Business Roundtable

Strengthening Global Clean Energy Supply Chains

Introduction

Global energy systems are in the midst of a transition to cleaner energy sources and transformative energy technologies, bolstered by a consensus around the need to combat climate change. To lead in this transition, the United States must accelerate the sourcing, manufacture, deployment and scaling up of clean and advanced energy technologies and their associated infrastructure.

However, this accelerating demand for and investment in alternative energy technologies—not only in the United States but around the world—is poised to strain global supply chains and strategic resources. Building a strong foundation for U.S. leadership and fully capitalizing on the potential benefits of Congress' historic investment will require decisive policy and regulatory actions now to establish secure, resilient and efficient clean energy supply chains.

The challenge is significant. Depending on the specific technology, supply chains may be complex, nascent, highly interdependent, vulnerable to unreliable international actors, reliant upon scarce resources and/or constrained by onerous regulatory and permitting requirements. To bolster supply chain resiliency, address potential bottlenecks and position the United States for domestic success and global leadership in the energy transition, policymakers must:

Technologies in Focus

Among the technologies that are critical to the energy transition, Business Roundtable has identified four as facing the most significant near-term supply chain constraints:

- **Solar panels**
- **Transmission grid**
- **Nuclear energy**
- **Clean hydrogen**

Specifically, each of these technologies currently depends on supply chains that are heavily reliant on critical minerals and components with uncertain sources of future supply and/or sourced from foreign entities of concern.

At the same time, Business Roundtable firmly believes that addressing the global climate change and building sustainable and resilient energy systems requires a diverse energy portfolio. This report is not a comprehensive review of alternative energy technologies and resources, or of the policy actions that have a critical role to play in establishing U.S. leadership in the clean energy transition.

More detail and supporting analyses describing the unique and pressing supply chain constraints for solar panels, transmission grid, nuclear energy and clean hydrogen can be found on our website.

Ensure Access To Critical Minerals And Materials

1. Develop and strengthen strategic alliances with friendly, mineral-rich countries (e.g., Indo-Pacific and Latin American countries) to expand and secure access to critical minerals and strategic materials from primary and recycled sources.
2. Support long-term domestic mining, processing and recycling of strategic materials and critical minerals of which the U.S. has sufficient reserves (e.g., lithium, copper, graphite).

Facilitate Competitive Domestic Manufacturing

3. Ensure predictable, consistent regulations and policies related to clean energy development.
4. Ensure promising new technologies receive necessary support to obtain first-mover advantage and secure emerging supply chains longer term (e.g., perovskite-based solar, clean hydrogen and advanced nuclear reactors).
5. Modernize America's workforce development system to scale the supply of skilled workers and equip the next generation with required skills for high-demand jobs.

Support Reliable Component Imports Where Necessary

6. Broaden the geographic eligibility criteria for domestic production incentives to secure long-term access to critical components.

Effectively Deploy And Connect Key Technologies

7. Support ongoing efforts to streamline planning and permitting to facilitate efficient deployment of pivotal clean energy projects (e.g., judicial review reform and prioritization of key projects, including brownfields).

I: Ensure Access To Critical Minerals And Materials

Demand for several critical minerals and materials essential to the clean energy transition is expected to outstrip supply in the short-term, creating significant shortages and increasing prices and volatility. For example, lithium, which is essential for electric vehicles (EVs) and battery storage, is expected to have a 65 percent supply deficit by 2030[1] and has seen its price increase from around $10,000/metric ton (T) in 2020 to over $60,000/T in 2022 before falling to around $20,000/T in 2023.[2,3] And many of the technologies subsidized by Inflation Reduction Act (IRA) and Infrastructure Investment and Jobs Act (IIJA) funding and tax credits will increase demand for copper over the next several decades.

At the same time, limited available mineral supply and headwinds in scaling domestic mining, processing and recycling capabilities have made the United States highly dependent on imports *(see Figure 1)*, often from countries with geopolitical risks and/or substandard environmental and labor practices. For instance, in 2022 China—which controls global mineral processing capabilities in large part due to low labor costs, lagging environmental standards, substantial foreign investments and historical government support[4]—was the leading import source for 17 of the more than 50 mineral commodities for which the United States is more than 50 percent reliant on imports[5].

