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INTRODUCTION

The Clean Energy Buyers Association (CEBA) thanks the Committee for the opportunity to share our perspective: the clean energy investments in the Build Back Better Act (BBBA) are good for business, good for markets, good for consumer energy prices, and good for the economy.

CEBAⁱ activates a community of 280 members — representing over \$7 trillion in annual revenues and over 14 million employees — to deploy market and policy solutions for a carbon-free energy system. Most of our members are institutional energy customers of every type and size— corporate and industrial companies, universities, and even cities.

Our vision is customer-driven clean energy for all.

CEBA is pro-market, pro-community, and pro-carbon-free energy. Energy customers have deployed over 44 gigawatts (GWs) of renewable energy since 2008, which is over a quarter of all wind and solar capacity in the United States, driving down air pollution and lowering energy costs for American businesses and families. Last year alone, voluntary energy customers contracted for 10.6 GWⁱⁱ of clean energy — the equivalent of 40% of all new carbon-free capacity installed in 2020.

Energy customers face intractable barriers to procuring clean energy: lack of organized wholesale markets, need for expansion of transmission, lackluster investments in clean energy technology incentives, and underfunded research and development of emerging clean technologies. BBBA makes important investments in each of these areas that will result in powerful outcomes for our economy and community:

- **Expanding organized wholesale markets to every region of the country could save energy customers \$11 billion per year**, thus we support the BBBA's \$40 million appropriated to DOE to provide states with assistance to form, participate in, expand, or improve organized wholesale electricity markets.
- **A national transmission grid could reduce energy bills by 2%**. Likewise, every \$1 billion invested in large-scale transmission infrastructure creates \$2-3 billion in customer benefits, about 7,000 construction jobs, and about 1,490 new related jobs. Therefore, the BBBA's 30% transmission Investment Tax Credit, \$1.5Billion in grants for upgraded lines, \$100 million for planning and \$800 million in siting authorities grants is a first step in the right direction.
- **Clean energy could create thousands of new, geographically diverse jobs** across the supply chain. The BBBA's roughly \$200 billion in clean energy tax incentives will spur private sector investment across a range of clean energy technologies, including investments in renewables, advanced nuclear, carbon capture and sequestration, and clean hydrogen.
- BBBA also makes important investments to bring the **benefits of the clean energy economy to rural America**. These communities also should benefit from lower utility bills and have the opportunity to develop clean energy infrastructure.

We support the flexible, market-based, complementary suite of investments in BBBA that can empower energy customers to unleash an economic boom in clean energy and help us reach CEBA's aspiration of a 90% carbon-free electricity system in the United States by 2030.

This testimony lays out three key points.

- First, American businesses support the clean energy provisions in the BBBA because they are good for business, good for our communities, and good for our economy.
- Second, energy customers and energy markets matter and are key to driving affordable, clean energy for all Americans.
- Third, to solve the climate crisis, we must focus on decarbonizing our power system.

1. Businesses support federal action on climate and clean energy under the Build Back Better Act

Investments in clean energy can resuscitate the economy and society by creating vital tax revenue to support communities, growing the workforce by training and employing tradesmen and women, and can begin to address the disparate impacts of pollution and climate change on disadvantaged communities.

Businesses have leveraged their brand voices and influence to advocate for federal action on climate change since the start of 2021 while continuing to accelerate Environmental, Social, and Governance (ESG) efforts within existing operational and strategic priorities. Leading up to the 26th Conference of Parties (COP), over 778 businesses representing \$2.7 trillion in annual revenue and 733 investors managing more than half of the world's assets called on governments to raise climate ambition and implement meaningful climate policies.ⁱⁱⁱ

In support of both the BBBA and the Investment Jobs and Infrastructure Act (IIFA), over 160 investors and companies of all sizes have urged U.S. lawmakers to support climate and energy investments to combat the climate crisis and put us on a path to achieving key decarbonization milestones.^{iv} Members of the CEBA understand the importance of this critical moment and have demonstrated public support through the organization and individual advocacy efforts.^v We have all of the tools and solutions to initiate meaningful solutions right now to help address extreme events ravaging communities, create new well-paying employment opportunities through ever-growing energy sector, and to improve U.S. economic competitiveness.

The clean energy provisions in the Build Back Better Act are good for business.

