
Cooling With Less Warming: updates from US, India and China



At the virtual 32nd Meeting of the Parties to the Montreal Protocol
24 November 2020

Agenda

19:00 - 19:05	Introduction & Update on AIM Act <i>Alex Hillbrand, HFC Policy Advocate, Climate & Clean Energy & International Program, NRDC</i>
19:05 - 19:15	Update on U.S. state action on HFCs <i>Christina Theodoridi, Technical Analyst, Climate & Clean Energy Program, NRDC</i>
19:15 - 19:25	Special update on California's new AC and refrigeration regulations <i>Kathryn Kynett, Air Pollution Specialist, California Air Resources Board</i>
19:25 – 19:33	UNEP cooling initiatives in India <i>Atul Bagai, Head-Country Office India, United Nations Environment Programme (UNEP)</i>
19:33 – 19:38	Update on AC market trends and other cooling initiatives in India <i>Prima Madan, Lead- Cooling & Energy Efficiency, NRDC India Program</i>
19:38 – 19:45	Update on cooling action in China – new AC standards & updated F-gas law <i>Mona Yew, Deputy Director, NRDC China Program</i>
19:45 – 20:00	Q&A

Domestic U.S. Action on HFCs

Federal and state action to curb HFCs in the United States



Natural Resources Defense Council

Federal legislation to phase down HFCs is being considered in Congress

Phase down use of hydrofluorocarbons HFCs in the United States over the next 15 years

- Require new production and import of HFCs fall from 100% to 15% of baseline by 2036
- Encourages EPA to implement HFC leak prevention and disposal requirements, incl. recycling, reclamation, and destruction
- Authorizes EPA to ban HFCs in end-use applications where there are better alternatives
- Bill does not ratify Kigali Amendment but mandates compliance with the core obligations

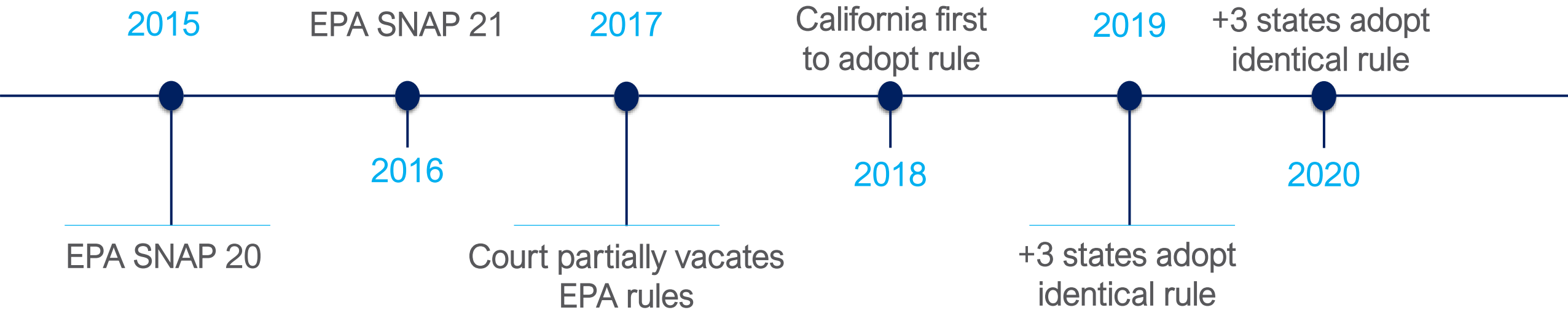


Federal legislation is broadly supported

Legislation is bipartisan and supported by broad coalition of stakeholders:

- Backed by industry and environmental community
- Passed in the House:
 - Part of larger legislative package
 - American Innovation and Manufacturing Leadership Act (H.R. 5544) with 28 cosponsors
- Agreement in the Senate:
 - Clear support but no passage yet
 - American Innovation and Manufacturing Act (S.2754) with 34 cosponsors
- Chance for enactment this year and if not then likely early priority for Biden Administration

States leading since court vacated federal HFC rules



Significant New Alternatives Policy (SNAP) rules:

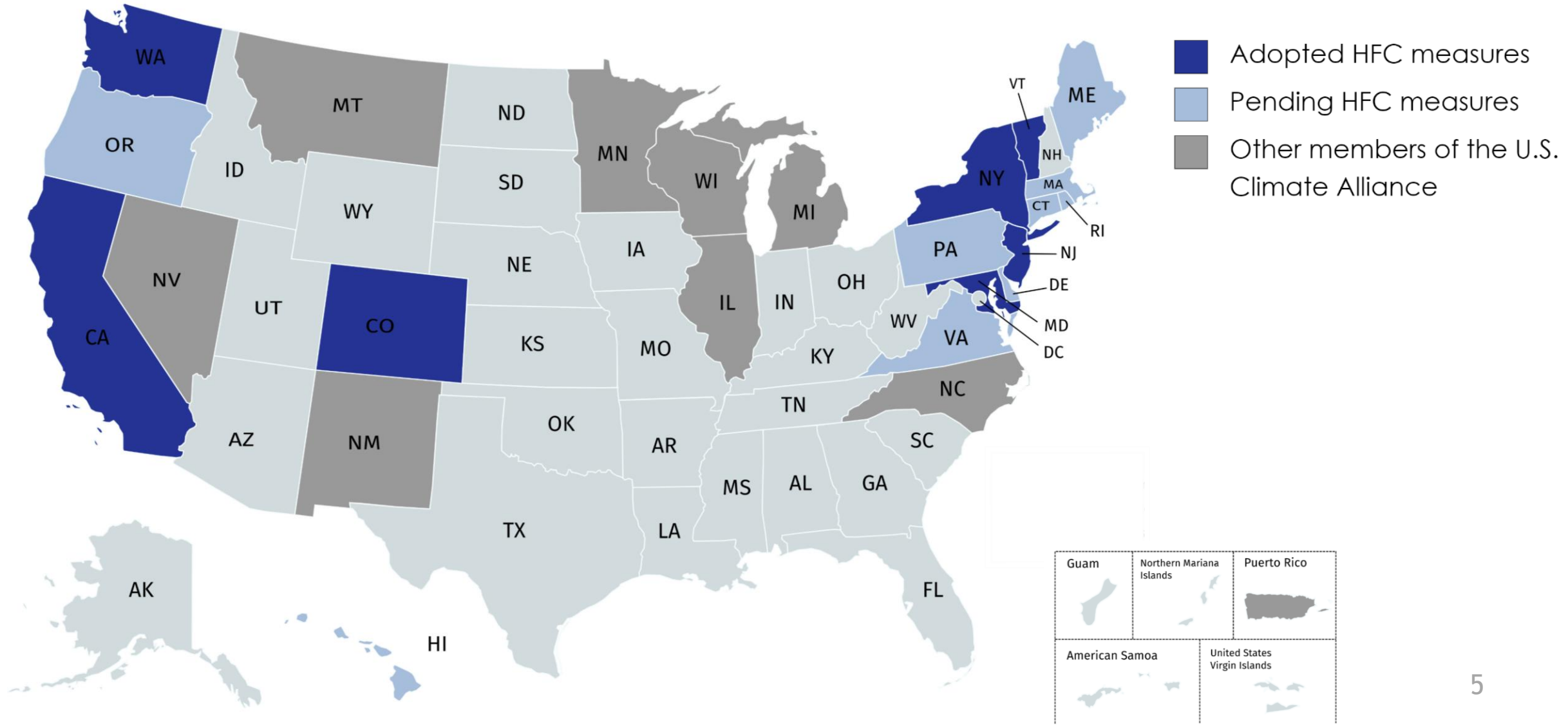
- U.S. Environmental Protection Agency (EPA) prohibited the use of HFCs in specific applications
- Rules were partially vacated by the U.S. Court of Appeals shortly after they were introduced
- State rules are almost identical to the SNAP rules

