

Economic Resilience: Health

A HOTTER FUTURE POSES NEW HEALTH RISKS AND OPPORTUNITIES



High, dry daytime summer temperatures continue to make headlines. These headlines are about more than setting records. **A healthy workforce is a critical part of any business' success...and its bottom line.** Awareness of the impacts of our region's changing climate on our quality of life can help businesses better manage risks, maximize efficiencies and innovate ahead of the curve. Working together and investing today, businesses, scientists and regional leaders can identify how technology, talent and local expertise can ensure our region maintains a strong economy, healthy environment and vibrant quality of life not just for today's workforce, but for all future generations.



A Hotter Future Poses New Risks

"Over the next 40 years global temperatures could increase twice as fast as they have in the last 40, and southern California temperature increases will likely follow this trend. In the San Diego region, rising temperatures pose significant challenges for our region's residents, businesses and communities that are accustomed to our mild Mediterranean climate."

Kristen Guirguis, PhD

Scripps Institution of Oceanography at the University of California, San Diego

FORECAST: Hotter and more humid heat waves

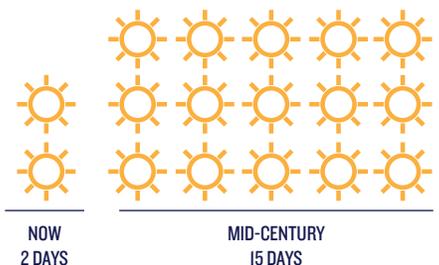
Why Should Our Businesses Care?

Our regional economy and the quality of life of our workforce are intimately connected to our mild climate. The businesses that make up our region's three major industries – tourism, innovation, and the military – as well as the local businesses that make up the other half of our \$200+ billion regional economy, should anticipate some changes to our climate despite best local and global efforts to reduce polluting greenhouse gas emissions.

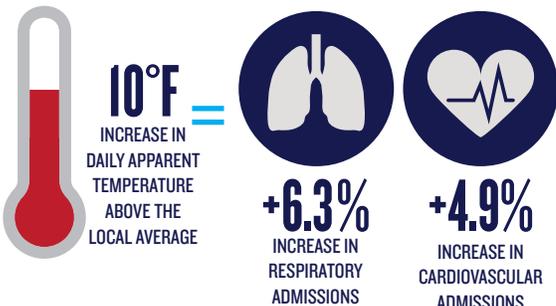
Approximately 220,000 workers—or 16% of the regional workforce—are employed in heat-exposed industries such as construction, agriculture,

transportation and manufacturing. When it is hot, employees find it harder to concentrate and work well. Greater demand for air conditioning to prevent worker exposure to warmer temperatures and maintain worker health and productivity will likely increase energy bills and the need for efficiency. Workers may also need to pay more attention to family members they care for such as children or elderly, who are more likely to be impacted by extreme heat days, similar to those that prompted school closures in the fall of 2014.

BY 2050, SCIENTISTS EXPECT THAT WE WILL HAVE 7 TIMES AS MANY DAYS OF EXTREME HEAT PER YEAR THAN THE PRE-2000 HISTORICAL AVERAGE.



ONE STUDY MODELED THE HISTORIC IMPACTS OF INCREASING TEMPERATURES ON HOSPITALIZATIONS AND FOUND THAT:



Perspectives from local leaders:

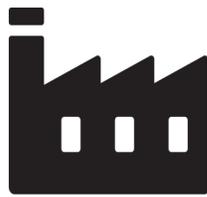
"There are increased health risks for our region from extended heat waves and poor air quality that adversely impact our smog and ozone levels, and increased risk of disease. During heat waves, wildfires and high pollution days, we may see more emergency room visits and hospital admissions across San Diego County. As a region, we can work better together to anticipate these changes, particularly in light of our changing climate, so individuals, families and businesses can be prepared and reduce the impact of these weather extremes."

Michael W. Murphy
President/CEO, Sharp Healthcare



By the Numbers

Number of workers in the top three most vulnerable heat-exposed industries in our region:



97,300
Manufacturing



66,400
Construction
(including ship work)



40,000
Transportation and
warehousing

\$32 billion generated for our regional economy by industries with a heat-exposed workforce

41 minutes lost work time from heat-exposed workers on days when peak temperature is between 95°F – 100°F

58 minutes lost work time on days when peak temperatures exceed 100°F

Potential productivity and financial costs by 2050:



65,000 production hours
estimated lost in
heat-exposed industries

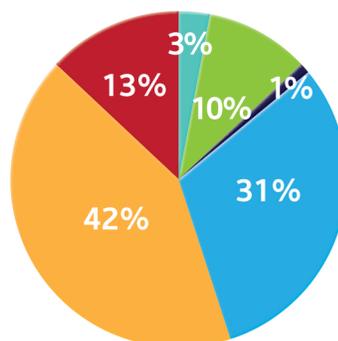


17% increase
in expected annualized
additional spending by
the region's commercial
sector on electricity due to
increased A/C usage over
the next two decades



\$4.8 - 9.4 million
in additional employee
medical costs per year
due to extreme heat

DISTRIBUTION OF PRODUCTIVITY LOSSES ACROSS HEAT-EXPOSED INDUSTRIES



- Agriculture, forestry, fishing & hunting
- Mining, quarrying and oil & gas extraction
- Construction
- Manufacturing
- Transportation & warehousing
- Utilities

We Can Slow Climate Change

Efforts to slow warming by reducing polluting greenhouse gas emissions are critical. A concerted effort by businesses everywhere to reduce emissions of climate warming gases would save money in the long run. In fact, more aggressive adoption of efficient and clean technologies could reduce the costs of climate change adaptation measures described above by as much as 40%.