Achieving a net-zero U.S. economy by 2050 hinges on having sufficient time for the sectors where it is hardest and most costly.^{vi} Ensuring the power sector decarbonizes as quickly as possible enables the clean electrification^{vii} of other sectors.^{viii} In the power sector, 11 independent recent studies^x, including by the Clean Energy Buyers Institute^x, show that it is possible to cost-effectively achieve at least 80% clean electricity by 2030 with existing technologies, and with significant net benefits. The BBBA makes investments in the power sector that could get the U.S. up to 76%^{xi} clean electricity when combined with broader federal actions, some of which are advanced by BBBA, and by state actions.

Tax credits are the cornerstone of clean energy deployment in the BBBA and modeling by Resources for the Futures (RFF) shows these investments alone could incentivize up to 69% carbon-free electricity by 2030^{xii}. The roughly \$200 billion in clean energy tax incentives will spur private sector investment across a range of clean energy technologies, including investments in renewables, advanced nuclear, carbon capture and sequestration, and clean hydrogen. Capital expenditures will decrease power sector emissions, reduce technology deployment costs, put new steel in the ground, create thousands of new, geographically diverse jobs across the clean energy supply chain, and serve as a catalyst for future investments in emerging technologies.

These investments are essential to accelerating the pace of deployment, but alone, tax incentives won't ensure the scale and pace needed. To create the enabling conditions for faster and cheaper clean technology deployment that mobilizes innovation, private capital, and the demand of energy customers, we need to also leverage technology research and development (R&D), expand and improve organized wholesale markets, and accelerate transmission buildout to develop a national transmission grid.

The Clean Energy Buyers Institute partnered with RFF to analyze the most impactful policy pathways to power sector decarbonization. In addition to finding that a well-designed, bipartisan Clean Energy Standard (CES) is the most impactful way to reduce emissions in the power sector to greatest benefit, it also found that expanding wholesale markets and supporting significant transmission expansion are substantially helpful in reducing the cost, accelerating the pace, and

enhancing the beneficial outcomes of the transition which include nearly \$100 billion in net annual benefits in 2035. The study's preliminary findings show that expanding organized wholesale markets to all regions of the country would save energy customers an additional estimated \$11 billion a year, and that the creation of a national transmission macrogrid by 2035 would reduce customer rates by roughly 2%.^{xiii} The BBBA creates important investments that support both markets and transmission enablers of a lower-cost transition to clean energy.

Organized wholesale energy markets currently serve two-thirds of energy customers.^{xiv} They are operated by various independent, non-profit entities, often referred to as regional transmission organizations (RTOs), that allow open, non-discriminatory access to the nation's transmission system.

In parts of the country with organized wholesale energy markets, clean energy is deployed at a higher rate and carbon emissions are dropping faster.^{xv} For example, according to a November 2021 assessment, regions with competitive wholesale power markets reduced their power sector CO₂ emissions by about 35% from 2005 levels, while regions without wholesale power markets reduced their power-sector CO₂ emissions by about 27% over the same period.^{xvi} Moreover, regions with wholesale power markets deployed almost 80% of all utility-scale wind and solar generation capacity, despite only accounting for about 67% of all existing power plant capacity, of all types.^{xvii}

RTO markets save energy customers money^{xviii} by efficiently using existing resource fleets and reducing the need for additional resources. RTOs have reduced production costs by increasing trade, better coordinating power plants, and driving efficiency improvements at plants.^{xix} One study estimates, nationwide, organized wholesale markets saved approximately \$3 billion per year in production costs from 1999-2012.^{xx} Organized wholesale markets, such as those operated by the Midcontinent Independent System Operator and PJM now save up to \$4 billion each annually.^{xxi} Recent regional studies evaluating the cost benefits of expanding organized wholesale markets into the West and Southeast found substantial net benefits as well.^{xxii}

Power grids are more resilient in parts of the country with organized regional electricity markets because regional grid operators have visibility across multiple utility territories. Risk of systemic disruptions are more effectively mitigated by pooling diverse resources and controllable demand across broader regions so that neighboring regions are better set up to assist each other.

