COLD CHAIN FEDERATION

COLD CHAIN CLIMATE SUMMIT

+

COLD CHAIN SUSTAINABILITY AWARDS

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cleanearth
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ECOOLTEC
THE NATURAL CHOICE

Marsh Commercial

MITSUBISHI FORKLIFT TRUCKS

PHASE CHANGE SOLUTIONS

Resource Data Management

SMI
thermal protection perfection

STYNE REFRIGERATION

SUNSWAP

THERMO KING

zestec
renewable energy

zlc energy
ZERO LOW CARBON

AGENDA

10:00 CLIMATE RESILIENCE AND THE COLD CHAIN
Keynote: Dr Chloe Brimicombe
How will climate change impact temperatures in the UK?

Keynote: Dr Tim Fox
Cold Chains as an adaptation strategy in a hotter world

Discussion Panel: The impact of future temperature rises on cold chain infrastructure

11:40 BREAK & EXHIBITION

12:15 COLD CHAIN SUSTAINABILITY AWARDS

13:15 LUNCH AND NETWORKING BREAK

14:15 REVIEWING TEMPERATURE SET POINTS TO SAVE ENERGY ACROSS THE COLD CHAIN
Keynote: Georgios Tetradis-Mairis
Turning the dial on frozen

Discussion Panel: Increasing temperatures in the cold chain, what are the practical considerations?

Discussion Panel: Increasing temperature setpoints – next steps for CCF and our members

16:00 CLOSE

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DR CHLOE BRIMICOMBE

University of Graz

HOW WILL CLIMATE CHANGE IMPACT TEMPERATURES IN THE UK?

Submit a question for Chloe:

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COLD CHAIN CLIMATE SUMMIT

Introduction to Climate Change

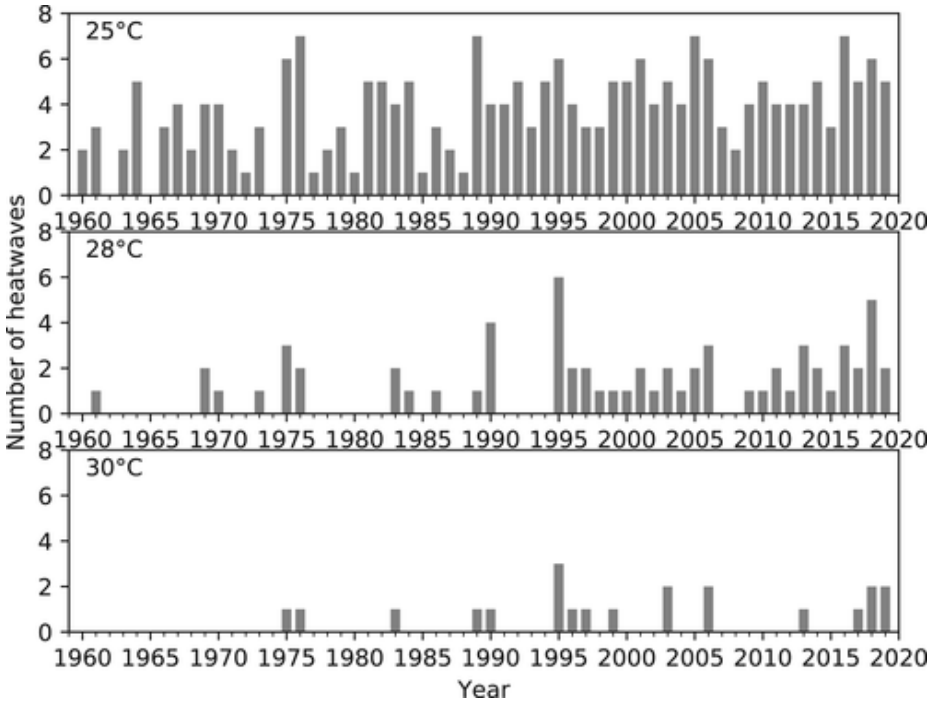
Dr Chloe Brimicombe

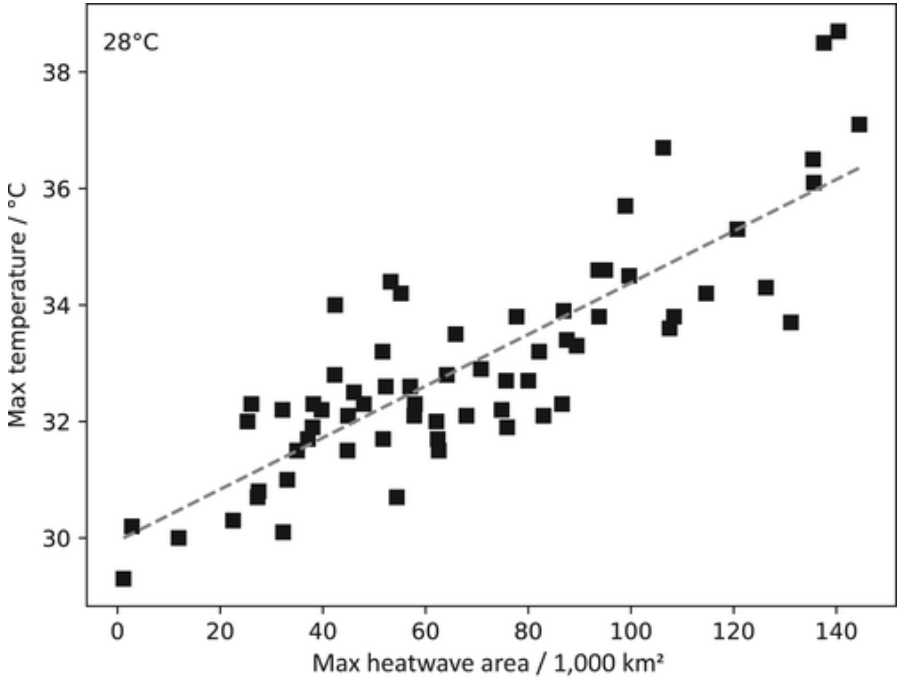
@ChloBrim chloe.brimicombe@uni-graz.at

2023 was the hottest year in at least 173 years

Copernicus Climate Change Center

Trends in heatwaves





Beckett and Sanderson 2021

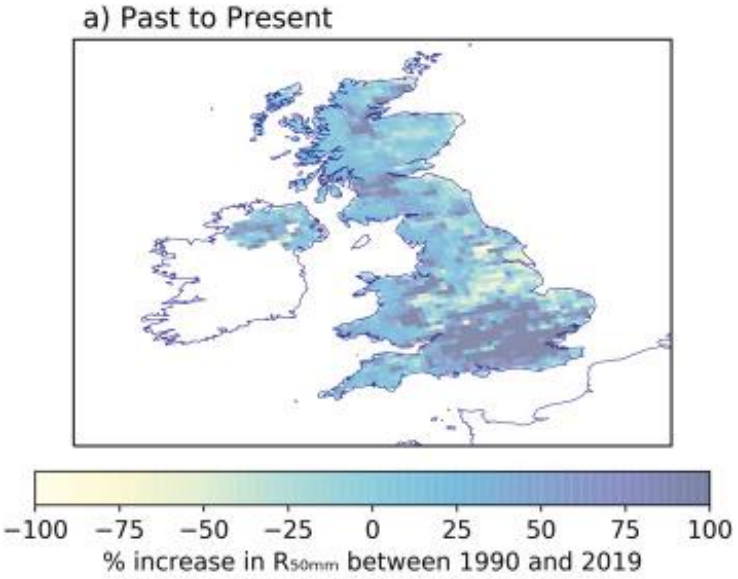
Impacts of heatwaves

- 4,500 people died in 3 heatwaves in 2022 in the UK - 60,000 across Europe.
- The RAC expected 15-20% more breakdowns during the peak of the July 2022 heatwave.