How to Make Your Business More Heat Resilient

- **Adapt.** Consider modifying work practices at organizations where employees will largely be outside. Actions, such as monitoring employee well-being, modifying timing of workload, improving ventilation, and rotating exposure to sun and shade can make a big difference to worker health, well-being and productivity as well as to the businesses' bottom line.
- **Find efficiencies.** Cutting demand for air conditioning through efficiency programs or green building can help businesses reduce energy bills. Better and more efficient building design in new buildings and intelligent retrofits for existing buildings can offer relatively rapid returns on investment.
- **Go solar.** San Diego was ranked the second-leading solar city in the U.S. in 2015, and the City of San Diego has committed to using 100% renewable energy by 2035. Installing rooftop solar is not only more sustainable and boosts our local economy, it also makes an ideal source of power for cooling businesses and consumers during sunny, hot days.

Beating the Heat

Businesses can be prepared to protect employees against the health impacts of our changing climate in several ways:

- Listen to local weather forecasts and stay aware of upcoming temperature changes.
- Get trained in first-aid to learn how to treat heat-related emergencies.
- During heat events, stay hydrated by drinking plenty of water. Avoid caffeine. Eat small meals, and eat more often.
- Wear loose-fitting, lightweight, light colored clothing.

Perspectives from local leaders:

"As a binational region, Tijuana and San Diego County share many resources including valuable members of the workforce. It is important we address health issues associated with climate change including illnesses that can worsen with heat waves or poor air quality, so that our businesses and the supporting workforce remain productive and sustainable, and we can continue to promote innovation and entrepreneurship on both sides of the border."



Tayde Aburto

President/CEO, Hispanic Chamber of E-Commerce

"It is only by working together as a region that we can ensure businesses of all shapes and sizes are prepared for disasters and risks from extreme weather events. A



dynamic group of business leaders from SDG&E, AT&T, Qualcomm, U.S. Bank and other businesses, small and large, have joined us at the Red Cross this year in a Business Leadership Council and series of disaster academies to ensure our region's economic resilience and preparedness."

Wendy McKinney

Business Leadership Council, American Red Cross of San Diego and Imperial Counties

"San Diego was recently featured as one of only four "World's Smart Cities," chosen for our strong innovation and cleantech sectors, sustainable business practices, smart public planning, and high quality of life. Cleantech San Diego is working together with private, public, and academic partners to reimagine how clean technologies can improve, upgrade, and transform energy, water, and other critical infrastructure in cities throughout our region."



Jason Anderson

President/CEO, Cleantech San Diego



DISCOVER MORE ABOUT REGIONAL HEAT, HEALTH AND CLIMATE ISSUES

- ❑ Climate Education Partners – www.sandiego.edu/2050
- ❑ County of San Diego – www.sandiegocounty.gov/hhsa/programs/ais/cool_zones

ACCESS TOOLS, TIPS AND INCENTIVES TO REDUCE ENERGY AND HELP EMPLOYEES BEAT THE HEAT

- ❑ CoolCalifornia – www.coolcalifornia.org/article/small-biz-actions
- ❑ San Diego Gas & Electric – www.sdge.com/business
- ❑ San Diego Green Building Council – www.usgbc-sd.org/Learn/Success
- ❑ Center for Sustainable Energy – www.energycenter.org

CONNECT WITH OTHER BUSINESSES WORKING TO BE MORE RESILIENT

- ❑ Cleantech San Diego – www.cleantechsandiego.org
- ❑ American Red Cross Business Preparedness Academy – www.preparesandiego.org

How Continental Maritime San Diego Beats the Heat

During periods when temperatures rise above 77°F navy ship repair company Continental Maritime monitors its workers for heat stress. It helps them stay cool through a series of measures including hydration, clothing, ventilation, offering sun/shade combinations and adjusting their workload with a work:rest cycle starting at 45 min:15 min, rising if needed to 15:45.

Ahead of the Curve

Local construction and design industries can help design, deploy and build green buildings to accommodate our region's changing climate. Green buildings use passive or low-energy features such as natural ventilation, green-roof or cool-roof technologies, and ultra-efficient HVAC systems that can keep buildings cool with lower energy use. According to the San Diego Green Building Council, the San Diego region already has more than 500 LEED certified buildings covering 52 million square feet of real estate.

Working Together, Investing Today

Working together, we can make our businesses more resilient and cost-efficient by developing action plans for reducing heat impacts, energy use and greenhouse gas emissions. Business resiliency planning resources are available to help prepare for the effects of our changing climate.

This summary report is based on "San Diego, 2050 is Calling. HOW WILL WE ANSWER?" and research from Josh Graff Zivin, Ph.D. at UC San Diego, Steve Messner and Tom Jensen with e360 LLC, and e360's partners. We also want to thank the following for data, input and reviews in assembling this summary: Steve Alexander – The Steve Alexander Group, Jason Anderson – Cleantech San Diego, Lisa Bicker, Michael Combs – San Diego Regional Economic Development Corporation, Kirsten Guirguis – Scripps Institution of Oceanography, Chanelle Hawken – San Diego Regional Chamber of Commerce, Cody Hooven – City of San Diego, Paulina Lis – San Diego Green Building Council, Jim Miller – SANDAG, and Ann Tartre – Ann Tartre Consulting.

This summary report is intended to provide additional insights to complement the regional climate impacts information provided by The San Diego Foundation and Climate Education Partners in the report, "San Diego, 2050 is Calling. HOW WILL WE ANSWER?" For more info regarding sources for this assessment, or to download reports by Climate Education Partners, discover more at www.sandiego.edu/climate. The report was funded by The San Diego Foundation, with financial support from the National Science Foundation under award DUE-1239797. Any opinions, findings and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.



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