American businesses and consumers demand a new paradigm — one that encourages both clean energy and economic competitiveness by leveraging markets. CEBA applauds the House for including language that would establish the “Organized Wholesale Electricity Markets Technical Assistance Grants” program, appropriating \$40 million to the U.S. Department of Energy to provide states, on a voluntary basis, with dedicated technical assistance and grants to evaluate forming, participating in, expanding, or improving organized wholesale electricity markets.^{xxiii}

Well-planned transmission is crucial to least-cost decarbonization. As the grid decarbonizes, substantive and comprehensive action is required to ensure the nation's transmission system can reliably and cost-effectively deliver carbon-free energy to all customers.

Due to ineffective, inadequate, and slow planning processes, as well as outdated siting procedures and cost-allocation methods, U.S. transmission expansion has not kept pace even with current demand despite major studies showing we need 2-3 times current transmission capacity by 2035 for decarbonization.^{xxiv} Every \$1 billion invested in large-scale transmission infrastructure creates \$2-3 billion in customer benefits,^{xxv} about 7,000 construction jobs, and 1,490 new related jobs.^{xxvi} Inadequate transmission infrastructure results in procurement challenges for customers in regions of the country where transmission is constrained, with congestion increasing prices and limiting project interconnections.

Expanding transmission will enhance grid operations to meet energy customer demand by integrating clean energy resources, increasing grid resilience and reliability, and facilitating

electrification initiatives. Transmission also enables markets to deploy generation over large areas, which optimizes renewable energy resources that are best managed and delivered across diverse geographic regions. For example, 15 states^{xxvii} between the Rocky Mountains and the Mississippi River account for 88% of the nation's potential wind capacity and 56% of potential solar capacity, but those states are only projected to account for 30%^{xxviii} of the national electricity demand by 2050. Constructing new high-voltage, interregional transmission lines as part of a macrogrid will enable the movement of electricity from clean energy sources to major load centers.

Provisions in BBBA that specifically address the bottlenecks and inefficiencies in transmission planning, siting and construction, include:

1. Inter-regional planning. The \$100 million to plan, site, and build an interconnected, national transmission “back-bone”, referred to as a “macrogrid,” will benefit customers by increasing grid reliability and efficiency, accelerating decarbonization goals, and creating cost savings.
2. Transmission Investment Tax Credit (ITC) and grants. Implementing a 30% transmission ITC can incentivize the construction of new lines where development otherwise would not occur due to challenges with cost allocation for interregional projects. An ITC can benefit customers by accelerating transmission projects that expand access to cheaper, zero-carbon energy and increase reliability. The \$1.5 billion in transmission grants in the bill would provide for new and upgraded lines as an important down payment toward dramatically expanding our transmission system and unlocking private sector capital.
3. Siting. Interstate siting is one of the biggest barriers to getting transmission projects built. The House allocated \$800 million to provide grants to transmission siting authorities to study and analyze the impacts of transmission projects, examining alternative transmission siting corridors, and for economic development activities for communities that may be affected by the construction and operation of a transmission project.

Additional programs make the BBBA a comprehensive approach to decarbonizing the electricity system. We need to make investments now to foster innovation and commercialize the technologies to get full decarbonization. The BBBA includes \$30 billion for clean technology funding, including \$1 billion for the Department of Energy (DOE) Research, Design, Development, and Demonstration (RDD&D) activities and \$29 billion to support the rapid deployment of low- and zero-emission technologies.

Furthermore, BBBA makes important investments to bring the benefits of the clean energy economy to rural America. These communities also should benefit from lower utility bills and have the opportunity to develop clean energy infrastructure. Twelve percent^{xxix} of U.S. electricity load is serviced by rural cooperative utilities and the BBBA uses a broad array of tools to support rural electric customers and spur rural clean energy economic development.

Finally, to bring increased clean energy onto the grid and reduce carbon emissions, we need to modernize the permitting process, including improving agency coordination to accelerate the environmental review process, while making certain that we do not compromise environmental protection and community participation. Combined, the BBBA advances the most comprehensive and substantial set of investments intended to unleash clean energy to date.

2. **Energy Customers Matter**

Energy customers have prioritized directly procuring clean energy as a key component of broader climate and energy goals since 2008. Leveraging their voice and demand for clean energy, organizations of all types have become agents of change by innovating to address market barriers hindering access to clean energy, creating new procurement structures, advancing emerging technologies, and advocating for policies that support the acceleration of clean energy.

