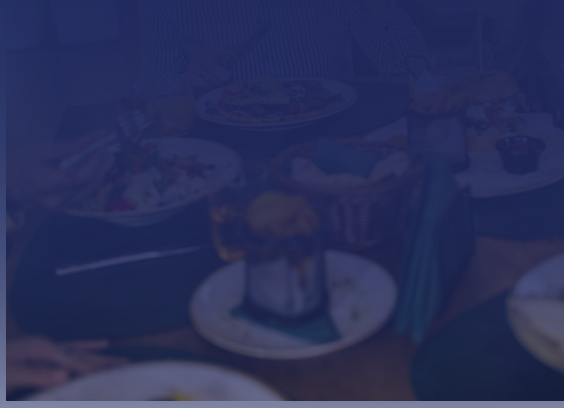
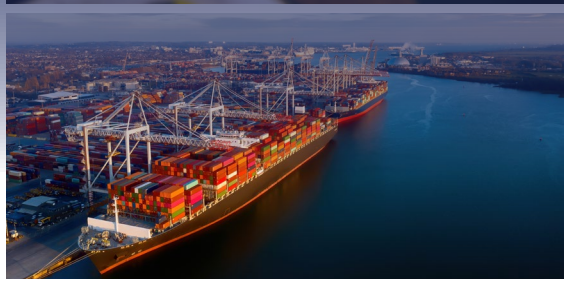
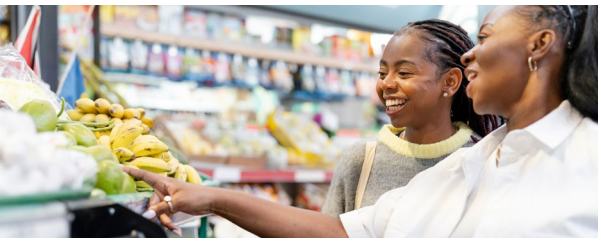
COLD CHAIN FEDERATION

# THE CRITICAL LINK:

## A RESILIENCE STRATEGY FOR PROTECTING UK FOOD SUPPLY AGAINST GROWING THREATS TO THE COLD CHAIN







Ten **urgent** steps for protecting UK citizen access to essential food

# EXECUTIVE SUMMARY

Access to essential food and life supporting pharmaceuticals is often taken for granted, but during a crisis it becomes an essential service, a lifeline that must keep functioning at all costs to ensure that citizens, including the most vulnerable in society, can still access critical supplies from shops, restaurants, foodbanks, home deliveries, or via national institutions such as the NHS. People rarely question where their food comes from, least still how it came to them, however disruption quickly leads to panic, stockpiling, and as studies have shown, can very quickly can result in civil unrest. The lives of UK citizens are at risk without a plan to ensure access to food when the next crisis hits. The stakes could not be higher.

It is businesses in the cold chain that provide the essential service of supplying vital perishable food and pharmaceuticals and yet their role in resilience and national security is almost entirely unrecognised in policies and reports assessing food resilience and crisis planning.

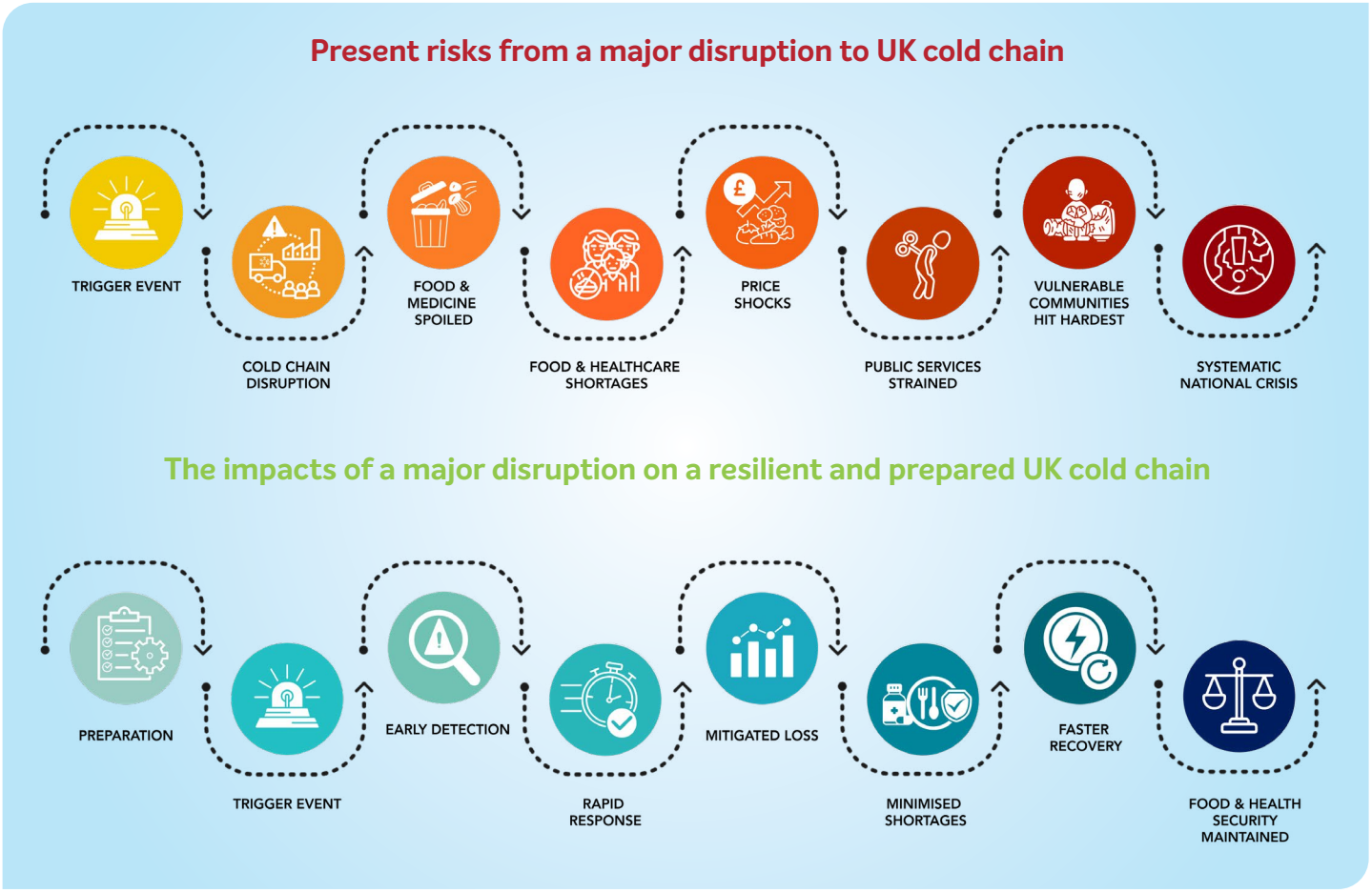
Through the safe storage and distribution of perishable products such as food, pharmaceuticals and horticultural products, citizens and institutions rely on the cold chain's service every day of the year. A strong cold chain industry helps spur economic growth, facilitates international trade, improves resilience to future economic shocks, and helps the UK to make huge strides towards becoming net zero. The cold chain directly adds £14bn gross value to the UK economy each year, supporting 184,000 jobs and contributing £3.7bn in tax revenue to the UK government.

Threats to the cold chain are increasing. As a nation that relies on imports for around 50% of its food, international conflicts and supply chain disruption affect the cold chain acutely. Closer to home, the Covid-19 pandemic, energy price rises and availability concerns, coordinated cyber-attacks and the impacts of climate change have all strained the ability of cold chain businesses to maintain a highly functioning cold chain.

We have had fair warning that our food resilience must be strengthened. In 2025 the National Preparedness Commission published 'Just in Case: 7 steps to narrow the UK civil food resilience gap', which details extensively how unprepared the UK is for disruptions to the food system and recommends wide ranging actions for increasing systematic resilience, including increasing the level of food storage across the country.

Future Government action to strengthen food security and resilience will rely heavily on the growth and development of the UK's cold chain infrastructure and yet current resilience assessments make scant reference to the cold chain's essential role. Without remedying this oversight, government action is destined to fail the UK citizen.

