

shecco
Base



**WORLD GUIDE TO LOW CHARGE
AMMONIA**

DEREK HAMILTON, SHECCO AMERICA



Business Case for
Natural Refrigerants

June 12-14, 2018 – Long Beach



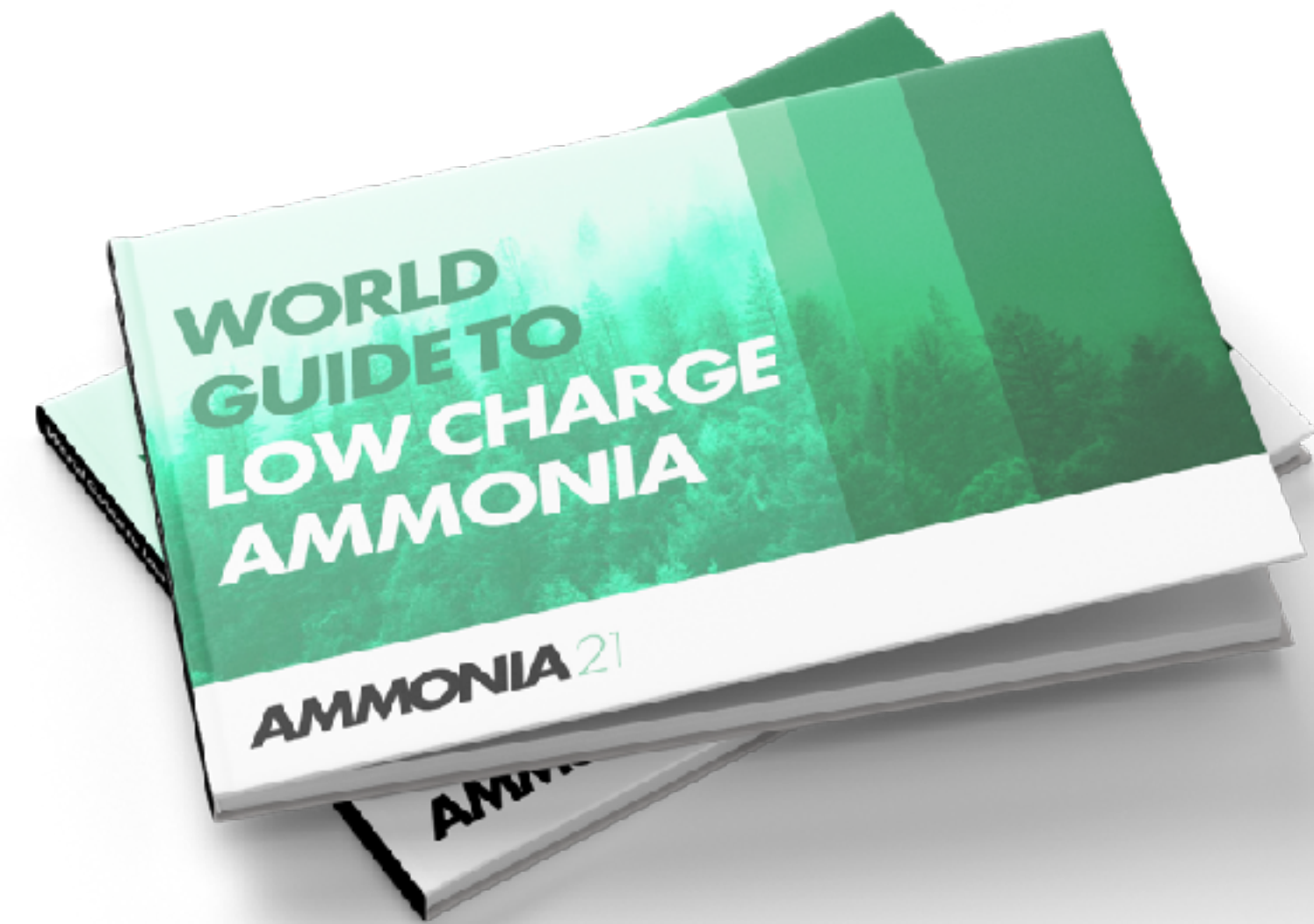
World Guide to Low Charge Ammonia
ATMOsphere America, 14 June 2018

Derek Hamilton, shecco America

WORLD GUIDE TO LOW CHARGE AMMONIA

First comprehensive guide to the low charge ammonia industry

- Market analysis
- Technology trends
- Case studies
- Code & standards updates
- New applications for ammonia



MARKET TRENDS

01

LOW CHARGE AMMONIA AROUND THE WORLD

Recently, growing pressure to improve **safety** and increase **energy efficiency** has led many to embrace low-charge ammonia systems.

The arrival of low-charge ammonia has disrupted the traditional ammonia refrigeration industry in a way that has never been seen before.

From an operational standpoint, the inherently simplified nature of low-charge ammonia systems means that they are **easier to service and maintain**, and more energy & cost efficient

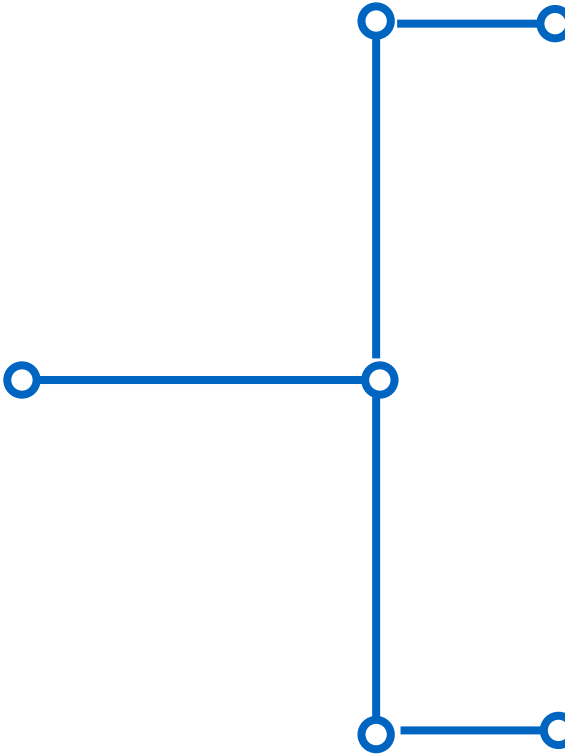
Low charge ammonia installations around the world