Today, 60% of Fortune 500 companies have a public climate or clean energy goal^{xxx}. Over 340 global businesses have committed to 100% renewable energy^{xxxi}, and over 1,100 companies^{xxxii} are committed to a science-based target aligned with 1.5 degrees Celsius. Financial markets are also increasingly interested in Environmental, Social and Governance (ESG) as financial regulators, investors, and asset owners turn their focus to more deliberate evaluation of the risks posed by climate change and prioritization of sustainable investing.

Clean energy has become a commonsense decision for many organizations. Because of clean energy's cost effectiveness, strong stakeholder demand, and greater interest in ESG impacts, Wood Mackenzie estimates that there is at least 85 GW of unmet demand in the U.S. from the largest existing energy customers to 2030.^{xxxiii} As market demand for clean energy continues to swell, energy customers are battling intractable barriers that impact their ability to leverage markets to meet business goals and accelerate decarbonization of the U.S. energy system.

The biggest barrier to customer-driven clean energy is whether there is a market to transact in at all. Eighty percent of the 44 GW of new utility-scale wind and solar contracts driven by customers were in the organized wholesale markets that serve two-thirds of the nation's electricity customers. Where those markets don't exist, customers must negotiate time-consuming, and often less cost-competitive bilateral deals or utility tariffs in order to access clean energy.

In addition to customers being able to source clean energy, the grid needs to decarbonize for all customers, which is a function of the constellation of policies driving down clean energy costs and incentivizing faster deployment, including through foundational approaches like leveraging organized wholesale markets and transmission expansion, and technology R&D. The BBBA provides transformative investments across these priorities.

3. Decarbonizing the power sector is critical

To achieve a zero-carbon global economy by 2050^{xxxiv}, the International Energy Agency calls for a 60% decline in emissions from the power sector globally by 2030.^{xxxv}

The United States must lead. We are the largest historical emitter of greenhouse gases, the second largest GHG emitter globally, and the electricity sector in the United States is the second largest source of greenhouse gas emissions. Commercial and industrial customers account for over 60% of electricity consumption.

Clean energy is cost-effective. A recent study^{xxxvi} found that the U.S. grid can achieve a 90% carbon-free generation mix by 2035 without increasing customer cost or undermining system reliability; what's missing is unified, predictable, durable, and ambitious deployment policy. The suite of approaches under Build Back Better Act (BBBA) would change that. As global investments in clean energy surpass a record-breaking \$500 billion^{xxxvii}, the BBBA clean energy and climate provisions are an opportunity to usher in a historic wave of investment and innovation to accelerate emissions reductions swiftly through clean energy deployment.

Throughout history, our country has relied on energy infrastructure investments to lift us out of crises. President Roosevelt's New Deal saved the U.S. from economic collapse and brought electricity to rural America through investments in public works projects. More recently, the American Recovery and Reinvestment Act rapidly put 2.3 million Americans to work, spurred innovations that dramatically reduced the costs of clean energy technologies, and leveraged private sector investments, raising the GDP by \$500 billion within one year.^{xxxviii}

We applaud the efforts of this Congress to address climate change, accelerate clean energy and empower customers to lead the transition through the Build Back Better Act. We urge the Senate to preserve the House allocations to the clean energy provisions and pass the Build Back Better Act without delay.

ENDNOTES:

ⁱ Clean Energy Buyers Association: www.cebuyers.org.

ⁱⁱ Clean Energy Buyers Association. 2021. *Clean Energy Buyers Association Deal Tracker*. <https://cebuyers.org/deal-tracker/>

ⁱⁱⁱ Lubber, M. and Schauble, B. 2021, November 19. *COP26 is over. Now it's up to investors, companies, and governments to raise their climate ambition*. Ceres. <https://www.ceres.org/news-center/blog/cop26-over-now-its-investors-companies-and-governments-raise-their-climate>

^{iv} Ceres. 2021, October 27. *'There is no time to waste': Dozens of companies, investors urge Congress to act now on climate*. Ceres. <https://www.ceres.org/news-center/press-releases/there-no-time-waste-dozens-companies-investors-urge-congress-act-now>

^v As of December 3, 2021, 24 CEBA member companies have released individual statements or signed letters of support of the clean energy provisions in the BBBA: Adobe, Amazon, Apple, Autodesk, Bank of America, Bp America Inc., Cummins, Ebay, Facebook / Meta, General Motors, Google, Hewlett Packard (HP), Johnson Controls, Mars Incorporated, Microsoft, Nestle, PepsiCo, Salesforce, Stonyfield Organic (Stonyfield Farm), Trane Technologies, VF Corporation, Volt Energy Utility, Walmart, Workday.