UK food security and resilience is a national security threat. This report details how a lack of awareness across government on the critical role of cold chain threatens national resilience, outlines how risks to our perishable supply chains are growing and recommends ten urgent actions the Government must take to safeguard national security and in doing so ensure businesses in the cold chain are better supported to provide their essential services to the nation, whatever lies ahead.



# THE TEN URGENT STEPS FOR PROTECTING CITIZEN ACCESS TO ESSENTIAL FOOD

## GOVERNMENT RECOGNITION OF THE CRITICAL ROLE COLD CHAIN PLAYS TO FOOD SECURITY AND RESILIENCE

1. The designation of cold chain infrastructure, including major cold stores and transport hubs as critical infrastructure.

2. Development of the National Risk Register and a national assessment of cold chain infrastructure to assess current and future requirements and vulnerabilities and to provide advice to local authorities on how to assess cold chain resilience and support cold chain development to ensure their communities, including the most vulnerable, continue to have access to essential products during major disruption.

3. Recognise cold chain workers, including food warehouse workers, refrigerated truck drivers and refrigeration engineers with permanent essential worker status.

## SUPPORT FOR THE COLD CHAIN TO, PREPARE, REACT AND RECOVER FROM THREATS TO FOOD SUPPLY

4. Assign clear Cabinet Office responsibility for cold chain resilience and security, to ensure faster and more targeted action to limit the impact of major disruptions, stronger integration into national resilience and defence planning and a better assessment of the impacts of future policy reform on the cold chain's critical infrastructure.

5. Development of early warning systems that enable rapid intelligence sharing between government bodies and cold chain businesses to react quickly to threats and extreme events affecting the supply of perishable products including:
   - Conflict-driven disruptions to food and energy supplies
   - Future pandemics or major events of national importance
   - Shortages in available cold storage space
   - Cyber attacks
   - Fuel shortages
   - UK border or major international supply chain disruption
   - Infrastructure failure during extreme heat climate events or major flooding

6. Development of an Incident Response Plan (IRP) and a Disaster Recovery Plan (DRP) to support businesses in the cold chain to continue their essential service during national emergencies. This must include identifying mechanisms to ensure that energy supplies for cold chain infrastructure are prioritised.

## EMBEDDING COLD CHAIN REQUIREMENTS INTO FUTURE FOOD RESILIENCE AND SECURITY POLICIES

7. As the Government considers following the lead of other countries and the European Union in ensuring minimum stocks of essential products are held within the UK as a civil contingency, there must be consideration and industry consultation on the need, availability and business case for expanding UK cold storage and distribution infrastructure.

8. Ensuring specific reference to cold chain as critical national infrastructure requiring special local planning considerations within the National Planning Policy Framework.

9. Introduce the requirement for an industry-government collaboration to undertake a national assessment of our critical cold chain infrastructure to assess future requirement and vulnerabilities and to provide advice to local planning authorities on how to support cold chain development.

10. Support initiatives to promote critical occupations in the cold chain, including HGV drivers, warehouse workers and refrigeration engineers.

# FOREWORD: PROFESSOR TIM LANG

I welcome this report very much. Looking, as it does at UK food security and how ready we are for shocks, it deserves to be taken seriously not just by Government and wider industry but by the consuming public. The food revolution since World War 2 has changed consumer expectations. Food is everywhere. Its availability is assumed. But food doesn't just arrive by magic at the outlet where the public meets it. It's been constantly moving, with some storage and transition through retail distribution hubs.

This vast complex logistics sector is the lifeblood of the food system. Yet its importance is not sufficiently acknowledged by policy-makers let alone the public. It's seen almost everywhere in the form of trucks – one in five on UK roads is food – yet, in my view, its strategic significance is not sufficiently acknowledged… or not yet. I hope very much this report gains attention where it matters not just in Whitehall but in across our four countries' regions, cities, local authorities and civil society. Resilience and security is a public challenge not something that can be left to 'high-ups'.

When I was asked to produce what became my *Just in Case* report to the National Preparedness Commission in late 2023, I set out to produce a summary of the realities of the modern UK food system, and to find out how prepared we are for the coming shocks that experts anticipated. Since publication in early 2025, events have confirmed almost everything the report outlined. We need, I concluded, to take storage and diversity of supply chains much more seriously than the UK has done.

Public policy has suffered from a certain British complacency – expressed to me once by a HM Treasury official as 'we are a rich nation, we can afford to buy food from anywhere'. This assumption and the many others my *Just in Case* interviewees outlined have been questioned by events. Recent wars, oil price hikes, food price inflation remind us how the food system is almost entirely fossil-fuel based. It's dominated by some very big commercial interests. Its model of efficiency was based on a geopolitics which no longer exists in the era of multiple shocks and what defence analysts call 'hybrid warfare'. We cannot assume that food simply 'gets to us'. Multi-levels actions are needed, not least on storage.

The importance of the cold chain, the knowledge that this sector has of how food moves between farm and fork, and the intelligence that people within the sector bring to discussions is heartening. Be confident that the messages of this report must be disseminated and acted on widely.

**Tim Lang is Professor Emeritus of Food Policy at City St George's, University of London. He is author of the Just-in-Case report on food resilience to the National Preparedness Commission**

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## ABOUT THE COLD CHAIN FEDERATION

The Cold Chain Federation are the voice of the UK's essential temperature-controlled logistics industry, which includes third party storage and distribution, retail, food service, maritime and production and manufacturing. Our over 250 members operate more than 450 specialist storage facilities and run over 40,000 vehicles and refrigerated trailers across England, Wales, Scotland and Northern Ireland. They operate within the UK and internationally.

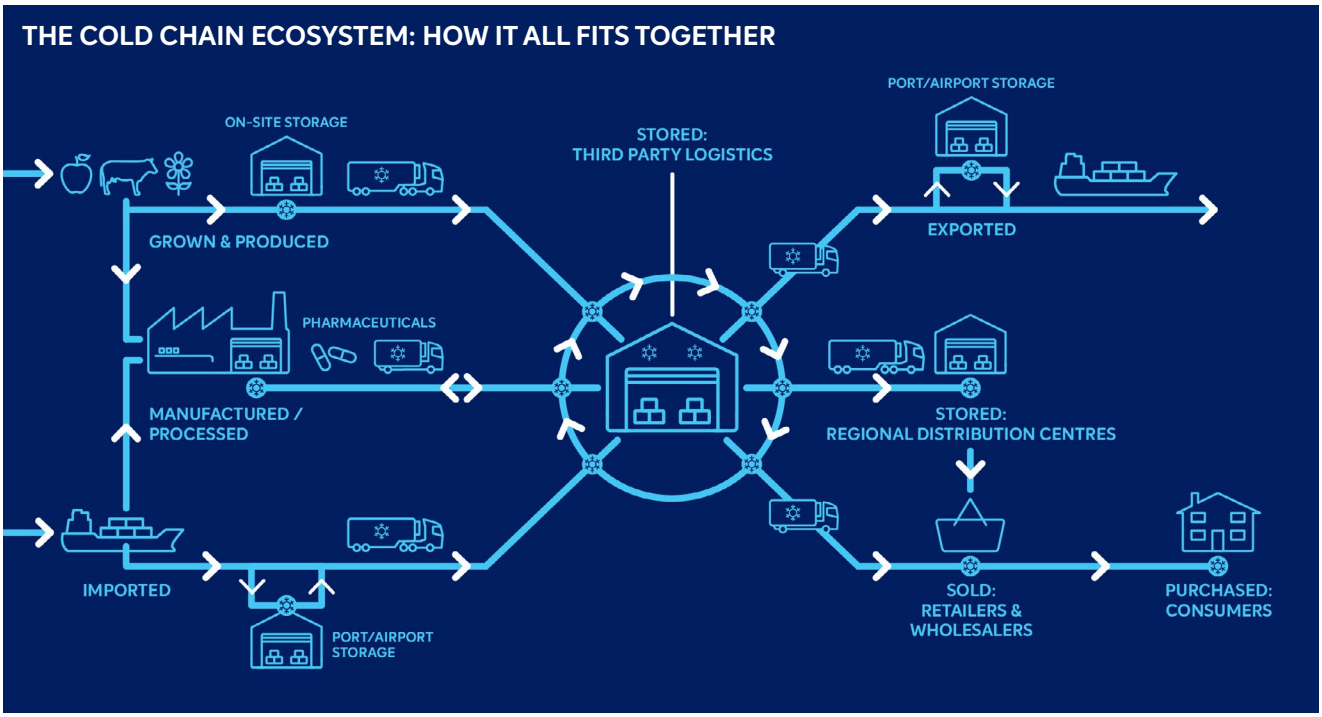
# PART ONE: THE COLD CHAIN'S ROLE IN FOOD SECURITY AND RESILIENCE

The cold chain is the network of specialist buildings, vehicles, shipping containers and other infrastructure which ensure perishable goods are kept in a safe and secure chilled or frozen temperature-controlled environment as they pass from production to the point of usage or consumption.

