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# 100% CES Challenges

- States with 100% CESs face unique challenges, in particular, as they expand past 80% clean energy
- Key challenges include:
  - Siting and Permitting Delays
  - Expanding Transmission
  - Need for Increased Storage (Long-Duration)
  - Supply Chain Constraints
  - Ensuring an Equitable Transition
- In this section we summarize these challenges, examples of how states have addressed them on their own, where possible, and the state role in accessing federal provisions that address these challenges.

# Cross-cutting concerns

- Social acceptance of accelerating the transition: Exacerbates other challenges
  - Nuclear, ground-mount solar on certain lands
  - Place attachment
  - Local context
  - Fairness and trust/community concerns
- These issues can impact siting and permitting, expanding transmission, and implementing an equitable transition

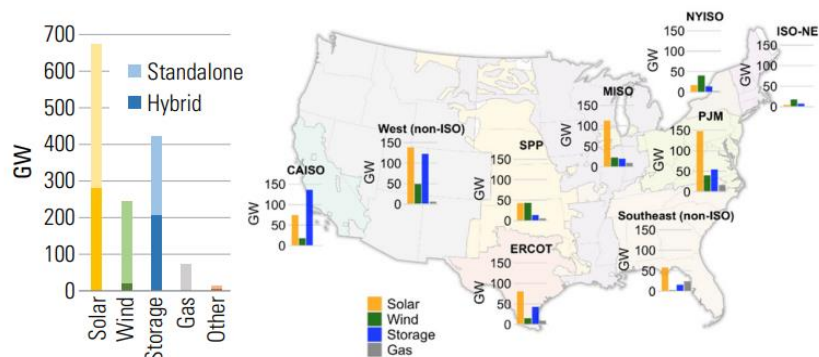
# Challenge 1: Siting & Permitting Delays

- States have authority in some siting and permitting processes<sup>1</sup>
  - State-level: AK, CT, KS, LA, ME, MD, NJ, OR, VT, & WI: Sole authority can have delays and backlash
  - Hybrid: 19 states with state oversight for larger projects. Needs guidance from state leaders to meet targets but can add to bureaucracy.
- Federal provisions:
  - [Transmission Siting and Economic Development Grants Program](#): Grants to siting authorities for analysis and examination of alternative siting corridors and other measures to reduce time in siting and permitting.
- States have begun addressing siting and permitting challenges. For example:
  - Washington's [HB 1812](#): Separates energy siting commission from PUC; adds additional requirements
  - California's [AB 205](#): Changes to clean energy permitting
  - New York's [A9508-B](#): Created Office of Renewable Energy Siting (ORES)
  - States can also be direct recipients of the Transmission Siting and Economic Development Grants Program

# Challenge 2: Expanding Transmission

- Transmission expansion is needed to unlock full IRA benefits
  - Recent expansion rate  $\sim 1\%/yr$ ; over 80% of emission reductions from IRA by 2030 are lost<sup>2</sup>;
  - Need to more than double to reach 2030 goals
- Federal provisions (BIL & IRA)
  - [Transmission Facilitation Program](#) : Construction of transmission lines
  - [Transmission Facility Financing](#): Construction/modification of transmission facilities designated to be in national interest
- States' role
  - Coordination among key stakeholders: Regional planning organizations, grid operators, utilities, states, non-governmental organizations, and the private sector

**Figure 1.** Power Plants Seeking Transmission Connection by Type (left) and Mapped to Region (right)



Notes: (1) Hybrid plants are those paired with one or more other type of generation or storage. (2) Data for Alaska and Hawaii were not collected. Represents queues as of the end of 2021.

