



The Italian HVACR Experience

An international overview of alternative and climate friendly solutions in the A/C Sector



Side Event, MOP 31

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Kigali amendment



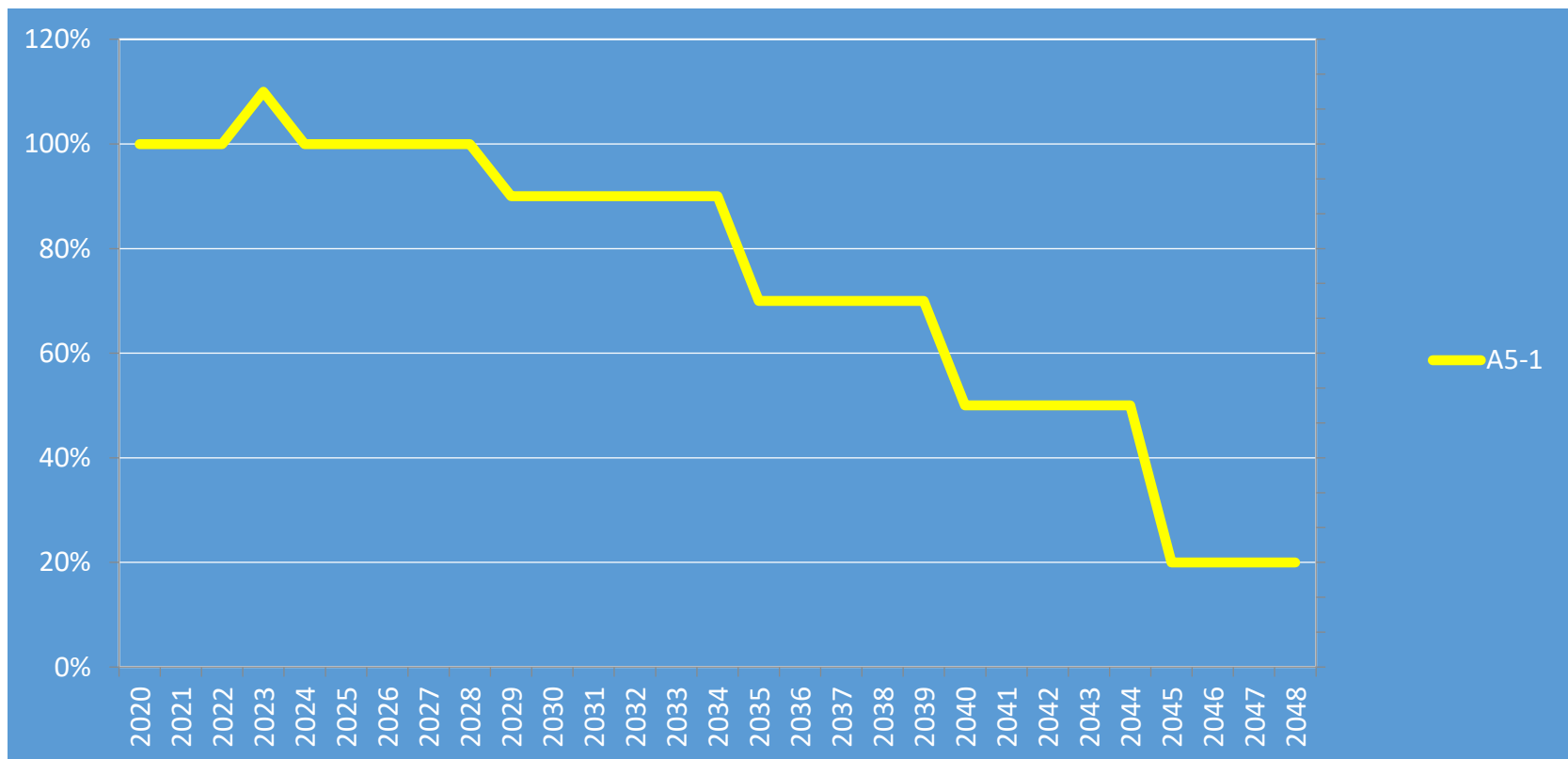
HFC Phase-down

- Annex F substances

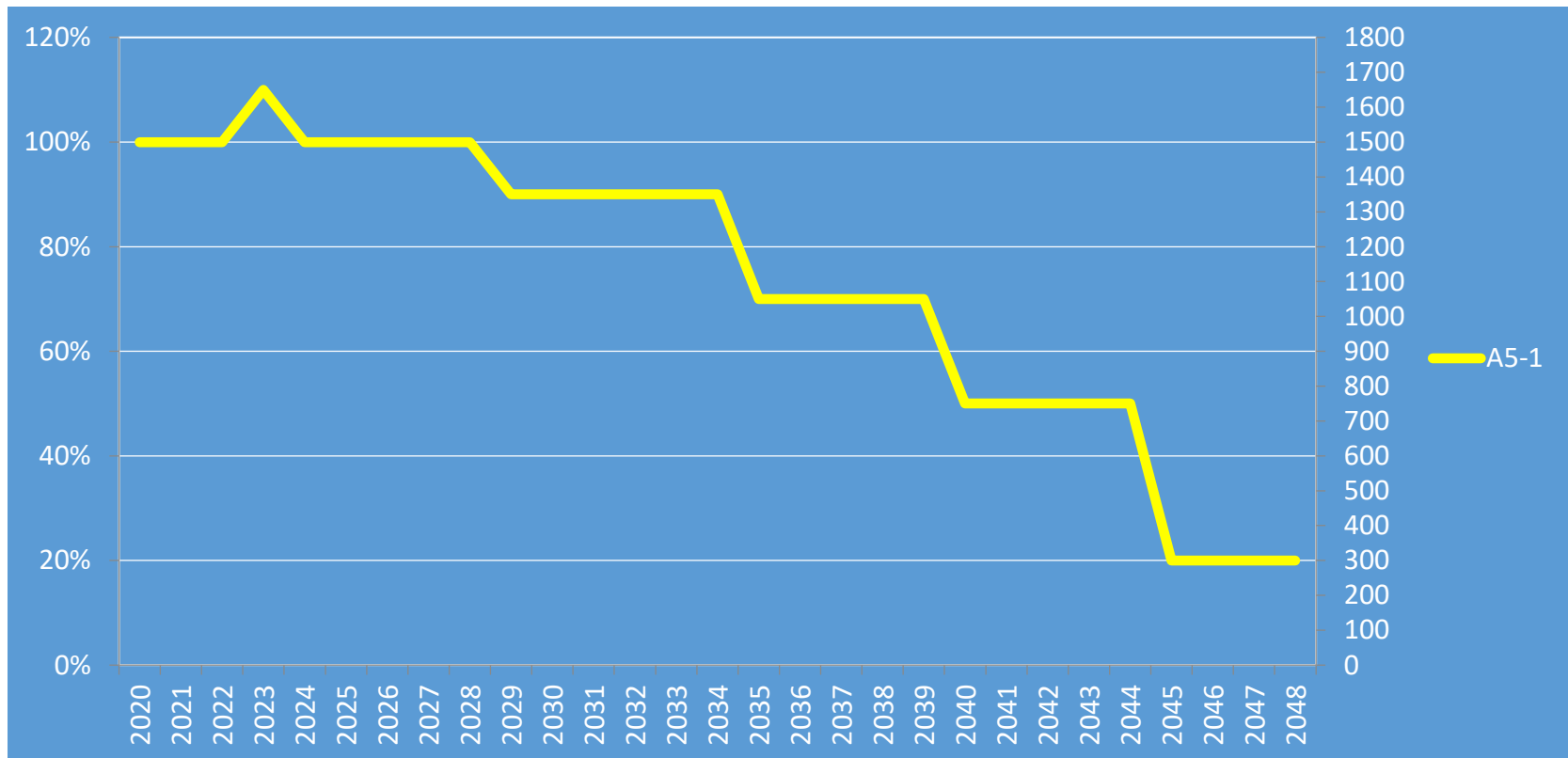
Substance*	100-year GWP**	Safety Class
HFC-134a	1,430	A1
HFC-245fa	1,030	B1
HFC-365mfc	794	–
HFC-227ea	3,220	A1
HFC-236fa	9,810	A1
HFC-43-10mee	1,640	–
HFC-32	675	A2L
HFC-125	3,500	A1
HFC-143a	4,470	A2L
HFC-152a	124	A2
HFC-23***	14,800	A1

HFC Blend ^(a,b)	100-year GWP ^(c)	Safety Class
R-404A	3,922	A1
R-407A	2,107	A1
R-407C	1,774	A1
R-407F	1,825	A1
R-410A	2,088	A1
R-507A	3,985	A1

Regulatory certainty



Regulatory certainty



A/C industry in transition

- HCFC-22 being phased-out
 - With or without external support;
- HFC-410A phased in;
- HFC-32 phased in:
 - Reported global sales of 80 million units;
- R-454B being considered; and
- R-290:
 - Global sales of approx. 1 million units.
- **But:** Major manufacturer announces HFC-32 alternative starting in 2023.



Some UNIDO programs in A/C sector

- Many industries in developing countries depends on SKD/CKD kits from China
- Egypt: Conversions into HFC-32 and R-454B:
 - Sustainability is key issue
- Bahrain: Cancelled;
- Tunisia: Designed for R-290 but cancelled;
- Pakistan: One company - R-290
- Brazil: 3 companies – R-290



UNIDO China program in A/C sector

- Support comprise:
 - Factory conversions
 - Technical assistance / research
- Current installed capacity: 6 M units annually;
- Future installed capacity: 6 M units annually;