States rules apply to specific end-uses

- Not a supply phase down
- State rules gradually prohibit HFC-use in certain applications:
 - Commercial refrigeration
 - Household fridges & freezers
 - Foams
 - Aerosols
 - Building chillers



States committed to HFC reductions account for 50% of GDP



Key drivers for state action

Shared climate ambition and environmental advocacy

Enabled by cooperation through the U.S. Climate Alliance:

- Coalition of 25 governors committed to acting on climate
- Responsible for about 40% of U.S. HFC emissions
- Serves as a platform to share lessons learned
- Provides opportunity to create uniform regulations



Source: usclimatealliance.org

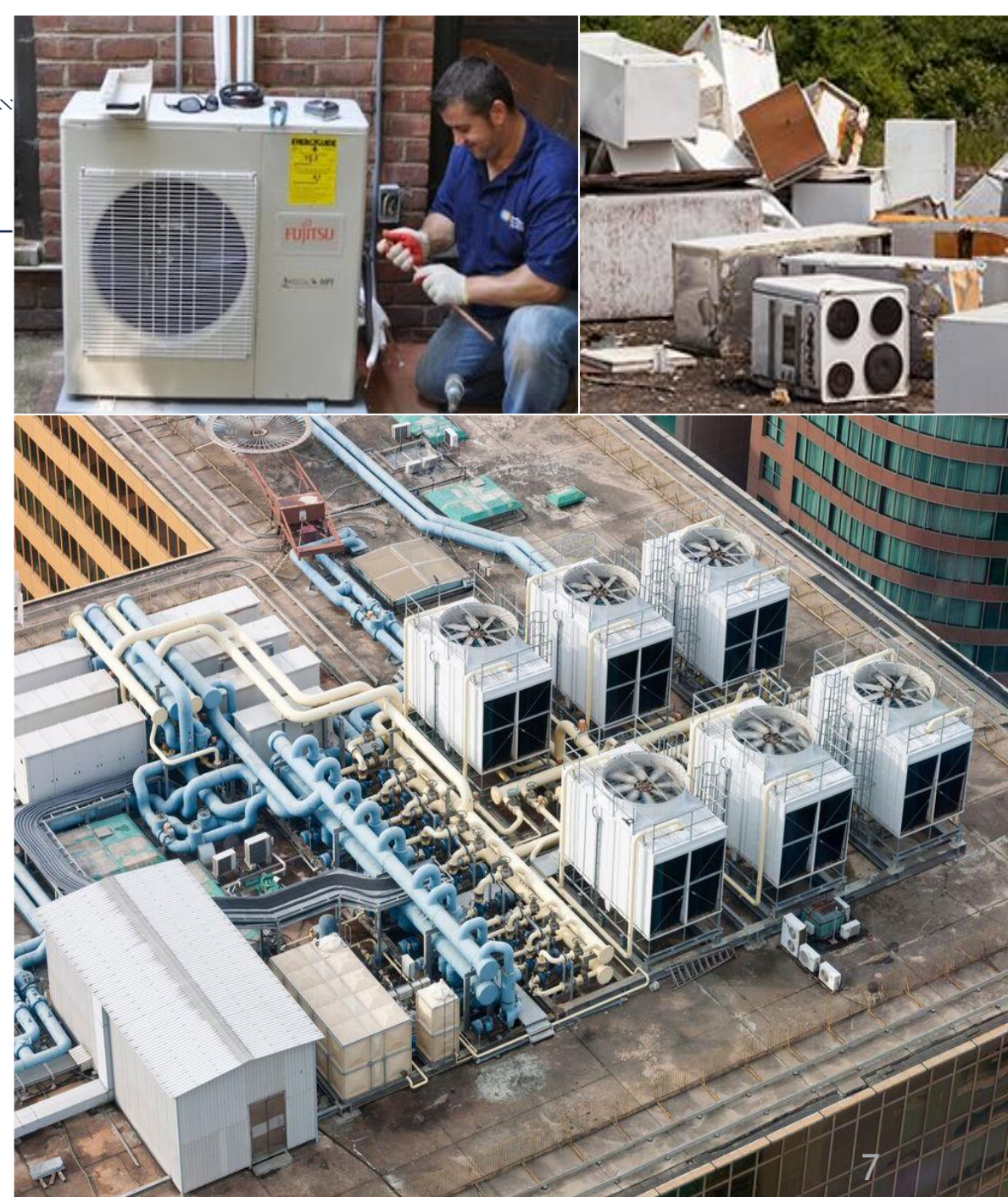
Additional action in California

Refrigerant management program

- Established in 2009
- Leak prevention and servicing
- Complement to federal program

Proposal to adopt measures for stationary air-conditioning and refrigeration

- Addresses major sources of HFC emissions
- Limits the potency of refrigerants sold in these applications



Thank you



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Update on California's Proposed New Rulemaking for Refrigeration and Air Conditioning