To effectively secure access to critical minerals and other strategically important materials, the United States must **develop and strengthen strategic trade alliances while supporting domestic mining, processing and recycling.**

Figure 1: **U.S. Reliance On Imports For Key Critical Minerals, Select Uses, Top Supplier (2022)**

>25% Lithium (Li)	76% Cobalt (Co)	56% Nickel (Ni)	>95% Rare Earth Elements (REEs)	100% Natural Graphite (C)
Electric vehicles Battery storage	**Electric vehicles Battery storage H2 electrolysis**	**Electric vehicles Battery storage Solar PV**	**Electric vehicles Battery storage Wind turbines**	**Electric vehicles Battery storage H2 electrolysis**
Top Supplier: **Argentina**	Top Supplier: **Norway**	Top Supplier: **Canada**	Top Supplier: **China**	Top Supplier: **China**

Note: Top supplier over 2018-2021 | Source: U.S. Department of Energy, U.S. Geological Survey

Recommendations

1. **Develop and strengthen strategic alliances with friendly, mineral-rich countries (e.g., Indo-Pacific and Latin American countries) to expand and secure access to critical minerals from primary and recycled sources.**

   In 2022, the United States was reliant on imports for over 50 percent of its consumption of 43 out of 50 critical minerals—and 100 percent reliant on imports for 12 of these minerals.[6] Growing geopolitical threats and increased demand for clean energy components worldwide threaten U.S. access to future critical mineral imports. Current trade restrictions, including tariffs on refined critical minerals from most countries (e.g., 5 percent ad valorem tax on Rare Earth Elements[7]), reduce cost competitiveness of domestically produced components and further exacerbate the issue.

   High-quality free trade agreements (FTAs) are essential tools for mitigating resource constraints in this area insofar as they reduce tariff barriers, minimize non-tariff barriers such as opaque regulatory requirements and ensure critical minerals are extracted and processed or recovered and recycled in compliance with fully enforceable labor and environmental standards. The Administration, in consultation with Congress, should:

   - **Review existing FTAs** to determine the extent to which they secure access to mining and processing capacity or recycled material supply crucial to the energy transition. **Where existing FTAs prove to be insufficient, the agreements should be reopened and amended** to achieve this objective.
   - **Pursue new, high-standard, enforceable FTAs, including in the Indo-Pacific region,** that contain enforceable market-access commitments, including reduced tariff bindings, clear rules of origin and high-standard investment protections to facilitate the integration of U.S. critical minerals supply chains.
   - **Build and expand pilot trusted trader programs for resource recovery trade** by leveraging ongoing work and models in international forums as well as in bilateral and regional dialogues. Ratify the Basel Convention, which will qualify the United States to receive more recyclable materials from global markets and boost the growth of a domestic recycling industry.

In the interim, while pursuing these FTAs, **policymakers should examine whether additional bilateral or plurilateral critical-minerals-specific agreements** could be negotiated with enforceable market-access commitments, environmental and labor standards, as well as provisions to limit the imposition of regulatory barriers and export restrictions that disrupt trade in this area *(see Figure 2).*

Figure 2: Potential Critical Minerals Trading Partners

These countries present an opportunity for U.S. minerals interests given existing relations, high concentrations of the world's mining production and reserves of key minerals, potential to improve environmental and labor conditions and the ability to combat growing influence from foreign competitors:

		Indonesia		South Africa	Brazil		Philippines	European Union	
Most Prominent Mineral(s)		**Nickel**	**Copper**	**Platinum Group Metals**	**Graphite**	**REEs**	**Nickel**	**Chromium**	**Cobalt**
Concentration of world production and reserve		~50% mine production ~40% processing	~4% mine production ~3% global reserves	~75% platinum mining ~90% processing	~23% global reserves	~17% global reserves	~10% mining production	~5% mining production	~15% processing
U.S. Import Reliance		>50%	41%	>50%	100%	>95%	>50%	~75%	~75%
Material Use Cases	Geothermal	✓					✓	✓	
	Solar	✓	✓				✓	✓	
	Wind	✓	✓			✓	✓	✓	
	EVs	✓	✓		✓	✓	✓		✓
	Battery Storage	✓	✓		✓	✓	✓		✓
	Hydro		✓					✓	
	Nuclear	✓	✓				✓	✓	
	H_2 Electrolysis	✓	✓	✓	✓		✓		✓
Other Considerations		Growing Chinese investment in Indonesian nickel mining and processing over the last decade.	Significant processing capacity expected to come online in 2023.				Ongoing USTDA critical minerals project with Eramen Mineral to support mineral processing standards in Philippines.	Processing is a critical step in the supply chain and is led by China for most mineral commodities (e.g., ~70% of cobalt processing)	

Note: Platinum Group Metals are iridium, osmium, palladium, platinum, rhodium and ruthenium
Source: U.S. Geological Survey, International Renewable Energy Agency, Bank of America Global Research, U.S. Trade and Development Agency, International Energy Agency

2. **Support long-term domestic mining, processing and recycling of strategic materials and critical minerals of which the U.S. has sufficient reserves (e.g., lithium, copper, graphite).**

   Domestic mining and processing capabilities for several minerals have atrophied over the past few decades, largely due to unfavorable market conditions and insufficient policy support. Metals mining in the United States decreased by around 25 percent between 1990 and 2018[8] leaving significant untapped potential in domestic resources of minerals such as lithium, copper and rare earth elements.[9] Improving the U.S. market position and the nation's ability to successfully transition to clean energy is essential.

   The United States has begun implementing policies to incentivize production of a select set of minerals and materials deemed important for national and economic security, based on the U.S. Geological Survey (USGS) list of 50 critical minerals most recently updated in 2022 and the Department of Energy's (DOE) list of critical materials, which also includes materials like silicon and electrical steel. For example, the IRAadvanced energy project credit (U.S.C. § 48C) provides a 30 percent investment credit to qualifying projects, including re-equipping, expanding or establishing facilities for processing, refining or recycling critical minerals and materials as defined by USGS and DOE.[10]

   While ongoing efforts have helped smooth regulatory hurdles (see section IV) and reduce production costs for some minerals, USGS's and DOE's existing criteria for designating minerals and materials as "critical" can fail to capture anticipated demand and omit materials that are pivotal for the energy transition (e.g., copper). The U.S. Department of the Interior, acting through USGS, and DOE should take the following actions to ensure that U.S. companies can harness the potential of domestically available mineral resources and processing operations, including downstream smelting and refining of strategic minerals:

