

HOW HEAT WILL CHANGE HOW WE WORK

2024 REPORT



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HEAT

The average air temperature has risen consistently since 1884, with all the warmest years occurring since 2003.

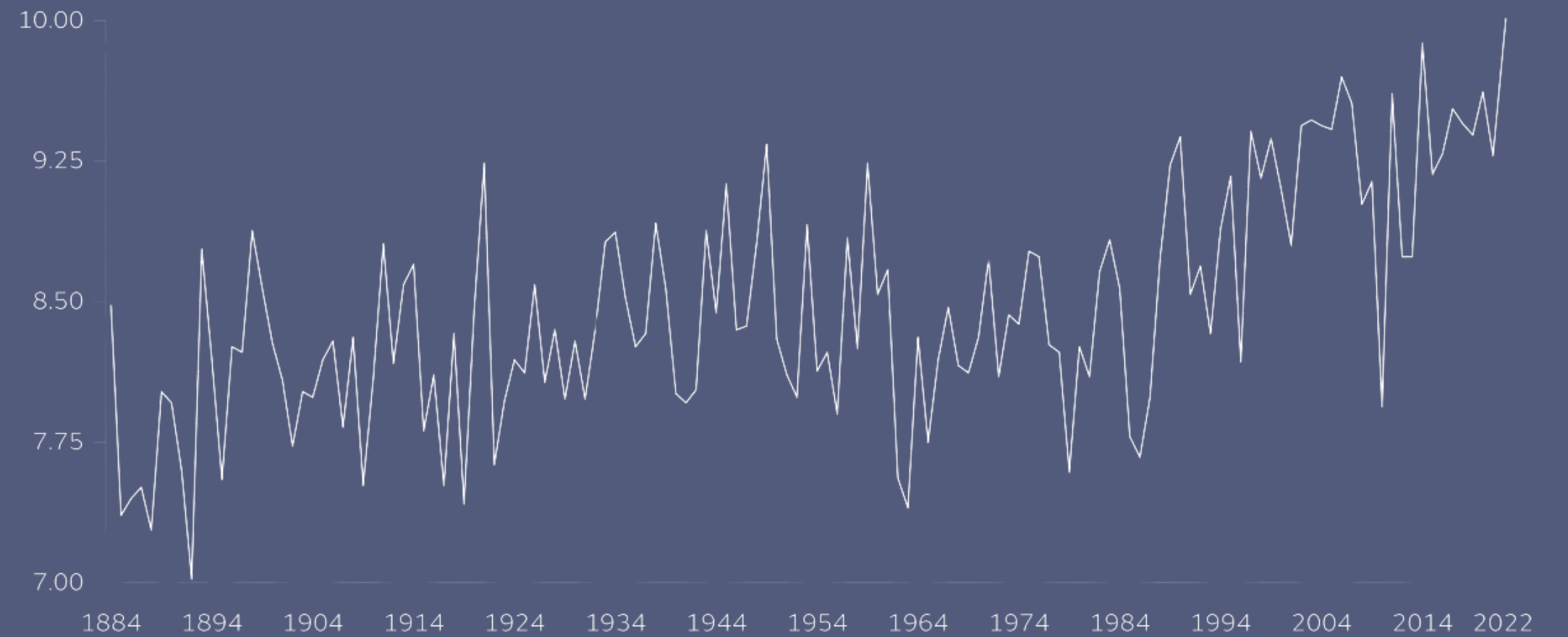
In US heat contributes to some 1,500 deaths annually. (1a)



UK annual average temperature since 1884



All of the UK's ten warmest years since 1884 have occurred from 2003





“UK extremes of temperature are changing much faster than the average temperature.”

Met Office

THEMES

The impact of heat can be seen across three themes. Companies should assess the risk of each and address accordingly.