APPLICATIONS FOR LOW CHARGE AMMONIA



Cold chain



Refrigerated warehousing



meat processing



fish processing



fruit / vegetable processing



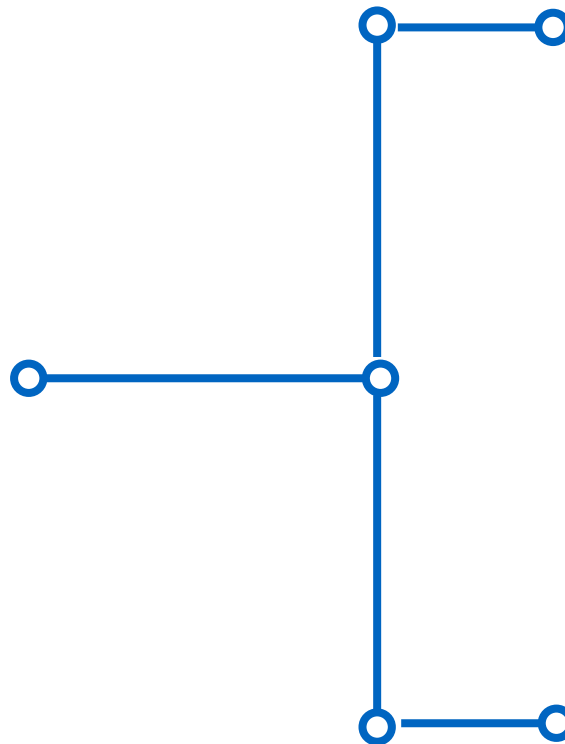
supermarkets



wineries, breweries