It is the backbone of a healthy society, safeguarding the quality and safety of food, medicine, and countless other products that underpin our daily lives.

In 2023, there were approximately 34 million cubic meters of temperature-controlled storage and 104,000 refrigerated vehicles operating across the UK. 340,000 refrigerated containers of perishable product were imported to the UK, and 104,000 exported, with other specialist cold chain products also traded via air freight.

The businesses who operate the UK's cold chain include farmers & growers, manufacturers, specialist logistics operators, major retailers, food service providers and ports. They range from large multinational organisations to family-owned businesses, but together they all contribute to the UK's growing supply chain for temperature-controlled products.




## THE NATION RELIES ON COLD CHAIN FOR FOOD AND PHARMACEUTICAL AVAILABILITY EVERY DAY

Through the operation of cold storage, distribution and other infrastructure the cold chain is estimated to support **£14 billion in gross value added, 184,000 jobs, and £3.7 billion** in annual government tax revenues. The cold chain's core impact benefits all parts of the UK economy, with East Midlands, East of England, Northwest, and Yorkshire and the Humber seeing the biggest contributions— reflecting the sector's widespread network of storage and transport hubs[1].

But the criticality of the cold chain is even greater when its often-unseen impact on the wider food, pharmaceutical and horticultural sectors is considered.

Many food items are highly perishable and therefore require chilling or freezing throughout the value chain from production to the point of sale. Approximately **49% of the food and beverages produced and sold by UK manufacturers, valued at £50 billion, consists of chilled or frozen products.**

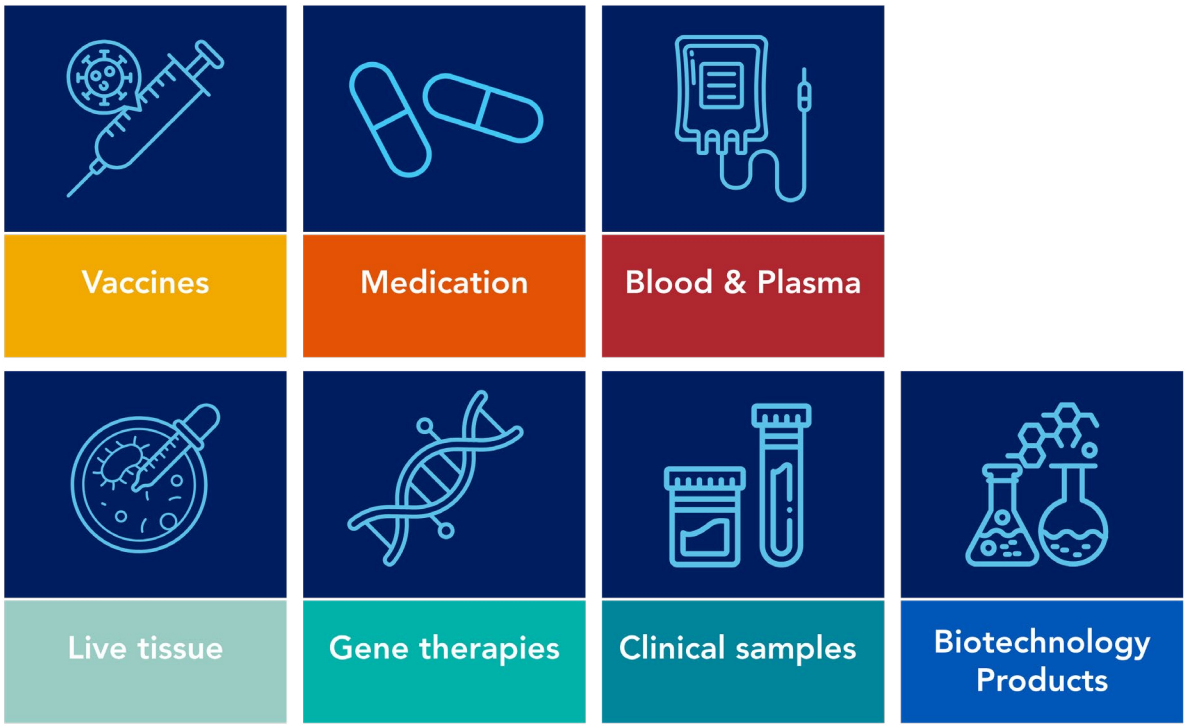
The reliance on the temperature-controlled supply chain is much greater than just the frozen and chilled aisle of a supermarket. As well as staple products like meat, fish, dairy, fruit and vegetables, many products sold as ambient, or shelf stable, also rely on freezing, storage and distribution in their supply chains. The majority of bread, cake and confectionery products utilise frozen storage for preservation, allowing food waste to be minimised and products to be tempered (safely brought up to a higher temperature) as required by consumer demand.

Whilst food products requiring cold chain make up around half of products sold, they are typically more expensive and valuable. 66% of the cost of a typical shopping basket and 8 out of 10 of the most expensive items are from products requiring temperature control[2], meaning that any cold chain disruptions or cost increases directly impact UK citizens.

### Essential food categories that require cold chain:


As well as food, pharmaceutical products often contain sensitive biological substances that lose their efficacy, or become unsafe, if not stored within recommended temperature ranges. Thus, secure and safe handling under the cold chain is vital. Around **one-fifth (£2.7 billion) of pharmaceutical products produced and sold by UK manufacturers necessitate cold chain logistics**.

## Essential pharmaceutical and life science categories that require cold chain:




The Office of National Statistics (ONS) estimate that by mid-2032 the population of the UK will have increased by 7.3%, or 4.9 million people from 2022 levels[3]. The cold chain will need to grow to meet these future population, increased urbanisation and changing consumer habits. Through its direct impact and indirect facilitation of manufacturing, trade and consumer health, maintaining a resilient cold chain will be critical to future UK economic growth.

**Food security** exists when people have access to enough safe and nutritious food[4].
**Food resilience** is the system's capacity to deliver desired outcomes when exposed to stresses and shocks[5].