12 companies have publicly supported the CEBA statements on the Build Back Better Act and Infrastructure Investment and Jobs Act's clean energy and climate provisions, including: Amazon Web Services, Ebay, Electric Power Supply Association, Environmental Defense Fund, First Solar, Google, Iron Mountain, LevelTen Energy, Primergy Solar, Wells Fargo, WeWork, World Wildlife Fund.

^{vi} The Net-Zero America Project which analyzes five different pathways to reach economy-wide net-zero emissions by 2050 finds, "Building a net-zero America will require immediate, large-scale mobilization of capital, policy and societal commitment, including at least \$2.5 trillion in additional capital investment into energy supply, industry, buildings, and vehicles over the next decade. Consumers will pay back this upfront investment over decades, making the transition affordable." Net Zero America. October 2021. *Net-Zero America: Potential Pathways, Infrastructure, and Impacts*. Princeton University. <https://netzeroamerica.princeton.edu/the-report>

^{vii} A meta-analysis of 11 clean energy studies found agreement that decarbonization of the power sector amplifies electrification-based emission reductions across other sectors. Achieving 70-80 percent clean electricity by 2030 is necessary to reach the GHG reduction target of 50-52 percent below 2005 levels by 2030 and be on track to achieve zero-emissions by 2050: Esposito, Dan. September 2021. *Studies Agree 80 Percent Clean Electricity by 2030 Would Save Lives and Create Jobs at Minimal Cost*. Energy Innovation. <https://energyinnovation.org/wp-content/uploads/2021/09/Studies-Agree-80-Percent-Clean-Electricity-by-2030-Would-Save-Lives-and-Create-Jobs-at-Minimal-Cost.pdf>

^{viii} A recent special report from the United Nations Intergovernmental Panel on Climate Change finds the world needs to cut its planet-warming emissions by about half by 2030 relative to a 2005 baseline: IPCC. 2018, Summary for Policymakers. *Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty*. <https://www.ipcc.ch/sr15/chapter/spm/>

^{ix} A meta-analysis of 11 cross-sector studies finds 80% clean energy by 2030 would add 500,000-1,000,000 net new jobs per year, prevent 85,000-317,000 premature deaths and save \$1-5 trillion in health costs through 2050: Energy Innovation. 7 September, 2021. *Studies Agree 80 Percent Clean Electricity by 2030 Would Save Lives and Create Jobs at Minimal Cost*. <https://energyinnovation.org/publication/studies-agree-80-percent-clean-electricity-by-2030-would-save-lives-and-create-jobs-at-minimal-cost/>

^x Research between CEBI and RFF, Summary for Policymakers released in July 2021, finds that a clean energy standard achieving 80% clean energy by 2030 increases rates by an average of 4%, compared to a 3% rate increase in 2035 to be on track for 100% by 2050 but significantly higher to achieve 100% clean energy by 2035: Clean Energy Buyers Institute (formerly Renewable Energy Buyers Institute) and Resources for the Future. July 2021. *Evaluation of Power Sector Emissions Reduction Pathways*. <https://cebuyers.org/wp-content/uploads/2021/07/Evaluation-of-Power-Sector-Emissions-Reduction-Pathways-Summary-for-Policymakers.pdf>

^{xi} Rhodium group found a combination of investment and regulations can achieve CO2 emission reductions of 69-76% below 2005 levels in 2031: Larsen, J., King, B., Kolus, H., and Herndon, W. 23 March, 2021. *Pathways to Build Back Better: Investing in 100% Clean Energy*. Rhodium Group. <https://rhg.com/research/build-back-better-clean-electricity/>

