

Q2 2021

ANSWERING AMERICA

**CAN WE FIX CLIMATE CHANGE
WITHOUT WRECKING OUR ECONOMY?**



BUSINESSFORWARD
FOUNDATION

CAN WE FIX CLIMATE CHANGE WITHOUT WRECKING OUR ECONOMY?

ANSWER: YES.

SWITCHING TO RENEWABLE ENERGY COULD SAVE OUR ECONOMY.



THE QUESTION

THE ARGUMENT

SUPPLY CHAIN COSTS

FORTUNE 500 WARNINGS

RENEWABLE ENERGY WON

VIRTUOUS CYCLE

MARKET FORCES

BUY LOCAL OPPORTUNITY

CLEAN ENERGY IN RURAL AREAS

INVESTMENT WHERE WE NEED IT

GLOBAL COMPETITION

SEVERE WEATHER

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THE ARGUMENT

1 Those who argue that switching to renewable energy will “wreck the economy” ignore how little manufacturers spend on electricity and how much they spend on their supply chains.

2 The global energy race is over: renewable energy won. Of every new energy dollar, 80 cents is going to wind, solar, or batteries — and renewables will produce two-thirds of the world’s power by 2050.

3 As renewable energy grows more competitive, the number of states that can profit from it grows. For Iowa, Michigan, Ohio, and Wisconsin, renewable energy represents a \$53 billion opportunity to “buy local.”

4 By protecting coal plants and propping up oil and gas, we’re fighting market forces that cannot be reversed. The U.S. should be leading on energy, not falling behind.



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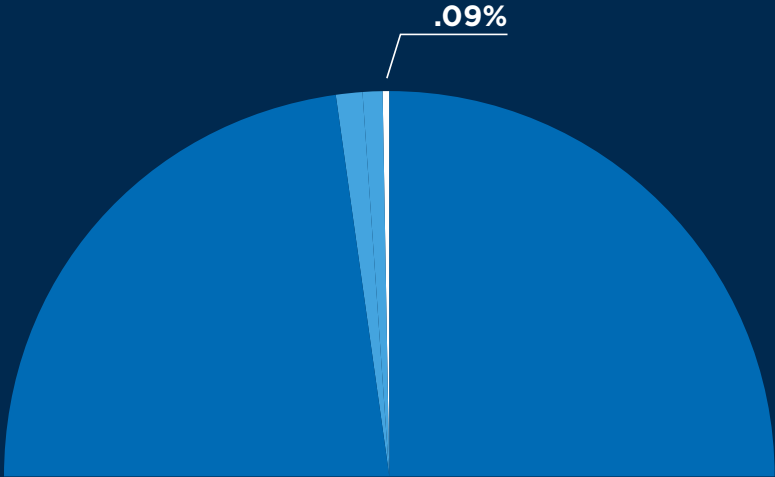
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ARGUMENTS ABOUT RENEWABLES “WRECKING THE ECONOMY” IGNORE HOW LITTLE MANUFACTURERS SPEND ON ELECTRICITY AND HOW MUCH THEY SPEND ON THEIR SUPPLY CHAINS

UTILITY COSTS REPRESENT TOO SMALL A SHARE OF A MANUFACTURER’S BUDGET TO “WRECK” IT

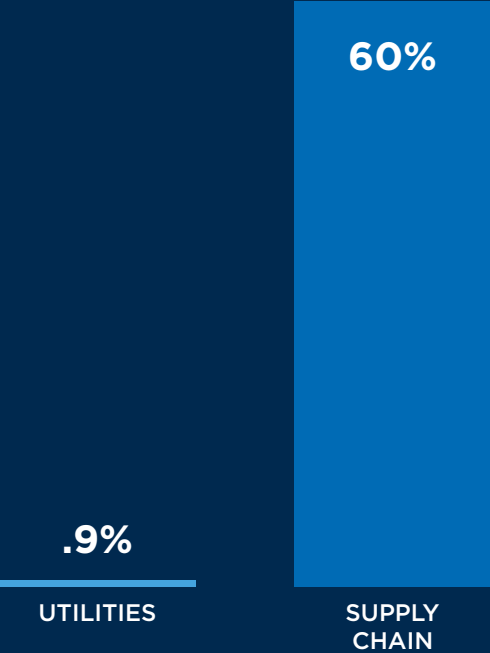
For example, auto manufacturers (OEMs and suppliers) spend .9% of their budgets on utilities. That’s 90 cents for every \$100 of product.¹

A 10% increase on an auto supplier’s utility costs = 9 cent increase on \$100 of product, or .09%.