Hottest day of 2022 saw 638 more deaths than normal in England

Experts call major spike in deaths on 19 July and following day 'extraordinary data' and a wake-up call over dangers of extreme heat

Trends in rainfall



Storm Henk batters UK leading to power outages, travel disruption and flooding

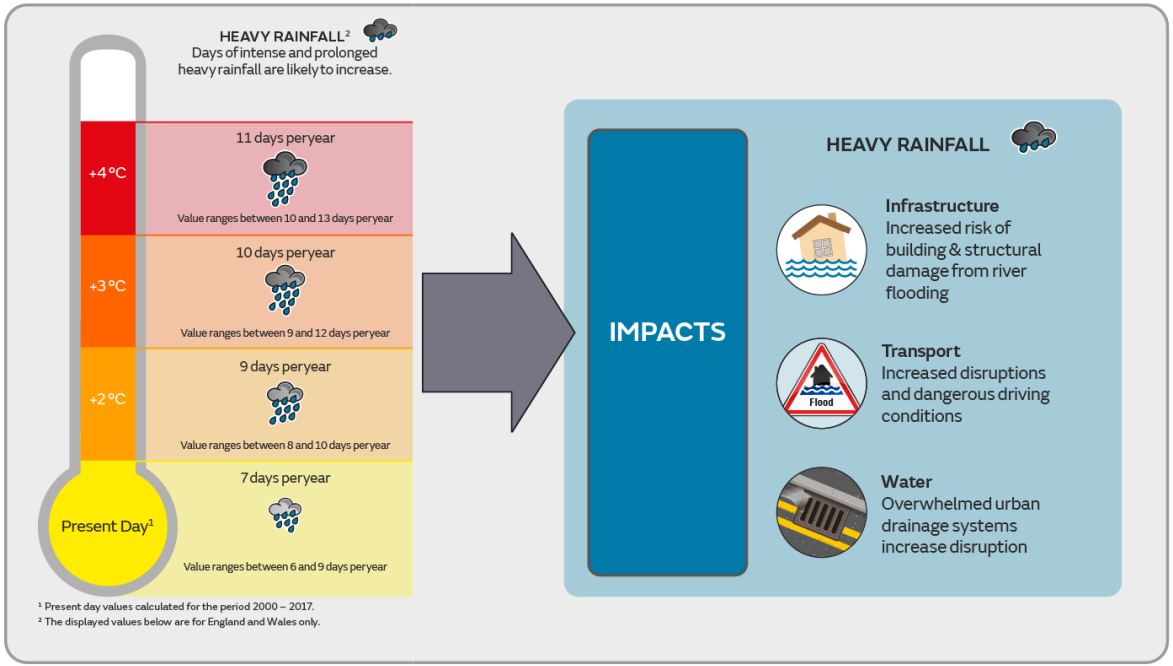
3 January

Cotterill et al., 2021

Impacts of extreme rainfall

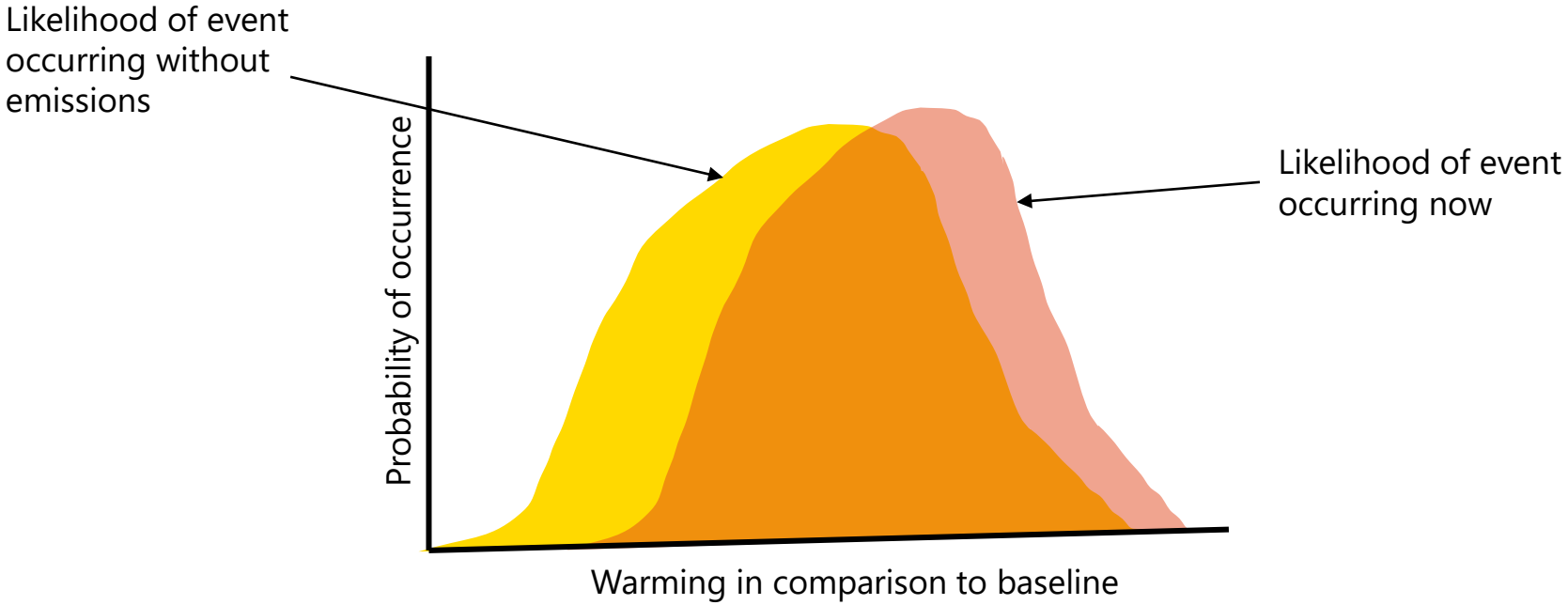
Met Office

Global warming and future high-impact weather in the UK

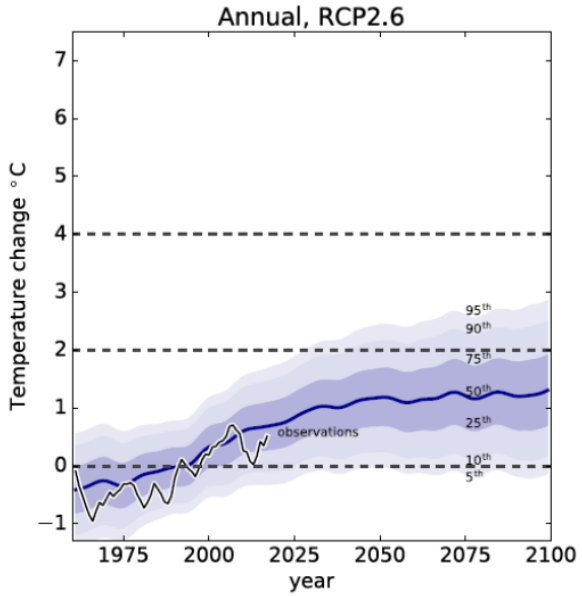


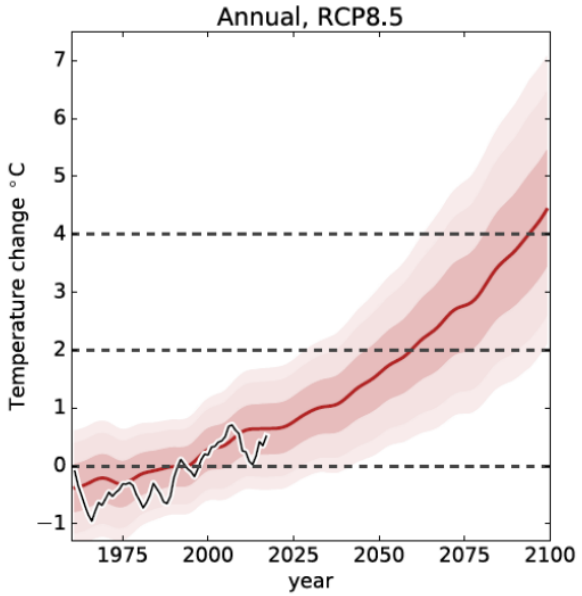
¹ Present day values calculated for the period 2000 – 2017.
² The displayed values below are for England and Wales only.

Climate Change Attribution?



Future Climate Changes in the UK



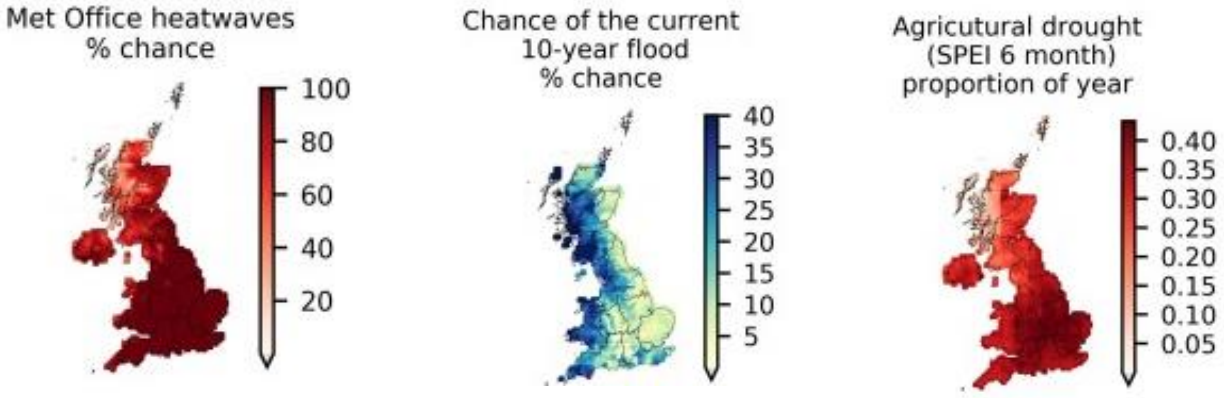


In RCP2.6 fastest rate of change in near future

In RCP8.5 fastest rate of change at end of century

Similarity between scenarios over next couple of decades

Changes in Climate Impacts



Increases in chance or proportion of the year effected by climate change impacts in a high emission scenario, between 2071-2100

Arnell et al., 2021

Thank you for listening, any questions?

Dr Chloe Brimicombe

@ChloBrim chloe.brimicombe@uni-graz.at

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DR CHLOE BRIMICOMBE

University of Graz

HOW WILL CLIMATE CHANGE IMPACT TEMPERATURES IN THE UK?

Submit a question for Chloe:

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DR TIM FOX

COLD CHAINS AS AN ADAPTATION STRATEGY IN A HOTTER WORLD

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Cold Chains as an Adaptation Strategy in a Hotter World

The Hot Reality: Living in a +50°C World

Dr Tim Fox

Independent Consultant

UNIVERSITY OF BIRMINGHAM

Centre for Sustainable Cooling

Introduction

- The Hot Reality
- Living in a +50°C World Project
- Impacts on Cold Chain Sectors
- Cold Chains as an Adaptation Strategy
- Cooling is Critical Infrastructure

The Hot Reality

NEWS

Home | Cost of Living | War in Ukraine | Climate | UK | World | Business | Politics | Culture | Tech

World | Africa | Asia | Australia | Europe | Latin America | Middle East | US & Canada

Europe heatwave: Red alerts issued in 16 Italian cities

