
Airgas
an Air Liquide company
NAATBatt 2022
presentation
Airgas in the Battery Manufacturing Ecosystem
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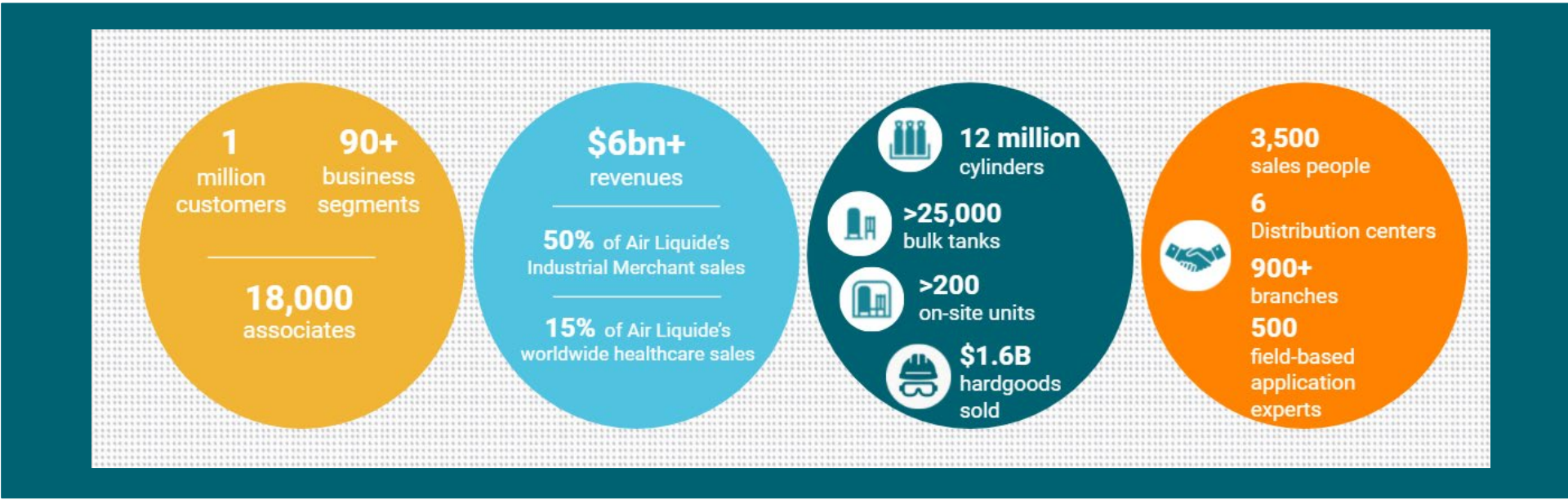
Airgas, an Air Liquide company | in brief



- Founded in 1982; built with over 500 acquisitions
- Acquired in 2016 by Air Liquide; adding in global sourcing capabilities and R+D network

