

How Oil & Gas Leaders Can
Win with Weather Data

Worker Safety | Infrastructure Protection | Site Assessment | Business Continuity

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Introduction

The oil and gas industry is at a crucial crossroads. Oil market growth may be decreasing due to price pressures and global pushes toward renewables. Site selection is reemerging as a major challenge for companies trying to grow because the most attractive reserves have already been drilled. Gas, on the other hand, is somewhat over-supplied at the moment, as warmer winters have increased yields.

Maximizing efficiencies within the sector rapidly is key to maintaining a position of strength for both sides of the house. From an operations leadership perspective, that means making intelligent infrastructure decisions, keeping workers safe and bought-in, and thoughtfully integrating renewables into the picture.

This book is designed to help operations and safety leaders in the oil and gas space overcome those challenges by shifting their strategic and technological approach to weather operations. **Moving forward, we'll explore:**

1

Why weather and environmental resilience are crucial to the new oil & gas climate

2

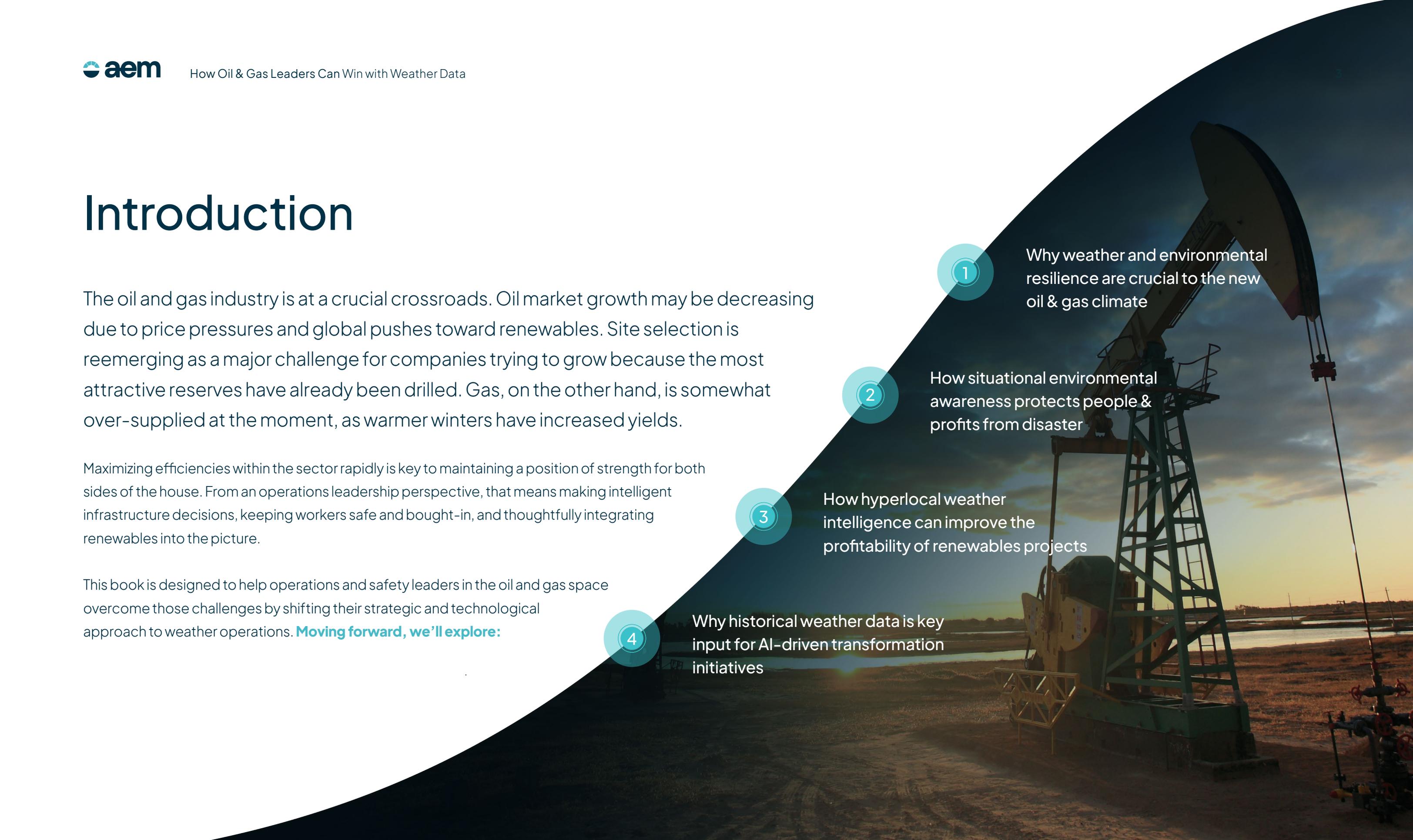
How situational environmental awareness protects people & profits from disaster

