more countries ratify it



If fully implemented: Kigali can reduce 0,5° of global warming by 2050

Message to market:

HFCs on their way out

Alternative technology needed on a **GLOBAL** scale

Top priorities: standards (initiated by China), access to finance, exemptions

Next key meeting

20-24 Nov: **29th Meeting of the Parties of the Montreal Protocol** (Montreal, Canada)

STANDARDS: KEY DEBATE FOR HYDROCARBONS



- **Standard IEC 60335-2-89** (household and similar electrical appliances) currently recommends charge limit of hydrocarbons at 150g
- On-going review: agreement on recommended limit expected by 2018: **raising the limits to 500g** likely
- 26 Working Group members (including Germany, NZ, Japan, US)
- A new IEC standard would influence the adoption of the same standards at national level across the world
- **Next step:** Submission of the proposal to the SC61C committee to go to the first official vote as a Committee Draft (CDV) in October in Vladivostok
- HC charge limit set by another standard - **IEC 60335-2-40** for air-conditioning, heat pumps - currently being discussed as well
- **Potentially opening up further opportunities to hydrocarbons globally**

POLICY TRENDS - EUROPE



EUROPE: EU F-GAS REGULATION OVERVIEW

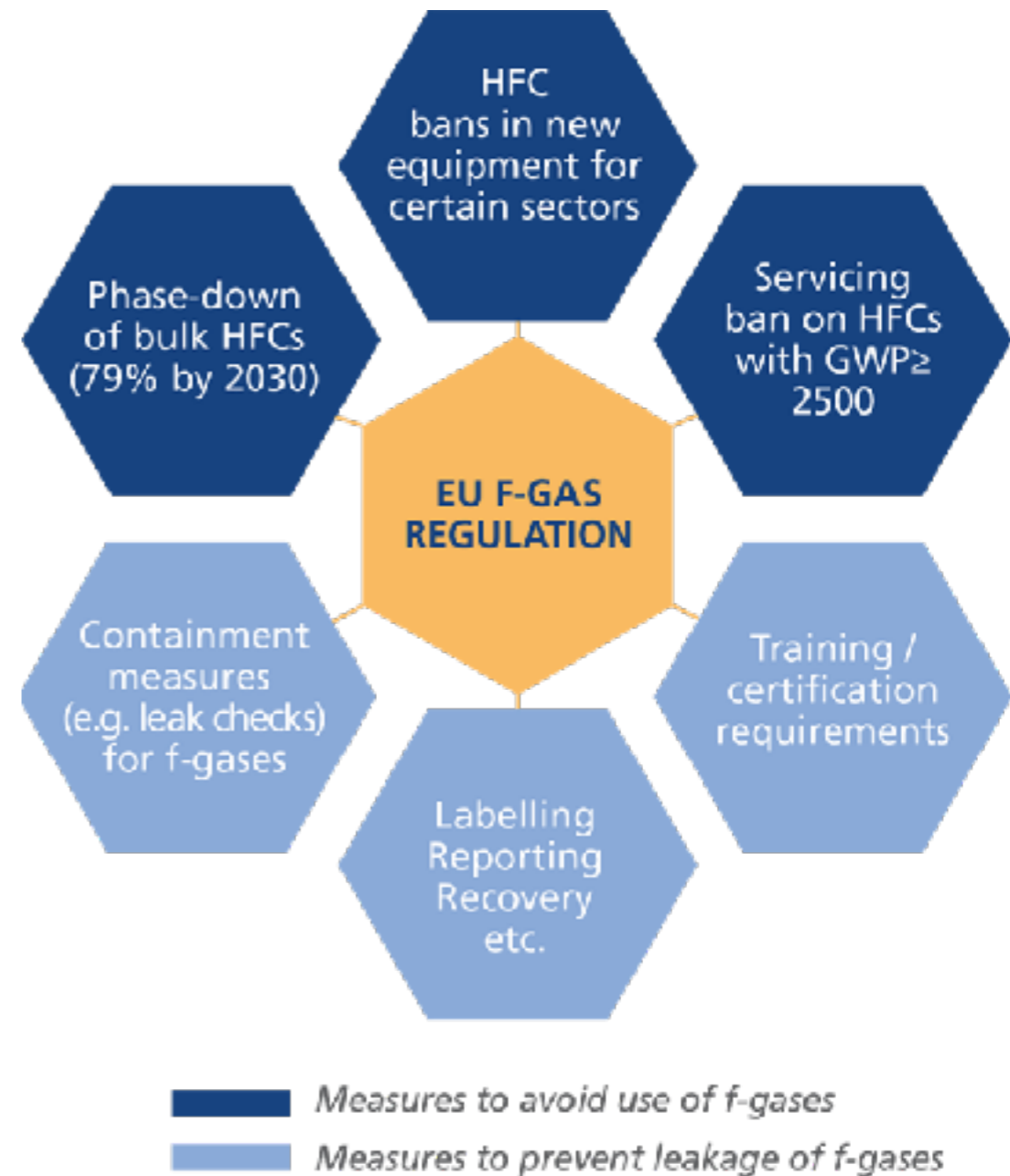
Key elements of the F-Gas Regulation

Entered into force in 2015

Introduced a number of measures to limit F-gas emissions

Aims to reduce HFC emissions by 79% by 2030 (compared to 2009-2012)

= the average GWP of HFCs will have to fall from today's 2,000 to about 400 by 2030 across all sectors



EUROPE: EU F-GAS REGULATION

HFC phase-down

2016: 7% cut in HFC quotas

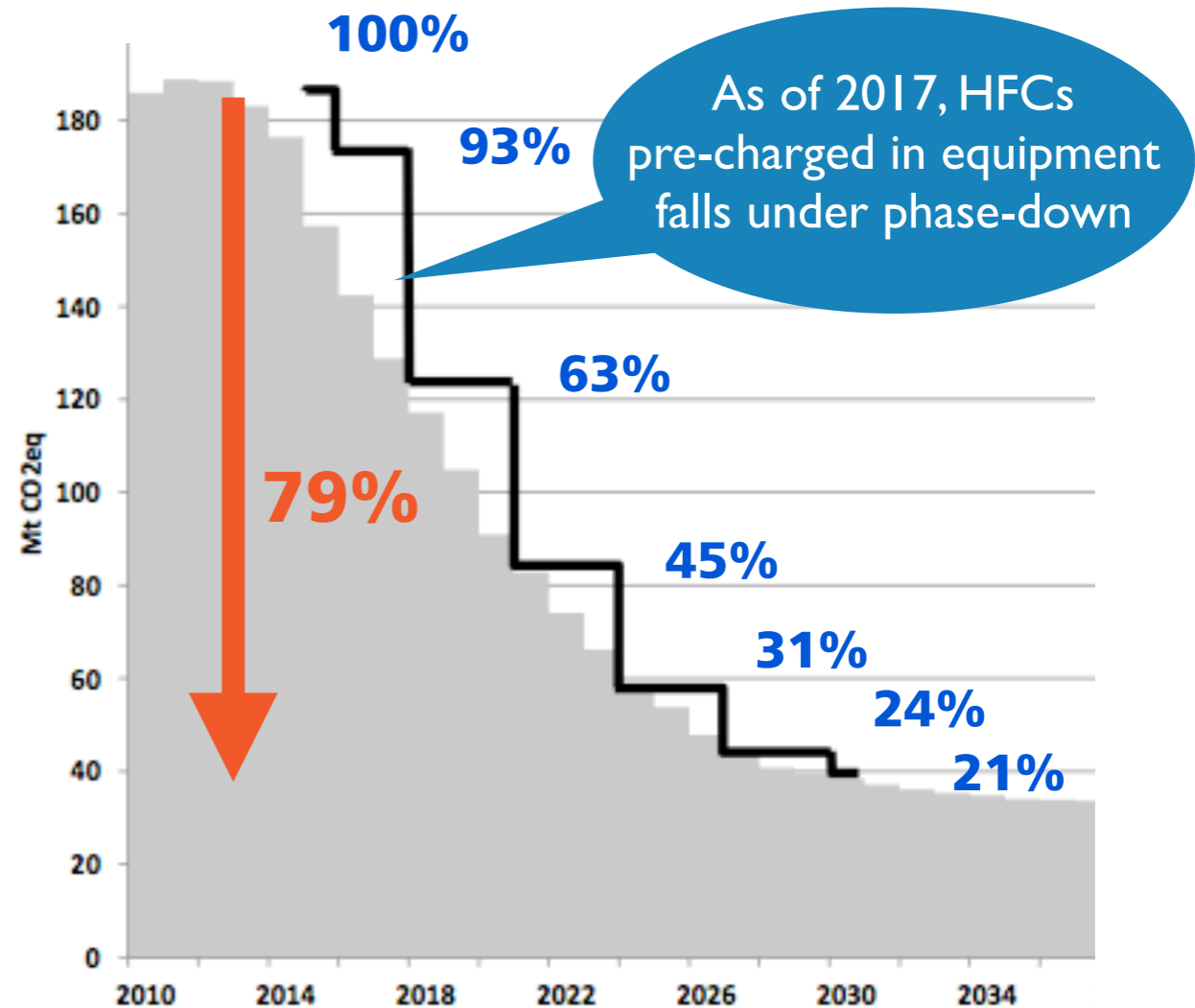
2017: HFCs pre-charged in equipment covered under phase-down

