



LIFE FRONT: ALLEVIATING BARRIERS FOR HYDROCARBONS

**Smarter Standards: Vital for Kigali Amendment
Success**

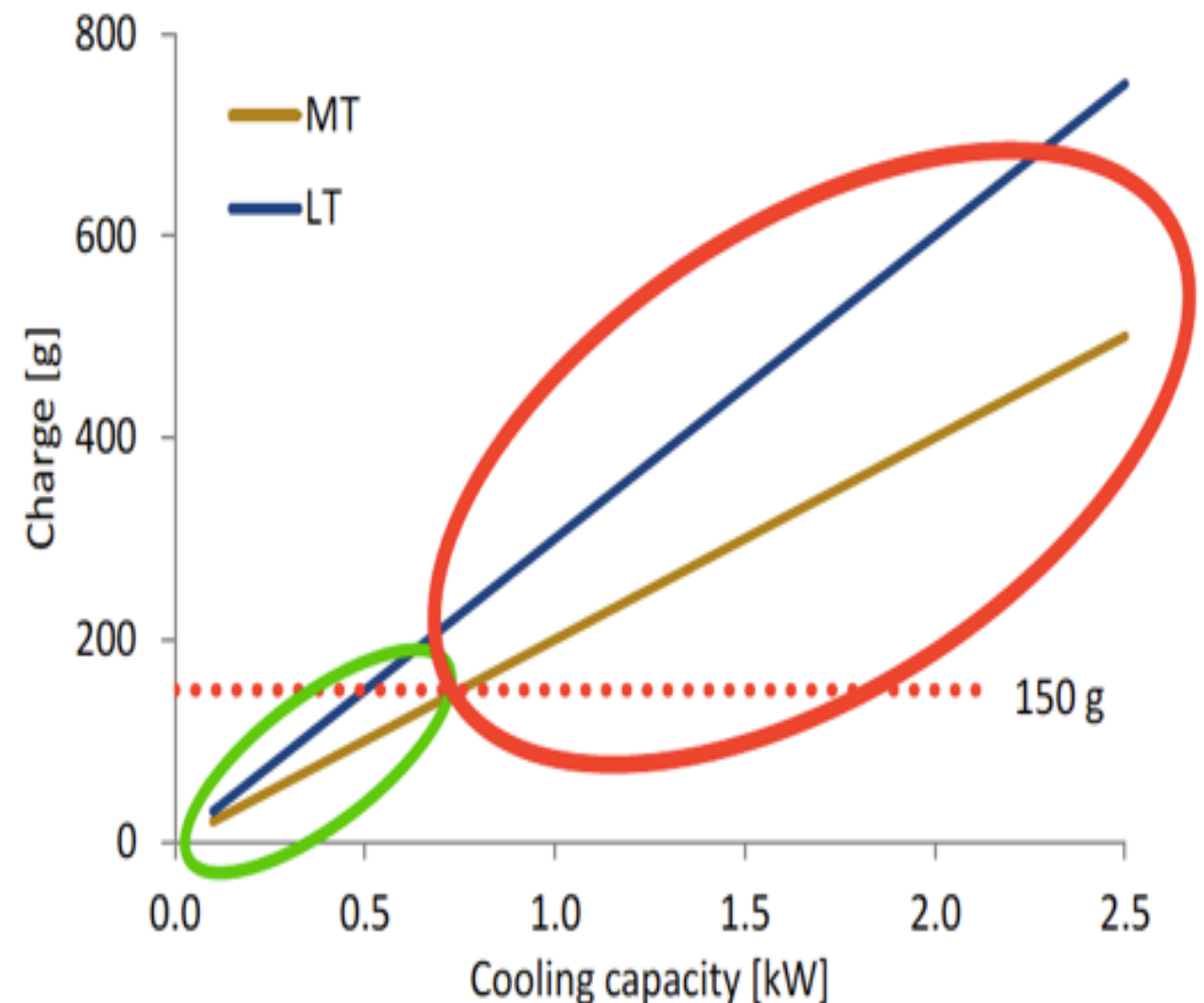
13 July 2018

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STANDARDS FOR FLAMMABLE REFRIGERANTS