3

How hyperlocal weather intelligence can improve the profitability of renewables projects

4

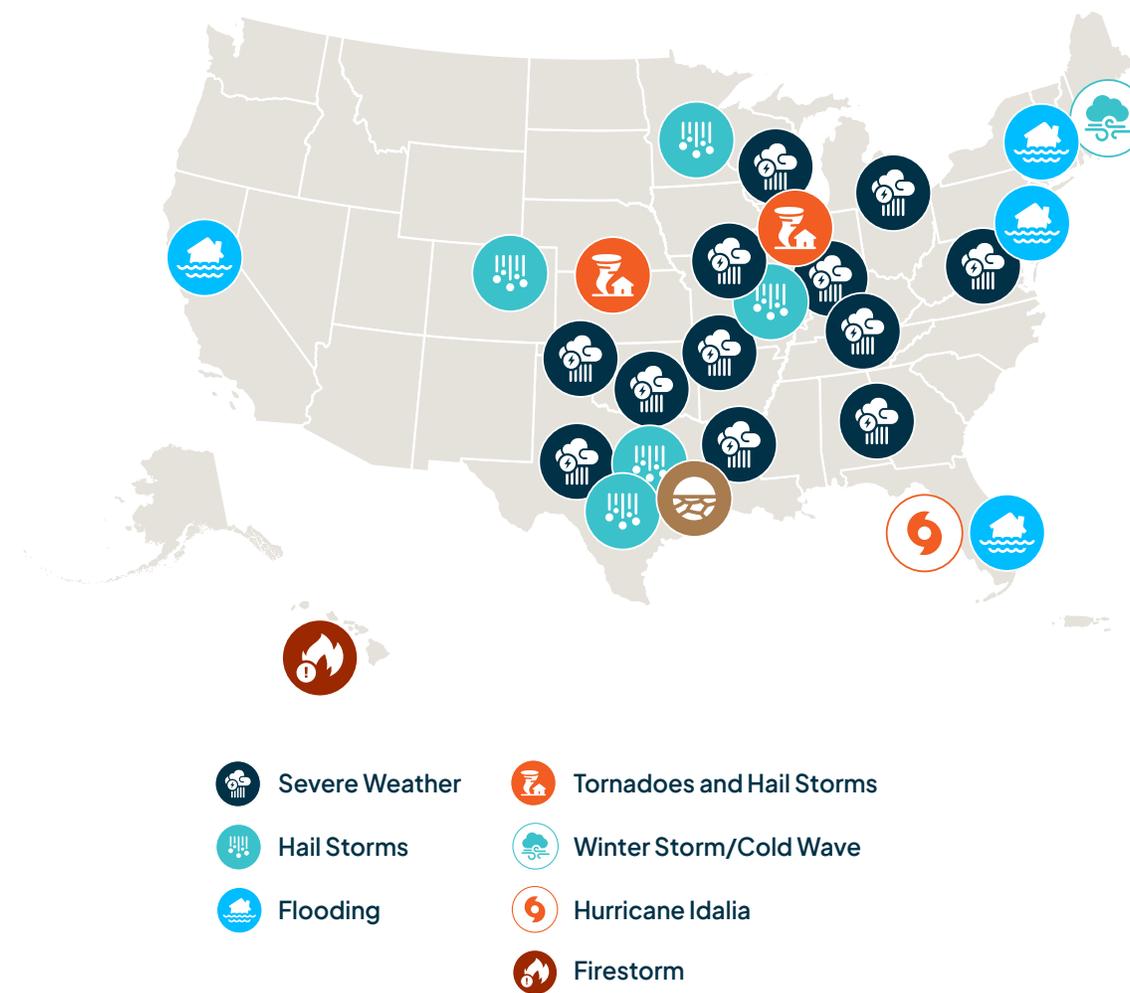
Why historical weather data is key input for AI-driven transformation initiatives



