

Cold Chain in the Context of Global Warming

Global distribution of life-saving pharmaceuticals is incredibly complex, with several different components from warehouse to final delivery. At each stage, providers must make sure strict temperature requirements are met across varying climates and infrastructures.

As a result of global warming, the increase of unpredictable weather patterns and increased temperatures is making distribution even more challenging. To combat this, manufacturers, logistics providers and distributors are having to work together to implement new strategies and routes whilst trying to keep costs down. However, someone vital is often being missed out of the conversation.

As witnessed during the pandemic, packaging providers play a crucial role in the delivery of lifesaving medicines. By building relationships with these providers now, logistics can adapt to ensure continued effectiveness of cold chain distribution as we prepare for the increase of extreme weather.



Cold Chain Needs to be Smarter, not Just Stronger

Supply chain disruptions can easily cause issues with the delivery of supplies and treatments. Global warming will create unpredictable conditions, with flooding, landslides and storm damage. These extreme weather fluctuations will impact routes and mean that future packaging may need to handle freezing temperatures, extreme heat and humidity all in one journey.

Ensuring reliability and efficiency is vital. Availability of packaging solutions must be successfully managed, and the industry must position themselves to be able to predict and prepare for all disruptions. The extreme weather fluctuations will mean a one-size-fits-all approach will no longer be viable. Instead, data-driven risk analysis and route-specific adaptation will be key. Manufacturers will need to factor in seasonal and regional climate risks when planning distribution.

One solution to these evolving challenges is integrating AI into the cold chain. AI-driven insights can help optimise routes, reduce waste and lower costs. By analysing historical data and predicting climate patterns, the most efficient, reliable and unaffected delivery routes can be determined. This not only cuts costs but also supports the timely and reliable delivery of medicine and minimises environmental impact. AI will need real-time data on transportation conditions, such as weather patterns and temperature fluctuations, to determine the correct route and solution type needed for a successful delivery.

Sustainability Matters, but it Must be Balanced with Efficiency

Although reducing the environmental impact of cold chain logistics is essential, it cannot come at the cost of efficiency and patient safety. AI also plays an important role here, through not only determining the best routes and solution choice, but by unlocking

efficiencies to help meet sustainability requirements. There must be a focus on minimising waste through forever-use packaging, making sure it is returned and re-used wherever possible. Adopting lighter, space-efficient packaging can lower fuel consumption and reduce emissions, as well as optimise the amount of product shipped to reduce cost. However, to truly have an impact, sustainability requires collaboration across the entire supply chain.

Global Warming's Impact on Cold Chain Infrastructure

As temperatures increase, so will the demand for enhanced cold chain infrastructure. Packaging solutions with significant autonomy will be required to maintain temperature and safe delivery, even in the face of extreme conditions. Additionally, climate-related supply chain disruptions may call for alternative backup routes, meaning redundancy will need to be built into distribution systems.



More frequent extreme weather events, such as heatwaves, flooding, wildfires, and landslides, will significantly disrupt supply chains. These events can lead to road closures, disrupted shipping lanes, and airport shutdowns, making it difficult to maintain consistent transportation routes. To address this challenge, it is crucial to collaborate with partners who have a wide global network to mitigate the risk of delays.

These partners must also demonstrate agility and proactivity in adjusting plans as needed to ensure that patients receive their vital medicines without disruption.

Handling Global Warming Requires a Delicate Balance

As learnt from any previous crisis, collaboration is key. Only by fostering collaboration between manufacturers,

logistics partners and packaging providers can the pharmaceutical industry hope to balance sustainability, cost and reliability in the face of global warming. New technology and AI will be key drivers of this, along with the agility to react fast to any potential disruption. Companies that prepare now and find the right balance will be more efficient and gain a competitive edge in a market that demands both resilience and responsibility.



Niklas Adamsson

Niklas is the CEO Interim and COO at Envirotainer. Niklas brings more than 15 years of international leadership experience from various roles. Before joining Envirotainer, he held the position as Technical Director Northern Europe at Dassault Systemes. Furthermore, he has also worked within the Operations and Supply Chain domain at Accenture in Sweden.