The limit of 150g in commercial refrigeration does not allow to fully exploit the potential of energy efficient HFC-free technology

- **standards** (at international, European and national level) regarding the **use of flammable refrigerants** appear to be an **important barrier** to the uptake of climate friendly alternatives to HFCs.
- **Charge limits are established on worst case scenarios**, which does not reflect the reality in the field



Source: GIZ Proklima, Heat GmbH (2017)

LIFE FRONT PROJECT

01

LIFE FRONT PROJECT



Flammable Refrigerant Options for Natural Technologies (FRONT)

- improve standards & product design for their safe use
- **international impact**

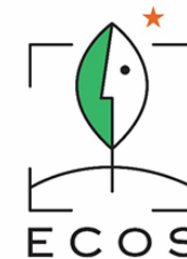
Funded under LIFE, the EU's financial instrument



DURATION:

- Start: 15/06/2017 – End: 14/06/2020

PROJECT PARTNERS:



MORE INFO: lifefront.eu

LIFE FRONT: OBJECTIVES

Key objectives:

- **Support** the EU and international **standardisation process** for flammable refrigerants
- **Reduce safety risks** from improved system design for air-conditioning, refrigeration and heat pump applications using flammable refrigerants
- **Increase availability** of alternatives to replace HFCs
- Engage in **technology capacity-building** for EU equipment manufacturers
- **Remove** non-technological knowledge **barriers**

life
front.

LIFE FRONT: EXPECTED OUTCOMES



- guidelines for draft requirements for standards on flammable refrigerants
- **field study on leak hole size and type** per application + establish a leakage size and simulation database
- EU-wide **Standards Action Group** (“FRONT”) on non-fluorinated flammable refrigerants, gathering 50 experts in the RACHP industry and providing capacity-building and activation of relevant stakeholders
- Conduct **quantitative risk assessment and develop prototypes with enhanced product safety** features for 5 different units of commercial refrigeration and heat pump models, as demonstration units for other manufacturers to follow
- Reach 20,000 stakeholders worldwide with information on improved requirements for flammable refrigerants

STANDARDS LITERATURE REVIEW

Primary barriers to flammable refrigerants in safety standards are mainly related to refrigerant charge size limits.

These limitations take shape as:

- Charge size limits for ‘human comfort’
- Charge restrictions for systems below ground
- 150g limit for systems installed without restriction of room size
- Charge size limitation for large systems

STANDARDS LITERATURE REVIEW

The current standards do not take account of risk mitigation measures in case of flammable refrigerants – these could increase the allowed refrigerant charge size while maintaining the same level of safety.

The review has determined that the following risk-mitigation measures are of use:

- Improved system tightness
- Systems with integral airflow
- Charge leak test method
- Housing design
- Sources of ignition test method

STANDARDS LITERATURE REVIEW

On-going revisions of international standards - potential to open up opportunities for hydrocarbons globally

IEC 60335-2-89 for commercial refrigeration

- Proposal to raise the max. charge limit for flammable refrigerants (e.g. propane from 150g to 500g)
- Final amended standard expected at the beginning of 2019

IEC 60335-2-40 for AC and heat pumps

- Proposal to increase allowable charge size for flammable refrigerants by implementing various mitigation measures while keeping the max. charge size
- Final amended standard expected in 2019-2022