AUTO MANUFACTURER’S TOTAL COSTS

Supply chain represents about 60% of total costs, while utilities represent less than 1%.²



SUPPLY CHAINS ARE VULNERABLE³

A TYPICAL AUTO PLANT PURCHASES

\$3B

IN PARTS PER YEAR

TRUCKS ARRIVE EVERY

3-5 MINUTES

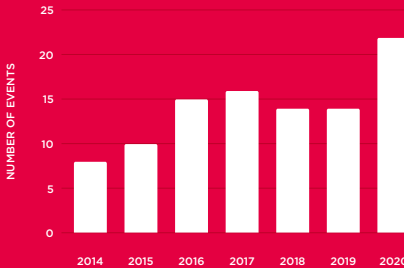
EACH HOUR OF DOWN TIME COSTS

\$1.25 MILLION

EXTREME WEATHER EVENTS IN 2020 COST \$95 BILLION

In 2020, the U.S. experienced 22 climate disasters causing at least \$1 billion in damage, far exceeding the previous record of 16. Tropical cyclones, severe storms, droughts and wildfires are estimated to have caused \$95 billion in damage.⁴

U.S. BILLION-DOLLAR WEATHER & CLIMATE DISASTERS



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KEY THEMES FROM FORTUNE 500 WARNINGS ABOUT CLIMATE CHANGE

“JUST IN TIME” EFFICIENCY RAISES CLIMATE RISK

To boost profits, U.S. companies source from across the globe, encourage their suppliers to specialize, and reduce overhead costs with “just in time” inventory.

As our supply chains grow more global, more specialized, and faster, severe weather events grow more expensive.

HIGHER TEMPERATURES AND RISING SEAS ARE STRANDING ASSETS

Ranchers slaughtered herds in Texas, closed ranches and processing plants, and shifted production to the upper Midwest.

New England’s fishing fleets are struggling to survive a drop in their Atlantic cod catch.

Michigan cherries, Iowa soybeans, and Wisconsin dairy are also struggling.

DAMAGE TO THE DEVELOPING WORLD HURTS U.S. COMPANIES

Developing markets face greater climate risk: their populations live in hotter climates and are concentrated in coastal areas with poor infrastructure.

This hurts Fortune 500 companies, because those developing markets are expected to drive their future growth.

WEATHER CAN BE THE DIFFERENCE BETWEEN A GOOD YEAR AND GOING OUT OF BUSINESS

For retailers, restaurants, and the entertainment industry, weather can make or break their year.

Good weather allows golf courses to sell more afternoon rounds and restaurants and sports teams to fill outdoor seating. For low-margin businesses, marginal sales are critical to survival.

SMALL BUSINESSES ARE LESS LIKELY TO SURVIVE SEVERE WEATHER LOSSES

They have smaller cash reserves, are more likely to operate out of a single location, are less likely to have backup systems, and have a harder time relocating.

Small business failures are also bad news for the big companies they supply.



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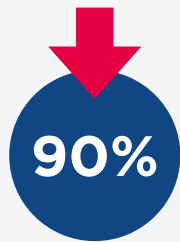
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THE GLOBAL ENERGY RACE IS OVER: RENEWABLE ENERGY WON

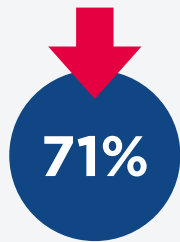
INVESTMENT OVER PAST DECADE
DROVE PRICES LOWER, WHICH
CREATED NEW DEMAND, NEW
CAPACITY, AND MORE INVESTMENT

PRICE DECLINES (2009-2020)^{5,6}

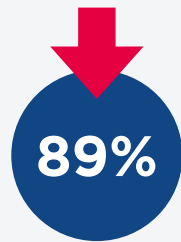
SOLAR



WIND



BATTERIES



In the U.S., solar capacity grew 80-fold in the last decade, and wind capacity more than tripled.⁷

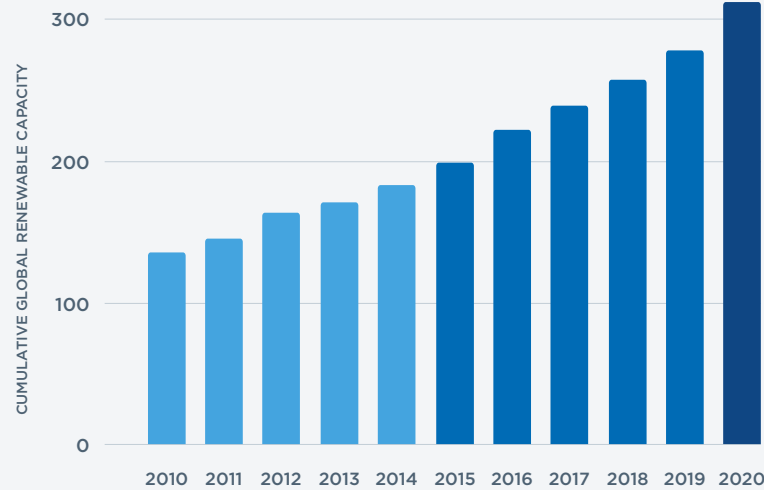
Renewables are more affordable than fossil fuels in two-thirds of the world.⁸

By 2030, they will be more affordable nearly everywhere.