Kathryn Kynett

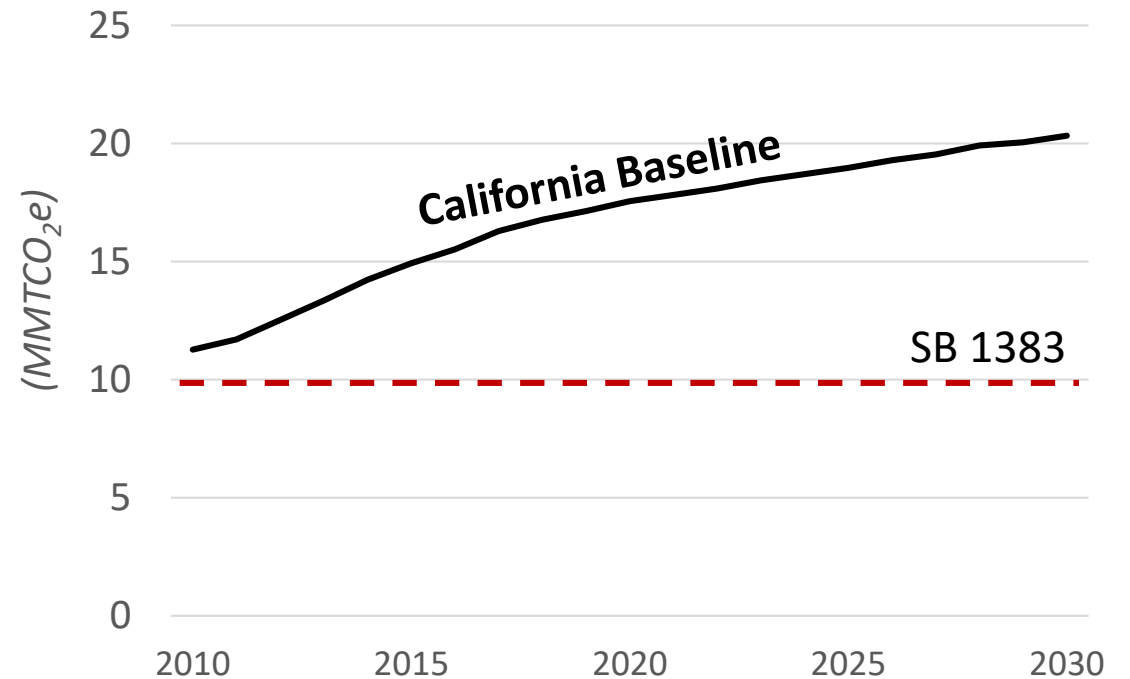
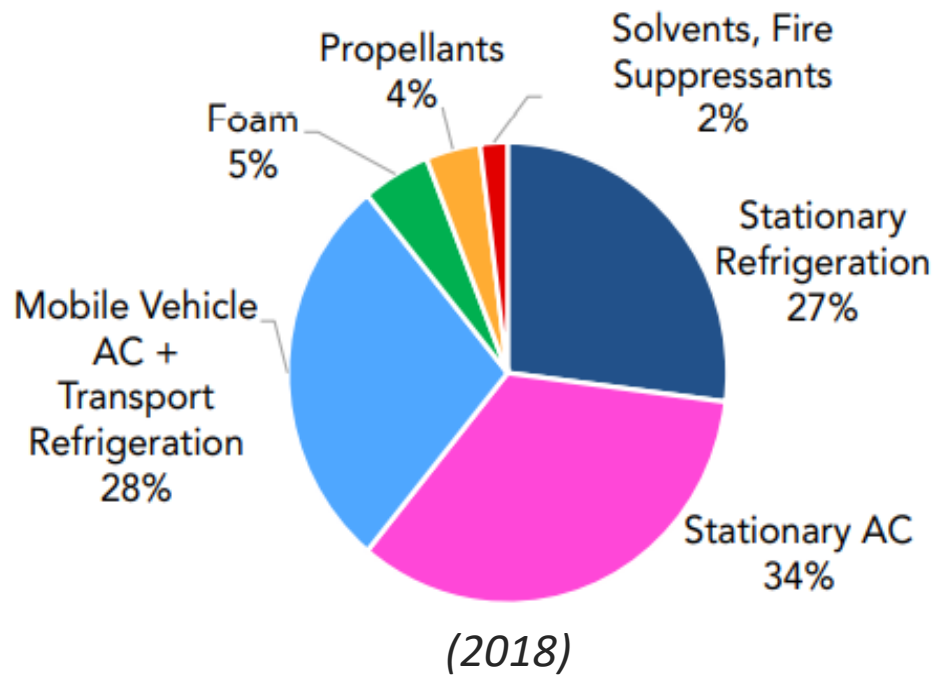
NOVEMBER 24, 2020



California is taking action to reduce HFCs



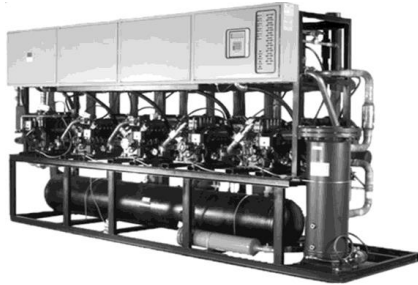
SB 1383 requires CARB to reduce HFC emissions 40% below 2013 levels by 2030



Existing Regulations in California

- **Refrigerant Management Program (RMP)**
 - Leak checks and repairs for refrigeration systems > 50 lbs
- **California HFC Regulation**
 - Adopts U.S. EPA SNAP Rules 20 and 21 into state law
- **Other Regulations:** Advanced Clean Cars, Consumer Products, Semiconductor Manufacturing, and Small Cans for Automobile Refrigerant
- **Proposed:** Transport Refrigeration Units

GWP Limits for R/AC Equipment (Proposed)