15 July

Europe heatwaves

www.bbc.co.uk/news

Science & Environment

Europe and US heatwaves near 'impossible' without climate change

3 days ago · Comments

Europe heatwaves

www.bbc.co.uk/news/science-and-environment

Australia weather

Unseasonably warm winter weather sweeps eastern Australia as Sydney reaches 25C

One of the main factors contributing to the unusually high temperatures is the warm ocean conditions, a BoM meteorologist says

Follow our Australia news live blog for the latest updates

Get our morning and afternoon news emails, free app or daily news podcast

Science & Environment

Heatwaves are new normal as 50C hits US and China - UN

17 July

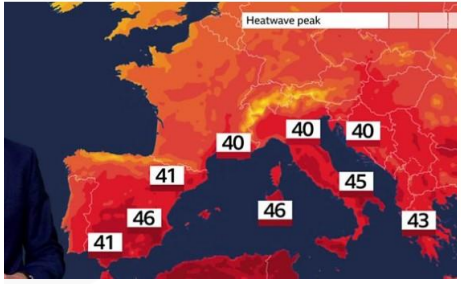
REUTERS

World · Business · Markets · Sustainability · Legal · Breakingviews · More

China logs 52.2 Celsius as extreme weather rewrites records

Reuters

July 17, 2023 6:59 AM GMT+1 · Updated 11 days ago



Science & Environment

Warmest September on record as 'gobsmacking' data shocks scientists

3 days ago · Comments

COP28

Centre for Sustainable Cooling

Hot and getting hotter…

- The reality is that worldwide seasonal ambient temperatures are rising and heatwaves are becoming more frequent, prolonged and severe.
- Current policy commitments will result in a 2.8°C increase in the global mean temperature compared to pre-industrial levels by the end of the century.
- Cooling provision across multiple sectors is vital to human survival in such a world.
- Deploying sustainable cold chains offers an adaptation strategy for society in responding to potential impacts of increased temperatures and heat extremes on the food and health sectors.
- **But,** if we are offering cold chains as an adaptation strategy we need to ensure that they themselves are well adapted and resilient to climate change.
- **The 'Living in a +50C World" project makes the case for cooling as an adaptation strategy to enable humans to survive and thrive in a hotter world.**

The Project (1) - Overview

- The project is driven by Professor Toby Peters and is part of a joint programme of work between the Centre for Sustainable Cooling (CSC) and the Africa Centre of Excellence for Sustainable Cooling and Cold-chain (ACES) located in Kigali, Rwanda.