How severe weather is targeting oil & gas

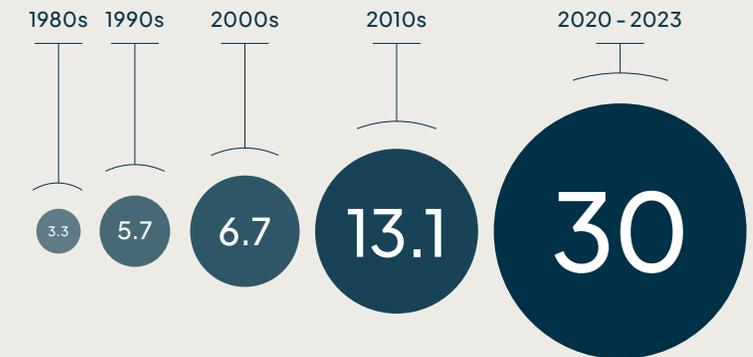
Major weather events have been earning headlines consistently the past few years for damaging communities and disrupting economic continuity. For oil and gas businesses, these weather disasters create both business and human challenges, impacting workforce stability, potentially damaging key business infrastructure, and wreaking havoc on the supply chain.

In 2023, there were **28 confirmed weather** or climate events with an economic impact of greater than **\$1 billion** in the U.S. alone. While laypeople often assume these impactful events are clustered in coastal areas, that's actually false. As the map illustrates, most of 2023's severe weather events have been inland storms in the parts of America where oil and gas businesses are among the most important employers.

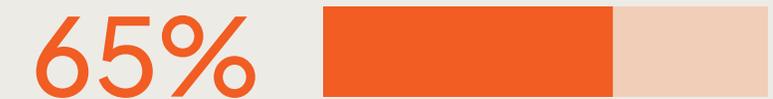


At a glance...

Billion-dollar weather events on average per year:



Source: National Center for Environmental Information



65% of the American workforce is concerned about severe weather events while they're at work

Source: Facility Executive

Workforce safety: a responsibility & a differentiation opportunity

Given that **65% of the workforce is worried about a severe weather** event striking while they're at work, employers need to recognize that weather safety is a workforce investment as much as an operational or compliance-driven one.

In the oil and gas industry, the weather can create major risks for workers at drilling sites or maintenance professionals monitoring pipelines. Extreme temperatures put employees working outdoors at risk for heat stress illnesses or hypothermia. High winds can blow them into danger's way directly or send heavy equipment flying at them. Lightning strikes can prove deadly and are an increased risk in the presence of metal infrastructure.

While those workers have eyes that can see storms rolling in and cell phones with weather apps on them, they still need guidance from a trustworthy and authoritative source on how and when to react. That's where some oil and gas leaders are starting to embrace a semi-automated system that keeps everybody safe while delivering a ton of value to workers and operations leaders alike.