industry, special applications & sport



petrochemical plants



HVAC



industrial / chemical processing



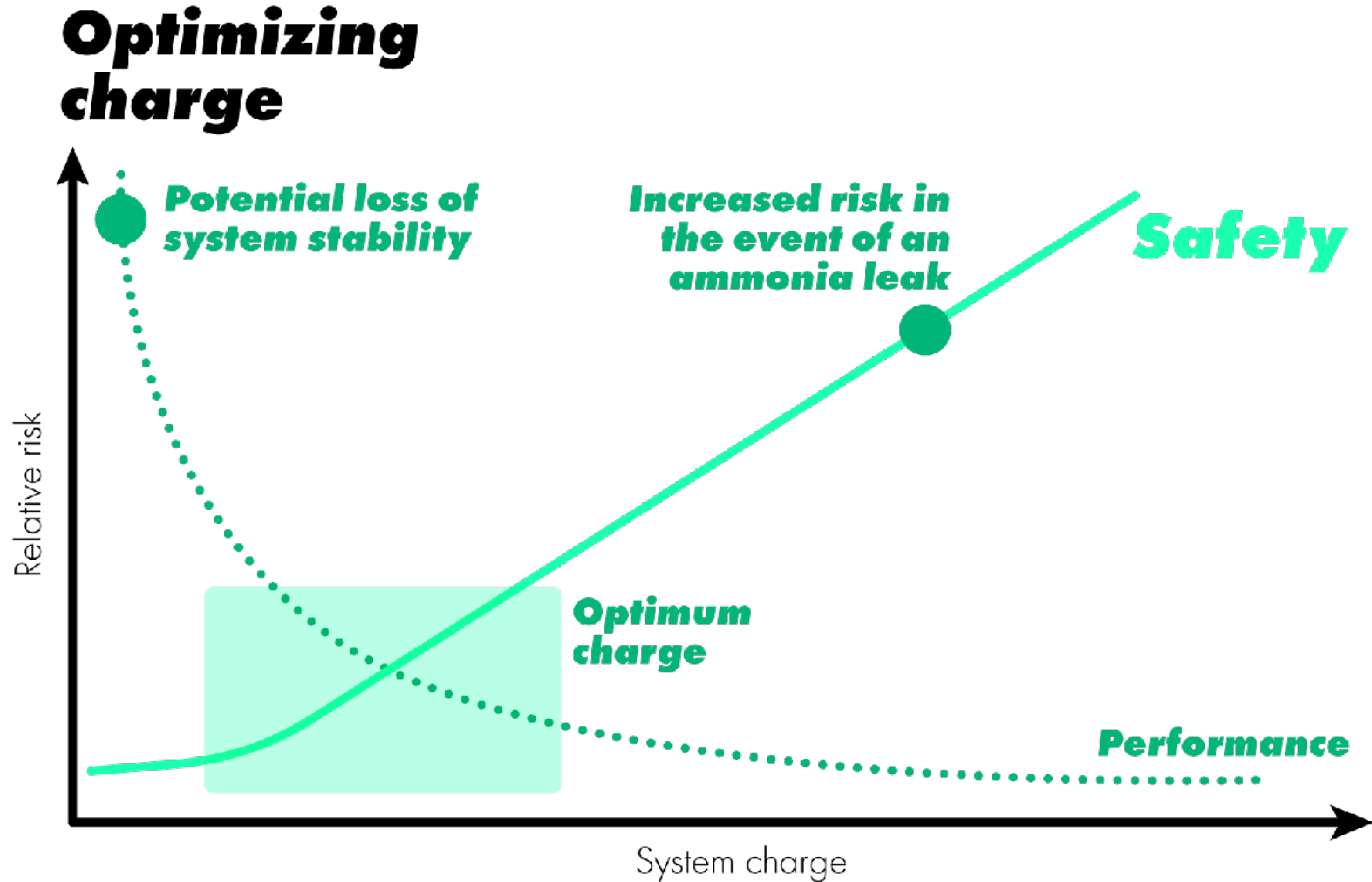
ice rinks



pharmaceutical processes

... and more

OPTIMUM SYSTEM CHARGE

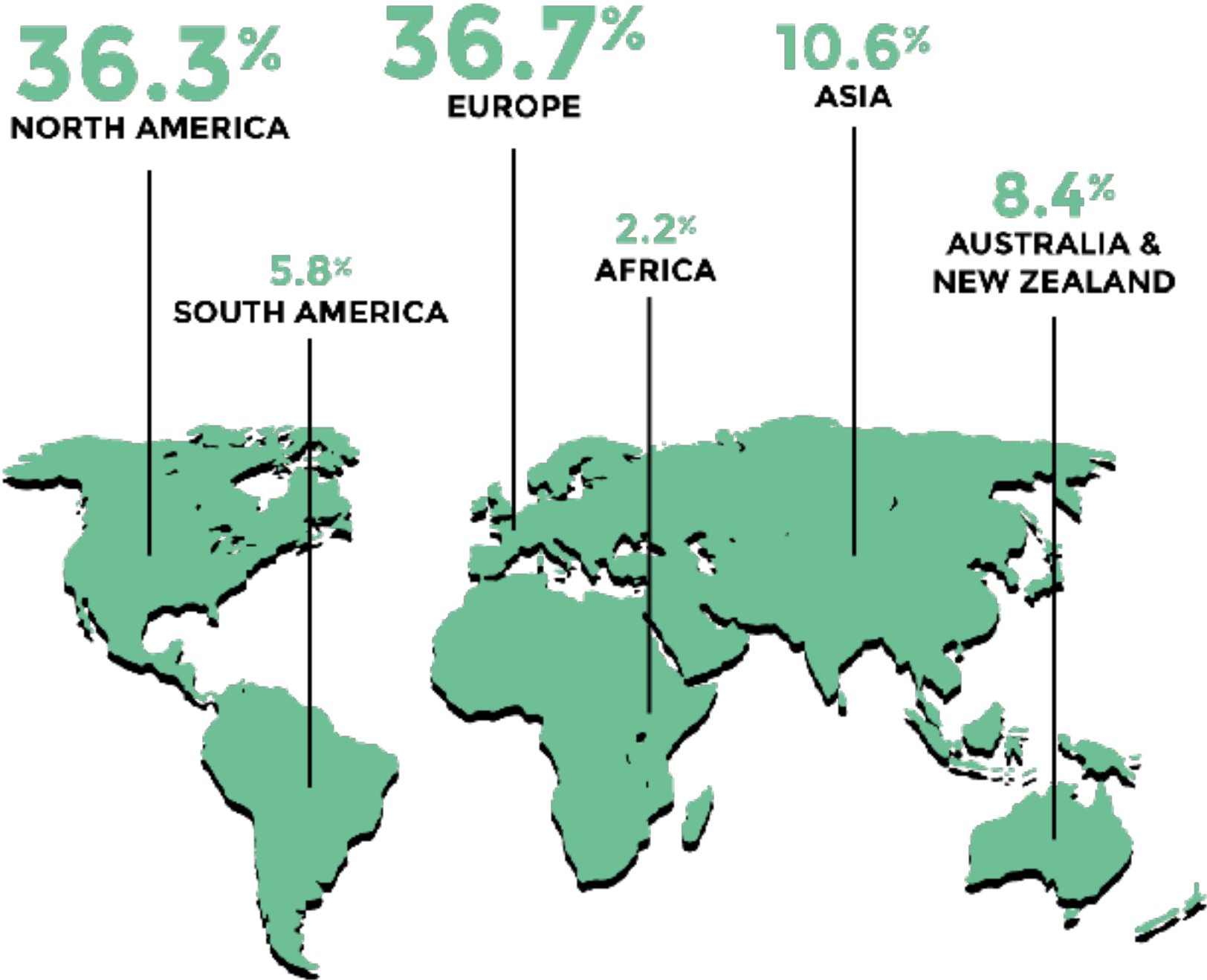


