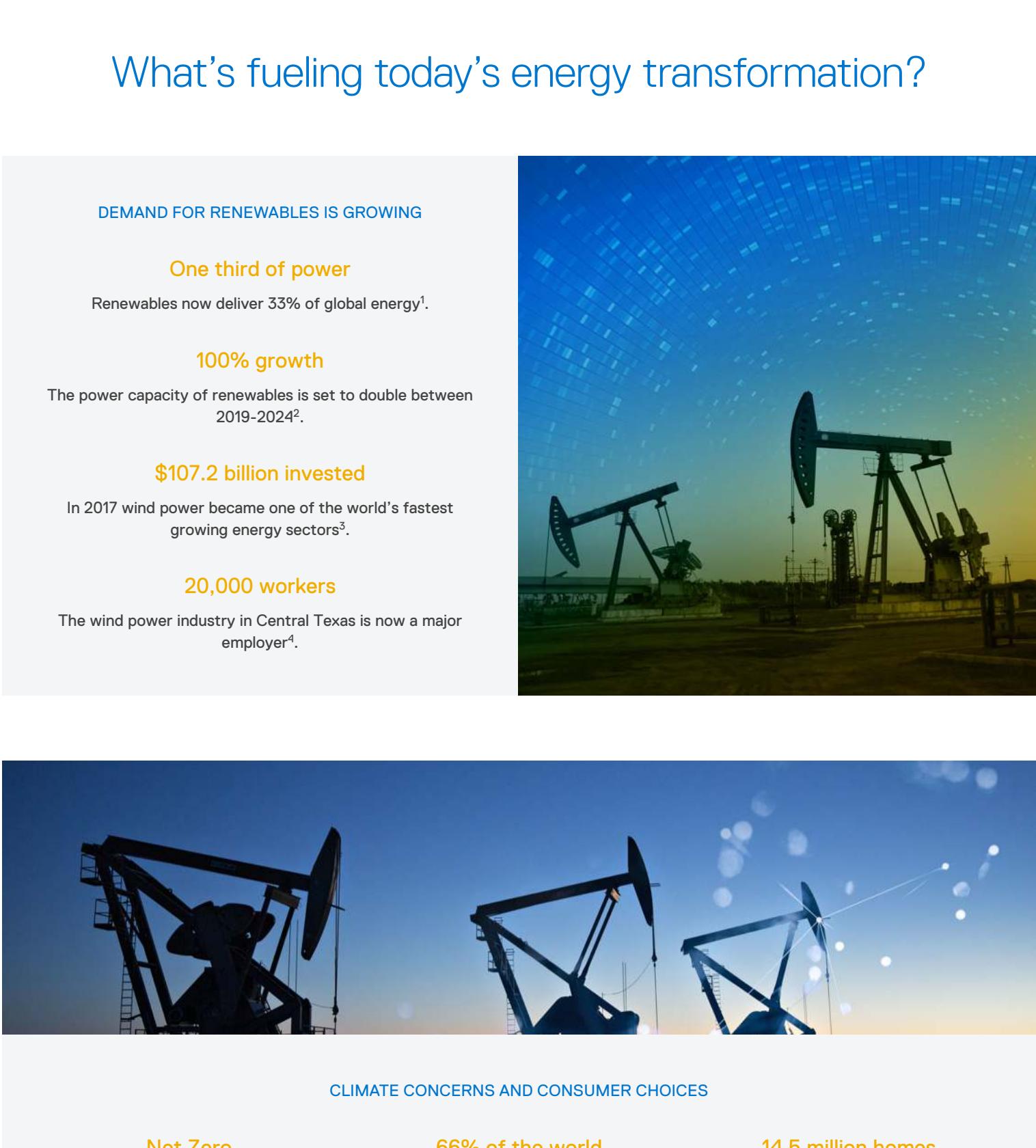


Edge computing and IoT solutions

Intelligence in energy



What's fueling today's energy transformation?

DEMAND FOR RENEWABLES IS GROWING

One third of power

Renewables now deliver 33% of global energy¹.