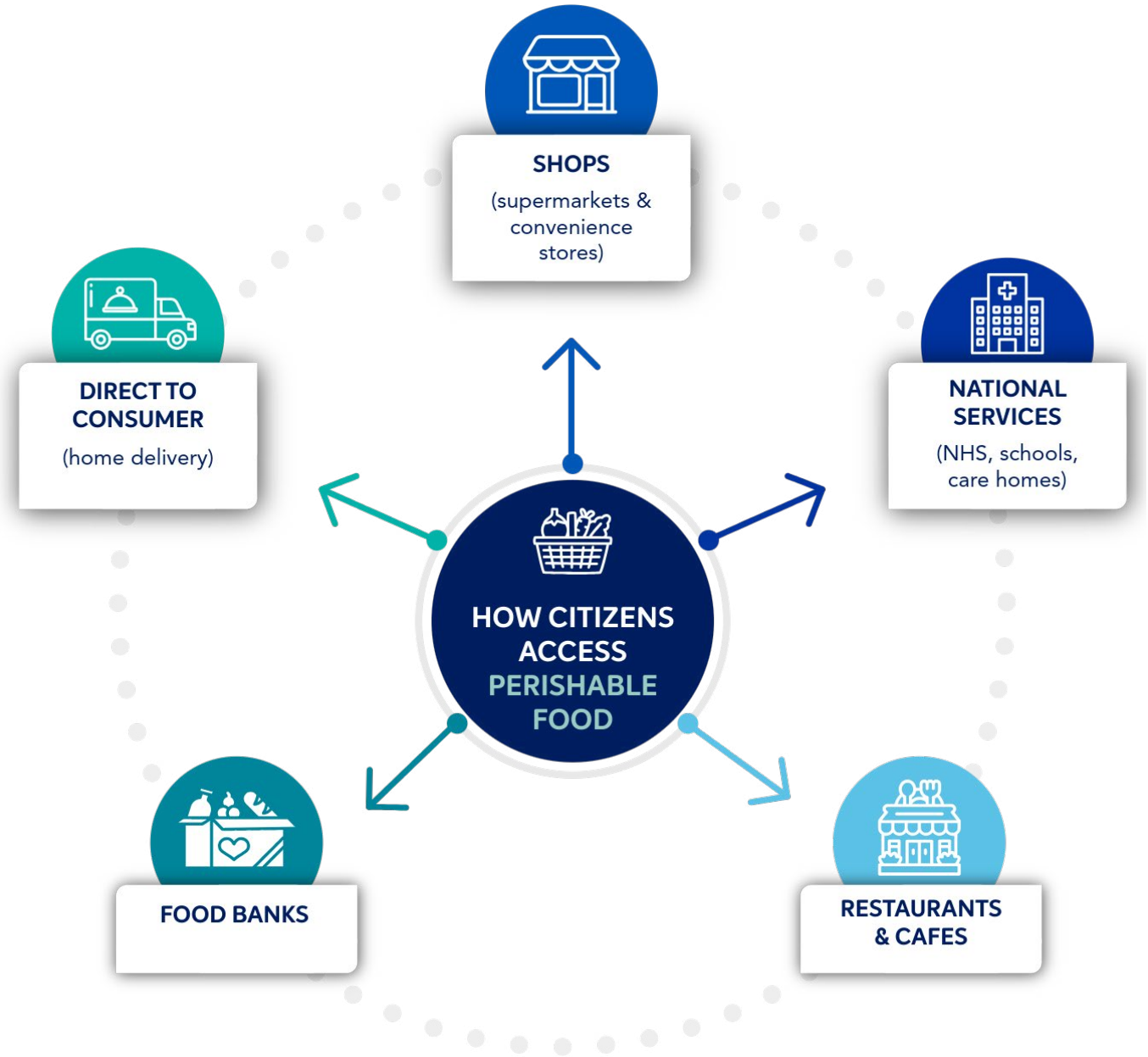
Without a strong and robust cold chain, the UK cannot achieve food security and without a thorough plan to ensure the cold chain can operate during threats and crises that impact it, the UK does not have food resilience.

## COLD CHAIN IS CRITICAL TO CONSUMER ACCESS TO FOOD

Consumers access perishable products in an increasingly diverse range of ways. Modern life demands near immediate access to food at any time of the day, 365 days a year. The traditional weekly visit to a supermarket has been supplanted by home deliveries, late night trips to a convenience store, foodbanks and direct to consumer options for ready meals or raw ingredients. The need for nutritious food in hospitals and schools has also increased significantly in recent decades. And all these access points require cold chain to bring products to the consumer.

The cold chain has had to develop new methods and models for meeting the demands of a growing population who want everything now, and it has done so admirably through innovations in packaging, refrigerated transport and cold storage development.

The result is a highly capable and multifaceted supply chain, but a more complex one.



## Cold storage is the nation's balancing system for essential products

Cold storage, or temperature-controlled warehousing, forms the backbone of the cold chain and food distribution. There are around 500 major cold stores in the UK, from smaller cross docking operations and local delivery points up to 50-metre-high automated units capable of storing over 150,000 individual pallets equivalent to around 1.5 million cases of frozen and chilled products.

Chilled storage allows short shelf-life products like milk, sandwiches and vegetables to be consolidated for deliveries, whilst frozen storage allows products like meat, fish, vaccines and bakery to be stored in pristine condition for a year or longer until it is sold frozen or safely brought up to a chilled temperature and transported to the shelves.

50% of the UK's food passes through these sites making their safe operation and what they contain fundamentally important to the resilience of the nation. Without cold storage products would need to go directly from the field, manufacturing facility or border to be sold with the result being huge wastage from surplus, a lack of products at certain times of the year and an extremely vulnerable supply to shocks affected harvests or global trade. Cold storage acts as the balancing system for perishable products holding them in stock for a long period and releasing them as the market and consumers require.


Cold storage has a long history of supporting the UK consumer during conflicts and government intervention policies. During the Second World War, for example, the Government built a significant number of refrigerated warehouses to support the war effort and owned at least 50% of the market by its end. These warehouses were subsequently sold back to private enterprises[6].

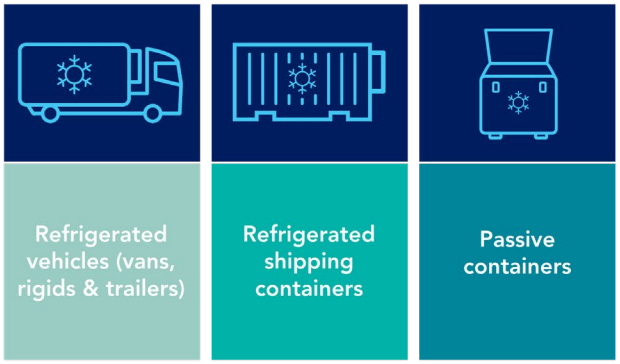
Cold storage is the UK's security system against threats to perishable food, what they store and in what quantities is directly related to overall national security, but it also relies on transportation to get essential products to consumers.

## Transportation & delivery underpins access to food

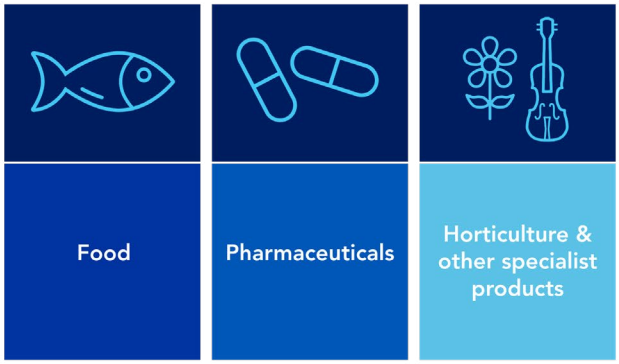
There are around 100,000 registered refrigerated vehicles in the UK each capable of carrying chilled or frozen products safely and securely to all corners of the UK. This makes up around 20% of the large goods vehicles on UK roads. They are supported by international hauliers who cross the channel in large numbers to bring perishable products into the UK largely from the EU, over 350,000 refrigerated shipping containers bringing products from around the globe.

### Cold storage


### Distribution




### Products




In a resilient food system, all these methods of transportation and delivery must operate to avoid disruption. Delays must also be kept to a minimum as with perishable products time is crucial, a delay at the UK or French border, can result in whole loads spoiling quickly. Access to fuel, whether that be diesel or electricity for the growing number of eHGVs and refrigerated trailers is essential.

Critical food delivery vehicles must also be able to reach an increasingly diverse set of delivery points, an activity that becomes a lifeline during a crisis event.

## Local authorities and charities rely on a resilient cold chain to feed the most vulnerable and isolated communities

The increased use of foodbanks has skyrocketed in recent years, with the Trussell Trust reporting their use nearly tripling over the last decade to 2.9 million food parcels a year[7]. Food waste charity, FareShare estimates that 11 million people in the UK struggle to get enough to eat[8].

Perishable products such as fresh fruit and vegetables, as well as proteins like meat and fish are an essential part of the support foodbanks provide to vulnerable communities. Millions of people rely on organisations like FareShare and the Trussell Trust for food and they now have an enormous responsibility for feeding a growing proportion of the UK population, a role that takes even greater significance in a major crisis or national emergency, as evidenced during the Covid-19 pandemic.

Local authorities and Local Resilience Forums are tasked with protecting their citizens in a crisis situation and whilst authorities must have plans for delivering food to vulnerable communities, in a crisis there is a heavy reliance on charities and a network of volunteers.

Local resilience plans make the assumption that food supply *into* a local area will always be unaffected. However, a major crisis event such as a coordinated cyber-attack, fuel shortages or health emergency affecting the availability of drivers could disrupt the local availability of food which could hit the most vulnerable and isolated communities the hardest.