Here's how innovative oil & gas leaders are doing it:

1

A storm with the potential to create dangerous conditions approaches your area

2

Employees working outside get an alert while there's still time to store equipment and seek shelter

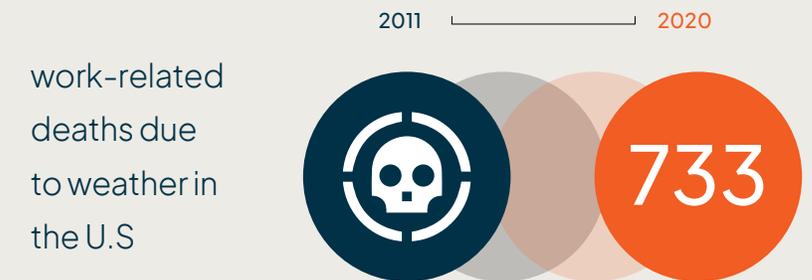
3

Your employees, equipment, and products stay safe

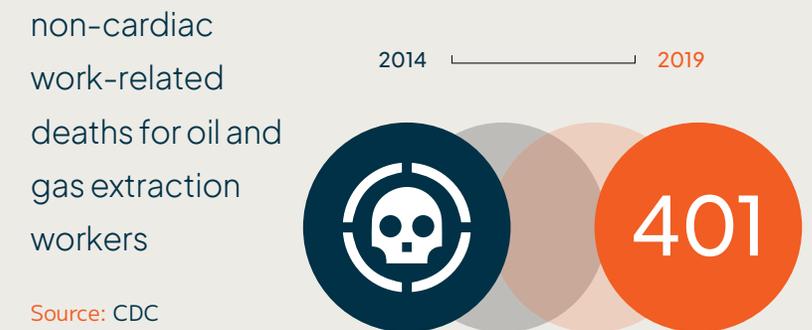
4

Employees get an automated all-clear as soon as it's safe to resume work

At a glance...



Source: BLS



Source: CDC

Bad weather

is a known contributor to fatal injuries in offshore oil and gas operations

Source: CDC

Weather safety as an investment in talent and infrastructure

Any quality-of-life improvement an employer can offer to prospective workers in this market is crucial. Weather safety is underrated and underappreciated as a promotable value that oil and gas leaders can deliver to their employees in the field, on the road, and beyond.

If workers don't have timely information about dangerous weather headed their way and how to react, it creates a climate of uncertainty in which great productivity isn't possible and employees feel disconnected from operational leaders in ways that damage culture and retention. At the same time, employees aren't just workers; they're people, and if a major weather or

climate event is headed their way, they also need to be able to make the right decisions for their families.

Of course, that same framework provides major value for the employer as well. By maximizing visibility and response time for potential weather hazards, operations leaders can execute better to minimize the impact of those events (damage to equipment, lost work time, lost product, and more).

In this way, weather safety provides incredible two-way value that strengthens the bond between employer and employee to enable better collaboration than ever before.

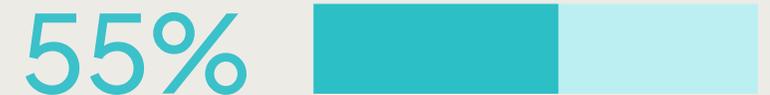


Food for thought...



of oil and gas workers do not have provided disability insurance

Source: TrueTransition



of oil and gas workers believe company safety cultures shift liability to the worker

Source: TrueTransition



of oil and gas workers believe company extreme weather evacuation protocols are insufficient