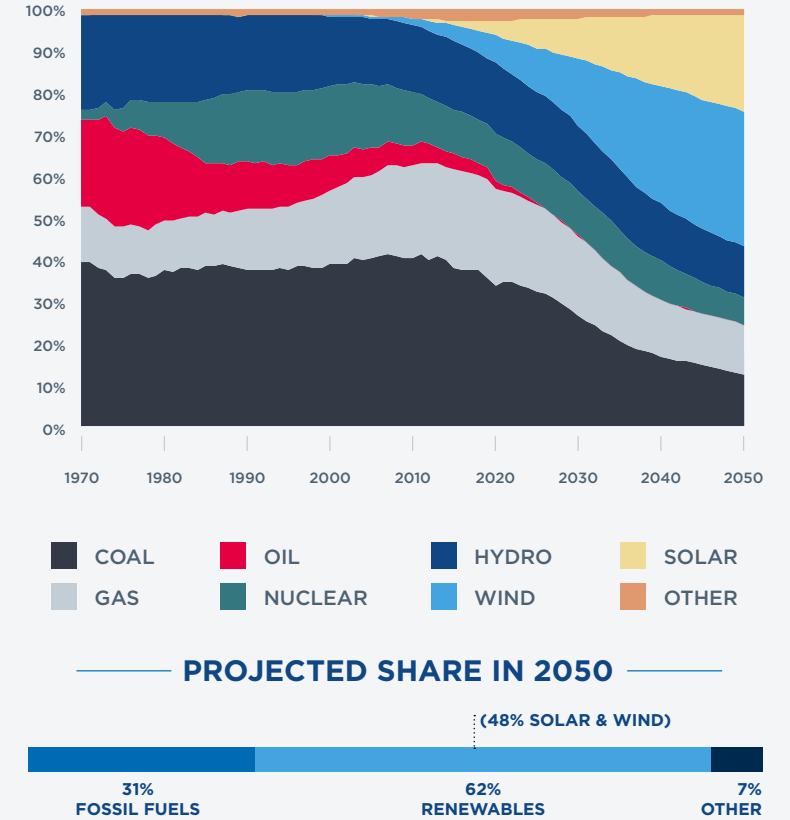
RENEWABLES WILL CAPTURE
80 CENTS OF EVERY NEW ENERGY
DOLLAR BY 2050, BUILDING ON
RECORD GROWTH

Of the \$15.1 trillion invested in new power capacity by 2050, 80% will go toward renewables and batteries.⁹