SURVEY - SNEAK PEAK

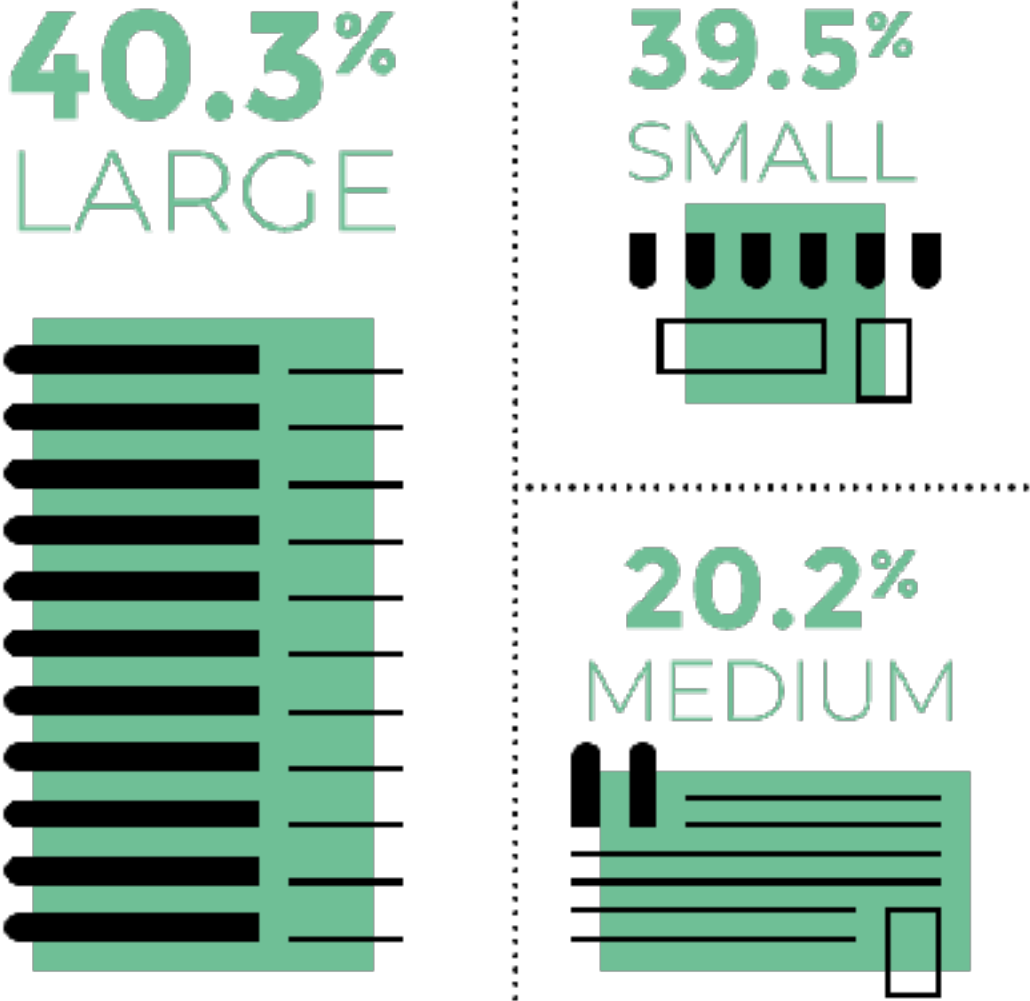
02

SURVEY - OVERVIEW OF RESPONDENTS

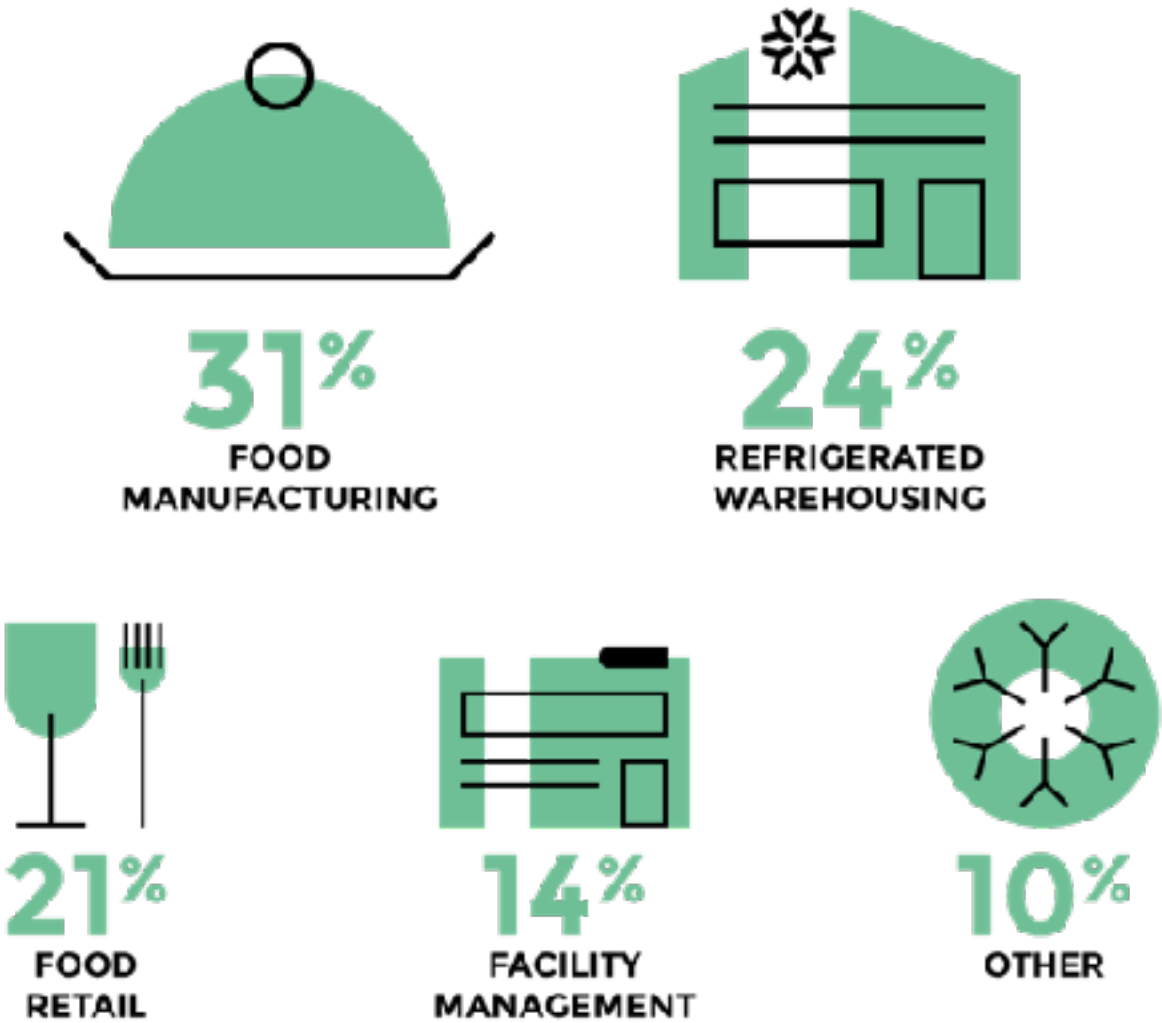
Location of organization



Size of organization



Primary business area