- It involves a multi-discipline, multi-sector, international team of over 30 contributors representing academia, industry, professional practice and broader civil society across the globe.

- Selected findings were presented during UNFCCC's COP28 in Dubai, UAE, and the full report will be published on 21st May.

Project (2) - Areas of particular focus

- Buildings and the built environment
- **Food production and supply**
- **Health infrastructure**
- Digital infrastructure
- **Workplace output and economic productivity**
- Migration, refugees and refugee camps
- **Funding, finance and business models**
- **Cooling technologies**
- **Cooling as critical infrastructure**
- **Training, skills and standards**
- **SOLUTIONS**






Impacts on people, places and functioning of society (1)

Food Production and Supply

- Food and nutritional security; food safety; health and livelihoods, particularly in the Global South with implications for Global North.
- Decreasing plant yields and quality, e.g. average of 6-7% yield reduction per 1°C above seasonal mean temperature.
- Shifting growing seasons; disrupted production schedules; disrupted supply chains.
- Lower animal health (17 million chickens died in 2015 Indian heatwave) and productivity, e.g could decline by up to 30% by 2050 – milk yields can reduce up to 50% under extreme conditions.
- Increased food losses due to postharvest spoilage.

Impacts on people, places and functioning of society (2)

Vaccines, Medicines and other Temperature-sensitive Products

- Emergence, re-emergence and geographical spread of infectious diseases, e.g. migrating mosquito species, ticks, flies and other insects already being observed.
- Disease outbreaks in populations unfamiliar with them and lacking appropriate health infrastructure (e.g during the recent COVID-19 pandemic, only 8% of the national vaccine cooling capacity in Rwanda had -20°C or colder capability for mRNA or viral-vectored vaccine).
- In temperate zones, gradual erosion of seasonality and predictability for respiratory viruses (such as influenza etc.) means timing of pre-emptive vaccination campaigns may become less clear.

Impacts on people, places and functioning of society (3)

Cooling technologies

- Stationary and mobile equipment will become increasingly stressed and likely to fail.
- Heat impacts not only on TRUs, but also vehicle chassis (tyres, brakes and electrics) and bodies (insulation, door seals) - increased energy consumption, more heat and friction wear, higher level of pollutants.
- Heat island effect in loading bay yards, increased pressures on limited TRU support capacity, knock on effect on routine maintenance schedules, leading to more breakdowns – vicious cycle.
- Maximum design conditions may frequently be exceeded, leading to poor performance, less resilience, and potential failures. Systems not well maintained will be more vulnerable and at higher risk of failure.
- Higher seasonal ambients and increased air moisture holding capacity will impact performance and reliability, through constant operation outside of optimum design envelope and increased ice formation.
- Anecdotal reports suggest 30-60 stores per large retailer experiencing whole store failures within a matter of days when temperatures exceed system design boundaries.

Impacts on people, places and functioning of society (4)

Workplaces

- Cumulative cost globally of extreme heat attributed to climate change in 1992 – 2013 estimated at US$16 – US$50 trillion, primarily a result of impacts on health, productivity, and agricultural output.
- Excessive 2023 heat in Chilean Andes exacerbated drought in Argentina and Uruguay, leading to estimated losses of US$15 billion in agricultural exports and US$1.1 billion in local farming activity, respectively.
- High temperatures impact physical and mental health, resulting in workforce more prone to illness, accident and injury, absenteeism, limiting working hours, low productivity, and low retention rates.
- Workplace injuries across various sectors observed to surge circa 180% in 2021 Canadian heat dome.
- Facility operatives, delivery drivers, frontline staff working in retail, and those employed in food service and hospitality, are all vulnerable to heat stress during hot weather.
- 2023 industrial action by Amazon drivers in California expected to continue making 400 stops per day in temperatures of over ≈37.8°C; UPS in USA agreed to install air conditioning in fleet after strike threats.

Adaptation and resilience building (1)

Food Production and Supply

- Development of heat and drought resilient plants, provision of early warning systems, water management measures, production diversification.
- Deployment of cooled indoor horticulture, farming and aquaculture.
- Loss reduction through preservation techniques and use of well-adapted sustainable cold chains – food saved as important as food produced.
- Address bias toward investing in production stage rather than post-production.
- Development of accessible, low cost, sustainable cold chain technology options, along with training programmes and innovation in funding, finance and business models, for better fit with Global South.

Adaptation and resilience building (2)

Vaccine and Medicine Distribution

- Study markers for vaccine need in vulnerable populations to prioritise product use; wastewater surveillance to witness and characterise emerging pathogens and signals of sub-clinical/mild human disease.
- Consider most challenging climate change projections and widespread future use of lipid-enveloped mRNA vaccine technology.
- Cold chains must be designed and optimised for ‘next-generation’ vaccine distribution, future resilience against climate impacts, sustainability, and affordability in Global South.
- Deployment of ultra-fast delivery systems, such as flexible, reconfigurable drone-based infrastructure for highly temperature sensitive vaccines and rapid response to emerging diseases.

Adaptation and resilience building (3)

Cooling technologies

- Design for operation at higher temperatures and incorporate more flexibility for ensuring effective and efficient functioning over a wider range of weather conditions.
- Reduce cooling load; improve equipment and system specifications; apply system design; revise design of vehicle bodies and loading - unloading areas; use correct control philosophy; optimise selection of components; put more emphasis on performance and less on initial cost; ensure correct operation, better training, and a focus on maintenance.
- Design of passive and nature-based solutions will need to account for the future performance impact of increased air and water temperatures and shifts in weather patterns.

Adaptation and resilience building (4)

Workplace Productivity

- Update safety procedures and policies on occupational health, as well as collaborate with employees to co-design working practices and strategies for dealing with heat stress.
- Reschedule manufacturing, production, installation, maintenance and other activities, changes to core hours of work, increase in number and timing of rest breaks, and workplace refurbishment.