**To strengthen the resilience of community access to vital supplies in a crisis, there is a need for a national assessment of our critical cold chain infrastructure to assess future requirement and vulnerabilities and to provide advice to local planning authorities on how to support cold chain development and ensure their communities continue to have access to essential products.**

## COLD CHAIN IS CRITICAL FOR MILITARY READINESS

Strong and resilient supply chains have long been recognised as a vital function of a modern military defence force. In both national defence emergencies or overseas operations, cold chains help ensure key medical supplies reach those who need them and perishable food supplies can be delivered safely and securely to remote bases.

In the UK, The Adaptive Capability Alliance has identified a need for enhanced collaboration with industries across the logistics sector to ensure logistics supply chains are better protected, structured and made more resilient to enable rapid future mobilisation. For the domestic cold chain, this means rapid access to secure, resilient warehousing at short notice and the ability to disperse products geographically both across the UK and internationally via our Ports.

As this White Paper outlines in Parts Two and Three, the UK's cold chain is significantly underrepresented in national policies for food resilience and security. What's more, our critical cold chain infrastructure is under an increasing range of threats to its resilience from cyber-attacks to energy supply and the impacts climate change.

Recognition and support for the UK's critical cold chain, including mechanisms to identify, monitor and react to threats, is not just imperative to protect citizens in the UK during peacetime, it is also essential for the development of our national defence.

With our national defence capabilities becoming increasingly dependent on industry, their resilience becomes a matter of national security. As a critical link in perishable supply chains, any failure or disruption within any part of the cold chain ecosystem has the potential to weaken the UK's strategic base and undermine military readiness during periods of crisis or warfighting.

**Ensuring cold chain resilience must therefore be considered as a key part of the UK's future national resilience and defence strategies.**

# PART TWO: HOW CURRENT FOOD RESILIENCE POLICY FAILS THE COLD CHAIN AND LEAVES UK CITIZENS AT RISK

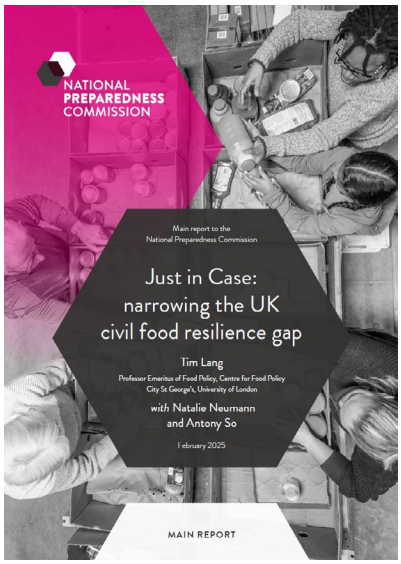
The cold chain's critical role in ensuring access to food is undoubtable and in normal circumstances products are usually always available, thanks to the highly developed business models of those who operate its infrastructure.

But what happens in a national emergency, or a crisis that impacts cold chain businesses' ability to operate is uncertain. What support is available to businesses to keep them running? Which delivery points have priority in a crisis and how can essential products be directed to those who most need them?

The National Preparedness Commission report '*Just in Case: 7 steps to narrow the UK civil food resilience gap*' released in 2025 outlines a robust and well evidenced case for the lack of government preparedness for growing threats to the food system. It highlights, strongly, the lack of planning for crises and amongst its many recommendations for improving civil food resilience, advocates for a shift away from 'Just in Time' to a 'Just in Case' model to help plan and react to food shocks and increase resilience. It also discusses the merits of greater stockpiling of essential products in the UK, measures increasingly being adopted by other nations including Canada, Switzerland, Finland and Sweden. There are also several directives, strategies and regulatory amendments being instigated or developed by the European Union to increase preparedness for threats to member states, including:

- **Preparedness Union Strategy:** Which aims to enhance the EU's civilian and military preparedness for future crises to allow for quick response to threats. Places requirements on member states to assess risks, adopt minimum preparedness requirements, develop early warning systems and aim for 'population self-sufficiency of a minimum of 72 hours'.
- **Stockpiling Strategy:** As part of the Preparedness Union Strategy, aims to ensure that during any crisis, member states have enough essential goods such as food, water, oil, gas and medicines to keep vital societal functions running.
- **The Critical Entities Resilience (CER) Directive:** Will ensure that critical entities providing essential services (including food supply, logistics and transport) must be identified by national authorities and regular risk assessment conducted on the nature of threats.

The recommendations of '*Just in Case: 7 steps to narrow the UK civil food resilience gap*' are well argued and the strong action by many other countries and blocs to better prepare for threats impacting their citizens are understandable. Should the UK Government follow their examples, there will be specific requirements from the cold chain, such as more cold storage and government intervention for identifying specific products and their minimum storage levels.




Before measures like this can even be considered, there is first a fundamental need for government recognition of the role the cold chain plays every day to national food resilience and security.

# CURRENT UK GOVERNMENT STRATEGIES FOR FOOD RESILIENCE AND SECURITY AND THEIR RELEVANCE TO COLD CHAIN

Recent government strategies and assessments of the security and resilience of the UK's food system have tended to focus on the production of domestic food and the trade in food products between the UK and the rest of the world. Whilst these are undoubtedly essential components, the crucial role of the cold chain in ensuring the supply of products to citizens has not been given equal consideration.

## Critical National Infrastructure (CNI)

The National Protective Security Authority (NPSA) recognises 'food' as a Critical National Infrastructure sector, with the Department for Farming and Rural Affairs (Defra) the Lead Government Department (LGD) responsible for ensuring a resilient and secure UK food supply. The NPSA recommend a simple process for the LGD to collect data and assess the resilience of the sector they are responsible for.

## The Five NPSA steps to the criticality process:

| | |
|---|---|
| **Step 1:** | **Map essential functions - Understanding what is important** |
| **Step 2:** | **Determine systems - Mapping the systems that provide the function** |
| **Step 3:** | **Assess sector impacts - Understanding the impact of system compromise** |
| **Step 4:** | **Identify supporting systems, organisations and relationships - Mapping the systems in more detail** |
| **Step 5:** | **Assess cross-sector impacts - Understanding the impact on other sectors** |

There is no publicly available information that provides confidence that this process has been undertaken for food. In fact, the food sector has no individual assets designated as CNI, suggesting that Step 1 has not been carried out. With no list of critical assets, or a risk register for food CNI, there is no evidence that the essential role of the cold chain in ensuring food security and resilience is embedded in Defra strategies. This is emphasised by the UK Food Security Report, Defra's primary and legally obligated assessment of food security in the UK.

## UK Food Security Report 2024

Under section 19 of the Agriculture Act 2020, Defra must publish at least every 3 years an analysis of the present food security in the UK. Last published in January 2025, the UK Food Security Report (UKFSR) contains a wealth of information relating to production, productivity, supply sources, resilience and safety. Despite the report extending to 464 pages and 'cold storage' being identified in the report's introduction as a major component of the food supply chain, there is otherwise no statistics, assessment or mention of the role of cold storage in UK food security and only a handful of transport related statistics. Whilst some of the growing threats identified in this white paper are addressed within Defra's UKFSR, including cybercrime and energy supply, their specific impact on the cold chain is not recognised.

All available evidence strongly suggests that the essential role of the cold chain is not understood or reflected in current CNI or food security strategies, constituting a major blind spot in UK preparedness for threats impacting food supply.

