

HOW WIND ENERGY IS REPOWERING AMERICA



#WINDWORKS



The Climate
Reality Project®

Repower America.

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Turn on the news today and no matter the channel, no matter the time, no matter the immediate topic, three questions always seem to be at the heart of the political discussion.

First, how do we energize our economy and put more Americans to work in good, middle-class jobs with a future?

Second, how do we lead the world in confronting issues from terrorism to the refugee crisis and ensure a more stable and secure planet?

Third, how can we protect our planet from climate change and give the next generation a future to be proud of?

What if the answer to all three questions began with one practical step forward?

That step? Shifting away from dirty fossil fuels to clean, reliable, and affordable renewable energy nationwide.

It's a bold aspiration and represents a huge step forward. And the good news is that the technology we need to do it is in our hands today. In fact, as former US Vice President Al Gore said:

“ [I]t turns out that the real solutions to the climate crisis are the very same measures needed to renew our economy and escape the trap of ever-rising energy prices. What if we could use fuels that are not expensive, don't cause pollution, and are abundantly available right here at home? ”

In recent years, one such energy source [has proven itself](#) to be ever-cheaper, incredibly reliable, and a real job creator – and it's a real breath of fresh air.

That source is wind. Wind won't just put thousands of Americans to work. It'll also help lower energy costs and replace our reliance on coal and foreign oil from unstable and undemocratic countries with a clean, renewable domestic source of power.

Taking full advantage of its promise is a vital step toward protecting the environment and solving the climate crisis. Plus, by expanding renewables like wind while also improving energy efficiency and transitioning the US car fleet to electric vehicles, we can RePower America with 100 percent clean, renewable energy. And with the right political leadership, we can do it quickly.

It all starts with wind.



WIND ENERGY CAN HELP POWER A CLEAN ENERGY ECONOMY



[From plunging costs to exploding growth to a fast-expanding job market](#), recent developments in wind have proven clean energy can both create real economic opportunity and help us stop climate change. To put it another way, the fact that wind is supplying more and more of our power while putting more and more people to work and reducing our dependence on carbon-emitting, climate-harming fossil fuels has turned us into very big fans.

Still, there is an awful lot most people don't know about this fast-growing energy source. Fortunately, we're here to set the record straight on how wind can revolutionize power production while creating a robust industry.

First, give it to me straight – can wind *really* provide as much power as fossil fuels?

It sure can – and then some! And we mean it, too: by some estimates, wind could supply worldwide electricity consumption more than [40 times over](#).

When we talk about that level of potential, we don't mean it in some big, theoretical "If we could harness all the wind in the entire world for power..." kind of way, either. In a far-reaching study published in the prestigious [Proceedings of the National Academy of Sciences](#) (PNAS), researchers from Harvard University and VTT Technical Research Centre of Finland found that a network of land-based 2.5-megawatt (MW) wind turbines – restricted to non-forested, ice-free, nonurban areas (i.e., places we really could build them) – operating at as little as 20 percent of their full capacity could easily supply that much electricity. Which would be more than five times the total energy the world uses in all forms (including oil, coal, and natural gas).

That same PNAS study found that in the United States, the Central Plains states – an area identified by researchers as “extending northward from Texas to the Dakotas, westward to Montana and Wyoming, and eastward to Minnesota and Iowa” – could alone accommodate wind facilities producing as much as 16 times the total current demand for electricity in the United States.

The potential is very much there – **we just need to harness it.**

What’s the connection between wind power and job creation?

The growth of the wind power industry is going to create many, *many* new jobs in fields such as development, construction, transportation, manufacturing, operations, and supporting services. After all, with demand for wind energy growing, we need factory workers and engineers to build the turbines and support systems. We need truck drivers to move them around the country and technicians to install them where they’re needed. And we need service professionals to keep everything working smoothly and interface with the public (that’s you and I) on the customer service side. We could go on.

The result is that by the end of 2015, the wind power industry [already employed](#) 88,000 Americans – 24,000 of those [in Texas alone](#).

The forecast is even better. [According to the US Bureau of Labor Statistics](#), wind turbine service technician is projected to be the fastest-growing occupation in the US through 2024. Just as exciting, the median annual wage for the gig is \$48,800 – that’s \$13,260 more than the median annual wage among all 15 projected fastest-growing occupations.

Now, with those numbers in mind, consider that the [US Department of Energy \(DOE\) estimates](#) wind power could support up to 426,000 jobs by 2030 and 670,000 by 2050.

By that same year, assuming the DOE’s estimates bear out and wind energy grows unabated (and without obstruction), the agency estimates that the [US could](#):

- [Avoid](#) the emission of more than 12.3 gigatonnes of greenhouse gases.
- Save 260 billion gallons of water (because generating electricity from wind power uses virtually no water).
- Save [\\$108 billion in public health costs](#) by cutting air pollution.
- Prevent 22,000 premature deaths.



So, how much electricity comes from wind in the US right now?

Wind energy currently powers about [5 percent](#) of the nation's total overall electricity demand – though, how much electricity a given place is getting from wind power varies greatly from place-to-place and frequently day-to-day. Wind provided [66.4 percent](#) of the power in Colorado at one point in November 2015, and at one point that same month, it reliably met more than 43 percent of Texas' electricity demand, [according to the state's primary grid operator](#).