Training and skills

- Holds paramount importance in successfully deploying well-adapted sustainable cold chains as an adaptation strategy.
- Required for specifying, designing, installing, operating and maintaining new technologies, undertaking risk assessments specific to new refrigerants, and operating, maintaining and decommissioning existing systems, and improving energy efficiency

Cooling is Critical Infrastructure

- Cooling is not optional or a lifestyle luxury, it is vital for a well-functioning, well adapted, resilient and healthy society and economy. It enables access to the basic essentials of life, provides safe and comfortable environments, underpins modern communications, trade and commerce, and is central to lifting millions out of rural poverty as well as delivering socio-economic development.

- Cooling will become increasingly important as the world continues to warm and humans seek to adapt to higher seasonal temperatures and more frequent, prolonged, and intense heatwaves.

Climate-resilience – Systemic Resilience – Critical Service

- When considering infrastructure, climate-resilience is a sub-set of systemic resilience, which is defined by UNDRR as:

"a property of an infrastructure system that arises dynamically when the national infrastructure is organised in such a way that it can provide agreed **critical services** (power, heat, communications channels, mobility services, potable water, and wastewater and waste removal) despite endogenous and/or exogenous hazards, and despite the addition, modification and removal of infrastructure components" - *Principles for Resilient Infrastructure, 2022.*

- Cooling is a critical service, as vital as potable water and mobility to our ability to function in a modern world.

- Logically, the infrastructure that delivers an agreed critical service is 'critical infrastructure'.

UK Government Definition - Critical Infrastructure

UK Government definition of critical national infrastructure (CNI):

"Those critical elements of infrastructure (namely assets, facilities, systems, networks or processes and the essential workers that operate and facilitate them), the loss or compromise of which could result in:

a) Major detrimental impact on the availability, integrity or delivery of essential services - including those services whose integrity, if compromised, could result in significant loss of life or casualties - taking into account significant economic or social impacts; and/or

b) Significant impact on national security, national defence, or the functioning of the state."

Cooling, and more particularly cold chain, infrastructure clearly meets criteria (a) and possibly (b), depending on the level of impact, and should be designated as critical national infrastructure.

Designating cooling as critical infrastructure

- Cooling infrastructure is not recognised by governments as CNI or designated as such in national list of such infrastructure.
- Needs to be designated as CNI by office within governance framework that has cross-government responsibility for CNI, and treated as such in their assessments of national resilience; adaptation and resilience planning and implementation; and resilience capacity building activities.
- Designation would resolve common policy related challenge by creating a central high-level focus on its provision within the governance framework, thereby avoiding fragmented, uncoordinated, sub-optimal approach typical where cooling is responsibility of multiple government departments.

Summary

• Cooling is vital to humans surviving and thriving in higher temperature environments, not just for comfort and safety, but for the basic essentials of life including food and nutritional security and physical and mental health, and to underpin modern communications, commerce, and productivity.

• Deploying sustainable cold chains offers an adaptation strategy for society in responding to potential impacts of increased temperatures and heat extremes on the food and health sectors.

• **But,** if we are offering cold chains as an adaptation strategy we need to ensure that they themselves are well adapted and resilient to the changing climate.

• **The 'Living in a +50C World" project makes the case for cooling as an adaptation strategy, that it should be recognised as critical infrastructure, at a local and global scale, and treated as such in assessments of national resilience; adaptation and resilience planning and implementation; and resilience capacity building activities.**

Contact us

drfox@hotmail.co.uk

https://www.sustainablecooling.org

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Centre for Sustainable Cooling

COLD CHAIN FEDERATION

DR TIM FOX

COLD CHAINS AS AN ADAPTATION STRATEGY IN A HOTTER WORLD

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DISCUSSION: THE IMPACT OF FUTURE TEMPERATURE RISES ON COLD CHAIN INFRASTRUCTURE

ASK A QUESTION:

Chris Smith – ALT-SOLAR

Catarina Marquez – London South Bank University

Scott Dargan – Carrier

Joanne Swift– P & M Group

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NETWORKING BREAK

COLD CHAIN SUSTAINABILITY AWARDS

STARTS AT 12:15PM

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MITSUBISHI FORKLIFT TRUCKS

PHASE CHANGE SOLUTIONS

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zestec
renewable energy

zlc energy
ZERO LOW CARBON

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AGENDA FOR THE AFTERNOON

14:15: REVIEWING TEMPERATURE SETPOINTS TO SAVE ENERGY ACROSS THE COLD CHAIN
Keynote: Georgios Tetradis-Mairis
Turning the dial on frozen

Discussion Panel: Increasing temperatures in the cold chain, what are the practical considerations?

Discussion Panel: Increasing temperature setpoints – next steps for CCF and our members

16:00 CLOSE

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GEORGIOS TETRADIS-MAIRIS

REVIEWING TEMPERATURE SET POINTS TO SAVE ENERGY ACROSS THE COLD CHAIN

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Turning the dial on frozen

Georgios Tetradis-Mairis – Head of R&D Futures

Nomad Foods

March 2024

Our Agenda

Nomad Foods
Serving the world with better food

01 A bit about us

02 What we've done

03 What we've found

04 The opportunity

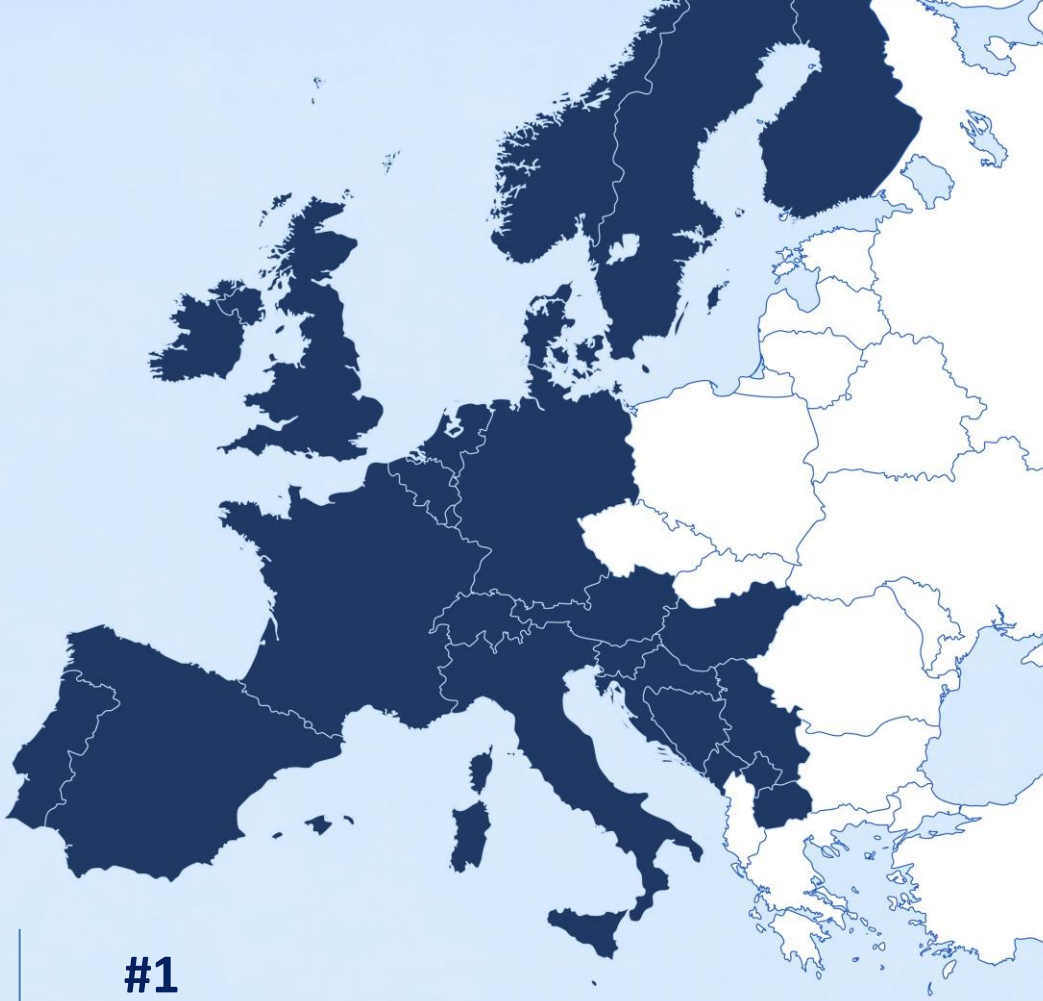
Nomad Foods
Serving the world with better food