DEFINITION OF LOW CHARGE AMMONIA

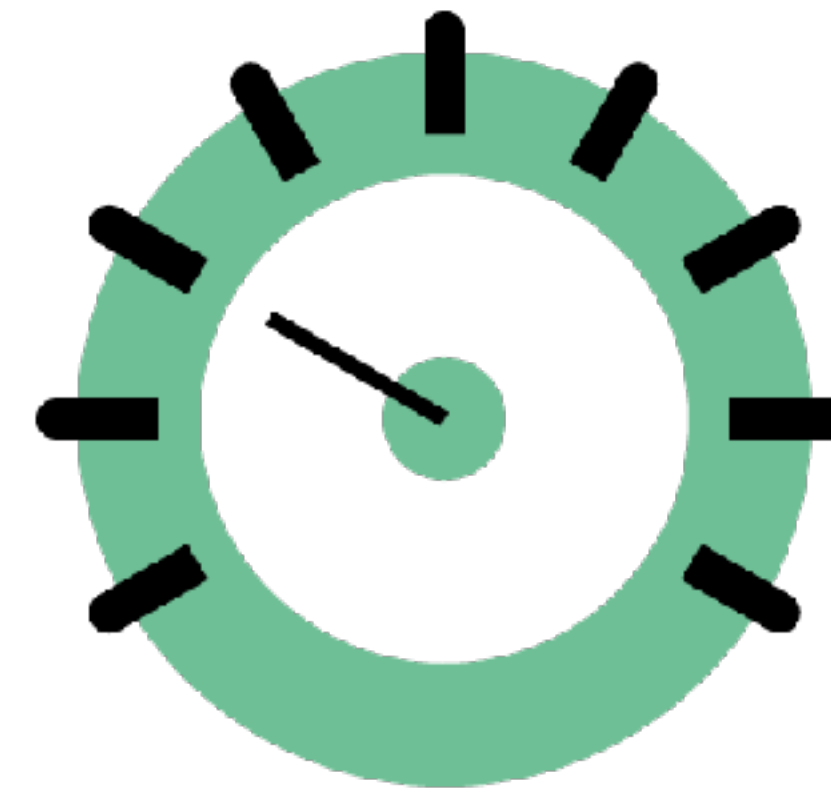
Several opinions

a) Total quantity of ammonia (lb or kg)

b) Specific ammonia charge (lb/TR or kg/kW)

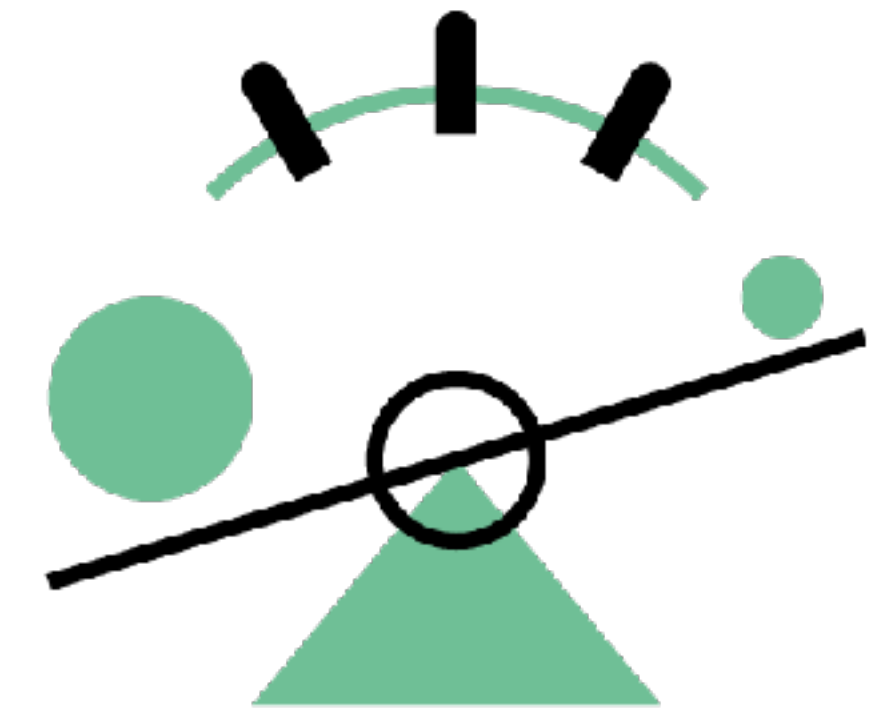
c) Some combination of a) and b)