## UK Food Resilience Policy: Assumption vs Reality

| THE ASSUMPTION | THE REALITY |
|---|---|
| Food logistics is protected as Critical Infrastructure, ensuring its resilience during a crisis. | Cold chain infrastructure is not specifically designated as CNI. Plans and resilience assessments under the 'food' CNI category do not reflect the role of the cold chain. 50% of UK food relies on this unprotected critical link. |
| Retailers hold a safety stock for emergencies. | Most supply chains operate on a just-in-time basis maintaining streamlined stock levels, any cold chain disruption can quickly create shortages. |
| All critically important national infrastructure is mapped. | Food critical infrastructure in not mapped in the UK. Many parts of the cold chain remain invisible, making it difficult for planners to identify and prioritise critical food hubs for crisis planning. |
| Facilities can withstand a prolonged power outage. | Frozen or chilled temperature-sensitive goods can spoil within hours without an uninterrupted electricity supply. Most do not have back-up generators. Cold stores are not recognised by the Network Energy System Operator (NESO) as needing priority access to energy supply in the event of supply disruption. |
| Supply chain operations can immediately restart following a trigger event. | Vital perishables must be destroyed if temperature safety tolerances are compromised. Recovery can take weeks or months of production and imports to replace lost goods. |
| Existing sites are built for modern climate extremes. | Whilst some cold stores are modern and equipped for climate change, 50%+ of UK cold stores are 20+ years old and not specifically engineered for 40°C+ heat. This risk has been identified by the Committee for Climate Change. |

## Cold chain absence from UK resilience policy is a national security threat

Preventing cold chain disruption, or failure, is of national importance because its implications are severe. A weakened cold chain has an instant impact on food supply and availability – which is seen by most in the UK as a basic right. In extreme instances this can result in health implications from a lack of appropriate nutrition and even civil unrest[9]. There are sustainability implications too, if there is no cold chain to take perishable products quickly from the farm, or manufacturing plant to the consumer, then a greater quantity of those products is wasted. All these scenarios play out every day in developing countries with rudimentary, or completely absent cold chain infrastructure.

And yet in the UK:

- **Cold chain infrastructure is not acknowledged as critical national infrastructure (CNI).**
- **Existing CNI sectors, such as food and life sciences make little or no mention to the role or requirements of cold chain.**
- **The National Risk Register has scant reference to food and no reference to the cold chain at all.**
- **Methods for tracking food resilience, such as Defra's UK Food Security Report have no metrics for cold chain infrastructure such as capacity, locations, inventory. A clear sign that cold chain's criticality to the food system is fundamentally not understood.**

The case is indisputable, to facilitate a thorough assessment of the resilience of the food supply and to assess how it will need to develop to suit the future requirements of the UK, **cold chain infrastructure must be made UK critical infrastructure.**

As part of this designation, the National Risk Register should be updated from **a national assessment of cold chain infrastructure to assess current and future requirements** and vulnerabilities and to provide advice to local authorities on how to support cold chain development and ensure their communities continue to have access to essential products during major disruption. And the **development of early warning systems for extreme events affecting the cold chain and the supply of perishable products.**

A major factor in the absence of resilience planning for threats to cold chain is the cross-departmental nature of the sector. Food, pharmaceuticals, refrigeration, logistics and energy are all underseen by different Westminster departments. **Designating the task of ensuring cold chain resilience and security to a Cabinet Office Ministerial portfolio** will enable the establishment of an early warning system for threats to the integrity of perishable supply chains, faster and more targeted action to limit their impacts and a better assessment of the impacts of future policy reform on the cold chain's critical infrastructure.

Recent events have shown that a lack of government resilience planning to respond quickly to threats to the cold chain have resulted in an increased risk of disruption to supply chains. The Covid-19 pandemic, implementation of border controls with the European Union, energy and labour crises and the threat of cyber-attacks are just several examples of recent events that have placed the cold chain under strain. With cold chain not adequately represented in government risk planning, the UK public's access to crucial products has repeatedly come under strain in the last 5 years, and the risk is growing.

# PART THREE: HOW THE COLD CHAIN IS UNDER INCREASING THREAT AND THE IMPLICATIONS TO FOOD RESILIENCE AND SECURITY

Although the UK has one of the most advanced and resilient cold chains in the world, it is uniquely impacted by domestic and international socio-economic factors.

Critical National Infrastructure (CNI) designation and a closer collaboration between the Government and the cold chain industry would ultimately help safeguard the nation's supply of perishable products, enabling the early identification of threats and appropriate mitigation or support measures to act quickly and avoid disruption.

The last decade has brought a torrent of threats and elevated risk to businesses which have affected the resilience, security, growth and development of the UK's food and pharmaceutical supply chains. Businesses have coped admirably and kept consumer disruption to a minimum, but the system has been pushed to the limit. Had Covid-19 been more deadly, cyber-attacks on the food system been more coordinated, or energy blackouts in the UK come to fruition, the UK would have been faced with a major food and pharmaceutical supply crisis, with no plan with how to support the cold chain to recover.

## EXAMPLES OF RECENT RESILIENCE THREATS TO THE COLD CHAIN

### Cold storage capacity

Frozen storage in particular is the UK's safety net for food and pharmaceuticals, keeping products in long term storage until they are required by consumers. At the onset of the Covid-19 pandemic, buying habits for food in particular changed drastically. With airlines grounded and restaurants closed, huge quantities of product required freezing to avoid wastage. The UK effectively ran out of available cold storage.

The situation was so acute that the Cabinet Office approached the Cold Chain Federation to help identify available capacity, we continue to monitor UK cold storage levels.

Several times since, in response to changes in post-Brexit border requirements, has the UK again come close to running out of long-term cold storage.


**These events highlight the need for closer collaboration and resilience planning for cold storage capacity levels between the cold chain industry and the Cabinet Office and for a greater understanding of the need for cold storage to meet future resilience stockpiling strategies.**

## Key workers status & labour shortages

As the implications of the Covid pandemic began to take force, there was initial uncertainty over whether those involved in the storage and distribution of temperature-controlled products qualified as 'key workers' and whether they could continue to carry out their jobs. The uncertainty over the critical infrastructure nature of the cold chain certainly contributed to the delay in Government confirmation that the designation was applicable. A permanent recognition of the importance of cold chain workers is just the first step to ensuring that this industry is seen as a critical and foundational sector.

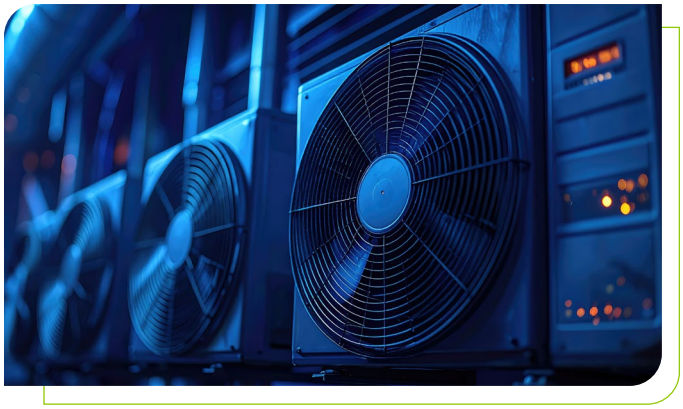
The pandemic also exposed many problems in our economy and one of the most lasting was labour shortages, which still persist. The government's focus on getting economically inactive people back into employment provides an opportunity to direct labour resource to the cold chain in order to support this critically important sector. The industry is making significant changes to provide more opportunities including in increasingly sophisticated roles, such as robotics, automation and data science.

**To prevent uncertainty over status during future crises and to maintain a strong workforce, the Government must specifically recognise cold chain operators in storage and transport with permanent essential worker status and support initiatives to promote critical occupations in the cold chain, including HGV drivers, warehouse workers and refrigeration engineers.**

## Energy prioritisation, cost & renewables

Cold stores are significant consumers of energy, being classified as an 'energy intensive industry' by the Department for Energy Security and Net Zero under the Climate Change Agreement Scheme. The requirement for industrial refrigeration systems is what sets cold stores apart from ambient warehousing. The vast majority of the around 1.7TWh of cold store energy consumption comes from grid sourced electricity. Whilst many cold storages have invested in renewable energy generation such as rooftop solar, the high energy demand means that even these facilities still obtain the majority of their energy from the grid.

Operating at temperatures as low as -25°C for food and closer to -80°C for critical vaccines, cold stores require a constant supply of energy. With the largest cold stores capable of holding over 150,000 pallets of product, a disruption in supply can be disastrous. Chilled food (2°C-8°C) is particular vulnerable to supply interruptions, with safe temperatures quickly breeched, especially in the summer months, should refrigeration shut down.