Significant **increase in HFC prices:**

- R404A and R507A: +225% since April 2017;
- R134a and R410A: +50% since April 2017

2018-2020: 37% cut in HFC quotas - further HFC price increases expected

NO negative impact on manufacturers & buyers of natural refrigerant-based equipment



EUROPE: EU IMPACT OF F-GAS REGULATION

2016 report: F-Gas Regulation shaking up the HVAC&R industry

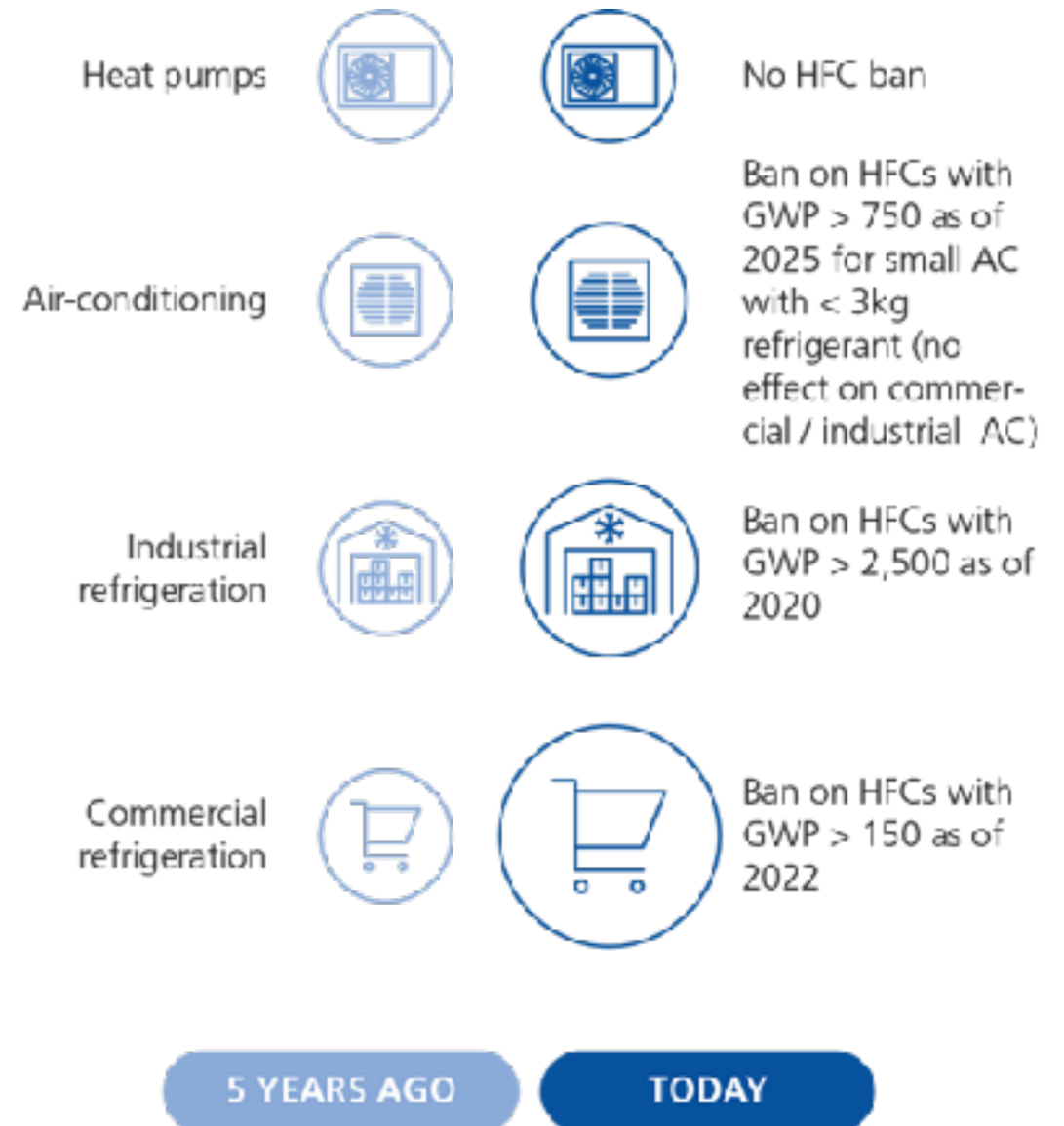
HFC bans proving to be the **most effective measure** in moving towards future-proof, low-GWP options such as natural refrigerants

Sectors that have HFC bans showed:

stronger growth in commercial availability of HFC-free technology over 5 years

greater shift in R&D investments (>60%) and employment

Growth in availability of HFC-free equipment



POLICY TRENDS - UNITED STATES



US: UNCERTAINTY AT FEDERAL LEVEL

US Administration under Trump: what it means for the Industry?

- Decision to withdraw from Paris Agreement
- Heads of key public bodies (EPA, DOE), unfavorable to environmental policy

Open questions / risks

- Ratification of Kigali Amendment?
- Role of EPA in enforcement of legislation?
- Investment in renewables, climate change programmes
- Future of SNAP?



US: STANDARDS

Underwriter's Laboratories (UL)

- Domestic refrigeration - increase charge limit of HC from 57g to 150g in line with current IEC standard; EPA approval still needed
- Aims to update requirements **before 2018** to allow revision of codes by standard setting bodies (ICC and IAPMO)
- HC charge increase under IEC standard likely to influence UL standards

ASHRAE

- speeding up its normal process of revising standards to meet the 2018 deadline

DOE - Energy conservation standards

- March 2017 - new efficiency standards for commercial refrigeration equipment went into effect - they make the average commercial refrigeration unit about 30% more efficient compared to the previous standards

US: CALIFORNIA LEADING THE WAY

Short-Lived Climate Pollutant (SLCP) Reduction Strategy Approved by CARB on 23 March 2017

- Aim to reduce HFCs 25% below business-as-usual emissions by 2020; by 40% by 2030 - one of the world's most ambitious programs
- Opportunities to increase uptake of natural refrigerant-based HVAC&R solutions
- CARB currently conducting a Scientific Assessment to investigate effective measures for low-GWP alternatives