DESPITE THE COVID-19 PANDEMIC, 2020 SET A RECORD FOR NEW CAPACITY¹⁰



MARKET SHARE WILL
SHIFT DRAMATICALLY



SOURCE: Bloomberg New Energy Finance¹¹



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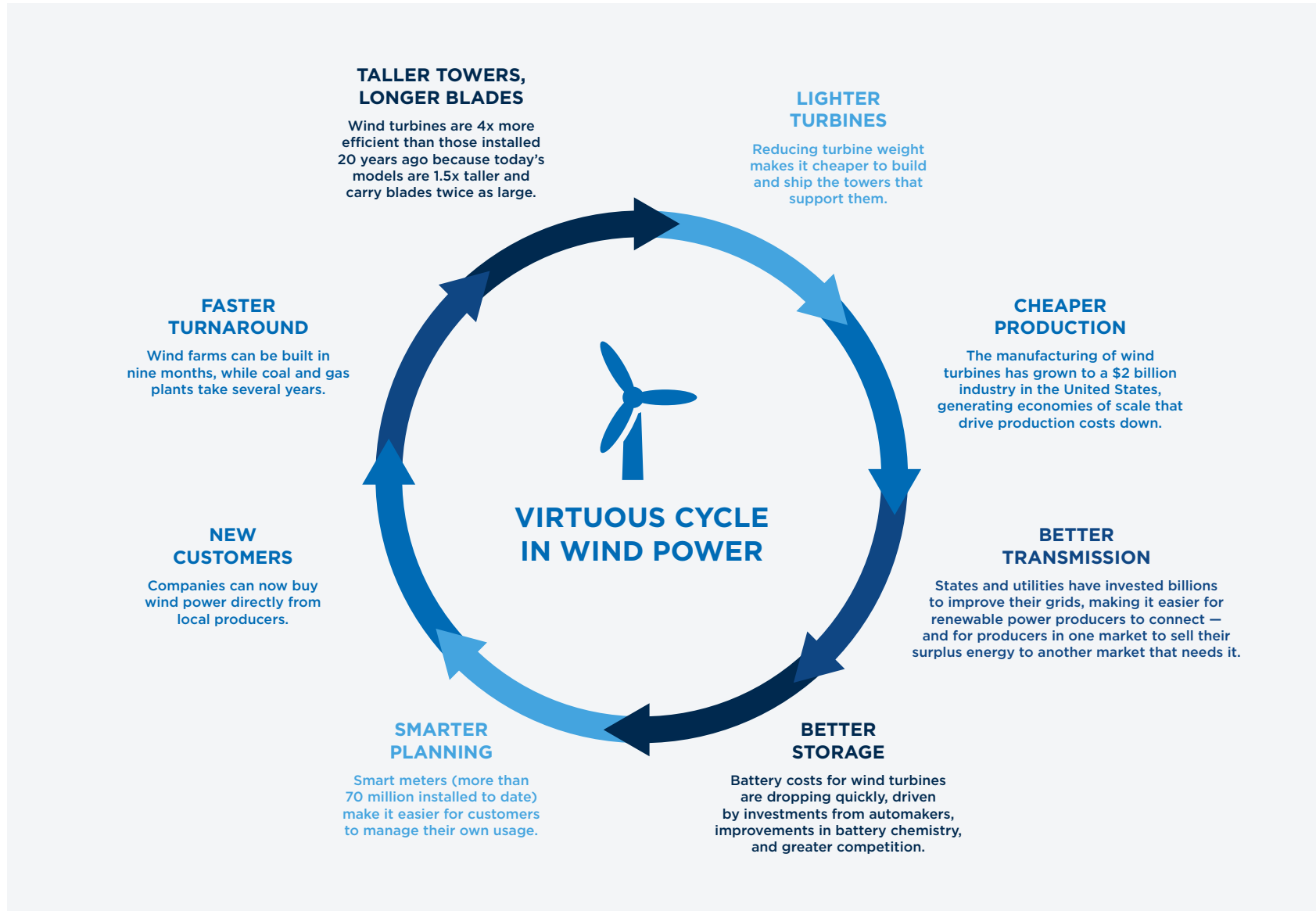
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HOW THE VIRTUOUS CYCLE IN RENEWABLE ENERGY WORKS



AS BATTERY PRICES FALL, CAPACITY GROWS 122-FOLD

The cost of lithium ion batteries dropped 89% from 2010 to 2020¹²

↓

Attracting an expected \$662 billion in new investment¹³

↓

Which will increase battery storage capacity to 1,095 GW by 2040 (a 122-fold increase from 2018)

↓

Increasing scale and new investment will cause costs per KW to fall another 50% by 2030



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FEDERAL INVESTMENT SHOULD FOLLOW MARKET FORCES

CLEAN ENERGY OUTPERFORMS FOSSIL FUELS¹⁴

In 2011, the traditional energy sector (without renewables) accounted for 12.27% of the S&P 500, ranking third-largest of 11 sectors.

By 2020, it had dropped to 2.28%, making it the smallest.

TRADITIONAL ENERGY IN THE S&P 500



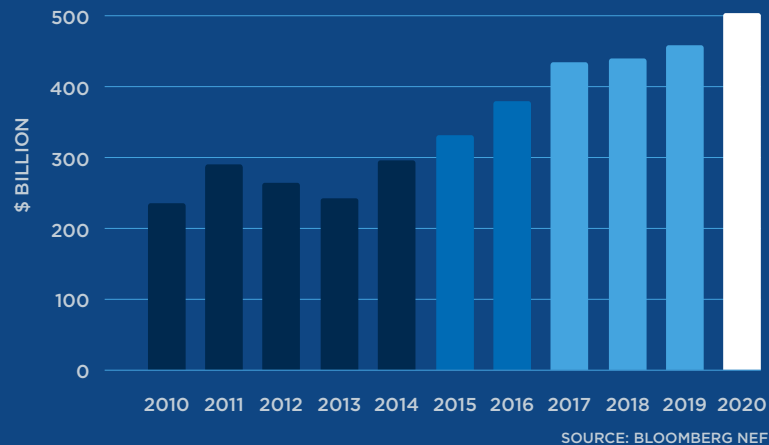
MARCH 18, 2021

RENEWABLE RETURNS TRIPLED VERSUS FOSSIL FUELS IN LAST DECADE

Bloomberg

GLOBAL INVESTMENT BREAKS \$500 BILLION DESPITE PANDEMIC

GLOBAL ENERGY TRANSITION INVESTMENT (2010-2020)¹⁵



Building new renewables is not only cheaper than new coal, but cheaper than operating more than a third of existing global coal capacity.