Source: TrueTransition

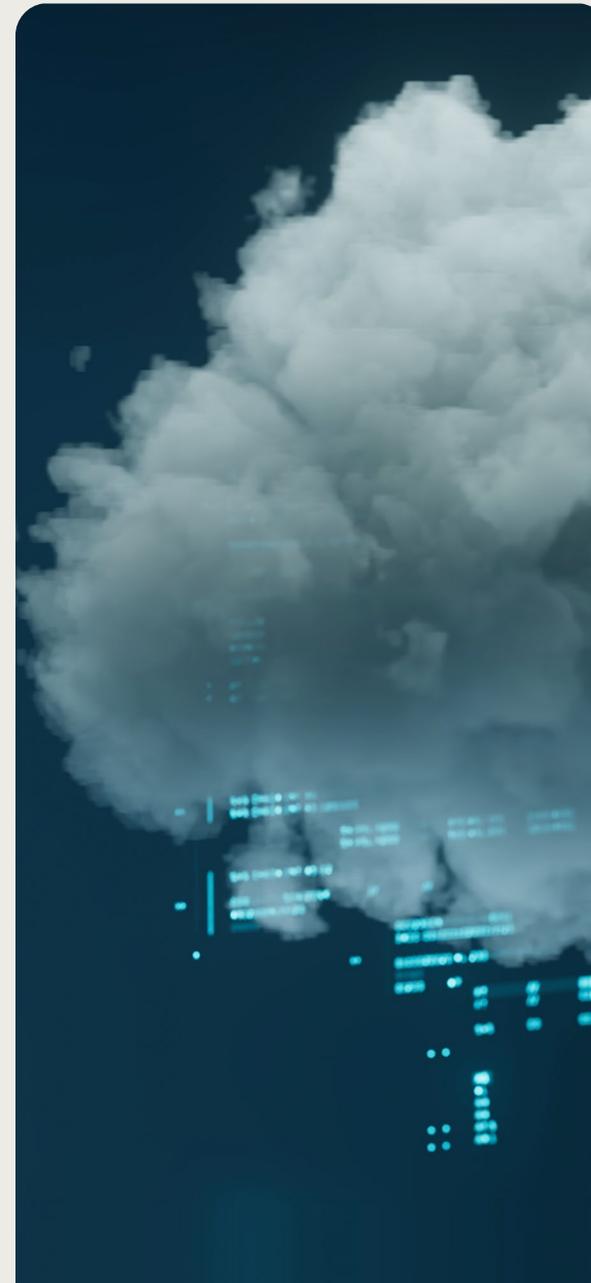
AI, meet weather data, your new best friend

Nearly every company in the world is working to uncover the best applications of AI for business right now. With that said, AI is a kind of program, and that means the “garbage in, garbage out” rule applies. Everybody will have access to the same intelligent business analytics tools in the near future, but the companies who know how to feed the right information into the system will be the ones who gain the major strategic advantages.

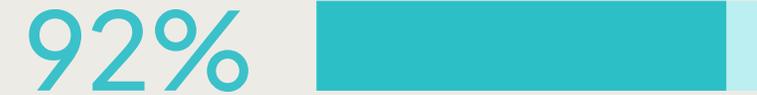
Long-term, high-accuracy weather data is emerging as one of the most powerful inputs for utilities, oil and gas

companies, and other site-based asset-intensive industries looking to uncover new efficiencies. AI can cross-reference that data against your proprietary internal data to identify areas of especially high risk or opportunity within a geographic territory or service area. That information can be used to guide investments and keep people safer.

In the oil and gas industries, where leveraging every possible strategic advantage is key, weather data is essential for decision making.



At a glance...



of oil and gas companies globally are either currently investing in AI or plan to in the next two years