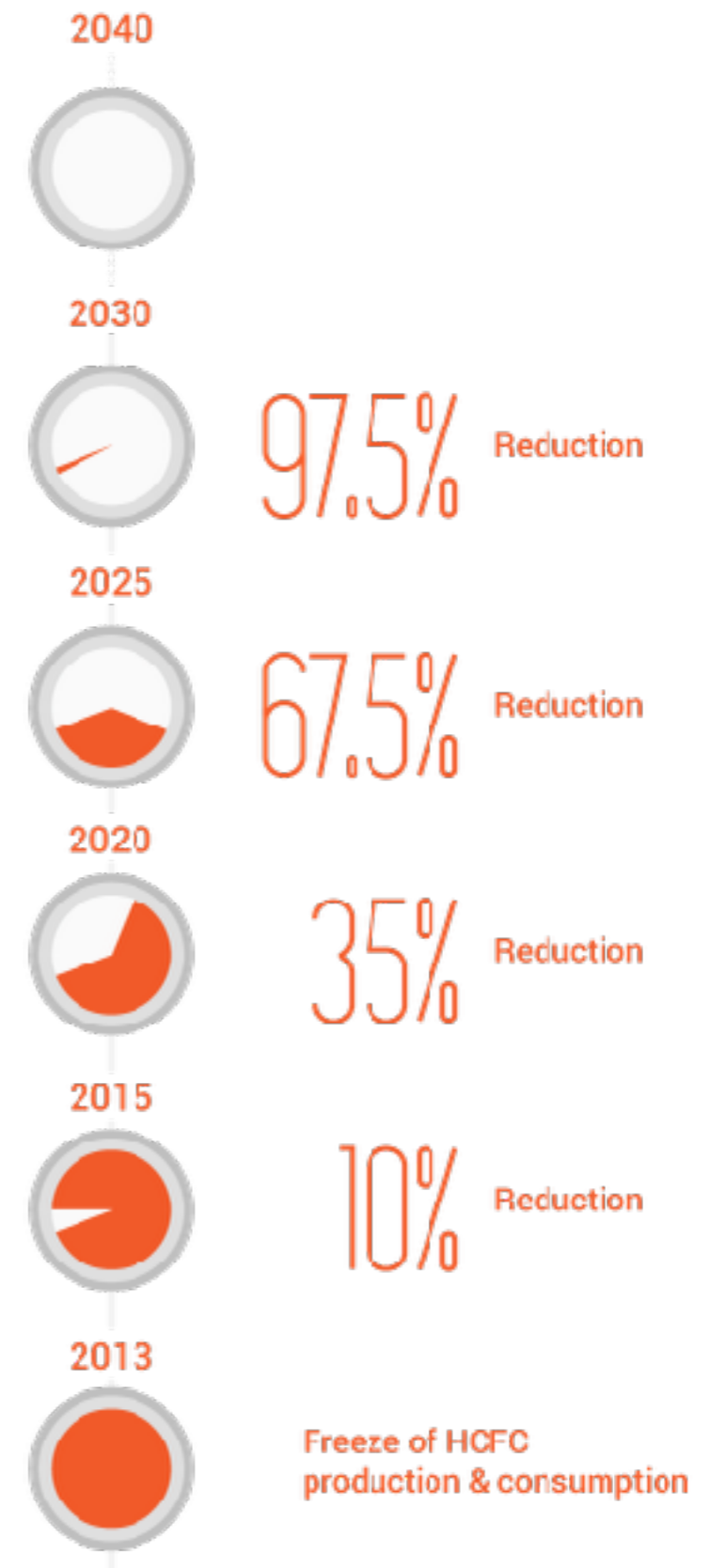


CHINA



CHINA: HCFCs PHASE DOWN SCHEDULE

- Phase-out of production and consumption of **HCFCs by 2030** = global impact
- Air pollution and air quality has become a priority for the Chinese Government - China committed to **peak CO2 emissions by 2030**
- At Montreal Protocol meetings **China pushing for revision of standards** to allow wider introduction of natural refrigerants
- Increasing **government support for natural refrigerants** in several sectors, especially room AC, heat pumps, commercial & industrial refrigeration



