EPEE SIDE-EVENT

THE NEW F-GAS RULES IN EUROPE AND THEIR GLOBAL IMPACT: CHALLENGES AND OPPORTUNITIES FOR THE EUROPEAN HEATING AND COOLING INDUSTRY

The impact of legislation and trends for the industry

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Talk Contents

- Comments on the new F-Gas Regulation
- Key issues for the RACHP industry
- Refrigerants: where are we heading?

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Industry Reaction to New F-Gas Regulation

- generally very positive
- lots of new technologies are “near market”
  - can lead to large cuts in F-Gas use and emissions
- the Regulation provides important clarity about future
  - will stimulate investment and rapid technology change
- the EU has adopted a bold and challenging approach
  - the developments in the EU will be readily transferable across the world
  - an international agreement based on the EU approach will be very beneficial to minimise global F-Gas emissions

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Key Issues for RACHP Industry

- HFC phase down will require much action and innovation
- early implementation of service ban is crucial
  - delivers quick savings through retrofill of HFC 404A systems
  - but, service ban date (2020) does not “fit” phase down profile
- use of low GWP refrigerants in all new equipment is crucial
  - avoid using very high GWP refrigerants immediately (e.g. 404A)
  - options available for lowest practical GWP refrigerant will rapidly change over next 3 to 5 years
    - as new lower GWP refrigerants are introduced
    - as our understanding of the “operating envelop” for these new refrigerants improves

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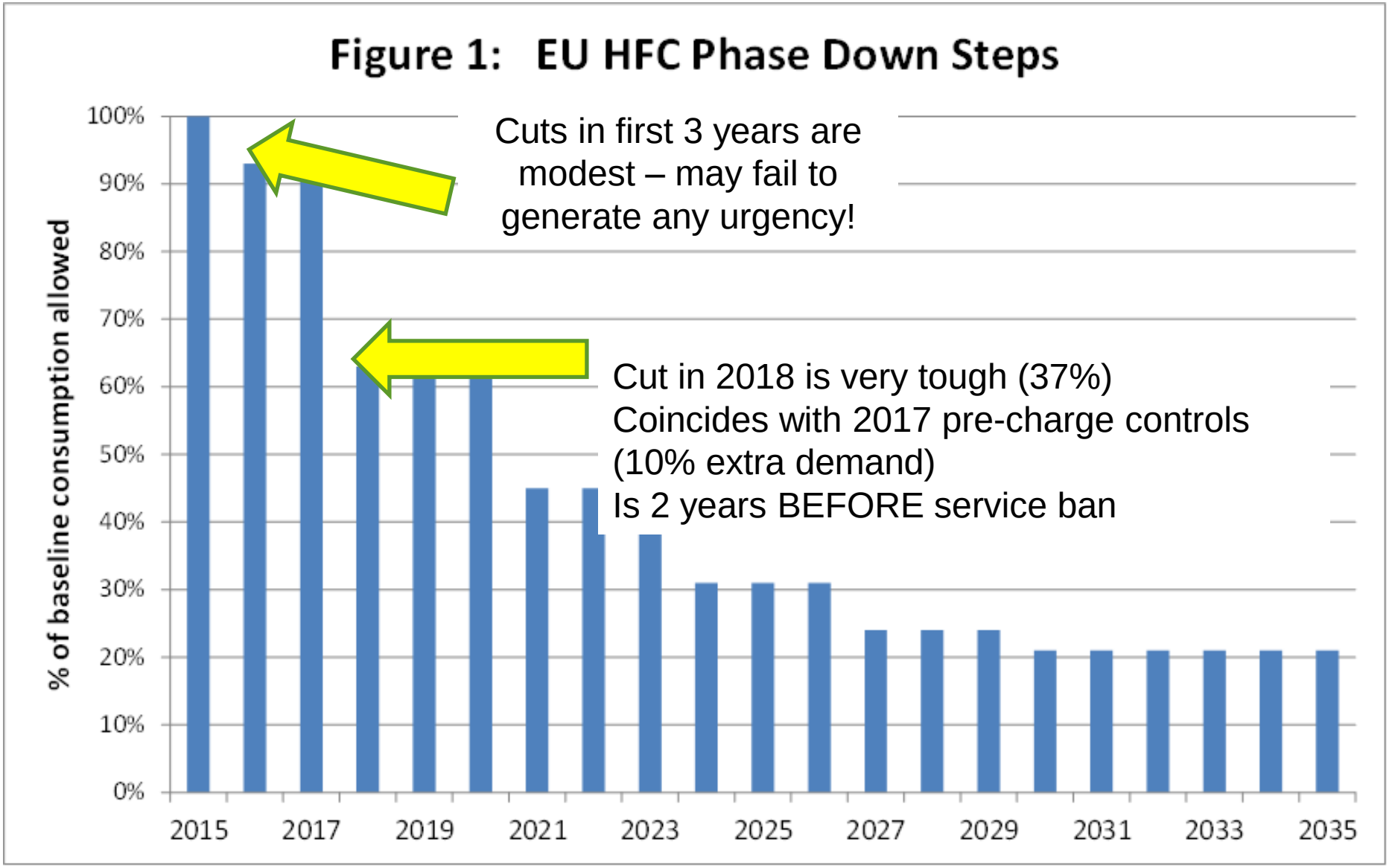
Big Cut in 2018