100% growth

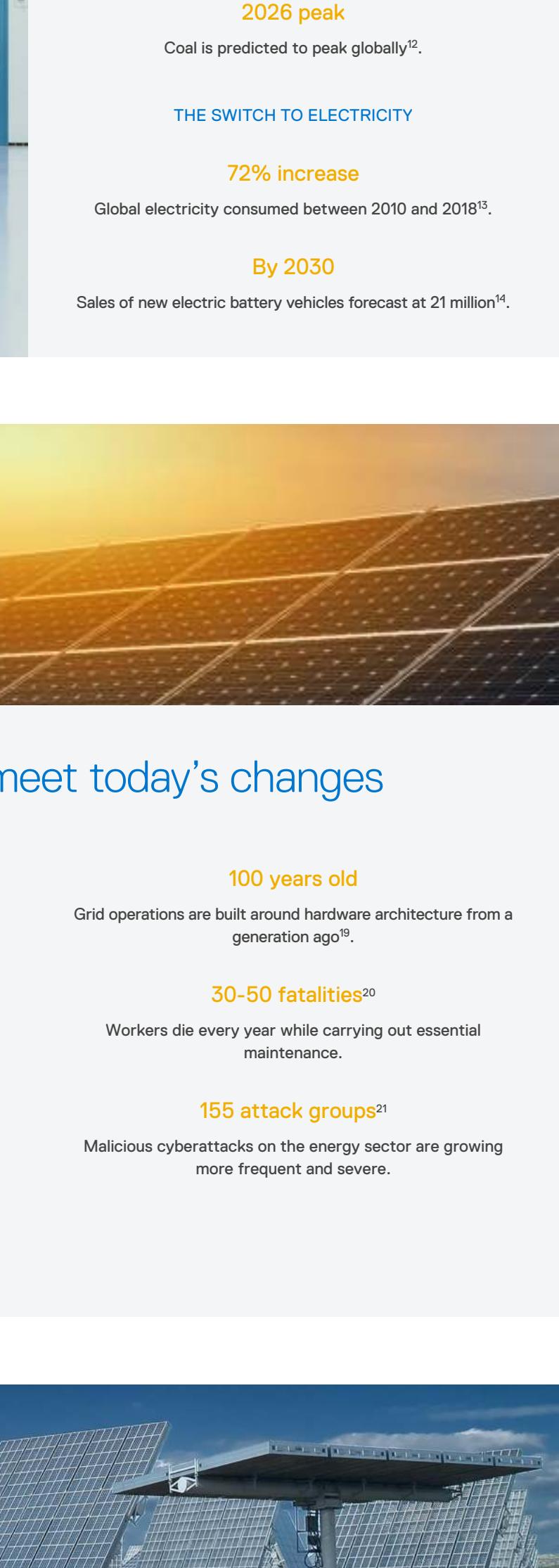
The power capacity of renewables is set to double between 2019-2024².

\$107.2 billion invested

In 2017 wind power became one of the world's fastest growing energy sectors³.

20,000 workers

The wind power industry in Central Texas is now a major employer⁴.



CLIMATE CONCERN AND CONSUMER CHOICES

Net Zero

The 2015 Paris Agreement is driving energy choices to reduce global carbon emissions⁵.

66% of the world

Wind and solar are among the cheapest energy sources for two-thirds of the world⁶.

14.5 million homes

77.7 GW of solar PV capacity is now installed in the U.S.⁷.

Smart grids

Smart grid technology is creating new generation and supply⁸ relationships between customers and utilities.

\$39.10 billion growth

The demand for reliable and secure power will grow the smart microgrid market significantly by 2023⁹.

\$13.1 billion

Increasing investment in utility battery storage and power supply¹⁰ to balance peak demand and favor cleaner fuel.

THE SHIFT FROM FOSSIL FUELS

546 power plants

U.S. coal-fired plants retired between 2010 Q1 2019¹¹.

2026 peak

Coal is predicted to peak globally¹².

THE SWITCH TO ELECTRICITY

72% increase

Global electricity consumed between 2010 and 2018¹³.

By 2030

Sales of new electric battery vehicles forecast at 21 million¹⁴.

The challenge to meet today's changes

Doubled risk of disruption

Weather-related power outages have affected millions of customers since 2003¹⁵.

285% increase in grid volatility

Complexity in energy supply is affecting power reliability¹⁶.

\$27 billion lost

Power disruption impacts business and the U.S. economy every year¹⁷.

200,000 miles

High-voltage transmission lines, underground and overhead, create a huge network¹⁸.

100 years old

Grid operations are built around hardware architecture from a generation ago¹⁹.

30-50 fatalities²⁰

Workers die every year while carrying out essential maintenance.

155 attack groups²¹

Malicious cyberattacks on the energy sector are growing more frequent and severe.