■ Stationary Refrigeration

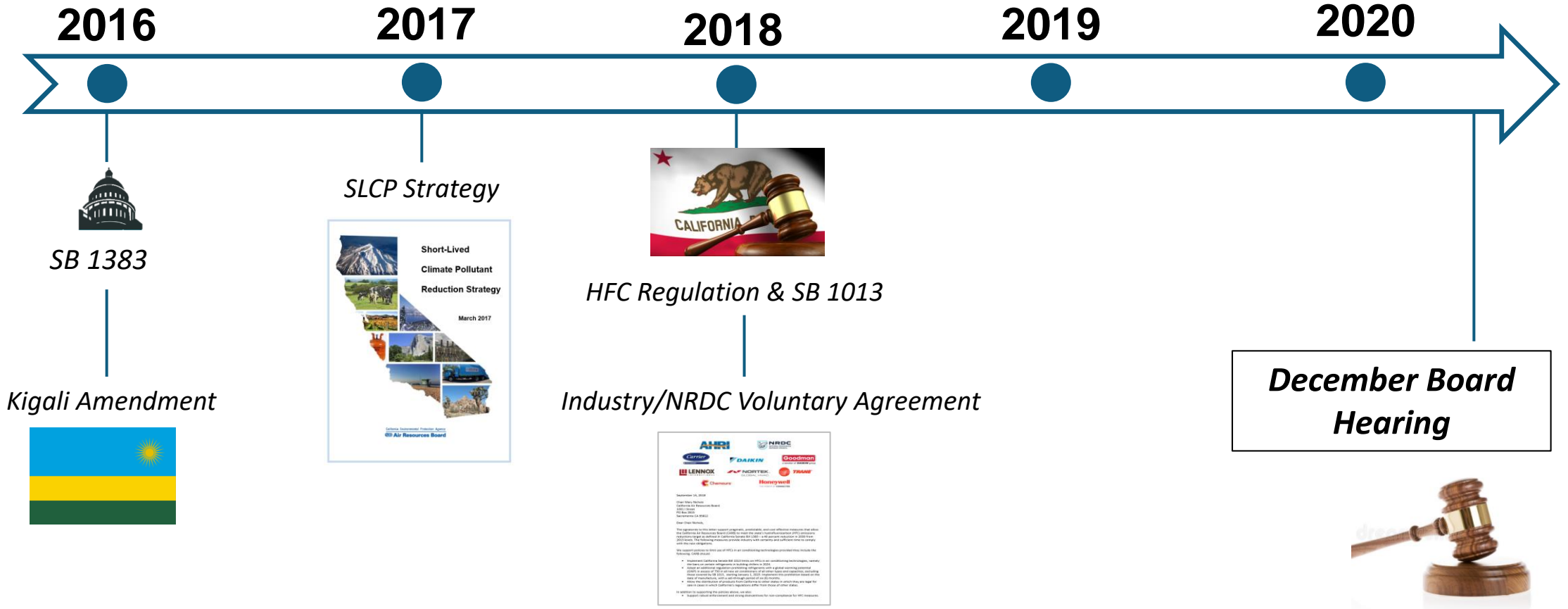
- 150 GWP limit → new or remodeled facilities
- Company-wide targets for existing retail food facilities



■ Stationary Air Conditioning (AC)

- 750 GWP limit for new equipment

California Timeline



Requirement for New Refrigeration Systems

- New Facilities: 150 GWP limit
 - Newly constructed facilities
 - Remodeled facilities with all new refrigeration

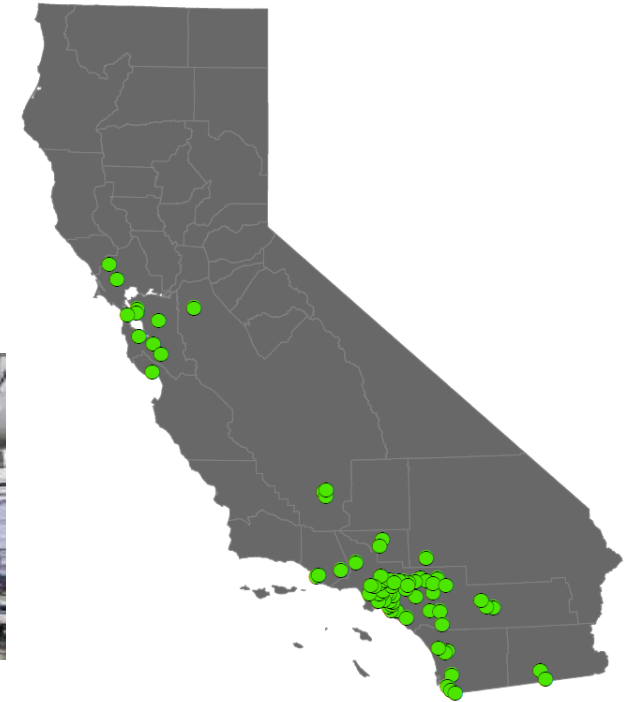
Retail & Commercial



Cold Storage



Industrial Process

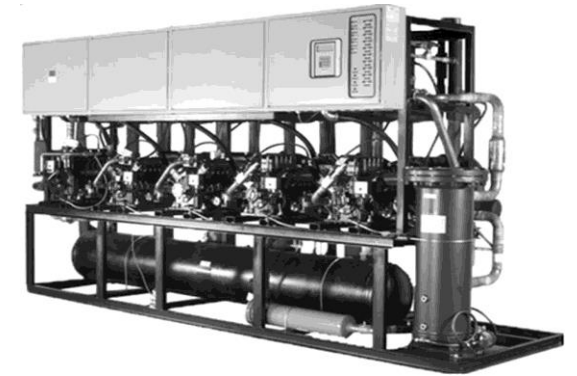


- Existing Facilities: 750 – 2,200 GWP limit

(80+ supermarkets using low-GWP refrigerants in 2019)

Requirement for Existing Refrigeration Systems in Retail Food Facilities

- Weighted-average GWP reduction (<1,400 by 2030), or
- Greenhouse Gas Potential reduction (55% by 2030)
- Flexibility to plan over 8 to 10 years
- Prepares sector for HFC phasedown (U.S. has not ratified)



Requirements for Existing Non-Retail Facilities

Proposed GWP limits for new systems that will be placed in existing facilities:

- Industrial refrigeration → GWP 1,500 - 2,200
- Ice rinks → GWP 750
- Cold storage covered by current regulation (GWP 1,500)



Proposed GWP Limit for Stationary Air Conditioning (AC)

- Air conditioning equipment manufactured after January 1, 2023, must use a refrigerant with a GWP value less than 750.