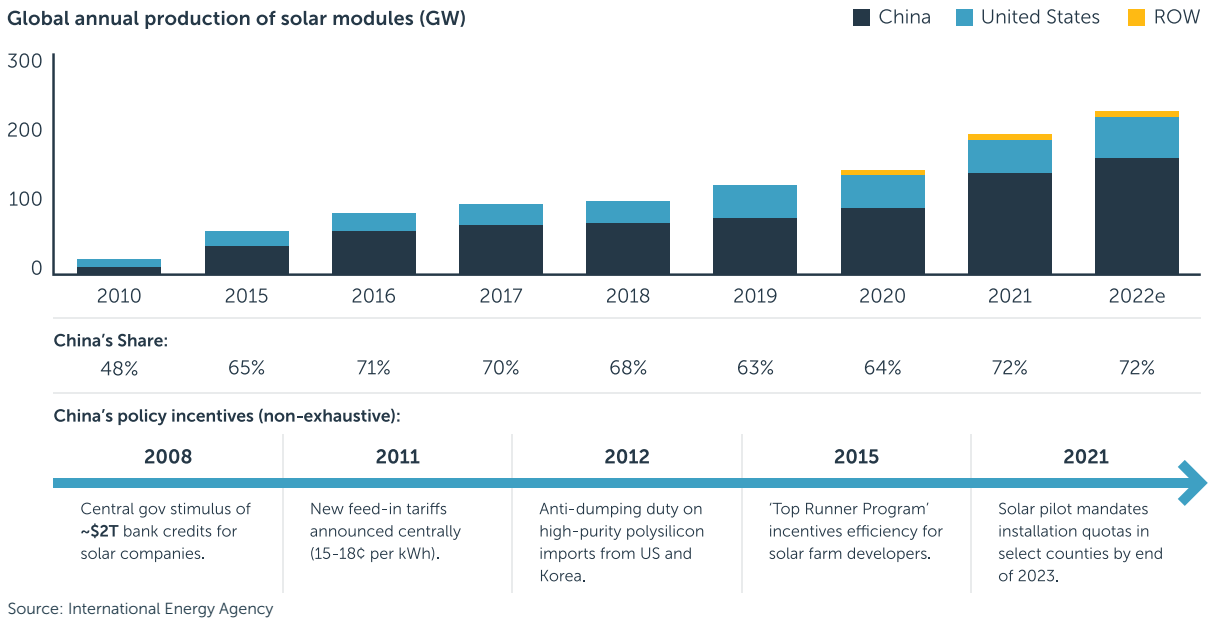
   - **Adjust the standards** used by USGS and DOE to determine mineral and material criticality and ensure both lists accurately reflect the near-term risk of anticipated supply deficits, with ample opportunity for input from stakeholders.
   - **Make official the draft list of critical materials**[11] to enable access to advanced energy project tax credits (U.S.C. § 48C) and DOE grant and loan programs.
   - **Reform the permitting process for domestic mining and processing** to make available more resources in a safe, expeditious and predictable way.
   - **Enhance capacity for critical minerals reclamation and recycling** and support research to enhance recoveries of strategic minerals and develop artificial substitutes that lessen dependence on foreign-sourced critical minerals.

II: Facilitate Competitive Domestic Manufacturing

Over the past few decades, market forces, predatory foreign government practices, dumping and lack of targeted domestic strategies have incentivized many U.S.-domiciled multinational corporations to outsource critical manufacturing capabilities. As a result, the country has fallen behind on innovation and manufacturing for several key technologies—including but not limited to those analyzed in this report—and has seen a significant decline in related domestic skilled labor. For instance, domestic solar wafer and cell manufacturing atrophied by 2020 due to price competition with Chinese companies, which benefitted from structural advantages provided by the Chinese economy and sustained government support *(see Figure 3)*.[12,13] In 2010, North America produced 4.6 percent of global solar cells and by 2021 had little to no domestic production.[14]

A predictable policy environment is essential to minimizing risk, particularly for projects with long pay-back periods. A U.S. government strategy that is consistent with U.S. free market dynamics and includes targeted incentives will help the United States continue improving its position as a leader in the energy transition and building a first mover advantage in the new wave of clean energy technologies. The United States must provide long-term certainty for clean energy investment, ensure promising new technologies receive necessary support to obtain first-mover advantage and grow critical talent pools by promoting high-quality training programs.

Figure 3: **Chinese Solar Industry Accelerated Under Government Support**



Source: International Energy Agency

Recommendations

3. **Ensure predictable, consistent regulations and policies related to clean energy development.**

   A predictable and favorable policy environment is essential to achieving U.S. clean energy potential and advancing U.S. competitiveness. A stable policy environment facilitates investment in domestic clean energy industries, including investments in emerging technologies (e.g., High-Assay, Low-Enriched Uranium, or HALEU, fuel for advanced nuclear reactors,[15] clean hydrogen storage[16]) and facilitates rapid adoption of these new technologies. Conversely, legislative and regulatory uncertainty hinders U.S. companies in their ability to execute on already high-risk projects with long payback periods.[17] Congress and the Administration should:

   - **Maintain a favorable policy environment** that will enable efficient deployment of capital towards clean energy projects and help grow domestic industries as they scale to the point of self-sufficiency.
   - Ensure implementation guidance and rulemakings related to existing policies are timely, reflect long project development timelines and preserve eligibility for a broad and diverse suite of projects.