MARKET SURVEY

02

MARKET SURVEY

Survey on availability of hydrocarbon-based products & impact of standards

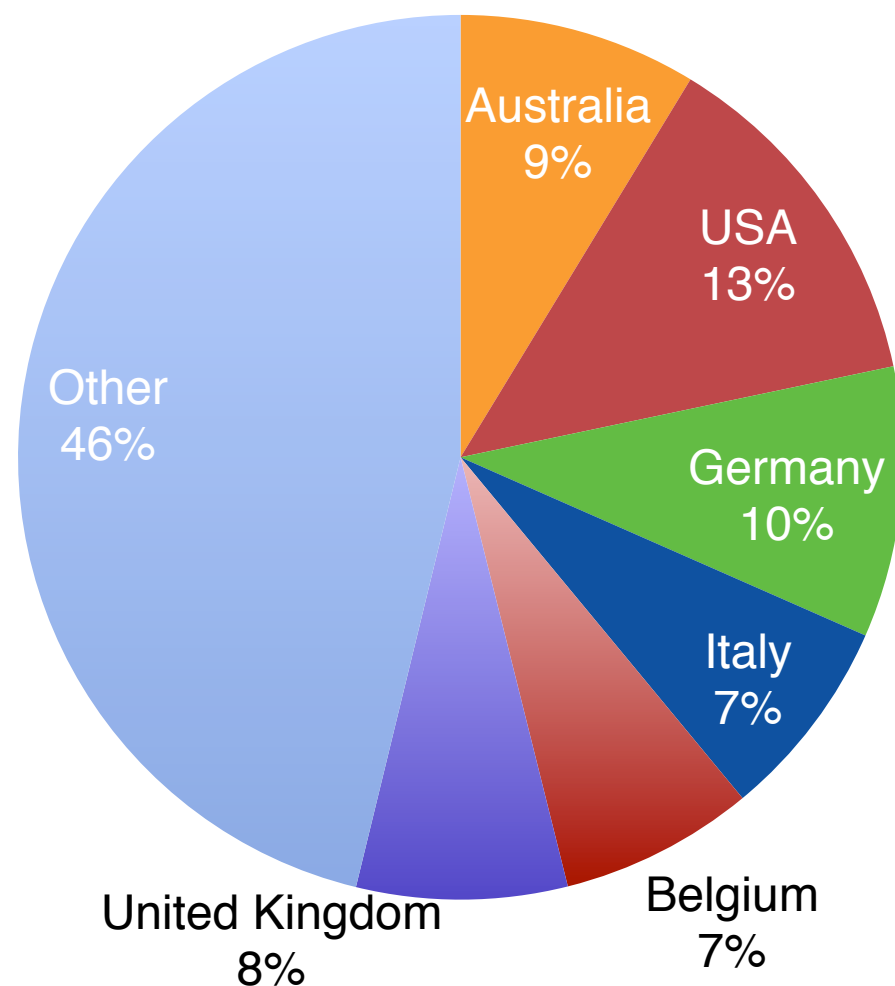
- Running between March – May 2018
- The survey results will be available to the public in early September
- Interested participants: system & component manufacturers, end-users, trade bodies, research community, NGOs, national authorities
- The results will remain anonymous and only aggregated data will be used to outline the current and future trends for hydrocarbons
- Participate now:
<http://www.surveygizmo.com/s3/4150423/LIFE-FRONT-WP3-2-Survey>