During the Winter of 2022, driven by Russia's invasion of Ukraine, the UK came perilously close to enforcing blackouts to preserve dwindling supplies. It became apparent that under National Grid emergency planning procedures cold stores were not prioritised for supplies. Had the blackouts gone ahead there was a significant risk of product spoilage and loss of supply. In addition, wholesale energy prices doubled within a year, hitting energy intensive sectors such as cold storage significantly and contributing to persistently high food inflation ever since. The 2026 conflict in the Middle East is likely to have a similar impact, once again highlighting the lack of a plan to ensure uninterrupted supply to critical infrastructure.

**With the UK's future energy mix likely to continue to be unpredictable, there is an urgent requirement to consider the prioritisation of critical food infrastructure in the event of energy prioritisation or blackouts linked to global conflicts or other global disruptions and to ensure critical cold chain infrastructure is included in future energy bill relief schemes to mitigate the risk of business insolvency, and the closure of essential assets due to high energy costs.**

Furthermore, domestic energy policies aimed at supporting energy intensive industries to remain competitive, such as the Energy Intensive Industries (EII) Exemption Scheme should be expanded to extend relief to all essential cold storage operations. Currently this scheme provides partial relief (for the storage of poultry) but this should be extended to all food and pharmaceutical temperature-controlled storage.

Renewable energy sources can provide a vital energy source should the traditional energy routes become compromised. In order to safeguard the ability to store vital food and medicines during energy uncertainty, the Government should prioritise and incentivise the cold chain sector in becoming as self-sustainable as possible.

## Cybercrime

The UK is the third most targeted country for cybercrime[10]. The estimated cost of an attack on an individual business is £195,000, with a total impact of £14.7bn per year, equivalent to 0.5% of the UK's GDP[11]. The impact is growing each year. Companies in complex supply chains, such as food and pharmaceuticals, have been identified as being a primary target for cyber criminals due the wider impacts that can be wrought by paralysing a crucial link in a wider chain and the knock-on impact on citizens.


Businesses are increasingly 'connected' through warehouse management systems, transport planning systems, automation and telematics that provide ever greater opportunities for attackers to find access points and disrupt systems that cause complete paralysis to the company's operations.

A significant number of cold chain companies have been hit by ransomware cyber-attacks in recent years. These have been hugely traumatic for the business involved and in high profile cases involving major retailers like Marks and Spencer, Coop and their supply chain partners, caused huge consumer disruption and financial impacts.

Despite the frequency of these attacks, there is a perception that a coordinated attack on a scale not yet seen impacting multiple cold chain businesses could grind the supply chain to a halt for an extended period of time.

**As part of critical national infrastructure designation, cold chain businesses need more guidance and training from the Government and its agencies on how to prepare and protect from future attacks, including Advanced Persistent Threats (APT) and ransomware with an early warning system developed to alert of threats and cyber incidents.**

## Climate

For an industry that requires a cold environment, UK climate change represents a major resilience challenge to the cold chain. All climate projections identify a greater prevalence of summer heatwaves in our future climate. In fact, we have already experienced this recently when temperatures hit 40°C+ in 2023. Cold chains can operate at these temperatures, provided their refrigeration equipment is designed for it.

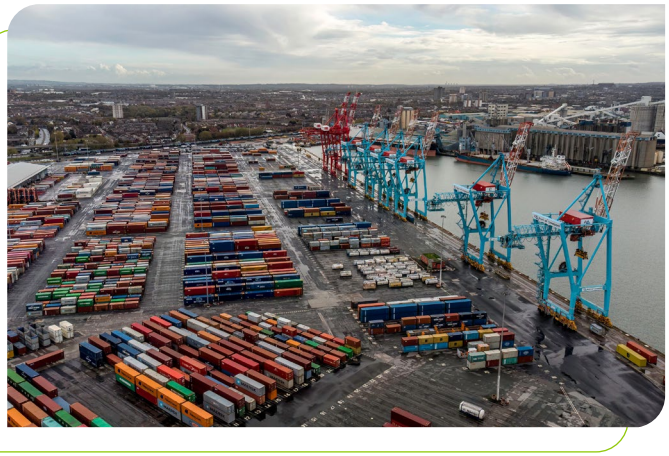
Much of the UK's cold chain infrastructure was designed decades ago when 40°C was not considered likely. The result of this was equipment failure at several key sites which would have been much more significant had the heatwave been more prolonged. Academic research has also made a robust case for cold chains to be designated as critical infrastructure due to their ability to protect citizens from some of the effects of global warming[12].

The UK's cold chain infrastructure needs huge investment in new equipment to be resilient to our future climate. Until this is achieved, every summer brings the threat of widespread system outages which would impact product supply.

**There is an urgent need for an early warning system between the Government and the cold chain industry to report outages and their impacts during future extreme heat events.**

## Trade

The UK's supply of perishable products relies on trade with other nations. For food and drink in particular, we import 40% of our requirements. For certain cold chain products the figures are higher – for fruit and vegetables for example we import nearly 45% of our requirements, with the majority coming from the EU.



It is therefore essential that the UK ensures as frictionless trade in cold chain products as possible to support businesses in exporting to key European markets and to ensure markets the UK relies on for food imports are greeted by a secure, but efficient entry system. This has been significantly challenged by the introduction of the Border Target Operating Model (BTOM) following Brexit and there has been continued disruption to key imports which continues to this day.

Throughout the process of introducing the border requirements, a lack of understanding of how temperature-controlled products transit the border from key Government departments tasked with designing the new system has worsened the impacts.

The smooth transit of temperature-controlled vehicles across the UK border is crucial to the UK's future trade prosperity.

**Updated risk registers and strategies for food and pharmaceutical resilience must make clear recommendations to Defra and other agencies on the need for negotiations with the EU on future trading arrangements for Products of Animal Origin and Phytosanitary products to reflect the essential need for a quick uninterrupted transit of the UK and EU border control posts.**

## THREATS TO GROWTH & DEVELOPMENT

For the cold chain to support the Government's target of a return to strong UK economic growth, businesses must be supported to invest and grow with progressive planning policies and a fair tax system.

### Planning policy

The UK's cold stores, distribution centres and depots are critical national infrastructure, ensuring our growing population centres have access to essential products when we need them.

It is also a sector whose sustainable growth is intrinsically linked to the prosperity of the nation as a whole. As our population increases, new towns are created or greatly expanded and the demand for cold chain products increases, the UK needs a planning system that reflects the critical nature of cold chain infrastructure provision.

The cold chain is also undergoing a transformation, with ageing buildings being replaced by modern, efficient facilities fit for a net zero economy. However, this transformation is being slowed by the sector being poorly understood by planning authorities. This risks the system becoming inefficient, with sites located away from where they are actually needed, increasing other challenges such as road congestion and the risk of the sector not fulfilling its potential with regards to decarbonisation objectives such as renewable energy generation, energy storage and the rollout of low emission and emission free vehicles.