4. **Ensure promising new technologies receive necessary support to obtain first-mover advantage and secure emerging supply chains longer term (e.g., perovskite-based solar, clean hydrogen and advanced nuclear reactors).**

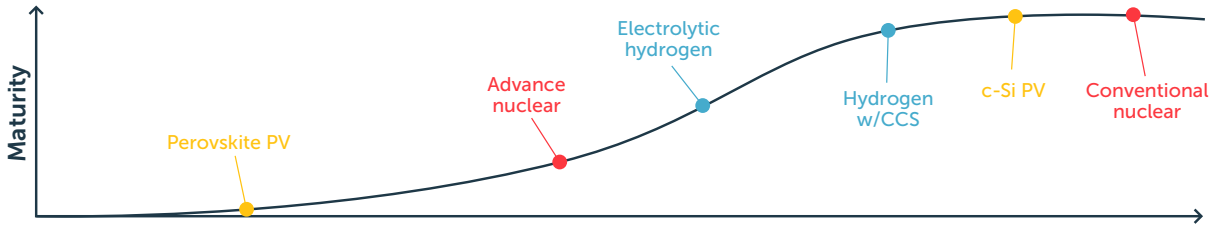
   Along with incentivizing the continued deployment of existing technologies and solutions not yet available at scale, the United States must actively support emerging technologies to solidify its position at the forefront of the new wave of technological innovation.

   Recent legislation,[3] including IIJA, establishes significant funding aimed at accelerating new clean energy technologies. For example, Congress expanded the DOE's Loan Program Office (LPO) in recent legislation, creating significant capacity for the DOE to direct funding to emerging technologies. Historically, however, authorized programs have not always been fully funded. For instance, Congress repeatedly underfunded the National Science Foundation, DOE Office of Science and the National Institute of Standards and Technology, creating a $77 billion gap between funding set out in the 2007 America COMPETES Act and cumulative funding by FY 2021.[18] More recently, while the CHIPS Act[19] created programs and funding to strengthen clean energy research and development (including $8.5 billion to support federal research, development and deployment for advanced nuclear technologies and fusion research), Congress has not fully appropriated funding for these programs.[20,21]

   Where funding is appropriated, it is rarely directed towards advancing and scaling newer technologies with longer investment horizons when more mature counterparts are in the market. Of over $10 billion granted to the LPO for solar projects, for example, no funding has gone to support perovskite, an emerging high-efficiency thin film solar panel technology.[22] Directing a share of funding to more nascent emerging technologies could help create a long-term competitive position relative to countries with substantial history of state-backed commercialization efforts (e.g., China) and solidify the United States' position at the forefront of the energy transition. Congress and the Administration should:

   - **Ensure appropriate authorizations are included** in the next budget to fund existing impactful programs fully (e.g., DOE's Loan Program Office, the CHIPS act).
   - **Direct existing and new funding towards developing, scaling and deploying more nascent emerging technologies,** including perovskite solar, clean hydrogen and advanced nuclear reactors *(see Figure 4).*

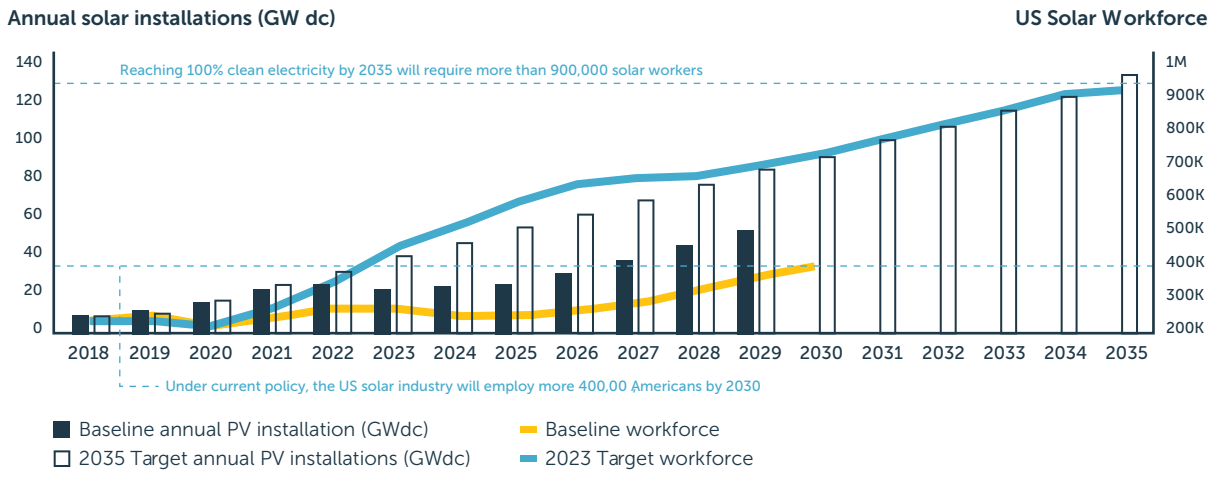
Figure 4: **Maturity Levels Of Emerging Technologies Vary, Requiring Different Levels And Types Of Government Support**