MARKET SURVEY

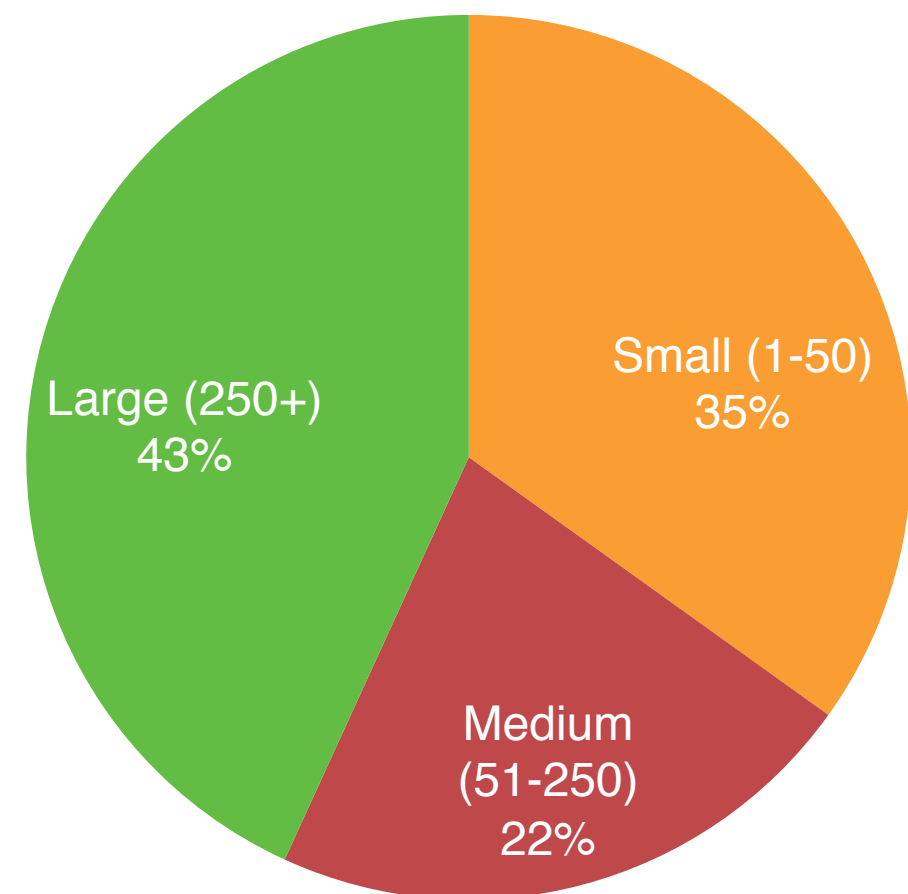
March – May 2018

Overall, **461 responses** (175 complete and 286 partial)

Location of organisations



Size of organisations (number of employees)