AC Equipment used in Residences



AC Equipment used in Commercial/ Non-residential Buildings

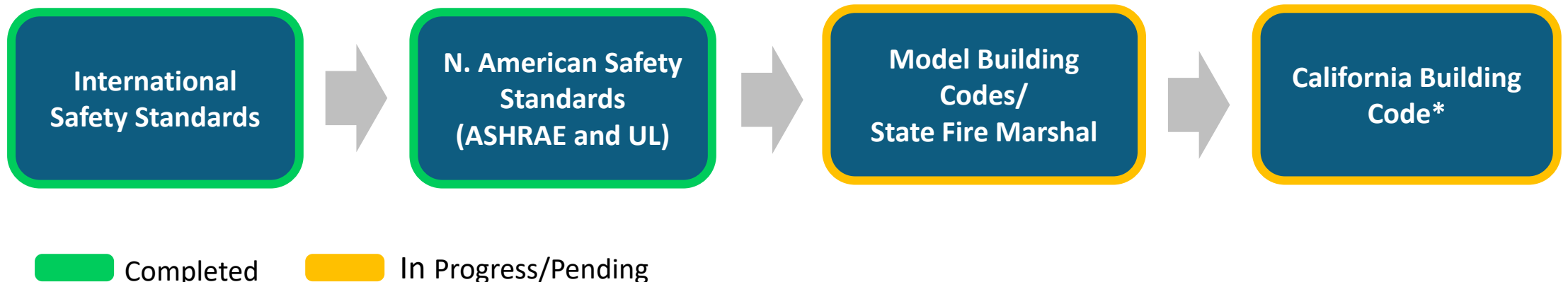


Room ACs + Dehumidifiers



AC Refrigerant Alternatives (<750 GWP)

- Many of the next generation refrigerants have an A2L classification
- Currently in use in the California in chillers, room AC and car AC
- Use in other types of ACs requires updates to Building Codes



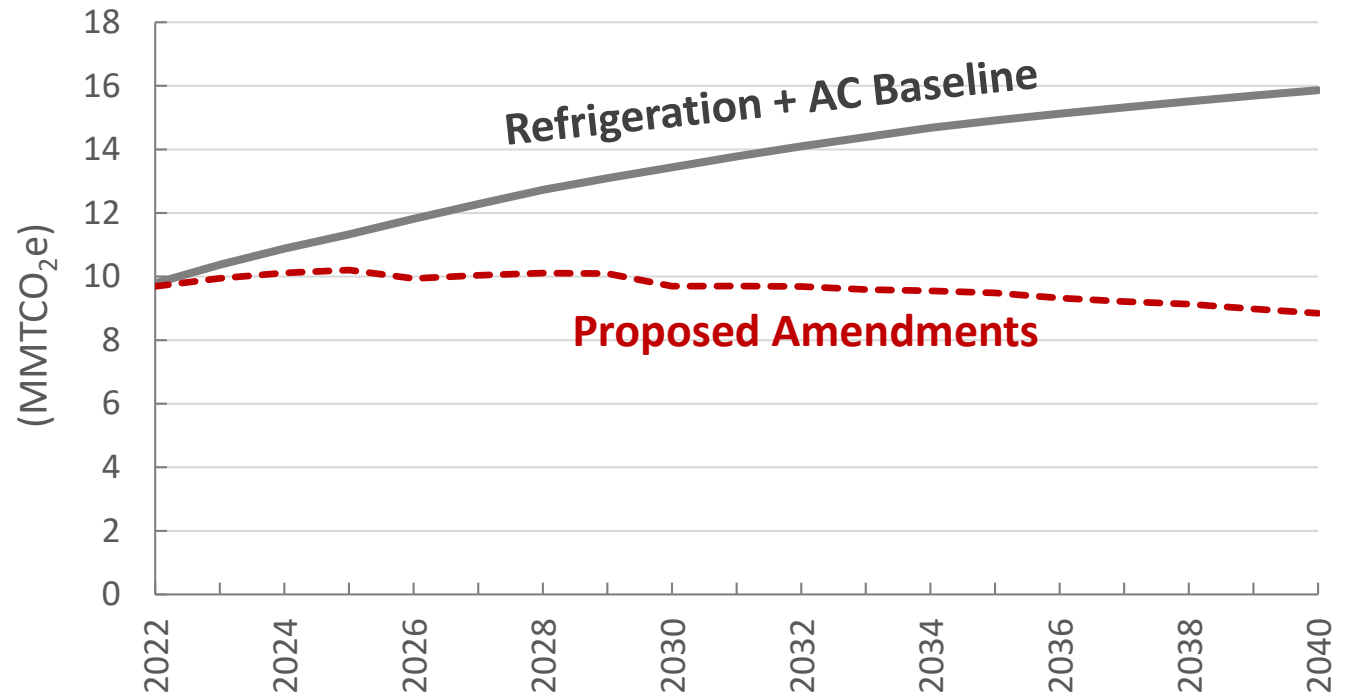
Emissions Benefits

- Annual Emissions Reductions in 2030: **3.8 MMTCO₂e**
- Cumulative Emissions Reductions by 2040: **72 MMTCO₂e**



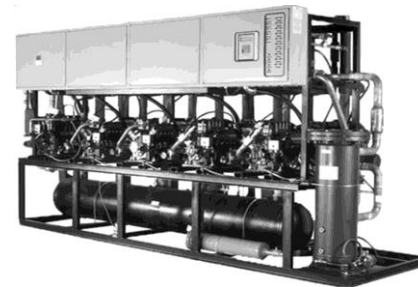
~38% of the reductions needed to meet the SB 1383 Goal

HFC Emissions from Stationary Refrigeration + AC



Next Steps

- Draft proposed regulation text made public October 20, 2020. Go to: <https://ww2.arb.ca.gov/our-work/programs/hfc-reduction-measures/rulemaking> or search for “CARB HFC Rulemaking”
- 45-day comment period (October 23 – December 7)
- Board hearing on proposed regulation: Thursday, December 10, 2020
<https://ww2.arb.ca.gov/board-meeting-dates>



New
Refrigeration
<150 GWP



New AC
< 750 GWP

Future Considerations



SB 1383 and EO B-55-18 (carbon neutrality by 2045)

- Sales prohibition of new refrigerant
- Low-GWP requirements for additional end-uses



1,430 3,900 2,088 3,985 1,774

GWP Values for Common HFC Refrigerants

Contact Information

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For more information, please visit:
[Stationary Hydrofluorocarbon Reduction Measures Website](#)



PROTECTING THE CLIMATE:

UPDATES ON SUSTAINABLE COOLING IN INDIA



Side Event on Cooling with Less Warming: Updates from US, India and China
32nd Meeting of the Parties to the Montreal Protocol