	Solar	Advance Nuclear	Hydrogen
Challenge	Majority of solar funding is deployed into c-Si PV, with **limited funding going towards R&D** for promising alternatives such as perovskite PV.	Advance nuclear reactors are ready for initial deployment, but risk of significant cost overruns remains a critical barrier to first-movers.	Thus far, guidance for qualification under 45V credit have not been published and some of those being contemplated could threatened this nascent industry's ability to scale; siting and permitting challenges could prevent the timely build-out of necessary supporting infrastructure.
Potentual Solution	Allocate/specify existing solar incentives (e.g., LPO loan guarantees, national lab programs) towards **R&D for c-Si alternatives.**	Reduce risk for first-of-a-kind projects, including by authorizing DOE to provide cost overrun insurance above a certain cost threshold.	Publish rules for 45V that incentivize broad deployment of clean hydrogen; address permitting challenges.

5. **Modernize America's workforce development system and employment-based immigration systems to meet employers' needs for skilled workers in high-demand careers.** To sustain a leadership position in the energy transition and effectively meet clean energy demand growth, the United States must rapidly develop and grow its skilled labor pool. For example, the Administration's 100 percent clean energy target and the associated policy support is expected to drive growth in the solar energy industry that will require almost 4 times its current workforce by 2035 *(see Figure 5).*[23]

Figure 5: **U.S. Solar Workforce Demand**



Source: International Renewable Energy Council

The United States must improve its workforce development system to better prepare workers for in-demand careers and strengthen the country's ability to competitively transition to low-carbon energy. This can be achieved by empowering states to structure workforce systems that meet their economic needs and deliver for workers; promoting high-quality, relevant employer-driven training programs, including apprenticeships, on-the-job training, internships and other forms of work-based learning; and giving workers more freedom and flexibility to get the training they need for fulfilling careers.[24] In particular, the employer-driven training model provides the market with flexibility optimally to align training programs to specific industry needs to address pressing and evolving domestic workforce concerns. Specifically, policymakers should:

- **Revise the Registered Apprenticeship Program,**[25] run by the Department of Labor, to align with evolving workplaces, occupations and career pathways.
- **Modernize the Workforce Innovation and Opportunity Act,**[26] the cornerstone of the public workforce development system, to direct more resources to training programs that meet states' regional workforce needs; to support sector-based partnerships and expand community colleges' and other high-quality providers and workforce partners' ability to work with employers; and to give workers more options to enroll in employer-driven training programs, including by expanding eligible uses of individual training accounts to upskill incumbent workers if their current job is in jeopardy due to technology or automation shifts and removing unnecessary limitations on the use of funds for on-the-job training.
- **Swiftly pass legislation**[27] to expand Pell Grant eligibility to high-quality short-term training programs, increasing the number of students and workers who can afford workforce-oriented, skills-training that leads to in-demand careers.
- **Reform the employment-based immigration system by, for example,** increasing annual limits and eliminating per-country limits, allowing temporary workers to remain in the United States if caught in the backlog and removing barriers to retaining foreign-born graduates of U.S. colleges and universities, to establish a resilient U.S. workforce and build the innovative and globally competitive economy of the future.

III: Support Reliable Component Imports Where Necessary

Securing long-term economically competitive offtake of clean energy components requires cooperation across jurisdictions. Narrow supplier bases for clean energy components put the entire value chain and transition at risk. For example, the shortage of high-voltage direct current (HVDC) converters limits the grid and renewable energy generation transformation underway. Building and expanding capacity in allied countries that have competitive market conditions and manufacturing capabilities will ensure long-term access to key components. To do so, the United States should enact broad eligibility requirements for clean energy tax incentives.