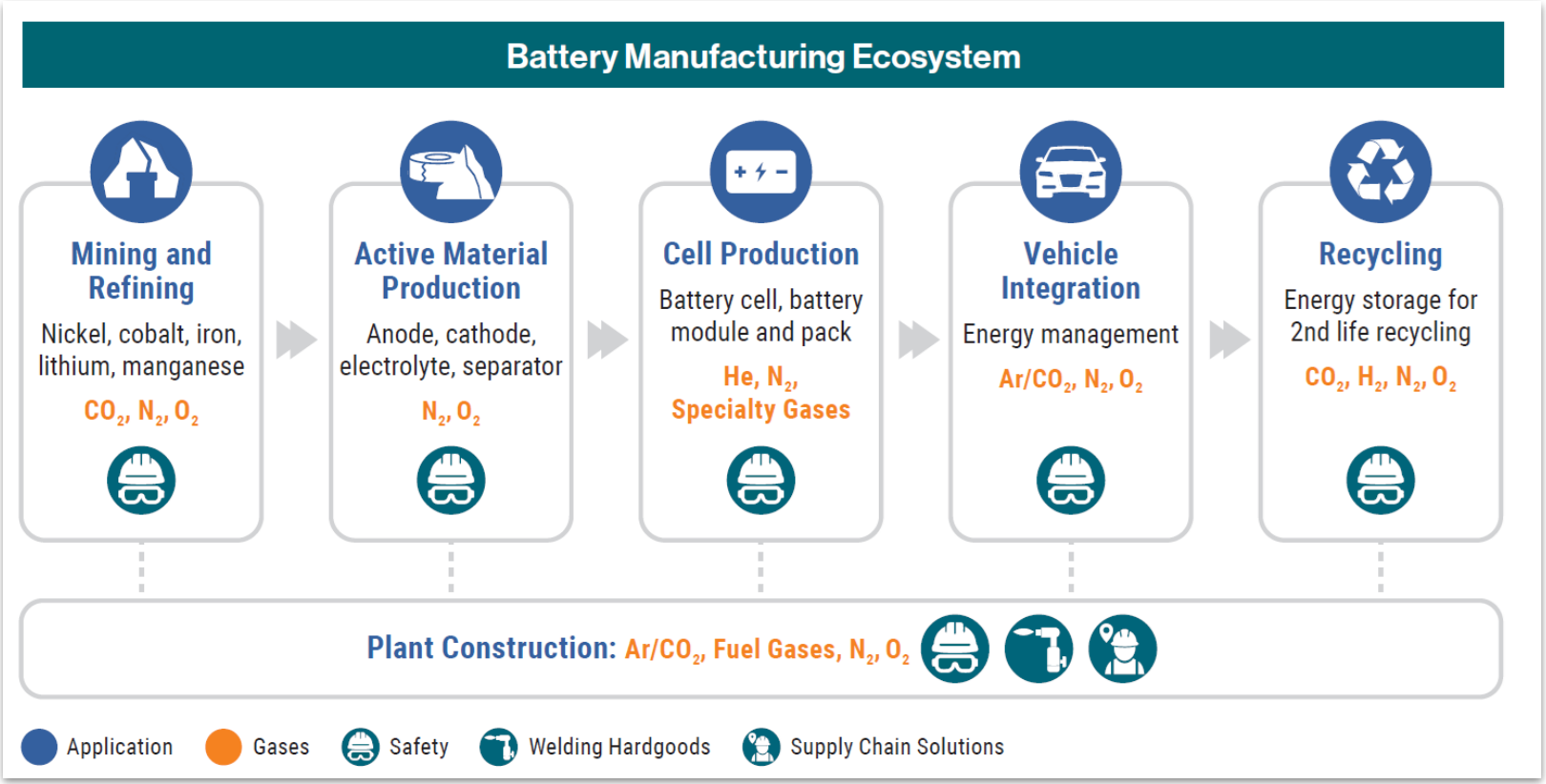
Innovation

At Airgas and Air Liquide, we are dedicated to advancing gas technology to help you improve your TCO

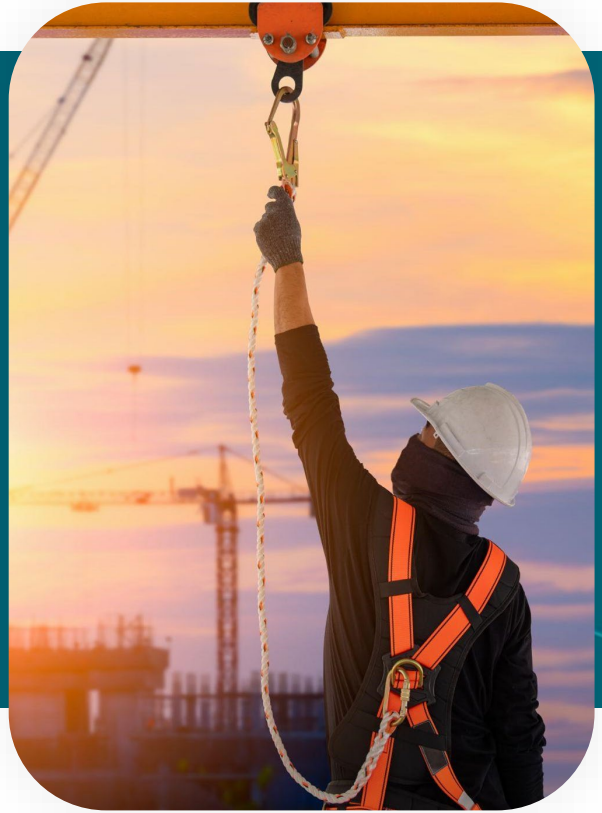
- **5 global R+D facilities, with over 500+ associates**
- **For the battery ecosystem:**
  - Developing tools and equipment designed to improve and promote efficient and sustainable gas use
  - Focusing on the development of advanced coating technologies
  - Collaborating and experimenting with customers using a calcination furnace

Advancing the eVchicle transistion with you.