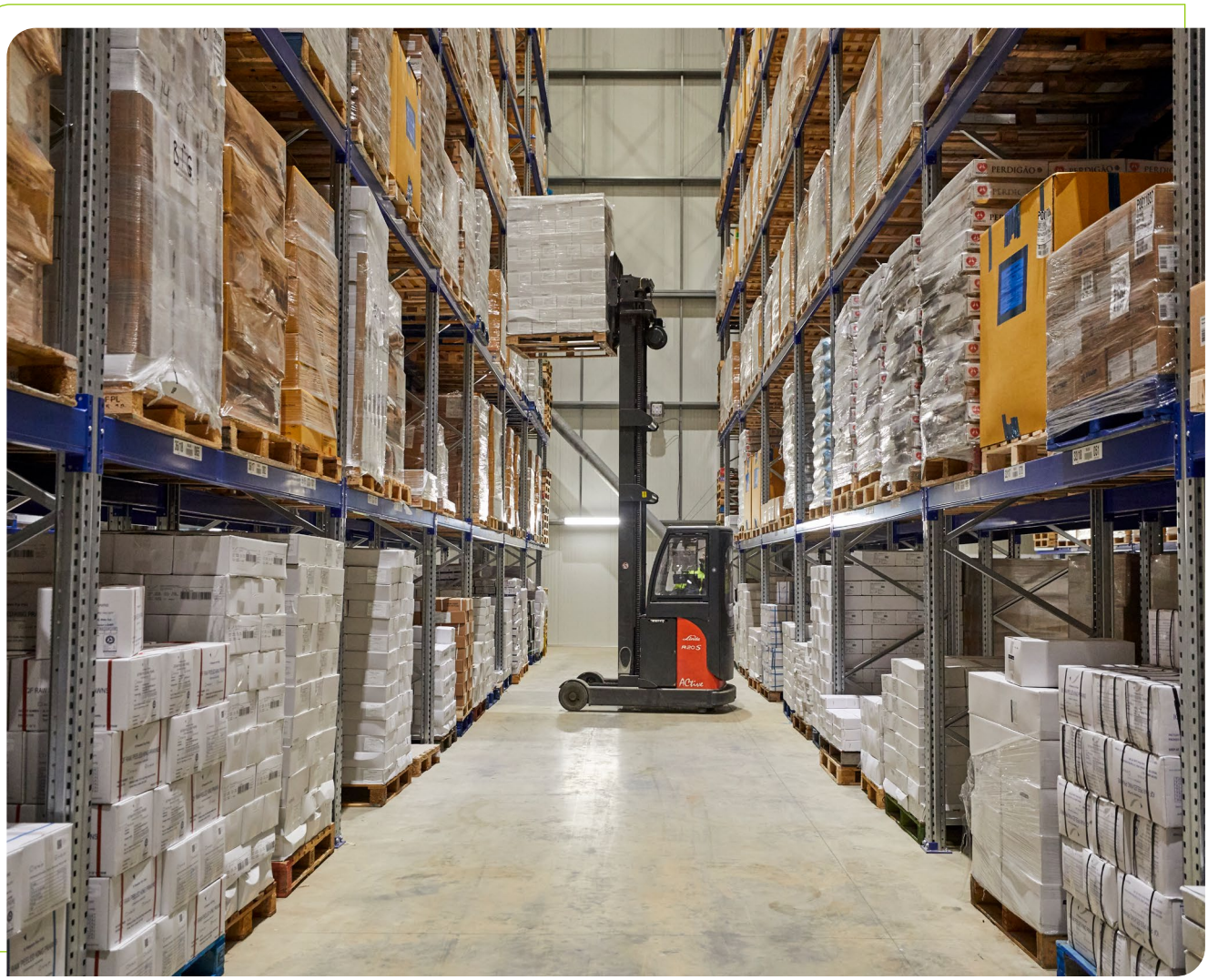
Ultimately an inefficiently planned cold chain increases the risk of disruption to the smooth supply of temperature-controlled products, a basic need of all citizens. Events in recent years have proved that disruption of critical services, such as food supply can lead to panic and in extreme cases even civil unrest.

**Due to the critical requirement for efficient and reliable UK cold chain provision to support the supply of housing to meet the UK's growing population, the Government must strengthen planning policies by ensuring specific reference to cold chain as critical national infrastructure requiring special local planning considerations within the National Planning Policy Framework.**

## Tax and business rates

The 2026 reform of business rates has increased the tax on cold storage sites by around £20m, partly due to the introduction of a new higher multiplier for all properties with Rateable Values (RVs) of £500,000 and above, which includes many cold stores. At the time it was introduced, the Treasury stated 'this group represents less than one per cent of all properties, but captures the majority of large distribution warehouses, including those used by online giants.' Cold storage and distribution operators are not large online giants. They are large because this is the most efficient method for operating an energy intensive temperature-controlled warehouse, their size is not a reliable proxy measure for their profit – operators of cold stores should not be punished by higher tax rates simply for operating in an energy efficient manner which serves to keep consumers prices to their lowest practicable level.

The reform of business rates was a clear example of the implications on critical infrastructure not being considered. Fair reform of the tax system is essential, but it must take into account the implications on critical national infrastructure.



# PART FOUR: A NEW APPROACH TO FOOD SECURITY – POLICY RECOMMENDATIONS FOR SECURING THE UK'S FOOD RESILIENCE BY REFLECTING THE COLD CHAIN'S CRITICAL ROLE IN FOOD SUPPLY

This report outlines how failures to reflect the critical role of the cold chain in policies aiming to safeguard the UK's food security and resilience risks future disruptions in citizen access to food, including during national emergencies. It also details, with evidence, the multi-dimensional and growing threats on the businesses who operate critical cold chain infrastructure and services.

Over recent decades, the food security of perishable products has focussed on the balance between domestic production and international trade and ceased to consider the resilience of the supply chain that connects farmers, importers or food manufacturers with end consumers.

In the future, government food strategies and policies aimed at assessing and improving food security in the UK must ensure they include an assessment or consideration of the cold chain infrastructure needed to support them.

The risks to food security and resilience outlined in this report range from the impact of domestic policies on energy, tax, planning and trade to global challenges including climate change and international conflicts. Whilst protecting UK food resilience and security against these threats will require a broad range of actions from across UK Government, devolved administrations and individual departments, at its core this report identifies the need for much stronger institutional awareness of the critical role of the cold chain, the need for a single government department to take responsibility for cold chain resilience and for this single point of contact to foster better engagement, cooperation and intelligence sharing between policy makers and the cold chain industry to ensure the UK continues to benefit from a strong and protected food supply chain.

Embedding cold chain resilience into food security policies will take time, but there are ten urgent steps the UK Government, and devolved administrations where applicable, must take to begin to increase protection for citizen access to essential food in both peacetime and to prepare for future national emergencies.

# THE TEN URGENT STEPS FOR PROTECTING CITIZEN ACCESS TO ESSENTIAL FOOD

## GOVERNMENT RECOGNITION OF THE CRITICAL ROLE COLD CHAIN PLAYS TO FOOD SECURITY AND RESILIENCE

1. The designation of cold chain infrastructure, including major cold stores and transport hubs as critical infrastructure.

2. Development of the National Risk Register and a national assessment of cold chain infrastructure to assess current and future requirements and vulnerabilities and to provide advice to local authorities on how to assess cold chain resilience and support cold chain development to ensure their communities, including the most vulnerable, continue to have access to essential products during major disruption.

3. Recognise cold chain workers, including food warehouse workers, refrigerated truck drivers and refrigeration engineers with permanent essential worker status.

## SUPPORT FOR THE COLD CHAIN TO, PREPARE, REACT AND RECOVER FROM THREATS TO FOOD SUPPLY

4. Assign clear Cabinet Office responsibility for cold chain resilience and security, to ensure faster and more targeted action to limit the impact of major disruptions, stronger integration into national resilience and defence planning and a better assessment of the impacts of future policy reform on the cold chain's critical infrastructure.

5. Development of early warning systems that enable rapid intelligence sharing between government bodies and cold chain businesses to react quickly to threats and extreme events affecting the supply of perishable products including:
    - Conflict-driven disruptions to food and energy supplies
    - Future pandemics or major events of national importance
    - Shortages in available cold storage space
    - Cyber attacks
    - Fuel shortages
    - UK border or major international supply chain disruption
    - Infrastructure failure during extreme heat climate events or major flooding

6. Development of an Incident Response Plan (IRP) and a Disaster Recovery Plan (DRP) to support businesses in the cold chain to continue their essential service during national emergencies. This must include identifying mechanisms to ensure that energy supplies for cold chain infrastructure are prioritised.

## EMBEDDING COLD CHAIN REQUIREMENTS INTO FUTURE FOOD RESILIENCE AND SECURITY POLICIES

7. As the Government considers following the lead of other countries and the European Union in ensuring minimum stocks of essential products are held within the UK as a civil contingency, there must be consideration and industry consultation on the need, availability and business case for expanding UK cold storage and distribution infrastructure.

8. Ensuring specific reference to cold chain as critical national infrastructure requiring special local planning considerations within the National Planning Policy Framework.

9. Introduce the requirement for an industry-government collaboration to undertake a national assessment of our critical cold chain infrastructure to assess future requirement and vulnerabilities and to provide advice to local planning authorities on how to support cold chain development.

10. Support initiatives to promote critical occupations in the cold chain, including HGV drivers, warehouse workers and refrigeration engineers.

**The UK's food system is only as resilient as the infrastructure that sustains it. Without urgent recognition and support for the cold chain, the nation remains exposed to avoidable risks. The actions set out in this report provide a clear and deliverable pathway to strengthen resilience, protect our citizens, and secure the future of the UK's food supply.**

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