> "We *can't onshore everything,* our company and assets are global, and we *match our supply chain across the globe where there's the right infrastructure, materials and people* .... We need to *focus on cost competitiveness.*"
>
> **— Critical Minerals Lead, BRT Member Company**

Recommendations

6. **Broaden the geographic eligibility criteria for domestic production incentives to secure long-term access to critical components.**

   The recently enacted clean energy incentives contain several provisions that incentivize onshoring or near-shoring manufacturing for a specific list of clean energy components. For example, the advanced manufacturing production tax credit (26 U.S.C. § 45X) provides an incentive for eligible components produced *within the United States.*[28] However, not all components critical to U.S. clean energy buildout are able to be built in these regions or recognized as eligible for the incentives.

   Manufacturing location requirements and inadequate component eligibility will impede U.S. ability to progress as a leader in the energy transition. For example, the advanced manufacturing production tax credit is limited to production of only solar energy components, wind energy components, inverters, qualifying battery components and applicable critical minerals.[29] Geographic limitations in current policy will also hinder U.S. ability to secure access to components such as HVDC converters, which are almost entirely produced abroad, in an economically viable way in the short-term while domestic capabilities are being developed.[30] Adjusting eligibility requirements for both manufacturing locations and qualifying components will help secure long-term access to critical clean energy components from regions with competitive

manufacturing conditions. Some eligibility changes can be accomplished by using Treasury guidance to interpret terms like "free trade country" and "eligible components" more broadly. Other provisions, including those that require manufacturing to occur within the United States, require longer-term statutory change. To address these issues, the Treasury Department and other relevant agencies should:

- **Expand the definition of "eligible components"** to include additional clean energy technology inputs and ensure crucial inputs for clean energy infrastructure qualify for tax credits (e.g., permanent magnets for EV motors, HVDC converters).
- **Extend eligible manufacturing locations,** for clean energy tax incentives to U.S. companies manufacturing in, or procuring from, free-trade and other non-comprehensive trade agreement countries (e.g., Japan, EU).[31]

IV: Effectively Deploy And Connect Key Technologies

The United States has invested billions of dollars into clean energy infrastructure over the last decade. Modernizing the electric grid is important to the clean energy transition and can make the grid more resilient and reliable. However, regulatory and jurisdictional complexity and legal delays during the planning and permitting processes have slowed deployment *(see Figure 7)*. To build clean energy infrastructure, attract investments and solidify the United States' position as a leader in the energy transition effectively, Congress and the Administration must **build on recent progress to streamline the planning and permitting processes** while continuing to protect the environment.

Figure 7: Significant Delays In Permitting Causes Major Transmission Grid Backlogs

Major grid projects require permits from local, state and federal governments and agencies before they can break ground. Requirements such as Environmental Impact Studies (EIS) serve an important purpose but are poorly managed and can be more burdensome and time consuming than necessary, with the average EIS alone comprising over 650 pages, taking about 4.5 years to complete and costing over $1 million.

Idaho Power transmission line:

- In 2008, Idaho Power began applying for permits for a **290-mile transmission line** connecting Idaho to Oregon.
- The Bureau of Land Management finished its environmental review **9 years later**, in 2017.
- The project still awaits separate permits from the **EPA** (federal wetlands permit) and **Owyhee County, Idaho.**

Source: Route Fifty, Brookings Institution

Recommendations

7. **Support ongoing efforts to streamline planning and permitting to facilitate efficient deployment of pivotal clean energy projects (e.g., judicial review reform and prioritization of key projects, including brownfields)** Administrative delays, insufficient staffing resources and overly complex review scopes contribute to lengthy delays in federal regulatory reviews and significant clean energy backlogs. For example, from 2010 to 2018, it took an average of 4.5 years to complete an Environmental Impact Study (EIS) and issue a Record of Decision.[32] If implemented appropriately, recent policies including provisions in the IIJA[33] and the Fiscal Responsibility Act,[34] will help speed up clean energy projects.