^{xii} Roy, N., Burtraw, D., and Rennert, K. 7 October, 2021. *Cost Analysis and Emissions Projections under Power Sector Proposals in Reconciliation*. Resources for the Future. <https://www.rff.org/publications/issue-briefs/cost-analysis-and-emissions-projections-under-power-sector-proposals-in-reconciliation/>

^{xiii} Clean Energy Buyers Institute (formerly Renewable Energy Buyers Institute) and Resources for the Future. July 2021. *Evaluation of Power Sector Emissions Reduction Pathways*. <https://cebuyers.org/wp-content/uploads/2021/07/Evaluation-of-Power-Sector-Emissions-Reduction-Pathways-Summary-for-Policymakers.pdf>

^{xiv} Federal Energy Regulatory Commission. November 2015. *Regional Transmission Organizations*. <https://www.ferc.gov/sites/default/files/2020-05/elec-ovr-rto-map.pdf>

^{xv} As of 2018, renewable energy generation reached 100 gigawatts in wholesale energy markets, which represents roughly 80% of US total installed variable renewable energy capacity. See 2018 Renewable Energy Grid Integration Data Book: U.S. Department of Energy. 2018. *2018 Renewable Energy Grid Integration Data Book*. <https://www.nrel.gov/docs/fy20osti/74823.pdf>

Additionally, about 73% of large-scale battery storage power capacity in the United States, is installed in states covered by independent system operators (ISOs) or regional transmission organizations (RTOs): U.S. Energy Information Administration. July 2020. *Battery Storage in the United States: An Update on Market Trends*. https://www.eia.gov/analysis/studies/electricity/batterystorage/pdf/battery_storage.pdf

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^{xvi} Rhodes, J., Kiesling, L., and Davidson, F. November 2021. *Assessment of the Emissions Performance of Wholesale Electricity Markets*. Energy Choice Coalition. https://static1.squarespace.com/static/5c60a6ff809d8e61723abdd4/t/619536b70740600220a236d0/1637168824983/EC-C-Assessment+of+Emissions_11182021.pdf

^{xvii} *Id.*

^{xviii} Current RTOs provide participants between \$2-4 billion in annual savings each (See MISO Value Proposition: MISO, 2021. *MISO Value Proposition*. <https://www.misoenergy.org/about/miso-strategy-and-value-proposition/miso-value-proposition/>; PJM Value Proposition: PJM. 2019. *PJM Value Proposition*. <https://www.pjm.com/about-pjm/~media/about-pjm/pjm-value-proposition.ashx>; SPP. 27 April, 2021. *SPP reports \$2.14B in annual savings for members, unveils new mission and vision to board of directors*. SPP. <https://www.spp.org/newsroom/press-releases/spp-reports-214b-in-annual-savings-for-members-unveils-new-mission-and-vision-to-board-of-directors/>).

Prospective studies on benefits of RTO participation find production cost savings in the range of 3% to 9%. (The Brattle Group. April 2019. *Potential Benefits of a Regional Wholesale Power Market*. <https://www.brattle.com/insights-events/publications/potential-benefits-of-a-regional-wholesale-power-market-to-north-carolinas-electricity-customers/>).

The State-led Market Study led by Utah’s Department of Energy and neighboring western states found an RTO expanding the west could save participants \$2 billion annually in gross benefits by 2030: Energy Strategies. 2021. *Insights and Experience*. <https://www.energystrat.com/new-insights-experience>

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^{xix} James Bushnell, Erin T. Mansur, and Kevin Novan. 23 February, 2017. Review of the Economics Literature on US Electricity Restructuring. University of California Davis and Dartmouth College Tuck School of Business. https://mansur.host.dartmouth.edu/papers/bushnell_mansur_novan_literature_elec_restructuring.pdf

^{xx} Chen, J and Hartman, D. 10 November, 2021. *Why wholesale market benefits are not always apparent in customer bills*. R Street Institute. <https://www.rstreet.org/2021/11/10/why-wholesale-market-benefits-are-not-always-apparent-in-customer-bills/>

^{xxi} MISO. 2021. *MISO Value Proposition*. <https://www.misoenergy.org/about/miso-strategy-and-value-proposition/miso-value-proposition/>

PJM Value Proposition: PJM. 2019. *PJM Value Proposition*. <https://www.pjm.com/about-pjm/~media/about-pjm/pjm-value-proposition.ashx>;