d) 'Best endeavors' design approach



65%

**FAVOR A DEFINITION
BASED ON SPECIFIC
AMMONIA CHARGE**



35%

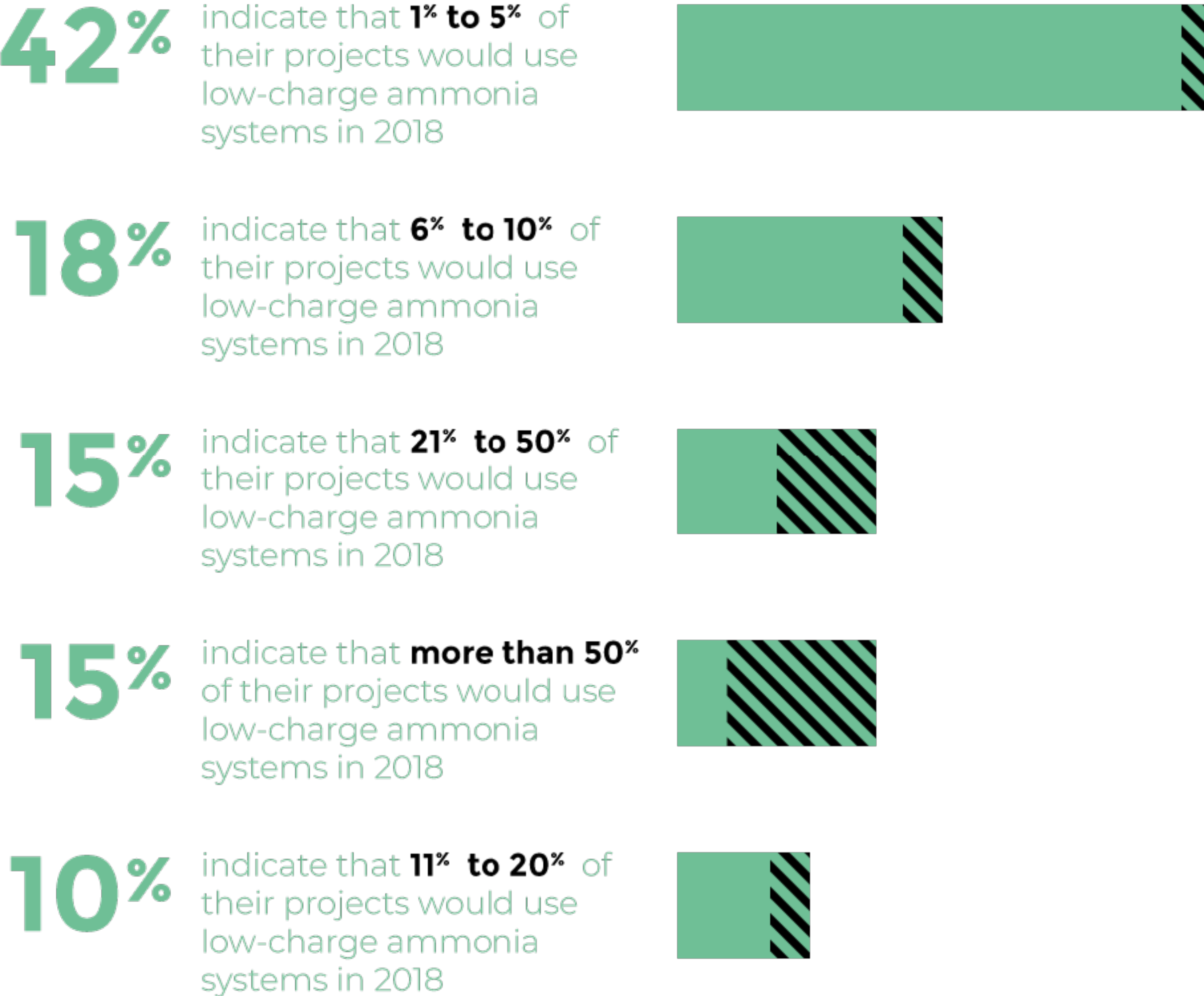
**FAVORING ONE BASED
ON TOTAL QUANTITY
OF AMMONIA ONLY**

LOW-CHARGE AMMONIA STILL A SMALL PART OF THE OVERALL MARKET



66% of respondents indicated they already manufacture / work with low charge ammonia.

Out of them.....



EXPECTATIONS OF ORGANIZATIONS NOT WORKING WITH LOW CHARGE AMMONIA

For organizations not working currently with low charge ammonia:

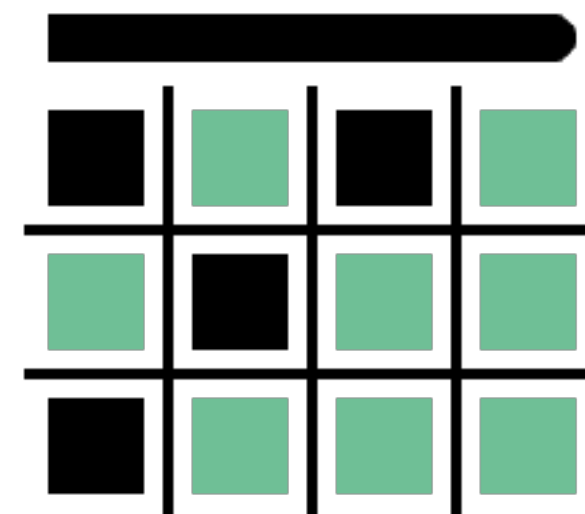
49% of respondents indicated they plan to manufacture / work with low-charge ammonia systems in the future

Out of them.....