01 A bit about us


One of Europe's largest frozen food companies
Nomad Foods

Nomad Foods

Serving the world with better food



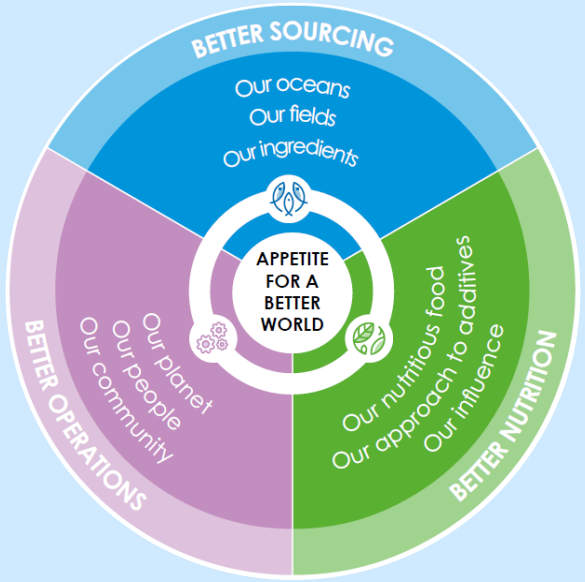
22	8,000	8	€3bn	#1
COUNTRIES	EMPLOYEES	CATEGORIES	TURNOVER	MARKET SHARE

Our Purpose & Sustainability Strategy

Nomad Foods
Serving the world with better food

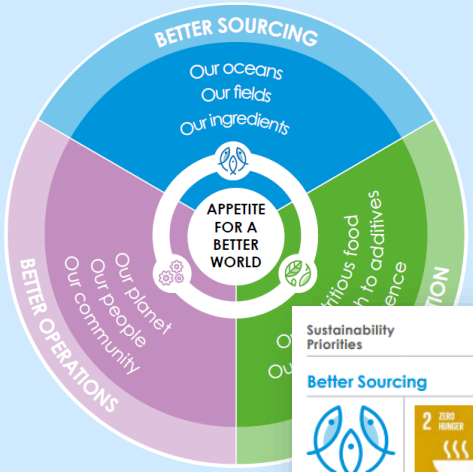
Our Purpose is built on three principles:

Better Food	Food For All	Appetite for a Better World



Timebound targets aligned to the UN Sustainable Development Goals

Nomad Foods
Serving the world with better food



Sustainability Priorities	SDG	SDG sub-targets	Targets
Better Sourcing	2 ZERO HUNGER; 12 RESPONSIBLE CONSUMPTION AND PRODUCTION; 14 LIFE BELOW WATER; 15 LIFE ON LAND	2.4, 2.5 12.2 14.1, 14.4 15.2, 15.5	1. We will use 100% fish and seafood from sustainable fishing and responsible farming by the end of 2025 2. 100% of our vegetables and potatoes will be produced using sustainable farming practices by the end of 2025
Better Nutrition	2 ZERO HUNGER	2.1	3. We will grow the healthier meal choices in our portfolio every year 4. 100% of our portfolio to be without flavour enhancers, artificial flavours and artificial colourants by the end of 2023*
Better Operations	12 RESPONSIBLE CONSUMPTION AND PRODUCTION	12.3, 12.4, 12.5	5. We will reduce our greenhouse gas emissions intensity across our operations by 45% from a 2019 baseline** 6. 100% of our consumer packaging will be recyclable by the end of 2025***

Our strategy is informed by input from internal and external stakeholders and reflects the changing world around us. This ensures we focus on the issues that are material to our long-term business success and that matter most to our stakeholders.

Fun Facts About Nomad Foods

The **2.5 BILLION FISH FINGERS** we produce annually would stretch around the world five and half times

Last year, **THE UK REMOVED 193 TONS OF MATERIAL FROM ITS PACKAGING** – this is the equivalent to 16 London double-decker buses

We have **THE LARGEST FISH FACTORY IN THE WORLD** in Bremerhaven and **THE LARGEST HERB FIELD IN EUROPE** in Reken

Our King Majestic Ice Cream was recently voted **BEST ICE CREAM*** **IN THE WORLD**

Our UK pea harvest will create **TWO BILLION PORTIONS OF PEAS THIS YEAR** and our spinach goes from field to frozen in less than three hours

Finally, **ONLY MCDONALD'S RIVALS NOMAD FOODS** as the largest fish processor

*Per the International Ice Cream Consortium

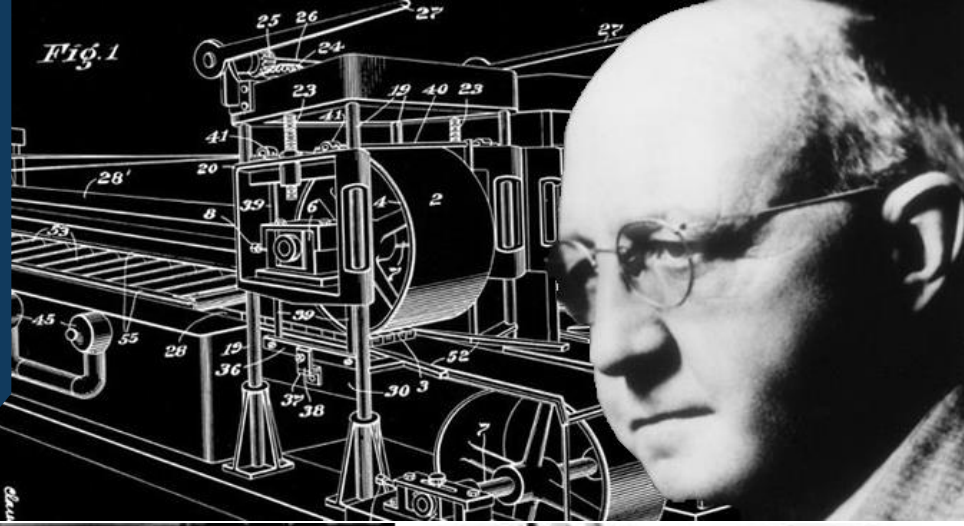
Nomad Foods
Serving the world with better food