By 2025, 73 percent of global coal plants will be uncompetitive. As early as 2022, it will be cheaper to replace all global coal plants with clean power.¹⁶

DESPITE FEDERAL ABSENCE, CITIES AND STATES HAVE TAKEN ACTION

Since 1991, more than 600 local governments in the U.S. have developed climate action plans.¹⁷

Eight states are committed to switching entirely to zero-emission electricity (CA, HI, ME, NM, NY, NV, WA, VA, plus D.C. and Puerto Rico).¹⁸

The Regional Greenhouse Gas Initiative will include 11 states by 2021, and PA has announced plans to join.^{19 20}

PA, NY, OH, NJ, and IL are among the states taking action to keep nuclear plants operating.²¹

Leading on environmental justice, CA and WA both have screening programs to identify communities disproportionately burdened by pollution and climate impacts.

NY is also implementing an equity screen and mandating investments go toward disadvantaged communities.²²



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FOR MI, OH, IA, AND WI, RENEWABLES COULD BRING \$53 BILLION IN ENERGY SPENDING HOME

REDISTRIBUTING ENERGY JOBS

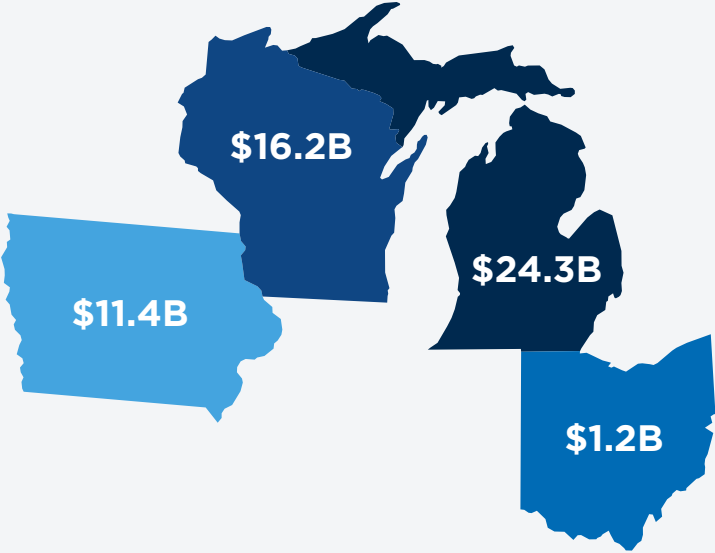
Energy jobs have been centralized in states with oil, gas, and coal reserves.

Renewable energy creates jobs in states that would otherwise import fossil fuels.



BRINGING ENERGY JOBS TO THE MIDWEST

If MI, OH, IA, and WI moved their energy imports to renewable production at home, \$53 billion would come to the Midwest.²³



WINNING ON RENEWABLES

THE MIDWEST HAS
39%

OF U.S. WIND CAPACITY²⁴



Iowa ranks number one in the country in per capita wind capacity and represents 10 percent of U.S. total capacity.²⁶

In 2020, land lease payments from clean power projects totaled \$73.8 million for Iowan farmers, ranchers, and landowners.²⁷



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CLEAN ENERGY CAN SMOOTH FARM REVENUES AND SUPPORT RURAL ECONOMIES

RURAL COMMUNITIES ARE STRUGGLING

Rural communities are threatened by declining populations, job growth, and investment.

And the impact of extreme weather means farmers can't always rely on crop yields.

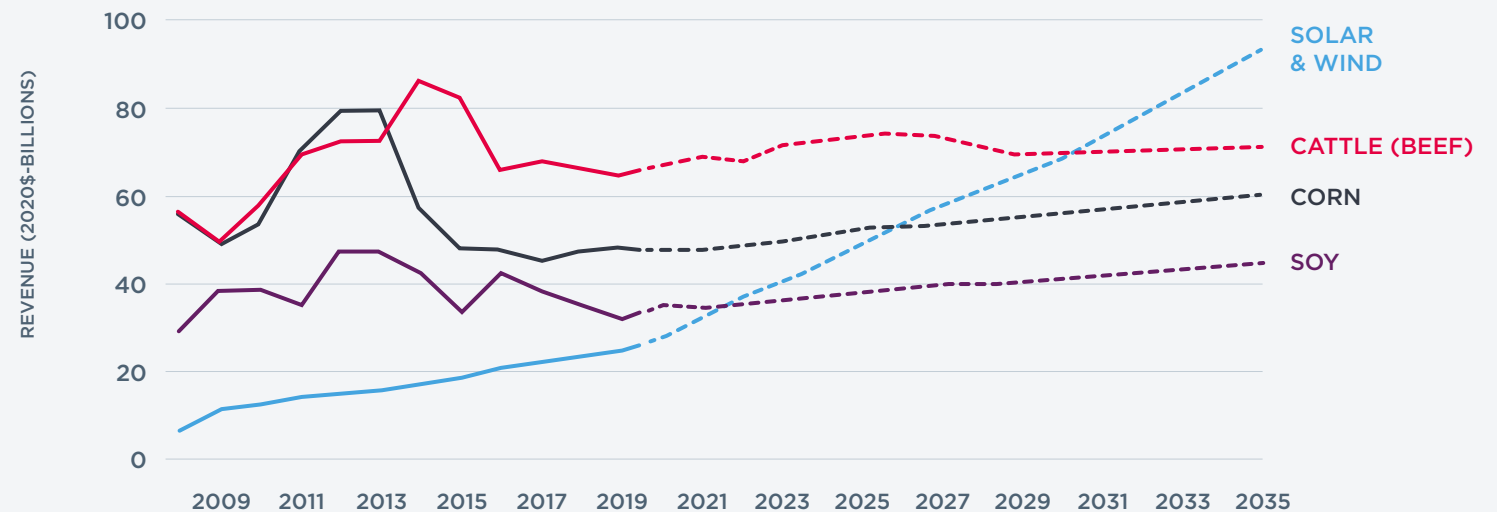
- By leasing part of their land to wind and solar providers, farmers obtain new, stable revenue to complement often volatile crop revenue.
- Turbines and solar panels can increase property values for rural landowners, particularly in areas with high foreclosure rates and shrinking populations.
- Wind and solar companies pay taxes that fund municipalities struggling with shrinking tax bases.