THE OPPORTUNITY TO

re-energize

reduce

Integrate existing substations and legacy architecture into the modern digital world

Ageing equipment

Improve stability and resilience with intelligent, self-monitoring grid operations

Construction costs

Rationalize equipment and control with a virtualized, standard substation platform

Complex substation modifications

Modernize infrastructure quickly and cost-effectively

Barriers to changes and upgrades

Decrease manual maintenance, construction and deployment costs

Redundant devices

Increase safety for workers and the public

Control rooms' footprint

Secure against cyber attacks across the entire grid

Dangers to the workforce

Gain grid and consumer insights powered by data

Cybersecurity threats

Carbon Footprint

Use cases

Empowering the future of energy through technology

Grid modernization and optimization

A virtual environment connects devices across the grid, analyzing data to optimize supply and demand

Allows substation and grid management in a secure software environment

Delivers intelligent distribution automation

Upgrades infrastructure to meet today's energy demands

Creates a standard substation platform for a straightforward scalability path

Many utilities are focusing on distribution automation as a

See Forrester report

Digitalization of distribution infrastructure

Measure, monitor and manage energy at a higher level with intelligent Edge and IoT devices

Smart sensors collect data from diverse sources

Advanced analytics are performed at the point of data collection

Insights inform automated decisions to ensure grid stability and safety

Only for fast, real-time data is transferred

Solves bandwidth limitations in distribution automation

Answers issues with network latency and limited analysis of harvested data

Intelligence at the Edge delivers

Distributed analytics to empower your data

Predicts and prevents potential problems

Cost-efficient use of resources and

Improved reliability

New revenue opportunities

Intelligent management of energy

Reduced costs and increased efficiency

Smart Meters' sensors can perceive peak load

Smart meters' sensors can automatically switch load to divert or reduce power in strategic places

– Department of Energy

Smart solutions for today's energy



Build on the value of the smart grid

Real-time demand forecasting reduces costs and drives

Manages demand and supply

Manages demand and supply

Makes intelligent switches to cleaner energy sources

Monitors all energy transactions

Smart grids could result in nearly \$600 in direct bill savings for the average household per year.

– Smart Grid Consumer Collaborative



Protect and manage energy security

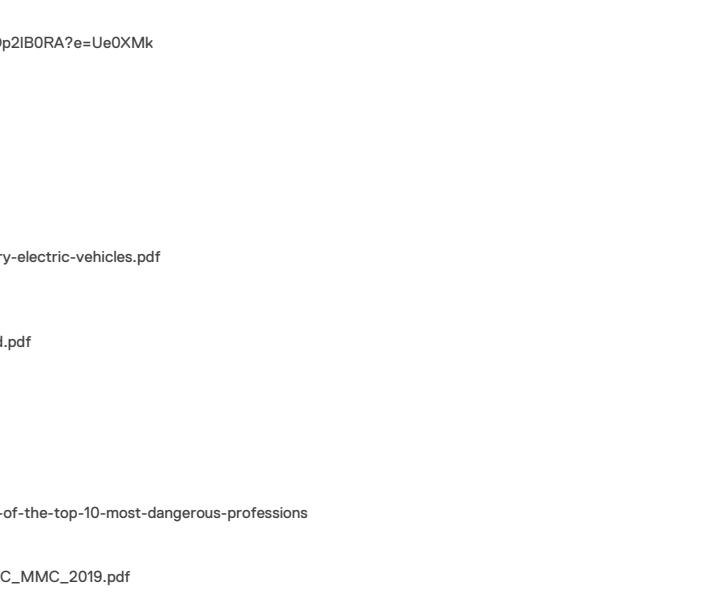
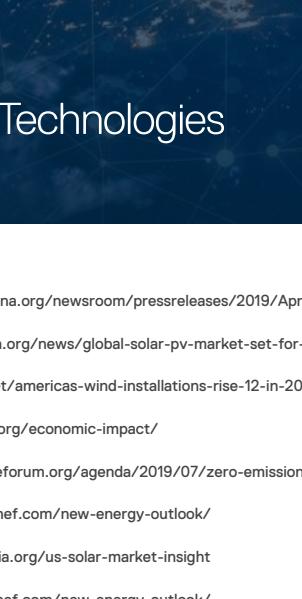
Cybersecurity at the edge protects against cyberattacks

Scans and maps the network, identifying all connected Edge and IoT devices

Distributed analytics detect unwanted actions, report anomalies and trigger responses to immediately isolate unauthorized activity

Resolves vulnerabilities to prevent future attacks

IT security standards at the Edge



Connect with customers through smart meters

Works with the smart grid to deliver valuable knowledge of domestic and commercial energy use

Customers can see their energy use in real time, creating awareness of usage and waste

Ability to optimize energy use (DR) and Energy Efficiency (EE) programs

Allows large scale analysis of electricity consumption in the home to reduce energy costs

Smart Meters' sensors can perceive peak load

Smart meters' sensors can automatically switch load to divert or reduce power in strategic places

– Department of Energy

Delivering business impact

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