^{xxii} Western States could save \$2 billion annually: Energy Strategies. 30 July, 2021. *State-Led Market Study: Market and Regulatory Review Report*. <https://static1.squarespace.com/static/59b97b188fd4d2645224448b/t/6148a03ea5c43d63b2873506/1632149569046/Final+Roadmap+-+Market+and+Regulatory+Review+Report+210730.pdf>

Colorado: joining an RTO could reduce customer rates 5%: Howland, E. 3 December, 2021 *Colorado utilities could cut costs 5% by joining an RTO, PUC finds, as Western market momentum builds*. Utility Dive. https://www.utilitydive.com/news/colorado-utilities-PUC-rto-report-power-markets/610918/?utm_source=Sailthru&utm_medium=email&utm_campaign=Issue:%202021-12-03%20Utility%20Dive%20Newsletter%20%5Bissue:38381%5D&utm_term=Utility%20Dive

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^{xxiii} See Section 30453 of H.R. 5376, the Build Back Better Act.

^{xxiv} MIT researchers show that coordinating power system planning and dispatch regionally, along with a doubling of transmission capacity, reduces the cost of zero-carbon electricity by as much as 46% compared to a state-by-state approach. Brown, P., and Botterud, A. 20 January, 2021. *The Value of Inter-Regional Coordination and Transmission in Decarbonizing the US Electricity System*. Joule. <https://www.sciencedirect.com/science/article/abs/pii/S2542435120305572?dgcid=author>,

The National Academies offer deep decarbonization scenarios that would allow the U.S. to reach net zero or net negative CO2 emissions by 2050. The central case estimates that expanding interregional transmission by a 2.5-fold increase over 2020 transmission levels would increase the share of wind and solar to 60% of total generation. National Academies of Sciences, Engineering, and Medicine. 2021. *Accelerating Decarbonization of the U.S. Energy System*. <https://www.nap.edu/resource/25932/interactive/>

Princeton University researchers identified a need for 3-5 times more transmission capacity to reach net-zero emissions by 2050: Princeton University. Net Zero America. October 2021. *Net-Zero America: Potential Pathways, Infrastructure, and Impacts*. Princeton University. <https://netzeroamerica.princeton.edu/the-report>

^{xxv} Brinkman, G., Novacheck, J., Bloom, A., and McCalley, J. October 2020. *Interconnections Seam Study*. National Renewable Energy Laboratory. <https://www.nrel.gov/docs/fy21osti/78161.pdf>

^{xxvi} Researchers from Iowa State University found that \$80 billion in transmission spending would create 562,000 construction jobs and a net gain of 3,083 jobs nationally across the energy sector. Swenson, D. July 2018. *Economic Impact & Job Creation Relative to Large-Scale, High Voltage Transmission Infrastructure*. Iowa State University. <http://www2.econ.iastate.edu/prosci/swenson/Publications/The%20Interconnection%20Seam%20Study%20Amended%20Title.pdf>

^{xxvii} Wimsatt, K. and David Gardiner and Associates. 29 July, 2019. *Transmission: A Key Aspect of New Climate Policies*. Americans for a Clean Energy Grid. <https://cleanenergygrid.org/transmission-key-aspect-new-climate-policies/>

^{xxviii} David Gardiner and Associates. January 2018. *Transmission Upgrades & Expansion: Keys to Meeting Large Customer Demand for Renewable Energy*. A Renewable America. <https://windsolaralliance.org/wp-content/uploads/2018/01/WEF-Corporate-Demand-and-Transmission-January-2018.pdf>

^{xxix} NRECA. 22 October, 2021. *Electric Co-op Facts & Figures*. <https://www.electric.coop/electric-cooperative-fact-sheet>

^{xxx} World Wildlife Fund. 02 June, 2021. *Power Forward 4.0: A progress report of the Fortune 500's transition to a net-zero economy*. <https://www.worldwildlife.org/publications/power-forward-4-0-a-progress-report-of-the-fortune-500-s-transition-to-a-net-zero-economy>

^{xxxi} RE 100. 2021. RE 100 Member List. <https://www.there100.org/re100-members>

^{xxxii} Science Based Targets. 2021. *Companies Taking Action*. <https://sciencebasedtargets.org/companies-taking-action>

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