CLEAN ENERGY IS A RELIABLE COMMODITY²⁸

Revenues from wind and solar projects are increasing, and 99% of capacity for onshore wind, plus a growing portion of utility-scale solar, are found in rural counties.

By 2030, annual revenues from renewable projects could total \$60 billion. Compare this with major agricultural outputs corn and soy, at \$58 billion and \$44 billion, respectively.

This is without considering that the USDA warns corn and soybean production could drop as much as 80% over the next 60 years due to increased heat and drought.



SOURCE: ROCKY MOUNTAIN INSTITUTE



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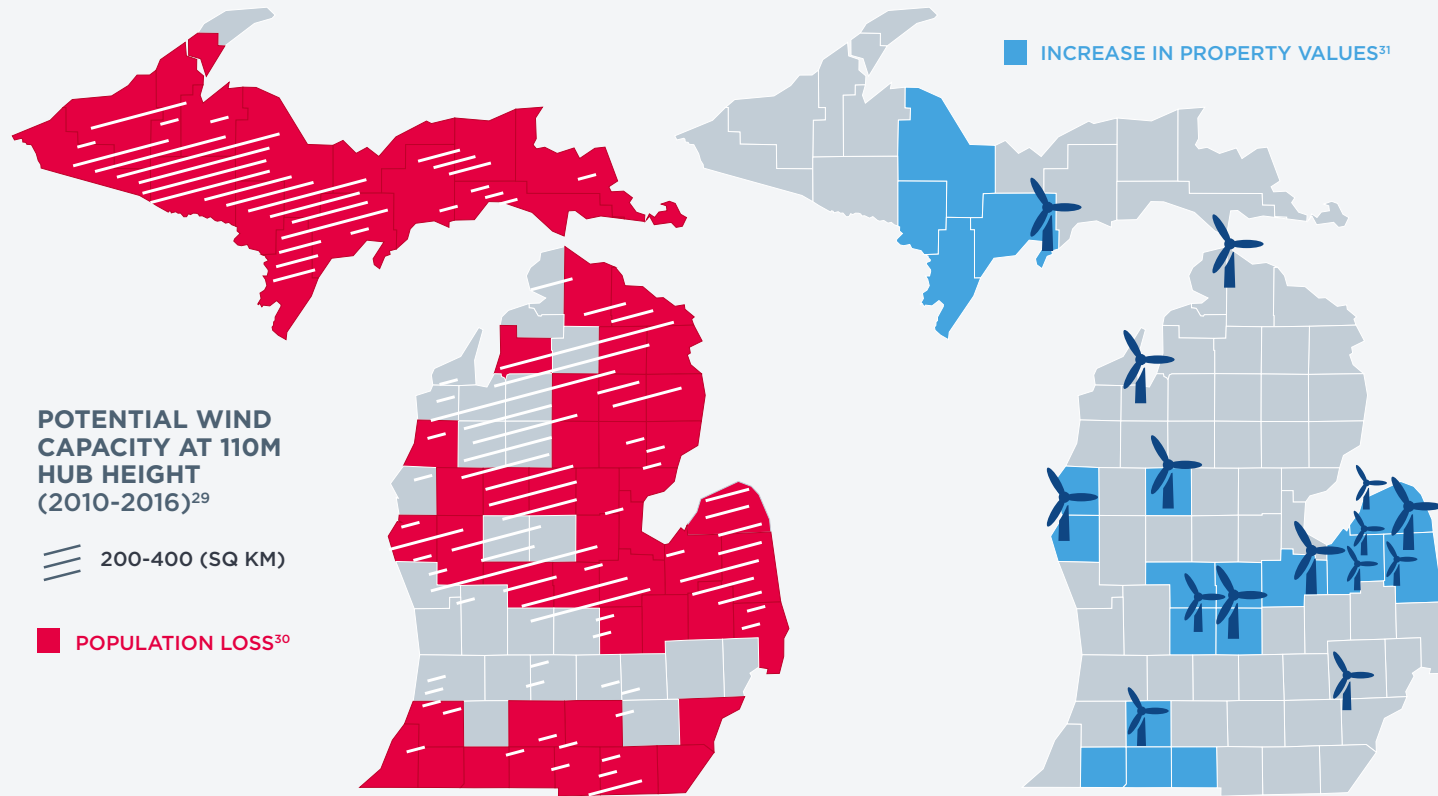
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JOBS AND INVESTMENT WHERE WE NEED THEM