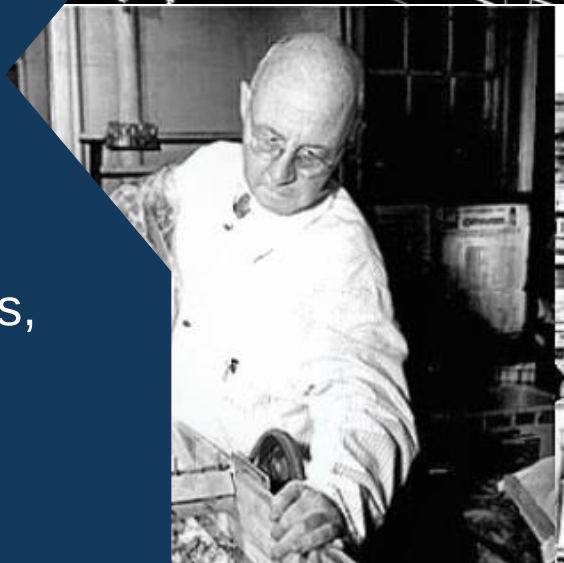
02 What we've done

In 1924, Clarence Birdseye's invention gave consumers high quality frozen food.

CELEBRATING 100 YEARS OF FROZEN

As we look to the next 100 years, we must ask ourselves what would Clarence do?





Only through curiosity can we discover opportunities.

Clarence Birdseye.

Real world context

01 Pressure on manufacturers and retailers to reduce environmental impact of operations & food sold

02 Cost of living crisis leads shoppers to switch to frozen, yet scepticism remains on the frozen aisle energy use

03 Since Clarence Birdseye invented the category, the assumed temperature (-18°C) has never changed

Campden BRI
food and drink innovation

Our Study

Key Facts & Figures

33
Experts working on the project

8
Individual tests performed each month

3000
Micro data points

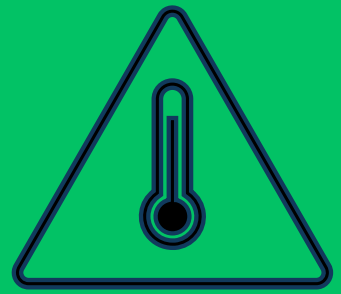
9000
Total data points

Our Testing Areas

MICROBIOLOGICAL

SENSORY

TEXTURE, OXIDATIVE RANCIDITY & DRIP LOSS



NUTRITION

ENERGY USAGE

PACKAGING

-18°C -15°C -12°C -9°C

Nomad Foods
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03 What we've found

We're proud to share with you our 12-month results

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MICRO

At all temperatures products are safe

SENSORY

All products at -15°C at parity with those at -18°C

NUTRITION

No downward trend at any temperature tested

TEXTURE

No change in texture at any temperature tested

OXIDATIVE RANCIDITY

No change at any temperatures tested

PACKAGING

Structure & functionality retained at all temperatures tested*

Every 3°C increase in temperature shows a drop of 10-11% in energy consumption, and a similar level of GHG reduction

*Only box products tested

Regulatory Landscape

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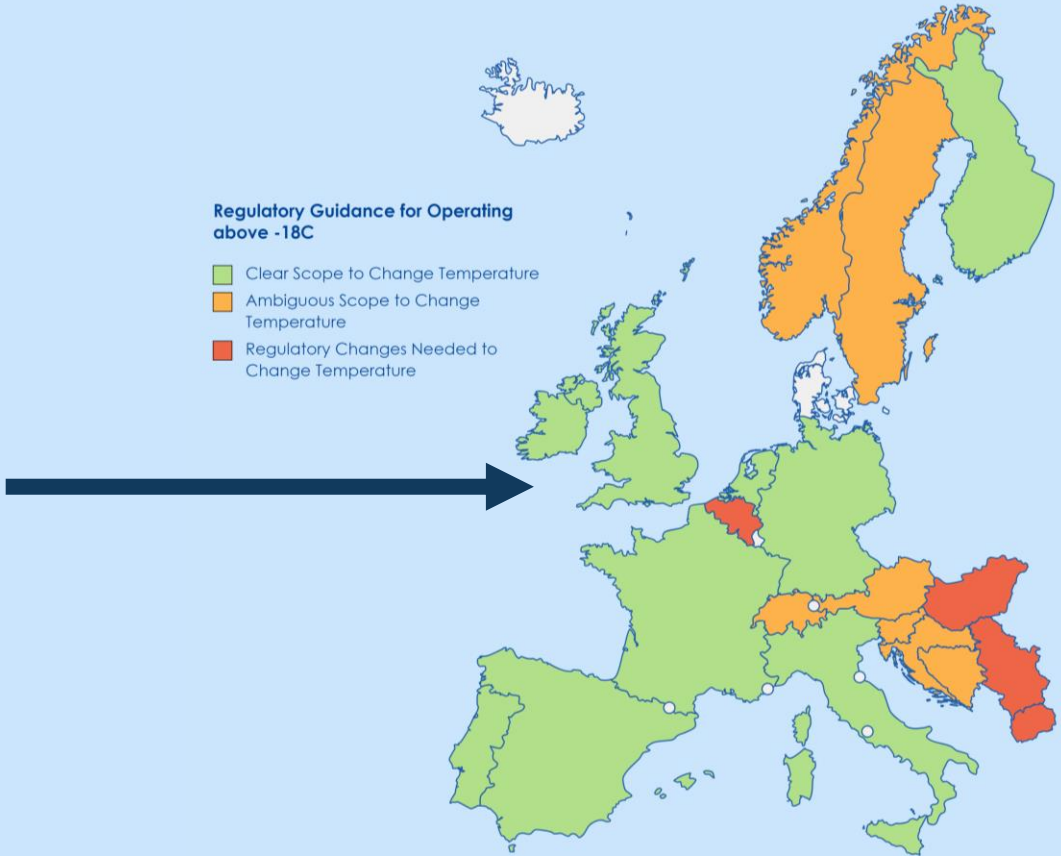
Across most of Europe, legislation already allows us to increase the temperature to -15°C.

In the UK, the requirement for -18°C only applies to products labelled 'Quick Frozen Food'



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04 The opportunity

“We are working to establish an industry alliance in frozen, to put the findings into action and, hopefully in time, pursue universal adoption. If Clarence was alive today, I hope he would commend the collective effort to make frozen food even better for the future.”