Future refrigerant options in new RAC equipment?

- R404A (GWP 3,922) will go quickly
  - it will be replaced in short term by lower GWP options like R407A (GWP 2,107) and R407F (GWP 1,825)
- but in longer term we need lower GWPs
  - otherwise we cannot meet phase down
- common refrigerants like R410A (GWP 2,088) and R134a (GWP 1,430) will also need to be replaced
  - by ultra-low GWP options (like ammonia, CO_2, HFOs)
  - by moderate GWP options (R32 and blends of HFOs / HFCs)

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GWP groups (slightly contentious choice of bands!)

GWP Group	GWP Range
Ultra-low	0 to 10
Low	10 to 200
Moderate	200 to 1,400
High	1,400 to 2,500
Very high	>2,500

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Commonly Used Refrigerants, 2012

GWP Group	GWP Range	Refrigerant	GWP	Flammability
Ultra-low	0 to 10	R 717 (ammonia) R 744 (CO_2) HC 290 (propane) HC 600a (isobutane)	0 1 5 5	**2L mildly flammable** 1 non-flammable **3 highly flammable** **3**
Low	10 to 200	None in common use		
Moderate	200 to 1,400			
High	1,400 to 2,500	HFC 134a HFC 407C HFC 407F HFC 410A HFC 407A HFC 417A	1430 1774 1825 2088 2107 2346	1 1 1 1 1 1
Very high	>2,500	HFC 422D HFC 434A HFC 404A HFC 507	2725 3245 3922 3985	1 1 1 1

Recently commercialised / being developed 2014

GWP Group	GWP Range	Refrigerant (Note: NB refers to "new blend")	GWP	Flammability
Ultra-low	0 to 10	HFO 1234yf	4	2L
		HFO 1234ze	7	2L
		HCFO 1233zd	4	1
Low	10 to 200	None currently proposed		
Moderate	200 to 1,400	HFC 32 mildly flammable R410A alternative	675	2L
		NB 1, mildly flammable R 404A alternative	~ 300	2L
		NB 2, mildly flammable R 22 alternative	~ 350	2L
		NB 3, mildly flammable R410A alternative	~ 600	2L
		NB 4, non-flammable R134a alternative	~ 600	1
		NB 5, non-flammable R404A alternative	~ 1300	1
High	1,400 to 2,500	None currently proposed		
Very high	>2,500	None being considered		

Using Mildly Flammable Refrigerants

- a key response is better knowledge of mildly flammable refrigerants such as R32, HFOs and new blends
  - it will be impossible to meet phase down without widespread use of mildly flammable refrigerants
- current understanding is relatively poor
  - we need to define safe system charge in different applications
  - we need to know what safety precautions are needed
  - without being too conservative
- much work still needed
  - by refrigerant producers
  - by equipment manufacturers
  - by standards committees and Member State safety authorities

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What is most urgent (1)

- avoid buying new equipment with R404A now
  - or any refrigerant with GWP > 2,500
  - don't be fooled by 2020 new equipment ban
    - you want to avoid the 2020 service ban
    - this creates an immediate 'de facto' ban
- for large systems, check the threshold for mandatory automatic leak detection
  - from Jan 1st 2015, R404A size threshold drops
    - from 300 kg
    - to 127 kg

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What is most urgent (2)

- check if you are affected by service ban
  - make plans for early actions
- develop (and regularly update) a strategy for all new plants
  - use lowest GWP refrigerants that are efficient / cost effective
  - be prepared to use mildly flammable refrigerants
- be aware of big cut in 2018
  - 2018 cut will only be achieved with early actions related to high GWP refrigerants
    - investments to prevent leakage
    - retrofill R404A before 2018

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Concluding Comments

- the Regulation will create a massive cut in GHG emissions
  - nearly 80% cut in EU F-Gas emissions by 2035
- it will help industry invest in new technologies to meet phase down targets
- it is logical that other developed countries could adopt a similar approach
  - and that every effort should be made to help A5 countries adopt the new technologies as soon as possible

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