Our battery ecosystem | the role of gases and services



For the safe, efficient and sustainable production of essential battery materials



Plant construction

- Gases needed: **Ar/CO_2, fuel gases, N_2 and O_2**
- Dependable supply from multi-channel distribution network
- Welding and hardgoods
- Safety and PPE supplies
- Customized supply chains including vendor-managed inventory

Safely and efficiently construct your facilities and stay on schedule

Cell production

- Gases needed: **N_2**, accurate **specialty gases** for lab use, **helium** for leak testing prismatic cells; **Ar and N_2** for laser station use
- Custom engineering and equipment expertise to help safe gas delivery
- Safe inerting of electrolytes and solvents like NMP from the storage tanks to use points, and through recycling of the chemicals

Safe, efficient and sustainable production of essential battery materials:
Battery cell, battery module and pack

Active material production

- Gases needed: N_2 and O_2
- A range of other materials for advanced coatings
- Distribution systems for electrolyte chemicals

Safe, efficient and sustainable production of essential battery materials:
Anode, cathode, electrolyte, separator

Mining and refining

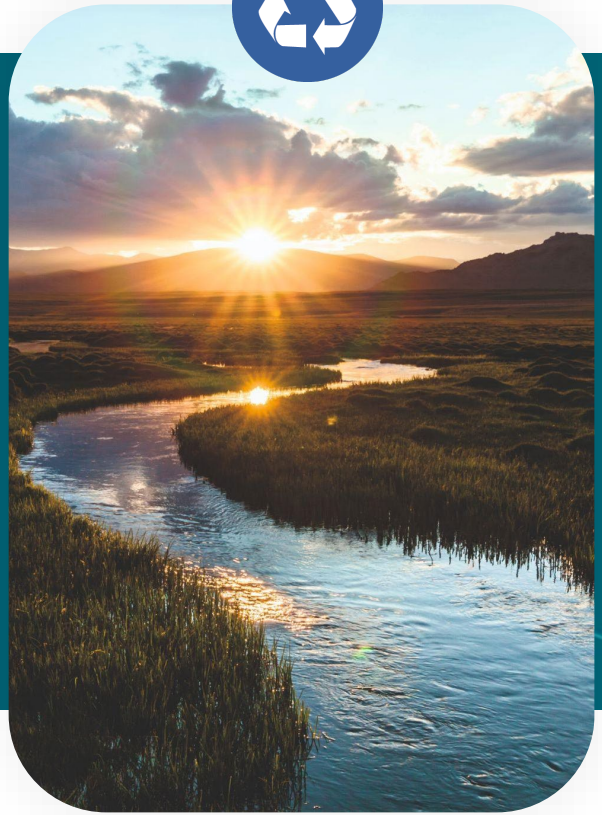
- Gases needed: Specific quality CO_2, O_2 and N_2 in large quantities
- Hydrometallurgy and pyrometallurgy expertise
- Flow sheeting support
- Optimization of gas purity
- Lab and pilot scale testing

Safe, efficient and sustainable production of essential battery materials:
Nickel, cobalt, iron, lithium, manganese

Vehicle integration

- Gases needed: **Ar/CO_2, N_2 and O_2**
- Production of electronics and plastic materials
- Melting, casting, heat treatment and welding for all metallic components, such as aluminum frames, magnets and other structural items

Safe, efficient and sustainable production of essential battery materials: Energy management



Recycling

- Gases needed: **CO_2, H_2, N_2 and O_2**
- Ensures long term supply chain of precious materials
- Contribute to overall sustainability of eVehicles

Safe, efficient and sustainable post production:
Energy storage for second life recycling

On-site gas generation

- N_2 and O_2 are critical to your process
- Gas purity and rate of consumption directly influences battery performance and safety
- Sustainable while reducing your Total Cost of Ownership

Safe, efficient and sustainable production of essential battery materials

Safety and PPE

Local safety specialists help you:

- Identify hazards and risks in your workplace
- Recommend the appropriate PPE and plant safety equipment
- Implement supply chain solutions to support your safety goals

Safety beyond products—to protect your team

Contact us

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