MANY OF THE RURAL COUNTIES THAT NEED HELP MOST HAVE STRONG WIND RESOURCES

ADDING WIND POWER CAPACITY HAS INCREASED PROPERTY VALUES IN MICHIGAN



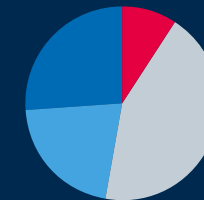
SOURCE: MIDWEST ENERGY NEWS

DIRECT BENEFITS TO RURAL AMERICA COULD TOTAL \$220 BILLION BY 2030³²

By the end of the decade, renewable projects could contribute \$11 billion per year to rural economies, through tax revenues, land leases, and wages for construction, operation, and maintenance workers.

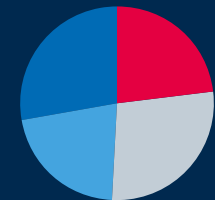
DIRECT BENEFITS TO RURAL ECONOMIES (BY 2030)

ONSHORE WIND \$108 BILLION



CONSTRUCTION WAGES: \$10B
O&M WAGES: \$47B
LAND LEASE PAYMENTS: \$23B
LOCAL TAXES: \$28B

UTILITY-SCALE SOLAR \$112 BILLION



CONSTRUCTION WAGES: \$26B
O&M WAGES: \$31B
LAND LEASE PAYMENTS: \$24B
LOCAL TAXES: \$31B

SOURCE: ROCKY MOUNTAIN INSTITUTE



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WE ARE FALLING BEHIND OUR GLOBAL COMPETITORS

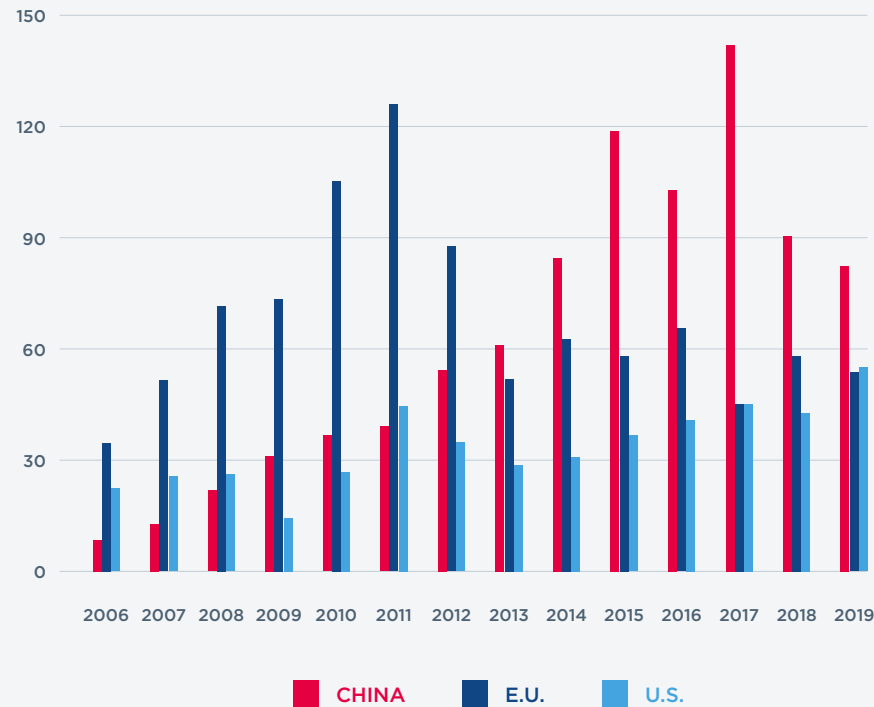
GLOBAL ENERGY DEMAND WILL INCREASE 62% BY 2050³³

Growing population, industrialization, demand for air conditioning caused by higher temperatures, and a shift to electric cars drive strong demand for electricity.



