INTERNATIONAL INSTITUTE OF REFRIGERATION
INSTITUT INTERNATIONAL DU FROID

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Technical brief

THE ROLE OF REFRIGERATION IN THE GLOBAL ECONOMY 3RD EDITION

SUMMARY FOR POLICYMAKERS

Refrigeration is a critical component of the global economy, impacting food security, public health, energy systems, and climate change mitigation and adaptation. As global temperatures rise, the demand for sustainable refrigeration solutions is becoming increasingly urgent. This technical brief highlights the economic, social, and environmental importance of refrigeration and provides key recommendations for policymakers to ensure its sustainable development.

KEY INSIGHTS

1. Economic Impact

- The global refrigeration market is vast, with over **5.4 billion refrigeration systems** in operation worldwide, including air conditioners, refrigerators, and heat pumps.
- The sector generates **over USD 300 billion in annual sales** and employs **12 million people** globally, with significant growth expected in developing countries, particularly in Africa and in South Asia.
- However, the industry faces a **shortage of skilled workers**, especially in Europe, where an aging workforce and declining heat pump sales have led to thousands of job losses.

2. Food Security and Health

- Refrigeration is essential for reducing **food loss and waste**, which currently amounts to **12% of global food production**. Expanding cold chain infrastructure could save **475 million tonnes of food annually**, enough to feed **950 million people**.
- In healthcare, refrigeration is crucial for **vaccine storage** and **cryogenic medical treatments**, contributing to the fight against diseases like polio and cancer.

3. Energy Consumption and Climate Impact

- The refrigeration sector accounts for **20% of global electricity consumption**, with air conditioning alone responsible for **12%**. Without intervention, energy demand for refrigeration **could double by 2050**.
- Refrigeration contributes to **7.5% of global CO_2 emissions**, with **30%** coming from refrigerant leaks and **70%** from energy use.

4. Innovation and Technology

- The refrigeration sector accounts for **20% of global electricity consumption**, with air conditioning alone responsible for **12%**. Without intervention, energy demand for refrigeration **could double by 2050**.
- Refrigeration contributes to **7.5% of global CO_2 emissions**, with **30%** coming from refrigerant leaks and **70%** from energy use.

POLICY RECOMMENDATIONS

1. Promote National Governance Models

Establish a **national governance model, such as national refrigeration committees, to structure the sector and ensure its transversal nature is addressed effectively**, coordinate policies, integrate refrigeration into climate and energy strategies, and align with global sustainability goals like the **Paris Agreement** and **Kigali Amendment**.

2. Develop National Cooling and Heating Action Plans

Create frameworks to address the growing demand for sustainable refrigeration, including **Minimum Energy Performance Standards (MEPS), labelling schemes**, and rebates for energy-efficient appliances.

3. Support Developing Countries

Provide financial and technical assistance to developing nations to build **cold chain infrastructure**, reduce food loss, and ensure access to refrigeration for health and food security. Leverage **international climate funds** and **public-private partnerships** to mobilise resources.

4. Invest in Workforce Development

Address the **labour shortage** in the refrigeration sector by expanding **vocational training** and **apprenticeship programmes**.

5. Encourage Innovation and Energy Efficiency

Support **research and development** in energy-efficient refrigeration technologies, including the use of **natural refrigerants** and **renewable energy sources**.
Promote buildings **passive cooling strategies** to reduce reliance on energy-intensive air conditioning.

6. Comply with Global Agreements

Implement measures to reduce emissions from high-GWP refrigerants, including **leakage control, refrigerant charge reduction, and end-of-life recovery**. Encourage the adoption of low-GWP refrigerants and natural refrigerants.

CONCLUSION

Refrigeration is indispensable for economic development, food security, public health, and climate resilience. Policymakers must prioritise sustainable refrigeration solutions to meet the growing demand while mitigating environmental impacts. By integrating refrigeration into national and international climate strategies, governments can ensure a sustainable, resilient, and climate-friendly future for the global refrigeration sector.

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