Productivity



Health



Transport



PRODUCTIVITY

Impact of heat on productivity

PRODUCTIVITY



LOWER

Temperature effects exist even though the manufacturer's work-spaces are indoors and protected by high-quality climate control systems. Causes include:

- Poor sleep
- Absence from work

“Our results provide compelling evidence that high outdoor temperatures have a substantial negative effect on the productivity of skilled labour, even when production takes place in climate controlled spaces.” (1)

0.83%

for every

1°C

PRODUCTIVITY



POWER OUTAGES

In 2023 UK Power surveyed 2,000 households and found the percentage of respondents that experienced a power outage in the last 12 months

was:

(2)

23%

PRODUCTIVITY

SCHOOLS OUT

American Economic Journal, found that a 0.55C (1F) warmer school year reduced that year's learning by 1%

U.S. schools are now cancelling class for an average of six to seven school days each year for heat, compared with about three to four days a decade ago (Paul Chinowsky).
(3)



HEAT DAYS



PUPILS SENT HOME FOR HEAT DAYS

With extreme heat becoming more common on days school is in session, lawmakers in New York passed legislation this month that would prevent students from going into classrooms that reach at least 88F (31.1C).

(3)





HEALTH

Severe Weather Emergency Protocols (SWEP)

Emergency humanitarian response to severe weather conditions, the primary aim of which is to preserve life.

HEALTH

HEAT IMPACTS HEALTH

Heat can lead to:

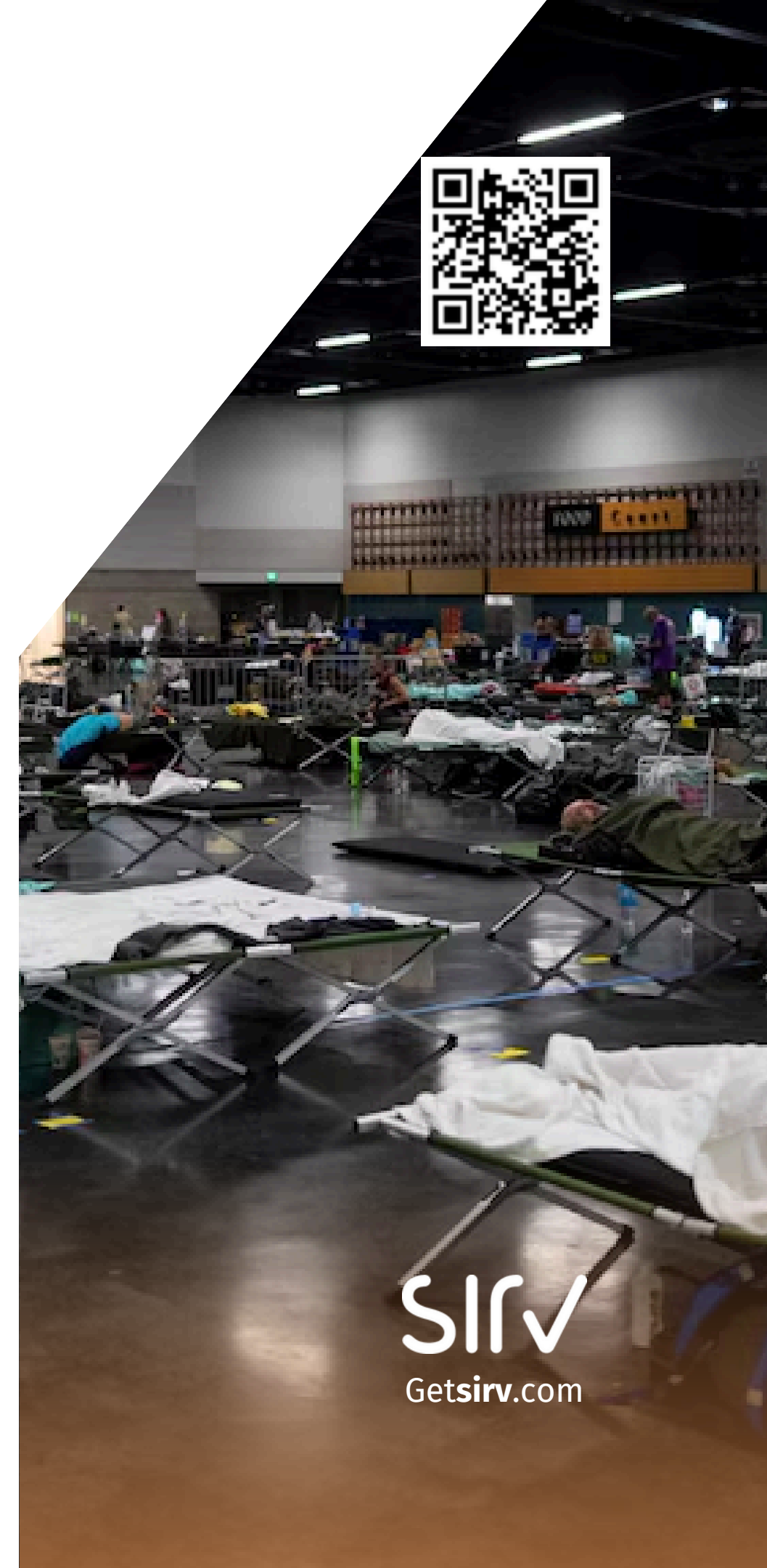
- dehydration
- heat cramps
- heat exhaustion
- heat stroke, which can be lethal