24th November 2020

HPMP and Industry Update

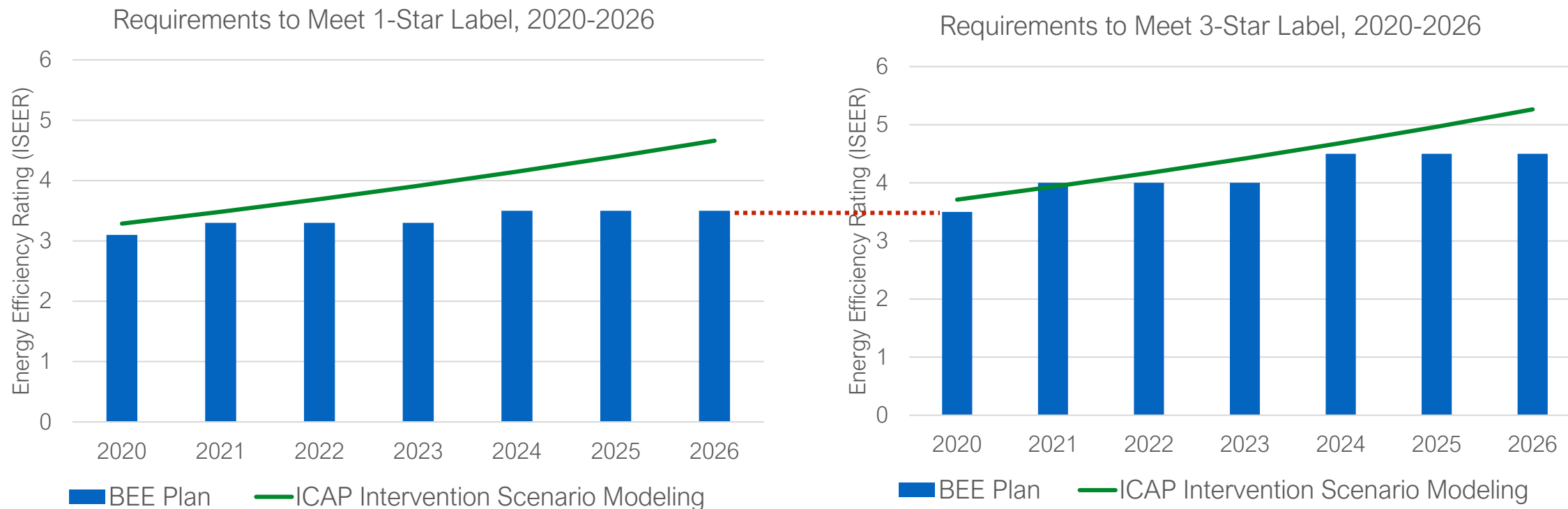


Industry in India has already begun to leapfrog, high-GWP refrigerant technology for room ACs to low GWP solutions

- Encouraging developments on R-290 and natural refrigerants, indigenous standards
- Market champions, 6 to 7 companies leapfrogging through the HPMP in India. Most use R-32
- EESL bulk procurement programs
- RMI's Global Cooling Prize, received many innovative submissions, with US and India in the lead.

AC standards update

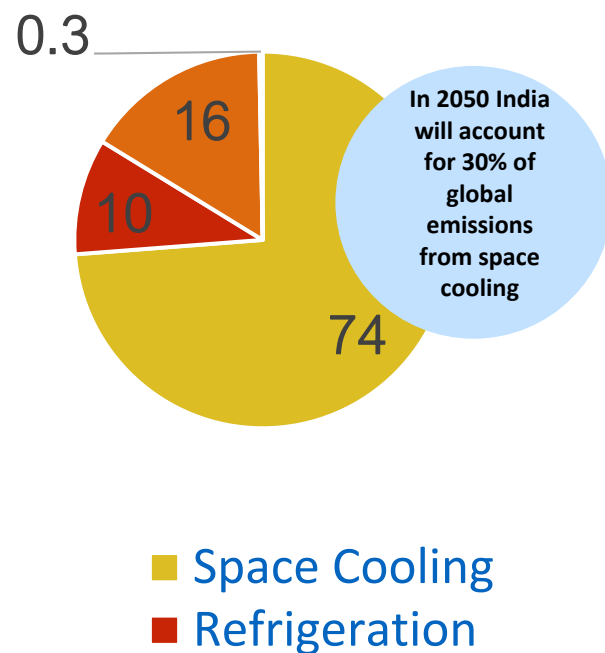
Comparison of Split AC Standards Current Revision v/s ICAP Ambitious Scenario



- Room ACs to constitute 50% of space cooling energy consumption in 2037-38
- An additional 30% reduction in cooling energy, estimated in the intervention scenario through stronger MEPS. Current revisions slows progress
- Opportunities for stronger standards, including low GWP labels and strengthen compliance and testing

ICAP Implementation

Makeup of India's Cooling Demand (2038)



Source: NRDC adopted from *IEA Future of Cooling, 2018* (some values indicative only); *India Cooling Action Plan 2019*

ICAP released in 2019

Implementation Approach:

- Recommendations for short, medium and long term
- Multi-stakeholder and multi-sectoral
- Emphasis on EWS
- Integration with on-going programs and initiatives

Implementation Progress:

- Inter-ministerial and inter-departmental thematic working groups set up by MOEFCC including civil society
- Group of four civil society organizations kicked off implementation in early 2020