CHINA: LIST OF RECOMMENDED SUBSTITUTES

Natural Refrigerants recommended by MEP/FECO China in majority of targeted HVAC&R segments

- **R290** - Room air conditioners, Heat pump water heaters, Stand-alone refrigeration systems
- **R600a** - Stand-alone refrigeration systems
- **CO₂** - Domestic heat pump water heaters, industrial or commercial heat pump water heaters, Industrial or commercial refrigeration systems (refrigerant or secondary refrigerant)
- **NH₃** - Cold storage, condensing units, industrial refrigeration systems



JAPAN



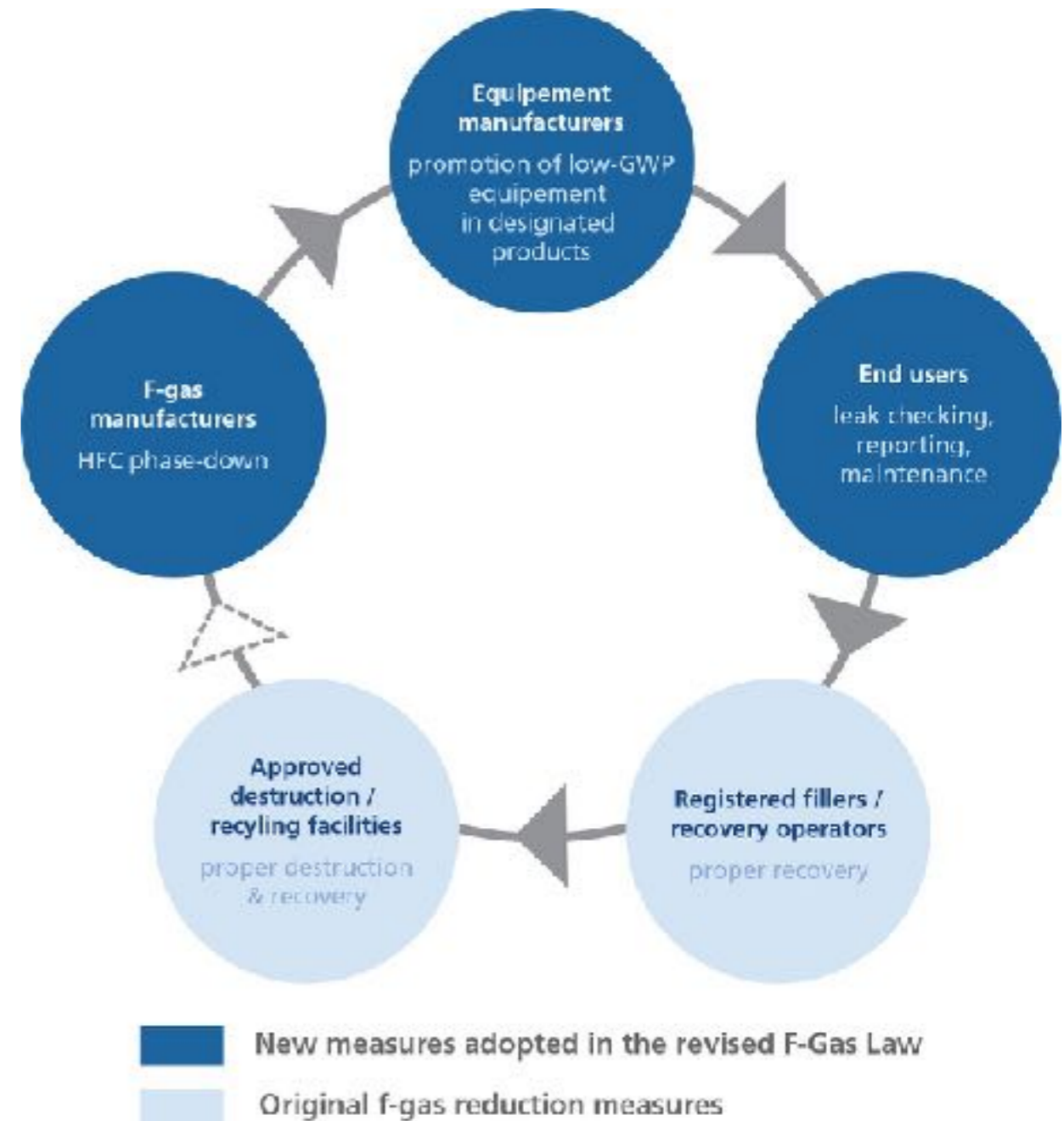
JAPAN: F-GAS LAW

Effective as of April 2015

Targets the entire life cycle of F-gases, from production to destruction

Reduced f-gas leakage from commercial equipment: periodical checks, maintenance, reporting etc.; proper refill and recovery; obligation of destruction

Promotion of low-GWP / HFC-free alternatives for designated products, incl. condensing units & refrigeration units > 1.5kW (target of average GWP 1500 by 2025)



JAPAN: HIGH PRESSURE GAS SAFETY ACT

July 2017: CO₂ reclassified under High Pressure Gas Safety Act

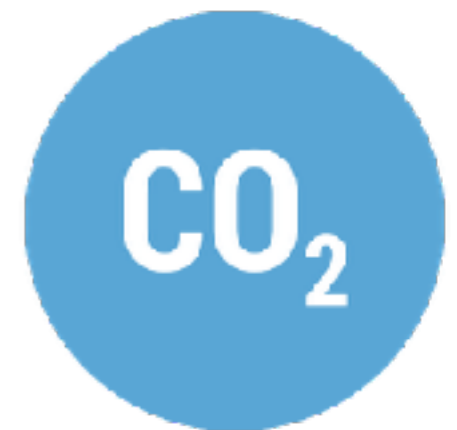
move from the strictest level of Group 3 to the **least restricted level of Group 1**

What does it mean?