Key permitting provisions within the Fiscal Responsibility Act41 (June 2023):

- Designates a single ***lead federal agency*** and concurrent reviews.
- Requires a ***single*** environmental review document.
- Requires agencies to evaluate ***foreseeable environmental consequences*** of project proposals.
- Institutes a ***150-page limit*** for Environmental Impact Study (EIS) documents or 300 pages for proposals of exceptional complexity.
- Creates a ***public schedule*** for completion of reviews (e.g., 2-year limit for EIS).
- Requires the Council on Environmental Quality (CEQ) to conduct a study about the potential benefits of ***digitization*** (online portal).
- Commissions FERC to study transfer capabilities and ***interregional connectedness of the grid.***
- Amends the list of ***"covered projects"*** under FAST-41 to include energy storage.

Additional permitting reforms are needed to maximize the impact of government incentives and quickly deploy critical mineral and clean energy infrastructure that will take time to construct and scale up. For instance, the only applicable statute of limitations that applies to all National Environmental Policy Act (NEPA) reviews is the general six-year limit as defined by 28 U.S.C. § 2401;[35] litigation can therefore lead to lengthy court delays or sometimes even entirely block critical additions to U.S. clean energy infrastructure. Suggested improvements for future permitting reform (outlined below) will facilitate U.S. clean energy buildout and bolster domestic clean energy capacity.

Potential improvements for future permitting reform:

- **Litigation reform:**
  - Shorten the statute of limitations to 150 days for legal challenges to federal decisions.
  - Limit standing to qualifying parties (e.g., parties that have participated in the NEPA review process, engaged with communities and affected parties, and have reached out as early as possible).
- **Shorten decision timelines:**
  - Require agencies to issue final decisions within 90 days of completing EIS.
  - For remanded or vacated permitting decisions, require accelerated timelines.
  - Reduce or eliminate redundant reviews by acknowledging state programs.
- **Allocate necessary resources:**
  - Ensure funding (e.g., from IIJA) is deployed to ensure agencies have the tools needed to implement timely permitting programs.
- **Support digitization:**
  - Support implementation of a centralized digital system for agencies to streamline permitting processes (following CEQ completion of study).
  - **Support the Federal Energy Regulatory Commission (FERC) and transmission operator efforts to** improve management of the interconnection application queue and interregional transmission planning, particularly as they relate to adding clean energy projects to the grid.
- **Differentiate and prioritize projects:**
  - Differentiate permitting requirements for projects in areas with ongoing operations and community support (e.g., brownfield sites for mining and processing).
- **Streamline processing requirements:**
  - Remove duplicative requirements across agencies / jurisdictions.

Conclusion

The accelerating transition to clean energy is putting pressure on global supply chains. To maintain and extend its leadership in clean energy manufacturing and the deployment and adoption of clean and advanced energy solutions at scale, the United States must act decisively and strategically to improve the security, resilience and efficiency of energy and technology supply chains.

While many clean energy technologies face obstacles to development and deployment at scale, those examined in this report—solar panels, the transmission grid, nuclear energy and clean hydrogen—face the most significant near-term supply chain issues and require action from Congress and the Administration to:

1. Ensure access to critical minerals and materials by strengthening strategic international alliances and expanding domestic production, processing and recycling capacity;
2. Facilitate competitive domestic manufacturing by ensuring the broad applicability of relevant tax incentives, providing sufficient support to promising new technologies and modernizing the U.S. workforce development system;
3. Support reliable component imports where necessary by securing long-term access to critical components; and
4. Deploy and connect key technologies by streamlining planning and permitting processes.

Addressing global climate change and building sustainable and resilient energy systems will require investments in a diverse suite of technologies and energy sources that are not covered in this report—including carbon capture, wind energy, etc.—each of which faces its own challenges. However, in addition to supporting policies that promote the accelerated deployment of these and other technologies with high emissions reduction potential, Business Roundtable believes the actions outlined in this report are urgently needed to establish a strong foundation for U.S. leadership in alternative energy technologies and a successful clean energy transition.

Endnotes

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