THANK YOU

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China Cooling Update



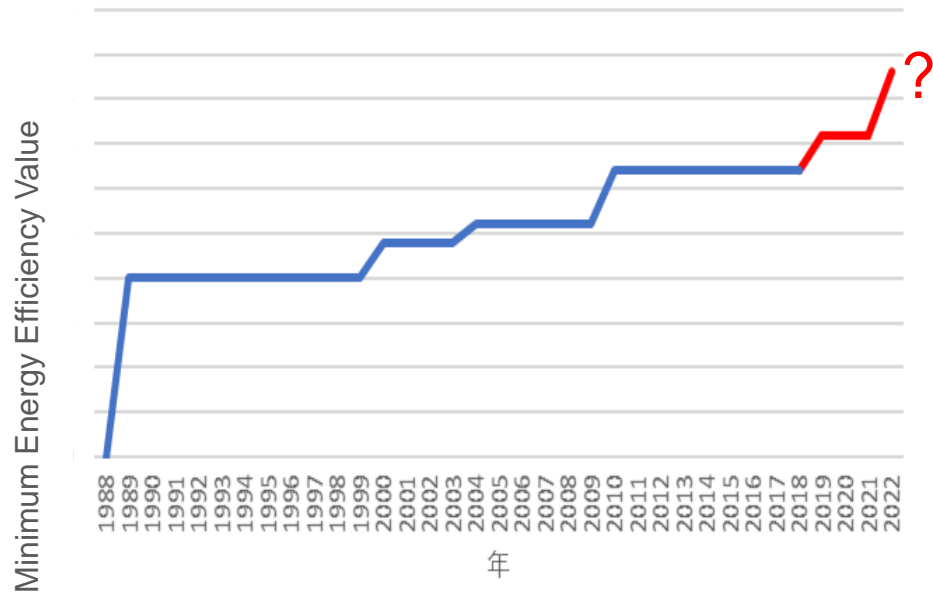
November 23, 2020
Mona Yew, NRDC

Largest AC Market in the World

- China produces 70% of the world's ACs, and buys 45% of them
- 150,627,000 units were sold in 2019, ~40% for export
- National Green Cooling Action Plan adopted in 2019 sets targets for strengthening cooling efficiency
 - Improve residential AC energy efficiency by 30% by 2022 and targets for other cooling appliances as well
 - Additional 15% improvement for major cooling products by 2030

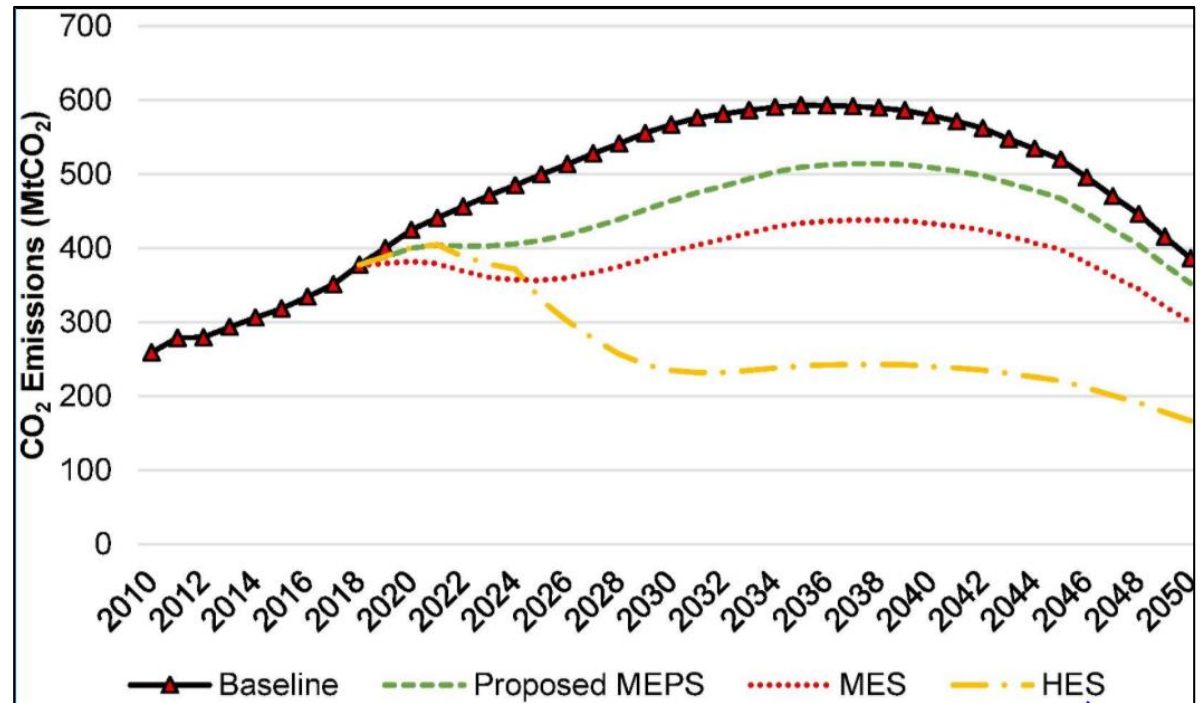
New Room AC Standard: Among the most ambitious in the world

Historical MEPS Level



Source: CNIS 2020

- Annual CO₂ emissions will fall by ~100 MMT/year in 2030
- Equivalent to taking 2-3 dozen 500MW powerplants off the grid