Source: Forbes



market for AI in the oil and gas industry by 2031

Source: Disrupting the Box



AI initiatives at Shell over the last decade

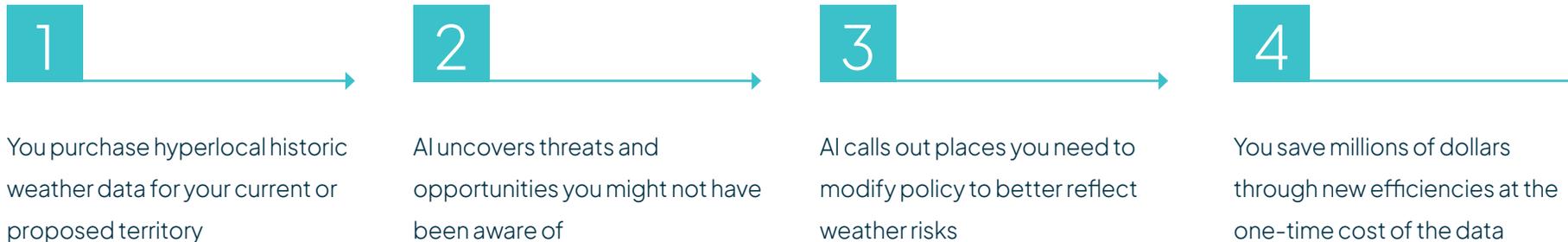
Source: GEP

Maximizing strategic business intelligence with weather data

Weather data can obviously help you understand where lightning has historically struck in your area and how the temperature has varied from place to place, but it's also a key lens through which to view risk management and operations in general. Since AI can process much more data much faster than any person or team of people can, it can unlock insights into how weather is impacting or has impacted operations and the bottom line at a level that couldn't previously be accounted for.

Your proprietary data is the most important starting point for unlocking business efficiencies using AI, but weather data is also must-have information in order to understand how your business functions in the real world, where there is weather.

Here's how innovative oil & gas leaders are doing it...

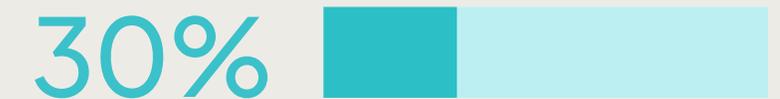


Food for thought...



inspection time reduction from AI insights at Aramco

Source: GEP



maintenance cost reduction from AI insights at Aramco

Source: GEP



power consumption reduction from AI insights at Aramco

Source: GEP

Oil, gas, and renewables can (and should) all get along

There's plenty of external pressure on oil and gas businesses to get onboard with renewable energy, but the industry is finally coming around to the opportunity in its own way.

While adoption of renewables has understandably been slow, contracts, compliance, and reputations are increasingly reliant on some form of clean energy investment.

Thankfully, the renewables picture is finally clear enough that oil and gas companies can invest in a way that supports and aligns with their overarching goals and core business. Instead of viewing clean energy as an existential threat, leaders in

traditional fuels can now see mindful investment in renewables as a chance to improve their bottom line through increased efficiency and by qualifying for additional tax credits.

While solar and wind energy may never be an oil company's favorite topics, they can be its ally. By increasing capex spend on renewables—especially well-planned renewables projects with high chances of success—the oil and gas industry can increase energy efficiency, lowering costs without compromising the core value of providing oil and gas.



At a glance...

4%



of spend in the oil and gas industry is currently focused on low-carbon fuels and technology

Source: Deloitte

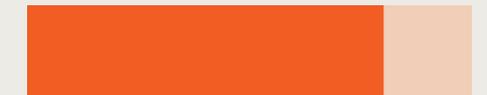
60%



of oil and gas executives would invest in low-carbon projects if the returns exceeded 12% to 15%

Source: Deloitte

80%



of oil and gas executives are considering securing clean energy manufacturing and critical mineral rights

Source: Deloitte

Using weather intelligence to maximize renewable initiatives

Oil and gas leaders often perceive that investments in renewables simply aren't profitable enough, but renewables enablement has taken several major steps forward in recent years, making the opportunity more attractive than before. As in drilling, site selection is crucial when it comes to solar, wind, and geothermal projects. Ensuring a site will be profitable requires a viability study from project launch as well as ongoing monitoring to ensure the site is working as designed.

Historic and real-time weather information are key to the success of these clean energy initiatives, from the planning stages to profitability. By studying (or, better yet, having AI study) temperatures, winds, UV levels, and beyond, oil and gas leaders can finally extract the value out of renewables they've always wanted.

Here's how innovative oil & gas leaders are doing it...