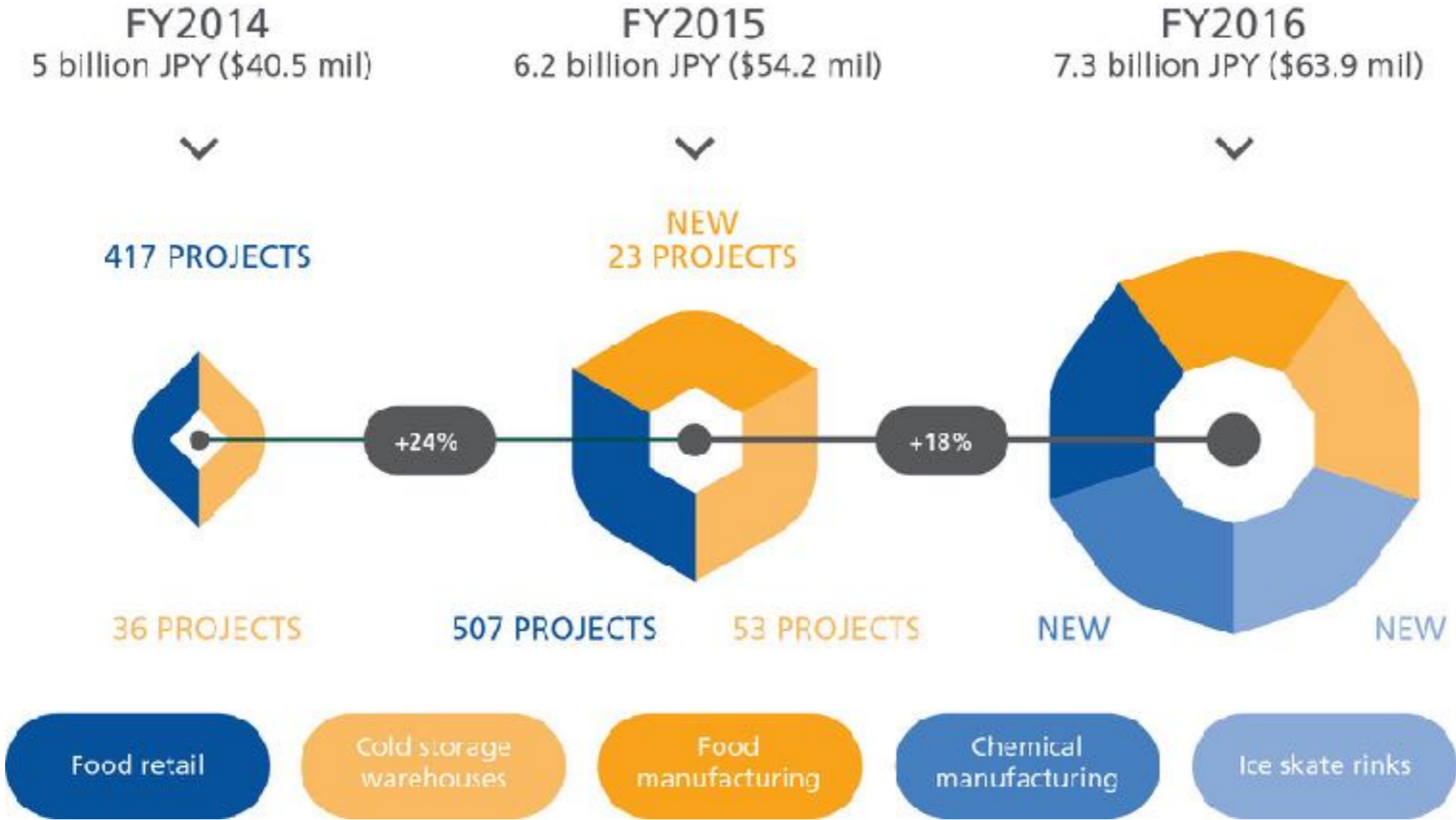
CO₂ equipment with **daily refrigeration capacity under 20 tons** does not require any government notification or permission (previously under 3 tons)

CO₂ equipment with **daily refrigeration capacity between 20-50 tons** will require a government notification (previously permission request as well)

≡ OPPORTUNITY for larger CO₂ refrigeration (commercial and industrial) systems to be introduced in the market, creating more options for end users



JAPAN: SUBSIDIES INCREASING... BUT CHANGING FOCUS



FY2017: 6.3 billion JPY, strong focus on Industrial refrigeration (Cold storage, warehouses)

By 2021: Thanks to the subsidy, the MoE expected that Natural Refrigerant equipment exceed 50% of funding

AUSTRALIA & NEW ZEALAND



AUSTRALIA HFC PHASE-DOWN PLAN

- **March 30, 2017:** New F-gas legislation introduced in Australia amending the **Ozone Protection and Synthetic Greenhouse Gas Management (OPSGGM)** Act by adding an HFC phase-down plan.
- A statutory phase-down of HFC imports will be implemented, commencing **January 2018**, and will reduce **HFC emissions by 85% by 2036**.
- The phase-down is slightly more ambitious than the Kigali requirements: **lower baseline** (reflecting Australia's current demand), & **more frequent reduction steps**.



Australian Government

Department of the Environment and Energy

NEW ZEALAND HFC PHASE-DOWN PLAN

- New Zealand HFC **phase-down plan:**
 - HFC import licensing system;
 - Permit system for the exportation of HFCs and imports of recycled HFCs;
 - Support programs for alternative refrigerants (open for consultation).
- **Targets:** reduce HFC consumption by +80% and HFC imports from around 1,340 KtCO₂ to < 260 by 2036.
- Expected to come into force by **January 1, 2019.**



Ministry for the
Environment
Manatū Mō Te Taiao

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THANK YOU!