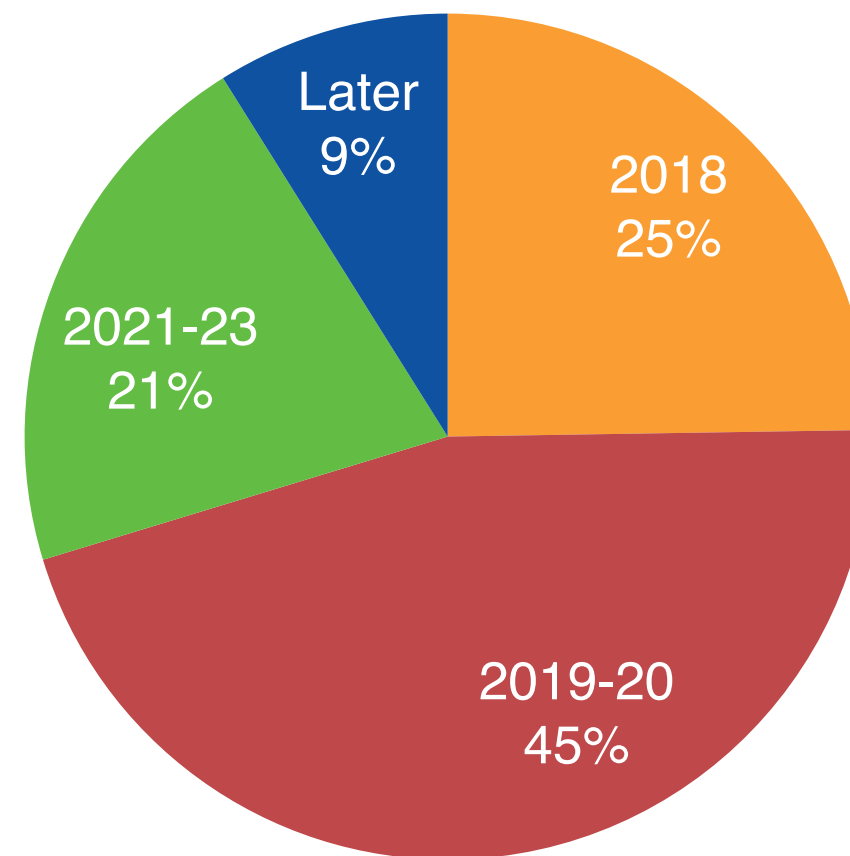


More than 50% of the respondents work with hydrocarbons

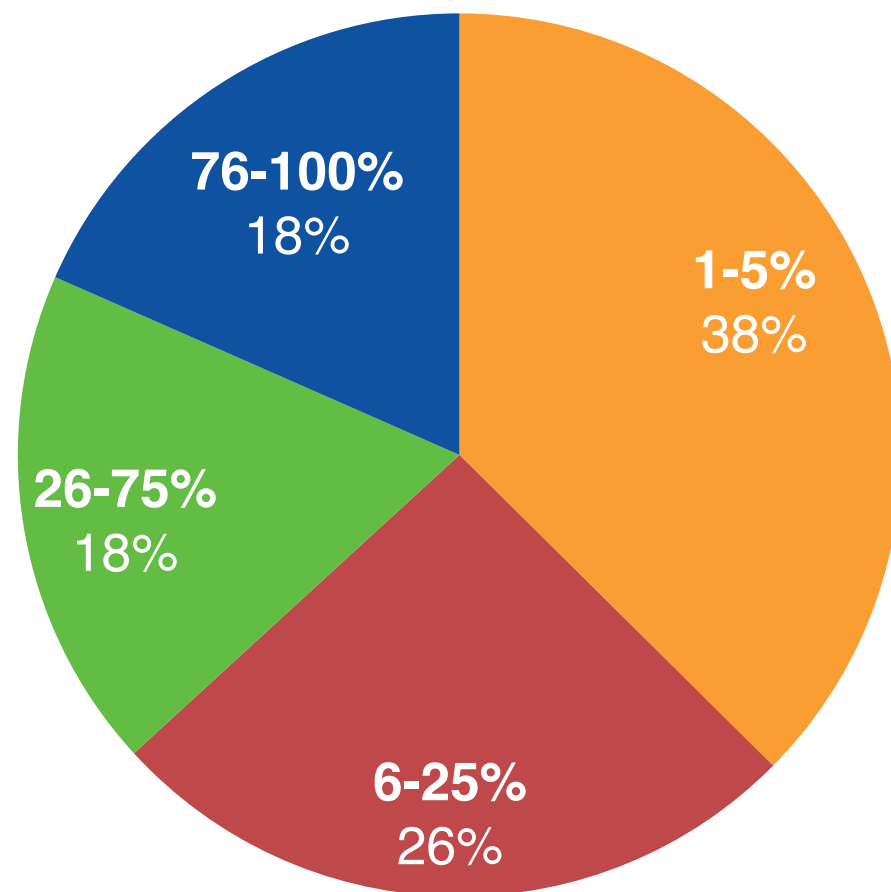
Out of those that do not work yet with hydrocarbons, **50% plans to start in the future**

➤ **Majority (70%) will start before 2020**

When are you planning to start working with hydrocarbons?



Share of HC-based products TODAY



By 2020, if standards allow higher HC charges

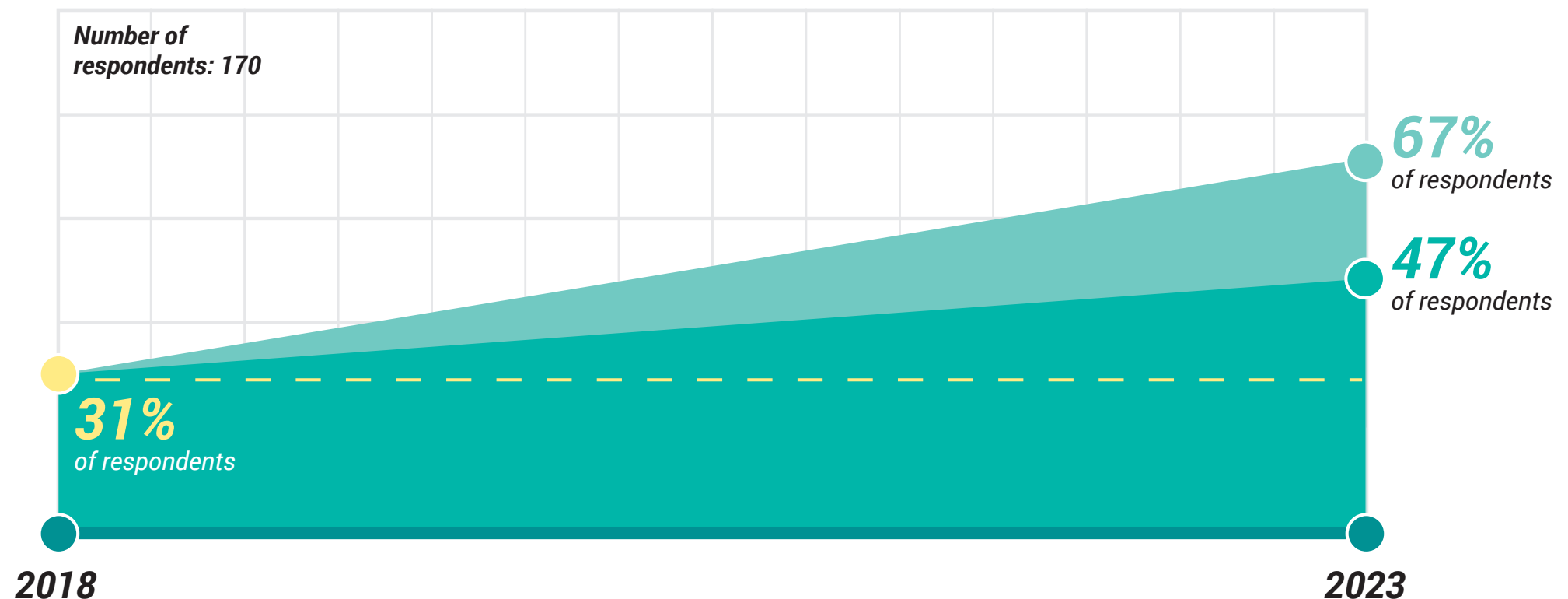
- over 36% of respondents indicated the share of HCs will grow to 76-100%