30%

will start working with low charge ammonia in

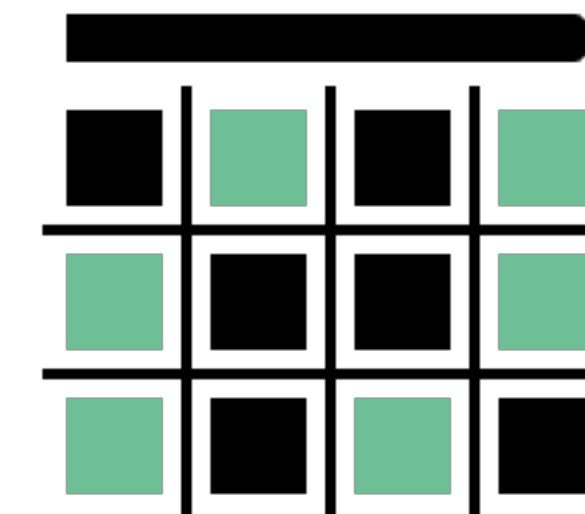
2018



55%

will start working with low charge ammonia in

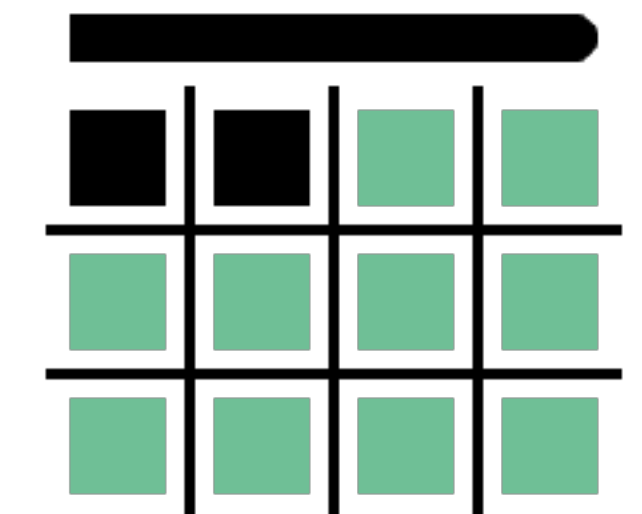
2019-2021



15%

will start working with low charge ammonia in

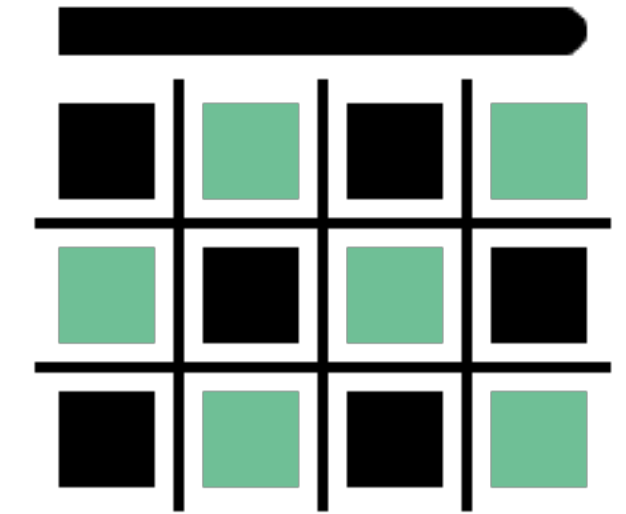
2021-2023



EXPECTATIONS OF END USERS

50%

are planning to install a low charge ammonia system in **2019-2020**

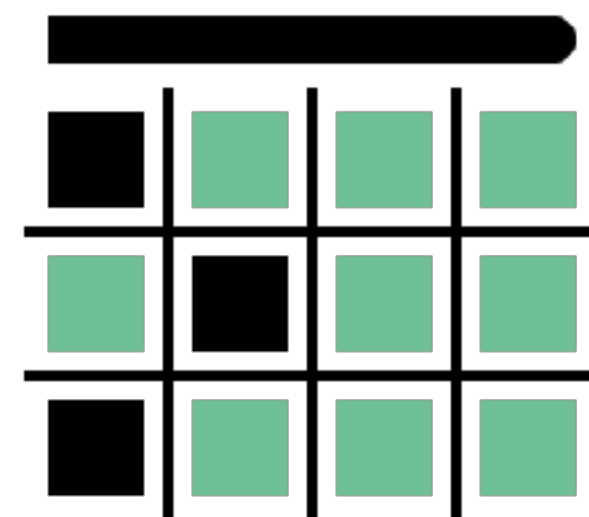


53% of end users indicated they plan to install low-charge ammonia systems in the future

Out of them.....