S.W.E.P.

MITIGATIONS

- Identify staff who are more vulnerable to heat
- Increase frequency of breaks, and ensure there is a cool area to rest and means to cool down
- Change work hours or routines to cooler parts of the day
- Consider cool rooms and cool tents
- Implement business continuity plans if service disruption
(4)





TRANSPORT

PLANES, TRAINS & VEHICLES

Sirv
Getsirv.com

PLANES

HOT AIR REDUCES LIFT

The landscape near airports and runways, especially during heat waves, can pose challenges to aviators.

“If it’s a hot day and you have a heavy aircraft, the aircraft will climb at a shallower angle, which may force the pilots to take a different route to safely clear surrounding mountains,”

The effects of hot air are felt most during takeoff roll and initial climb. With less thrust, an airplane requires more runway to take off.
(5)





Sirv
Getsirv.com

TRAINS

BUCKLED RAIL

Steel absorbs heat easily and track can get up to 20 degrees hotter than the air temperature.

Speed restrictions in place during the hottest part of the day, when the forecast air temperature is over 36 degrees Celsius.

Long periods without rain can mean the ground underneath the tracks dries out and shrinks, creating pothole-like cracks.

(6)

VEHICLES

DISRUPTION

- Tyres more likely to explode, especially HGV tyres
- Asphalt melts. Overheated concrete expands and collides. This creates a bulge that looks like a speed hump. It can create a road rupture that can break an axle.
- Can force fuel refineries to reduce capacity for safety and operational reasons
- Parked vehicles should not be parked over dry vegetation where engine heat can ignite what's underneath.





TAKE ACTION

Timelines

Board directors

Facilities directors

Health and safety directors



Today **New Normal**

SWEP Working group
Assess risks



Q1 **Mitigations**

Review mitigations
available



Q2 **Agree budget**

Agree proportionate
response



Q3 **Implement / Monitor**

Procure and implement
mitigations. Monitor.





RISK ASSESSMENT

Heat Risk Assessment: People

Assets

People

Threat

Heat leading to

- dehydration
- heat cramps
- heat exhaustion
- heat stroke, which can be lethal

Wildfire

Smoke in atmosphere

Vulnerabilities

Those with physical health conditions such as:

- heart
- lung
- kidney
- diabetes



Vulnerabilities

People working outside

People with Parkinson's disease and dementia

Impact

Injury and mortality

Breathing impacted by poor air quality caused by wildfires

Lower productivity

Insomnia from hot uncomfortable night-time temperatures

Staff absence owing to school Heat Days

Members of the public request use of organisation's cooling facilities

Heat Risk Assessment: People

Mitigations

Receive advance warning of high temperatures (sign-up to SIRV or Heat Health Alert notifications)

Deploy intelligent technology (SIRV) to help:

- Monitor heat
- communicate alerts to relevant parties
- Optimise work flows

Activate Severe Weather Emergency Protocols (SWEP)

Change work patterns to avoid peak temperatures

Change kind of work to avoid exposure to high temperatures or high levels of physical exertion

Cool room/tent to provide hydration and cool environment

Reduce travel

Increase availability of cooled water

Prioritise work environments with temperature control (home, office or third party work space).