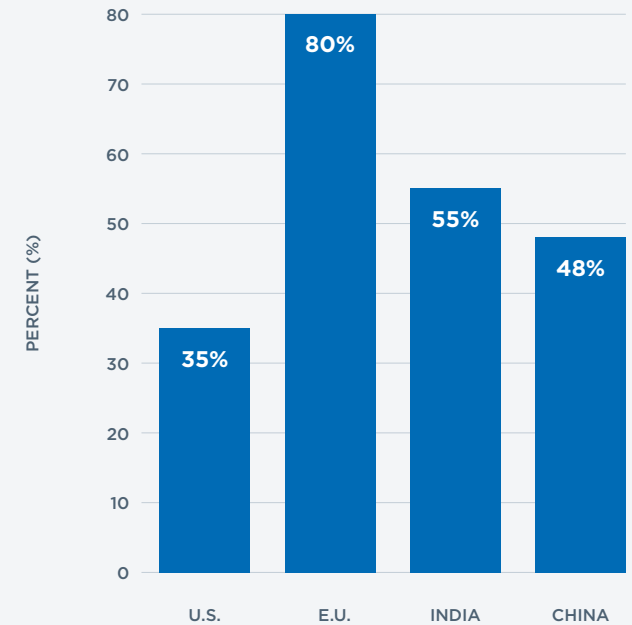
CHINA AND THE EU ARE OUT-INVESTING THE U.S.

GLOBAL TRENDS IN RENEWABLE ENERGY INVESTMENT, BY GEOGRAPHY (\$ BILLIONS)³⁴



EUROPE WILL LAP U.S. IN SOLAR AND WIND

SOLAR AND WIND PENETRATION IN 2050³⁵



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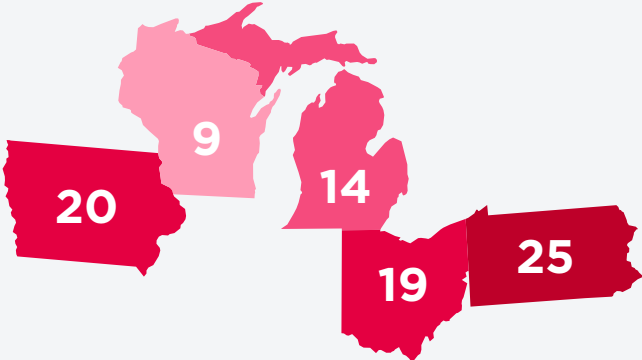
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SEVERE WEATHER IS UNDERMINING MANY OF THE MIDWEST'S MOST IMPORTANT COMPETITIVE ADVANTAGES

BILLION-DOLLAR DISASTERS (2014-2020)³⁶



FORTUNE 500 COMPANIES HEADQUARTERED IN FIVE STATES³⁷

- OH (27)
- PA (22)
- MI (17)
- WI (8)
- IA (2)

OF THE 76 FORTUNE 500 COMPANIES ACROSS THESE STATES, MORE THAN

80%

HAVE ISSUED SEVERE WEATHER WARNINGS

THE MIDWEST ECONOMY DEPENDS ON ITS CENTRAL LOCATION, AGRICULTURAL CLIMATE, WATERWAYS, NATURAL RESOURCES, AND INFRASTRUCTURE

IOWA FARMS AND WISCONSIN DAIRIES

Heat stresses plants and reduces crop yields. With livestock, it hurts milk yield, reproduction, and tolerance to diseases. Climate change is disrupting weather patterns, so rain falls in fewer, stronger bursts. Storms last longer, move farther, and pack more punch. It's also changing the timing and duration of growing seasons.

OHIO'S GROWING E-COMMERCE FULFILLMENT SECTOR

Ohio is an e-commerce powerhouse, in part, because of its 8,000 miles of interstate and 5,338 miles of rails.²⁸ Ohio also has seven commercial airports.³⁸ Ohio's shippers can get to 60% of the U.S. and Canadian population within 24 hours.³⁹ Extreme weather causes delays in shipping and damages critical infrastructure used to ship goods from Ohio to markets across North America.

PENNSYLVANIA INFRASTRUCTURE

Pennsylvania bridges, roads, rail, and power grid are among America's worst. Deficient roadway conditions cost the average Pennsylvania motorist more than \$500 in maintenance per year.⁴⁰ Climate change increases the number of freeze-thaw cycles, creating more potholes. Flooding damages bridges and roads. Heat and drought damage Pennsylvania's electrical grid.

GREAT LAKES WATERWAYS AND FISHERIES

Thirty million Americans and Canadians live off the Great Lakes, home of 84% of North America's surface fresh water.⁴¹ Climate change is affecting water quality (mostly, algae blooms), which harms fisheries. It's also causing water levels to rise and fall sharply, which harms shipping.



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