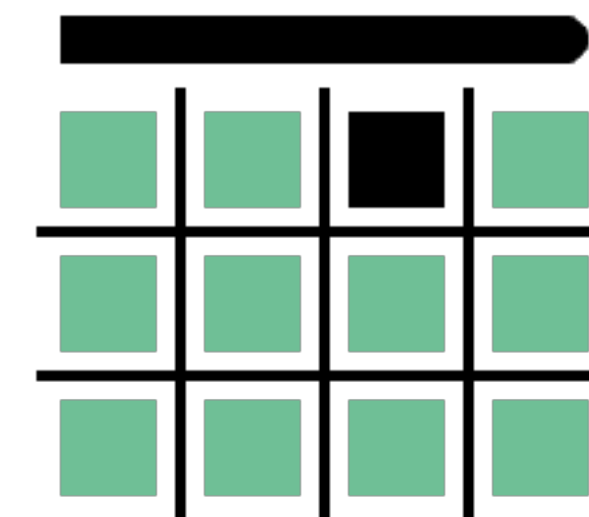
25%

are planning to install a low charge ammonia system in **2018**



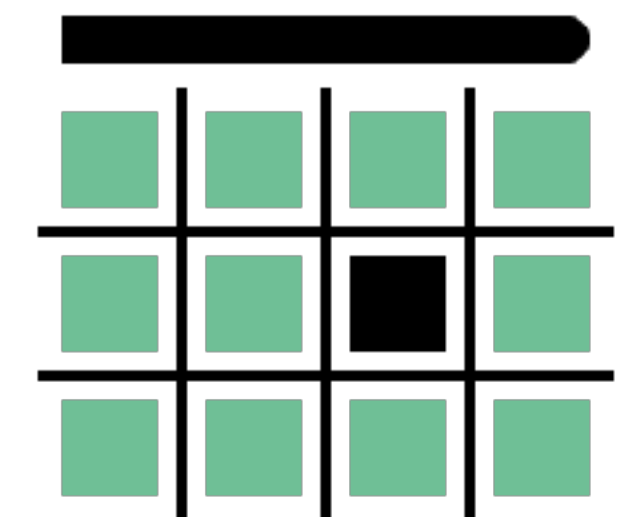
12.5%

are planning to install a low charge ammonia system in **2021-2023**



12.5%

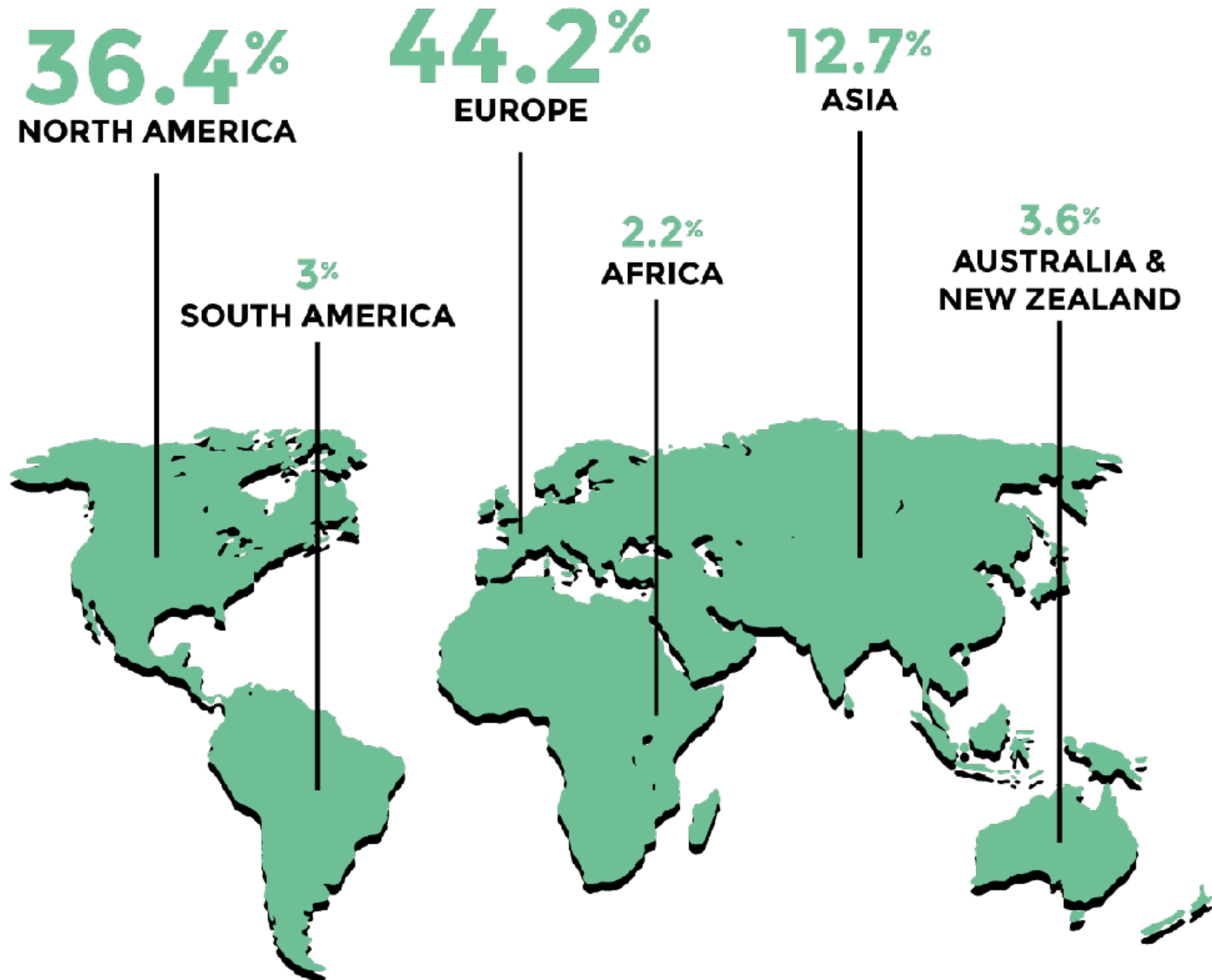
are planning to install a low charge ammonia system **later**



REGIONS TO EXPERIENCE FASTEST GROWTH

Which world region do you expect to experience the fastest growth in low charge ammonia installations in the next 5 years?

44.2% of respondents expect Europe to experience the fastest growth

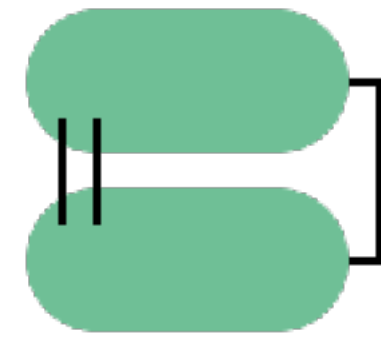


DOMINATING TECH 10 YEARS FROM NOW - NEW INSTALLATIONS

Refrigerated warehousing



Low charged packaged ammonia systems

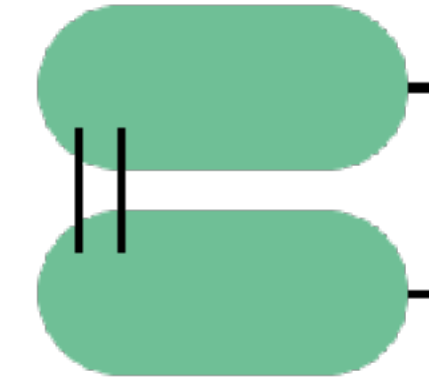


NH₃ + CO₂ cascade systems

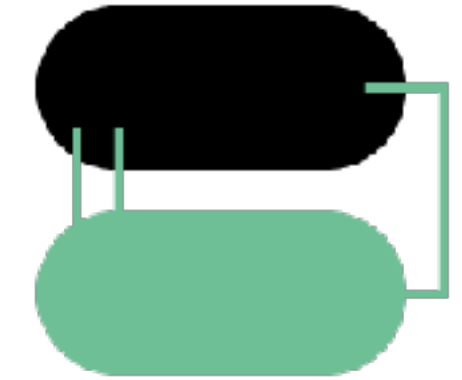
Food retail



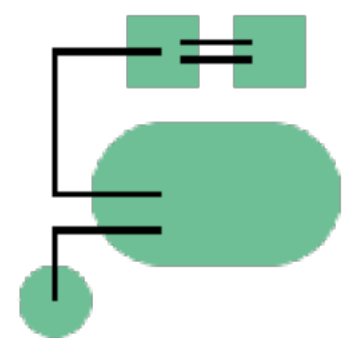
Transcritical CO₂



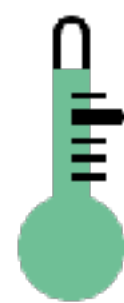
NH₃ + CO₂ cascade systems



Other refrigerant + CO₂ cascade systems



Traditional ammonia systems



Transcritical CO₂



Other



Synthetic refrigerants



Self-contained hydrocarbons



Hydrocarbons water loop



Other

SUPPORTERS



SHECCO USEFUL LINKS



Industry platforms



Accelerate magazines



ATMOsphere events



shecco publications



sheccoBase Webinar



The Natural Voice



sheccoBase



shecco
Base



THANK YOU!