Increase frequency of breaks

Preparations for wildfire in place

Safety and security protocol ready for wildfire

Monitor air quality



Heat Risk Assessment: Facility

Assets

Facility

Threat

Heat

Wildfires

Smoke in atmosphere

Vulnerabilities

Power supply interrupted owing to draw on power network

Building fabric

Roads and rail buckles

Concrete expansion

Wild fire

Temperature controlled environments such as server room

Vulnerabilities

Combustible materials and machines such as Battery Energy Storage Systems (BESS)

Impact

Business interruption owing to power outages

Business interruption owing to wildfire

Business interruption owing to smoke in atmosphere

Lower productivity



Heat Risk Assessment: Facility

Mitigations

Receive advance warning of high temperatures (sign-up to SIRV or Heat Health Alert notifications)

Deploy intelligent technology (SIRV) to help:

- Monitor heat
- communicate alerts to relevant parties
- Optimise work flows

-Heat

Activate SWEP

Check and report building fabric damage and deterioration

Monitor temperature controlled environments such as server rooms

Monitor combustible materials and machines such as Battery Energy Storage Systems (BESS)

Mitigations

-Power outage

Ensure uninterrupted power supply, batteries and generators available and operational with sufficient fuel

Reduce use of power in facility



Heat Risk Assessment: Transport

Assets

Transportation of people, product and vehicles

Threat

Heat

Power outage

Fuel shortage

Vulnerabilities

Rail buckles lead to rail cancellation

Trains run at reduced speed leading to delays and cancellation

Flights are delayed owing to take-off requiring greater distance

Road buckle and/or concrete expands leading to accidents and delays

Vulnerabilities

International staff travel

Wildfire and smoke leads to disruption and closure of transport routes

Temperature controlled product exposed to high heat

Low fuel

Power outages delays rail, ship and air travel

Vehicle tyres explode



Heat Risk Assessment: Transport

Impact

Business process interruption
Delays and cancellation in means of transport
Supply chain disruption
Critical safety and security services unable to reach destination
Fuel and refineries close owing to high safety and operational reasons
Means of transport too hot for people to travel

Mitigations

Receive advance warning of high temperatures (sign-up to SIRV or Heat Health Alert notifications)
Deploy intelligent technology (SIRV) to help:

- Monitor heat
- communicate alerts to relevant parties
- Optimise work flows

Mitigations

Recommend travel in cooler periods
Ensure sufficient fuel on hand for cold storage of goods
Consider fuel storage at work
Ensure vehicles are parked in areas where they are not likely to spark fires (avoid vegetation)
Adjust delivery schedules to account for delays
Monitor vehicle tyre status





SIRV monitors services and threats to help businesses avoid, manage and recover from business interruption. Find out more at getsirv.com

References

Heat

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(1) <https://link.springer.com/article/10.1007/s10640-023-00803-4>

(1) <https://news.exeter.ac.uk/research/hot-weather-hits-productivity-even-in-air-conditioned-factories/#:~:text=The%200.83%25%20productivity%20dip%20for,compared%20to%20a%20typical%20day.>

(1) <https://apnews.com/article/climate-science-health-and-environment-4f23d928ea637d239147c0e4adb6dc>



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Productivity

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(3) <https://www.bbc.co.uk/news/articles/cv225xgy5xxo#:~:text=Gabrielle%20Wessels%20was%20scrolling%20on,Friday%20because%20of%20extreme%20heat.>

(3) <https://www.reuters.com/business/environment/extreme-heat-is-closing-schools-widening-learning-gaps-worldwide-2024-04-30/>

Health

(4) <https://www.gov.uk/government/publications/hot-weather-and-health-supporting-vulnerable-people/supporting-vulnerable-people-before-and-during-hot-weather-people-homeless-and-sleeping-rough#risk-factors>



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(6) <https://www.networkrail.co.uk/campaigns/hot-weather-and-the-railway/#:~:text=Buckled%20rail&text=When%20steel%20gets%20hot%20it,them%20a%20safe%20distance%20apart.>

(7) <https://www.scientificamerican.com/article/extreme-heat-can-ruin-your-road-trip-heres-how-to-prepare/>