By 2020, if standards are not updated

- over 1/2 of respondents indicated the share of HCs will be below 25%,
- but 27% still expect to have 76-100%

MARKET SURVEY

Do you expect the **share** of your organisation's **product portfolio** related to **hydrocarbons** to exceed **25%** by **2023**?



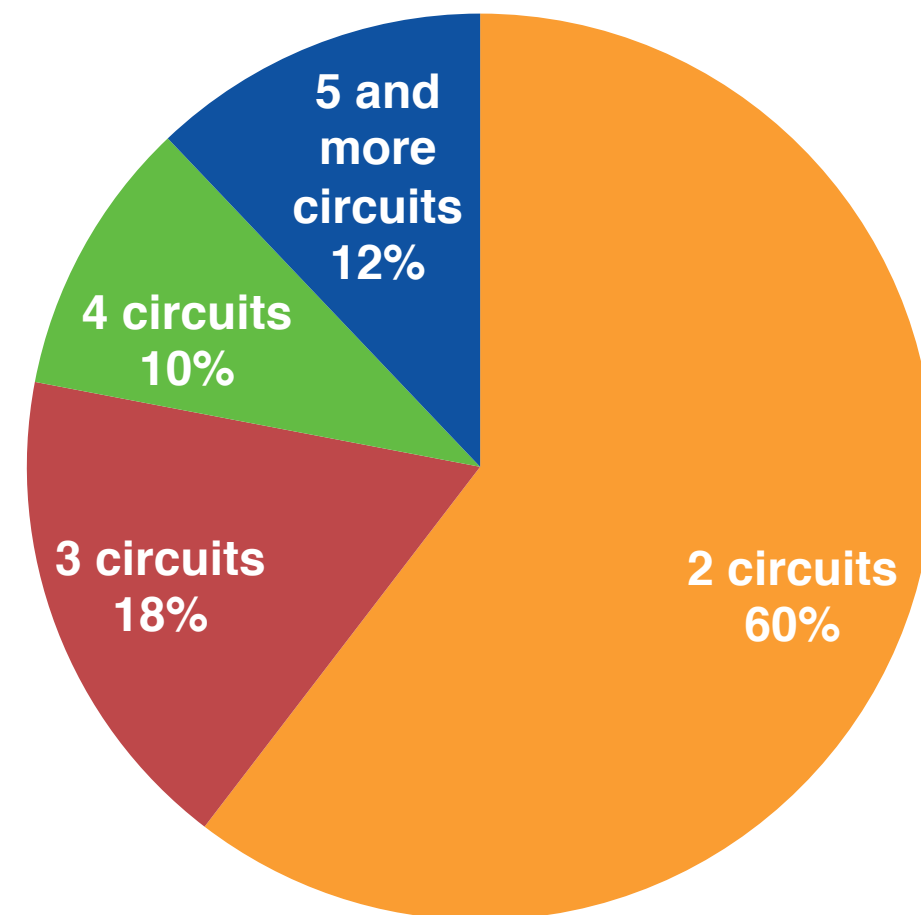
-  Yes, if standards allow higher charges
-  Yes, if standards don't allow higher charges
-  31% of respondents said their hydrocarbon share already exceeds 25%