- Total sales with subsidy from FECO (IOC):
 - Approx. 180,000 split A/C's



UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION



SUSTAINABLE DEVELOPMENT GOAL 9
INDUSTRY, INNOVATION AND INFRASTRUCTURE





Barriers for R-290 market penetration

- Restrictive standards:
 - R-290 charge limitations;
 - Current upper limit for R-290 is 7 kW;
 - R-290 products sensitive to charge in terms of energy efficiency.
- Marketing:
 - No financial incentive to market R-290 as a gas;
 - Consequently no technical support from R-290 manufacturer;
 - Technical expertise at A/C manufacturer level.

Barriers for R-290 market penetration

- Liability:
 - Flammability;
 - Difficult to control use/maintenance/EOL for manufacturer;
 - Uncertainty on skill level of service technicians.
- Cost:
 - Technical solutions to mitigate flammability risks has extra costs;
 - Not yet reached the level of economy of scale;
 - Additional operations needed for installation and servicing.

Barriers for R-290 market penetration

- Visibility/availability:
 - Despite interest in R-290 products; they are not available through regular sales channels.

- Important to capture lessons learnt from current market introduction in China.

Italian bilateral component in China

- Integrated into the HPMP stage II;
- Main focus areas:
 - Identification of export barriers;
 - Risk assessment for R-290;
 - Standards;
 - Training; and
 - CO₂ HPWH demo.

China program in A/C sector

- Portable A/C:
 - R-290 technology established and accepted;
 - Italian influence through JV's with China in combination with EU f-gas regulation.





Thank you for the attention!