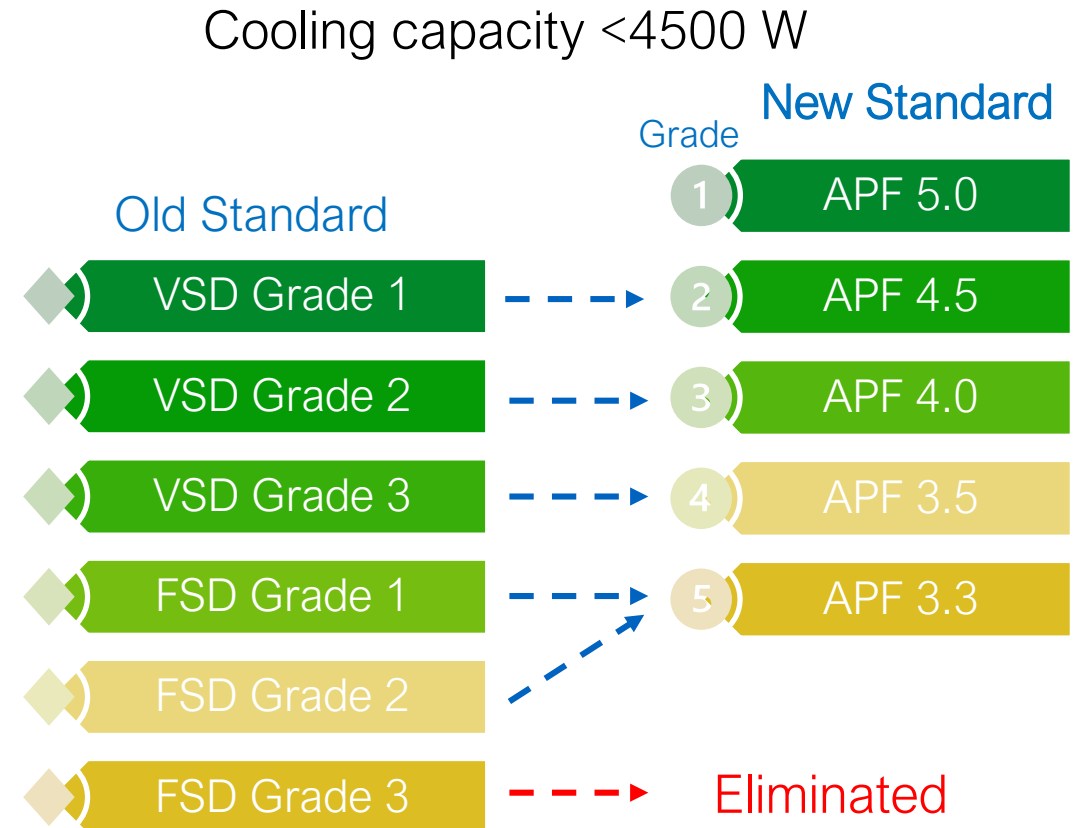


Source: LBNL 2020

New Room AC Standard: Among the most ambitious in the world

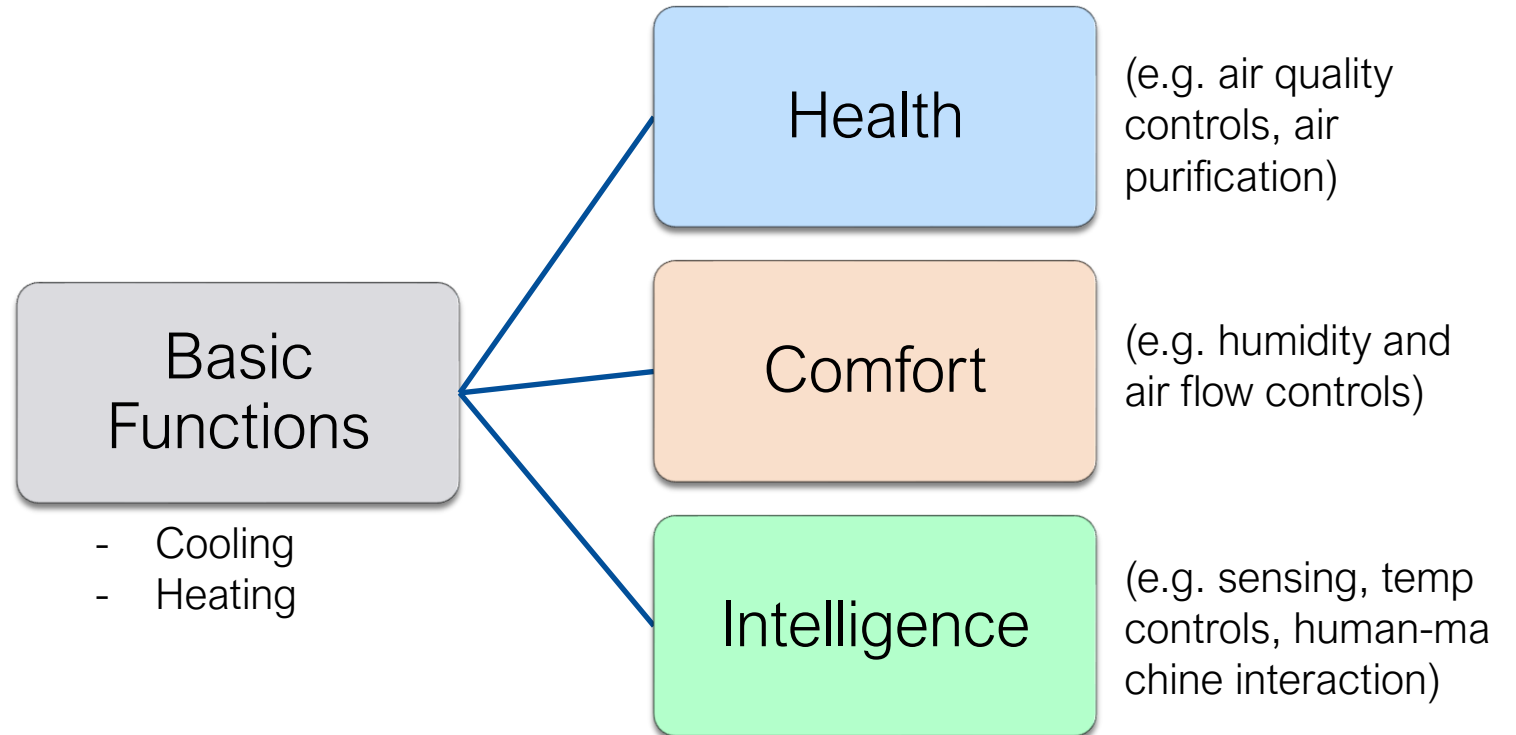
Improves energy efficiency by an average of 15%

- Fixed-speed (FSD) and variable-speed (VSD) units combined into one product category.
- FSD Grade 5 (least efficient) are ~13-16% more stringent compared to the previous FSD Grade 3
- New standards apply to domestic sales only
- UN United for Efficiency program “model” regulations for any country to adopt AC standards as ambitious as China’s.



Residential AC Development Trend

- Rapid development in additional functions driven by need for product differentiation to avoid homogenous market competition or price wars
- Focus on improving user's comfort and use experience
- Promote industrial technology upgrading and international competitiveness enhancement



- Additional functions in middle and high-end markets have become a major force in the growth of the industry
- Higher capacity products tend to have more additional functions

NRDC Study on Impact of Additional Functions

- Functions that tend to **reduce** energy consumption
 - Zonal air supply control, body sensing
 - Self cleaning
- Functions that **increase** energy consumption: fresh air supply, UV sterilization, dust filtration and removal
- **Low or no** impact on energy consumption
 - Software based intelligent functions
 - Some increase in standby power consumption
- Increases and decreases in energy consumption due to additional functions cannot be reflected in product energy efficiency assessment based on current energy efficiency evaluation system
- Strengthening the standardization of additional functions is recommended

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Update on China's Proposed F-gas Law

- China's Ministry of Ecology & Environment released a proposed update to its F-gas law in May 2020, a domestic implementing law for the Kigali HFC phasedown
- Expands scope of current ODS-focused law to include HFC quotas and other controls, and strengthen the law more generally
- Strengthens enforcement tools available to MEE and increases liability for violations
- Establishes national atmospheric monitoring for ODSs and HFCs
- NRDC and others comment in favor of making data publicly available and more

Thank you! Any questions?



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