MARKET SURVEY

Over 50% of those working with hydrocarbons indicated they manufacture / acquire **systems with multiple refrigeration circuits**

→ if standards allow higher HC charges the **cost of equipment will go down**

Max number of refrigeration circuits

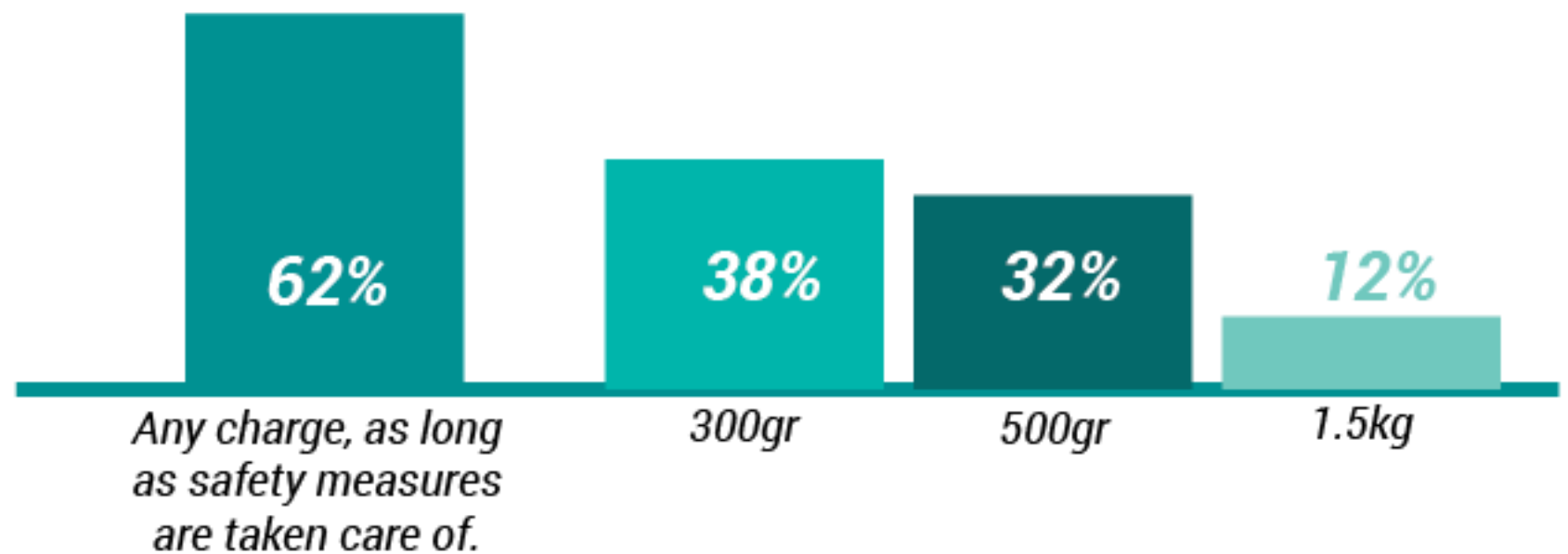


MARKET SURVEY

An overwhelming majority (84%) of those working with HCs are open to working with higher refrigerant charges, while 12% are undecided

Up to what charge limit would your organisation be comfortable to work with?

Number of respondents: 154



CONCLUSIONS

Adapting safety standards to current technologies to allow higher HC charges will unveil the potential of this technology

A large number of industry players are already working with HCs - the production could scale up quickly if the conditions are favourable

LIFE FRONT invites interested industry partners to join the Standards Action Group to contribute to project outcomes

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Base