With more and more wind power coming online, these numbers will just keep growing. [Wind power represented](#) the largest source of new US electricity capacity in 2015, making the country second in the world in annual wind additions that year.

If the industry flourishes as expected, DOE estimates that wind could [provide more than one-third](#) of the nation's power by 2050. Where there's a will there's a way, and the conditions are just right for wind power to blow up here in the US.

Which states are the biggest wind energy producers?



Texas is by far the biggest [wind energy-producing state](#) in the US, with nearly 18,000 MW installed, accounting for about 10 percent of overall in-state electricity production in 2015. That may seem like a surprise for a state better-known for its robust oil industry, but it makes a great deal of sense when you consider its vast, generally flat topography and just how good an investment wind power has become (more on that below).

The [distant runners-ups in 2015 were](#) Iowa (with about 6,200 MW of wind capacity) and California (with close to 5,700 MW of wind capacity). However, even though they might have less wind *capacity* than Texas, wind power nevertheless supplied a larger share of overall electricity generation in many states. In Iowa, for example, wind power met more than [31 percent of overall electricity demand in 2015](#), the highest percentage in the nation. Kansas and South Dakota were not far behind, both generating more than 20 percent of their electricity from wind last year.

States like these are proving that wind is far from a niche technology and can reliably meet a substantial portion of electricity demand.

Isn't wind energy more expensive than energy from conventional sources?

Not at all – and it's getting even less expensive very quickly. This wasn't always the case, something the fossil fuel industry trumpets to mislead consumers today, but since peaking in 2008–09, the cost of wind energy has fallen dramatically.

Wind turbine prices have fallen 20 to 40 percent from their 2008 highs, per a [recent report from DOE and the Berkeley National Laboratory](#), and the average levelized long-term price from wind power sales agreements has dropped to an average of around 2 cents per kilowatt-hour (kWh), after reaching a nearly 7 cent/kWh high in 2009.

It's important to note that 2 cents per kWh is a nationwide average heavily influenced by projects hailing from the very windy (and consequently lowest-priced) Central Plains states. But even when looked at a little more broadly, rates for electricity generated by today's better-than-ever wind farms [are currently comparable](#) to wholesale electric power prices of 2.5-3.5 cents/kWh. Moreover, current wind energy contract prices [compare very favorably](#) to the projected future costs of electricity generated from fossil fuels.

And wind energy costs are expected to get even better in the very near future. Wind turbines are getting bigger, and as you might expect, taller installations with bigger blades can harness the power of more wind and generate more power, driving down prices even further.

Because of these falling costs and rising installations, the cost of electricity generated by wind is expected to plunge. [Top experts in the field estimate](#) that by 2030 the cost of wind-generated electricity could drop by as much as 30 percent – and even further by mid-century.

Just how popular is wind energy – and why does it matter?



Maybe it's the image of a turbine at work in the breeze without any pollution in sight, but wind energy is remarkably popular. [Seventy-three percent](#) of Americans “prefer emphasizing alternative energy, rather than gas and oil production.” That's [pretty firmly in line](#) with the 70 percent of registered voters who have a favorable impression of wind energy, specifically.

Perhaps even more telling is wind power's popularity in the very states where it is flourishing. In Iowa's Third Congressional District (one of the top 20 US Congressional districts for most wind capacity), a poll conducted by [WPA Opinion Research](#) found that 91 percent of respondents supported wind energy, and in Texas, the Texas Clean Energy Coalition similarly found that 85 percent of registered voters in the Lone Star State [support growth in clean energy like wind power](#).

WIND ENERGY CAN HELP POWER A CLEAN ENERGY ECONOMY



We could go on and on, but you see where we're going – both in this e-book and as a nation with clean energy.

One of the best ways to create jobs and grow the economy is to invest in sources of clean, renewable energy like wind. And in 2015 alone, wind energy [garnered over \\$109 billion in investments](#) globally, or more than one-third of all renewable energy investments during that year. It's unlikely investors and governments would pour that amount of money into an industry unless they too saw the potential described throughout this e-book.

When we use more clean energy, families pay less to treat kids suffering from asthma attacks and other ailments caused by air pollution. Our government pays less to Middle Eastern dictators for their oil supplies. And we all pay less for the myriad other devastating economic and human impacts of climate change.

Wind energy investment is a smart jobs plan and a public health no-brainer. It's a practical solution to the numerous major economic challenges presented by climate change and a flourishing industry that will propel America through the twenty-first century and beyond.

ABOUT THE CLIMATE REALITY PROJECT



**The Climate
Reality Project**[®]

Repower America.

Founded and chaired by former US Vice President and Nobel Laureate Al Gore, The Climate Reality Project is dedicated to catalyzing a global solution to the climate crisis by making urgent action a necessity across every level of society.

Today, climate change is standing in the way of a healthy tomorrow for all of us. But we know that practical solutions are right in front of us. We can create a healthy, sustainable, and prosperous future by making a planet-wide shift from dirty fossil fuels to clean, reliable, and affordable renewable energy. At Climate Reality, we combine digital media initiatives, global organizing events, and peer-to-peer outreach programs to share this good news with citizens everywhere and build overwhelming popular support for policies that accelerate the global transition to a clean energy economy.