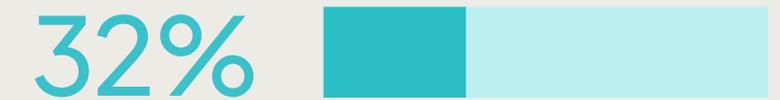


Food for thought...

\$35 billion

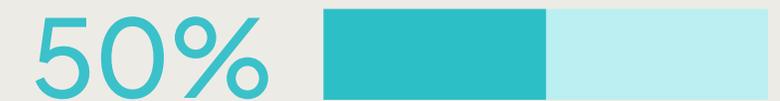
average investment in new energy from top energy majors by 2030

Source: McKinsey



of global energy production will be electric or hydrogen by 2035

Source: McKinsey



of global energy production will be electric or hydrogen by 2050

Source: McKinsey

Next steps: making it real

Weather intelligence has so much to offer oil and gas, especially given the current climate of increased supply chain and workforce challenges against the backdrop of productivity expectations. While the recommendations above provide a few specific examples of how emerging weather tech can address many of the industry's emerging needs, there's really much more to the story.

If you're interested in learning more about how leading oil and gas companies are already using weather technology and data to their greatest possible effect or what a bite-sized first step might look like for your organization, we hope you'll reach out to us to initiate an individualized conversation. In that discovery chat, we'll get to know you and your exact situation so we can provide you with the exact information you need to take the next step forward.

Meet the authors



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Mike Alberghini is Director of Commercial Sales at AEM, overseeing solutions for a variety of industries including aviation, utilities, mining, and beyond. Mike joined AEM as a member of the legacy Earth Networks and WeatherBug team, meaning he's served brands in the AEM portfolio for more than 20 years.

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Stuart Hershon has been consulting with clients within the AEM brand portfolio for almost 18 years. During that time, he's worked with customers in the government and commercial sectors to identify and implement solutions that protect their employees and customers and their physical assets against a wide variety of environmental risks.

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Sources

Chronis, A., Mittal, A., & Hardin, K. (2023, December 1). 2024 oil and Gas Industry Outlook. Deloitte Insights.

<https://www2.deloitte.com/us/en/insights/industry/oil-and-gas/oil-and-gas-industry-outlook.html>

Fantaguzzi, I., & Handscomb, C. (2024, January 25). The state of Energy Organizations 2024. McKinsey & Company.

<https://www.mckinsey.com/industries/oil-and-gas/our-insights/the-state-of-energy-organizations-2024>

THE FUTURE OF ENERGY & WORK IN THE UNITED STATES: THE AMERICAN OIL & GAS WORKER SURVEY. True Transition. (2023, March).

<https://www.truetransition.org/research-reports>

How does AI and Big Data Drive Oil and gas industry recovery?. GEP. (2016, March 18).

<https://www.gep.com/blog/mind/ai-and-big-data-in-oil-and-gas-industry>

McCandless, M. E. (2022, March 15). Employees say workplace safety is more important than ever. Facility Executive Magazine.

<https://facilityexecutive.com/employees-say-workplace-safety-is-more-important-than-ever>

National Oceanic and Atmospheric Administration. (2024, January 9). Billion-dollar weather and climate disasters. Billion-Dollar Weather and Climate Disasters | National Centers for Environmental Information (NCEI).

<https://www.ncei.noaa.gov/access/billions/>

Sahota, N. (2023, September 26). AI in oil and gas exploration: Digging into data-driven efficiency. LinkedIn.

<https://www.linkedin.com/pulse/ai-oil-gas-exploration-digging-data-driven-efficiency-neil-sahota/>

Sharma, G. (2023, October 5). How multibillion dollar investments in AI are driving oil and Gas Sector Innovation. Forbes.

<https://www.forbes.com/sites/gauravsharma/2023/08/14/how-multibillion-dollar-investments-in-ai-are-driving-oil-and-gas-sector-innovation/?sh=391b4a4a1ff7>



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