Stefan Descheemaeker,
Chief Executive Officer, Nomad Foods

CELEBRATING 100 YEARS OF FROZEN

Will you join us?

We are aiming to bring together retailers, customers, other FMCGs, white goods manufacturers and trade bodies to help push this project forward and drive change.

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Thank you

DISCUSSION: INCREASING TEMPERATURE SET POINTS– WHAT ARE THE PRACTICAL CONSIDERATIONS?

ASK A QUESTION:

Georgios Tetradis-Mairis – Nomad Foods

Dirk Hoffmann – DP World

Mark Slater - Magnavale

Simon Nicholls – Olympus Power

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COLD CHAIN FEDERATION

COLD CHAIN CLIMATE SUMMIT

DISCUSSION: NEXT STEPS FOR THE CCF AND OUR MEMBERS

Paul Bennell– CCF President

Phil Pluck – CCF Chief Executive

Tom Southall – CCF Deputy Chief Executive

ASK A QUESTION:

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COLD CHAIN FEDERATION

HOW THE CCF WILL SUPPORT OUR MEMBERS

1 ASSESS THE READINESS OF THE TEMPERATURE-CONTROLLED SUPPLY CHAIN FOR LOWER FROZEN FOOD SET POINTS

Work directly with our members and government officials to understand the practicalities of lower frozen temperature set points on the cold chain, including identifying risk points and collaborating with the wider frozen food sector to find solutions.

2 SUPPORT FOOD MANUFACTURERS TO DETERMINE PRODUCT LEVEL OPPORTUNITY AND TO PLAN THEIR FUTURE SUPPLY CHAINS

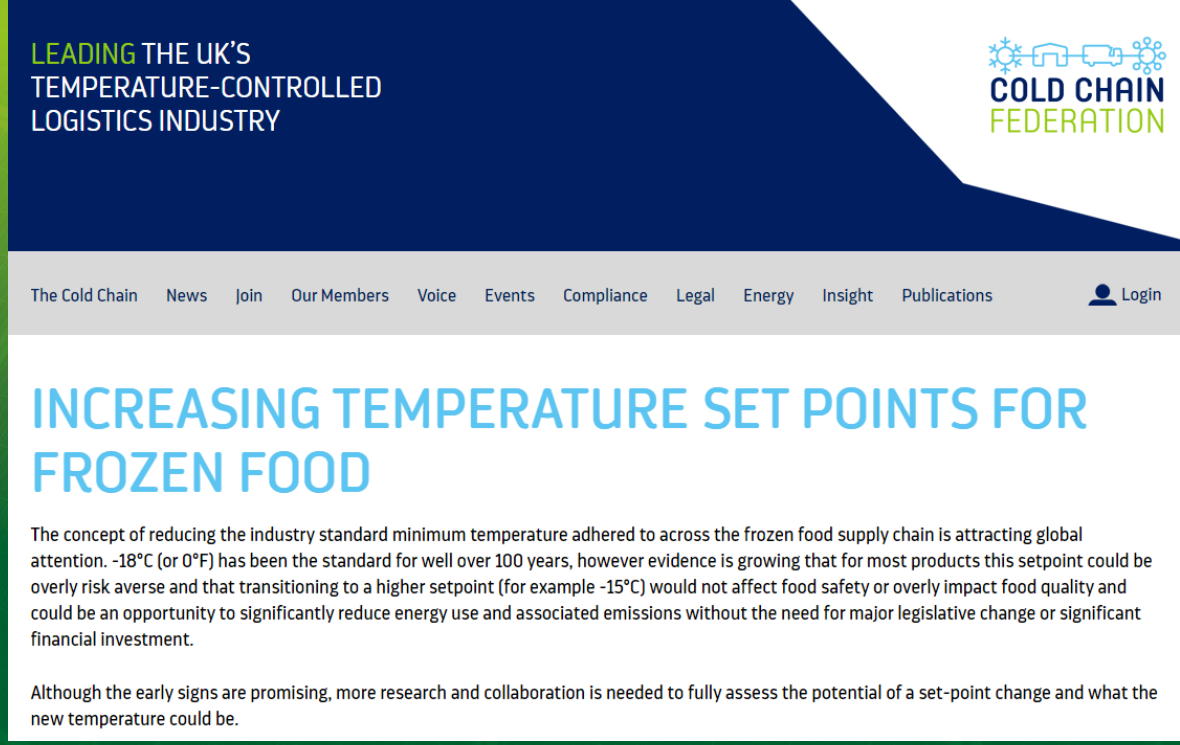
Collaborate with frozen food manufacturers and industry groups to ensure the needs of the cold chain are factored into their research and deployment strategies.

3 BACK ACADEMIC RESEARCH TO QUANTIFY THE EMISSIONS BENEFITS, EVALUATE REGULATORY BARRIERS AND VERIFY SYSTEM LEVEL IMPLEMENTATION

Facilitate and actively support government backed independent research from trusted UK institutions to verify research into higher set points

1. NEW WEBPAGE

To provide insight, case studies and member updates as businesses begin to examine higher frozen set points



https://www.coldchainfederation.org.uk/frozen-food-set-points/

COLD CHAIN FEDERATION

2. NEW NET ZERO REPORT

Providing an overview of the initiative, key knowledge gaps and how the CCF intends to support our members and work in collaboration with others to evaluate the opportunity

3. MEMBER SURVEY

A new survey designed to capture views from across the cold chain on how temperatures are currently determined and opinions on the challenges and risks of a change

COLD CHAIN FEDERATION

HAVE YOUR SAY – INCREASING TEMPERATURE SET POINTS FOR FROZEN FOOD

Thank you for completing this survey.

Your feedback will be used to help us understand different views from across the Cold Chain Federation membership on the issue of raising temperatures in the frozen food supply chain from the current industry standard minimum of -18°C (0°F). We are specifically looking for views on how set points are currently determined, opinions on how an increase could be implemented within temperature-controlled logistics operations and what the associated risks, or challenges, might be.

Views are welcomed from individuals and businesses operating cold stores or refrigerated vehicles and those providing technologies or services for the sector.

Your information will be treated confidentially and not passed to anyone outside of the Cold Chain Federation.

For more background on this issue, please refer to the Cold Chain Federation report *'Increasing temperature set points for frozen food to cut emissions across the UK cold chain'*, available from www.coldchainfederation.org.uk/frozen_temperature_set_points

COLD CHAIN FEDERATION

THANK YOU

ALT-SOLAR

OLYMPUS POWER
ZERO CARBON TOGETHER

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The P & M Group

BLUE CUBE

Carrier TRANSICOLD

cleanearth
WIND · SOLAR

ECOOLTEC
THE NATURAL CHOICE

Marsh Commercial

MITSUBISHI FORKLIFT TRUCKS

PHASE CHANGE SOLUTIONS

Resource Data Management

SMI
thermal protection perfection

STYNE REFRIGERATION

SUNSWAP

THERMO KING

zestec
renewable energy

zlc energy
ZERO LOW CARBON

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COLD CHAIN SUSTAINABILITY AWARDS