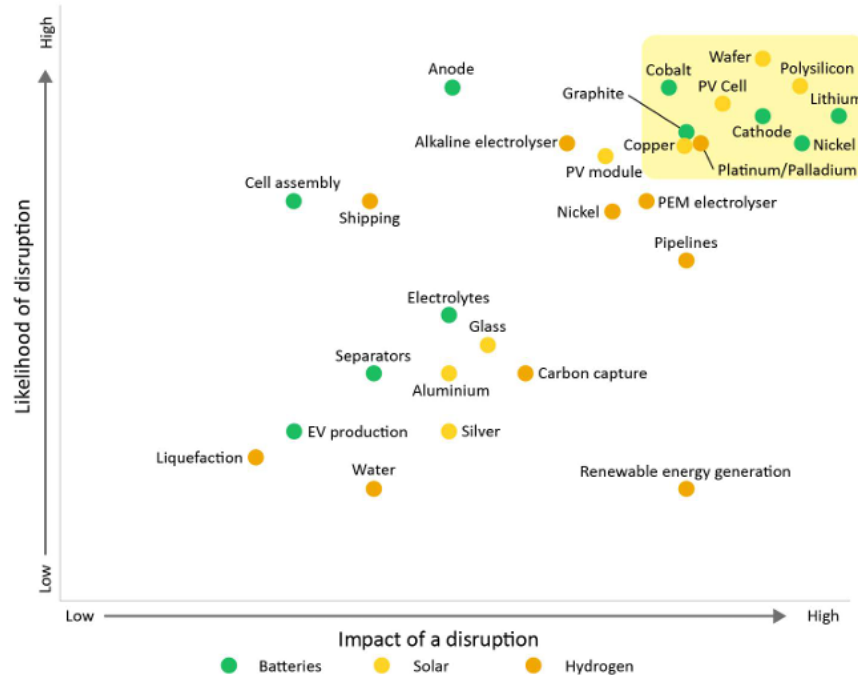
Rand et al. 2022. "Queued Up: Characteristics of Power Plants Seeking Transmission Interconnection As of the End of 2021." Berkeley Lab.

# Challenge 3: Need for Increased Storage (Long-Duration)

- Storage capacity will need to increase dramatically
  - Current: Over 30 GWh of battery technologies across the globe; 160 GW of long-duration energy storage provided by hydropower (Pumped storage)
  - Need to grow to **~2,500 GWh** in under a decade to reach 2050 net-zero emissions goal
- Federal provisions (BIL & IRA)
  - [Long Duration Energy Storage for Everyone, Everywhere Initiative](#): Lowering costs and increasing the duration of energy storage resource.
  - [Clean Energy Financing](#): Loan guarantees open to clean energy technology categories, including critical minerals processing
  - [Energy Infrastructure Reinvestment Financing](#): For retooling, repurposing, or replacing energy infrastructure
- States' role
  - Clean Energy Financing when combined with financial support from state energy financing institution (SEFI) are exempt from innovation requirements

# Challenge 4: Supply Chain

- Supply chain constraints exist already
  - Pandemic-related disruptions have increased cost of materials and energy
  - As strong as the weakest link
- Federal provisions: IRA
  - Production Tax Credits, Investment Tax Credits
- States' role
  - Investing in domestic manufacturing
  - Help build resilient supply chains



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# Challenge 5: Ensuring an Equitable Transition

- Energy Justice
  - Disproportionate impacts of clean energy plans<sup>3</sup> : Recognition, distributive and procedural justice
- Federal provisions (IRA)
  - [Several categories](#): Access to clean energy, EVs, Financing GHG reductions, environmental and climate justice block grants, etc.
- States' role
  - States have addressed equitable transitions, for example: [Maine](#) identifies higher energy burden for low-income households and [North Carolina](#) addresses the barriers to adoption of clean energy by LMI households.
  - Share knowledge on Community Benefit Plans with stakeholders
  - States can combine IRA provisions for both direct and indirect benefits to use toward achieving equity

Equitable Policy Design	Highlights and Priorities
1. Ensure equitable access to economic benefits and opportunity by empowering communities.	Support participatory processes, direct funding, removal of barriers to autonomy and independence and greater access to processes and decisions.
2. Ensure universal and equitable access to affordable remote service options.	Efforts must be expanded to develop affordable, quality broadband, including in rural and under-resourced areas.
3. Center program design on reduction of energy cost burdens.	Reduce home energy and transportation costs for highly impacted populations by focusing on cost burden as a metric in planning.
4. Incorporate health disparity metrics into energy planning.	Improve health and safety, safeguard against health and safety risks and improve access to the physical, service and social conditions linked to health and well-being by operationalizing a health disparity metric in energy planning. <sup>23</sup>
5. Increase resilience and energy sovereignty for Tribes and energy independence for vulnerable communities.	Support the efforts of communities especially prone to instability from climate change and other natural disasters, such as communities located in the Cascadia Subduction Zone and wildfire prone areas and communities impacted by fossil fuels. <sup>24</sup>
6. Address procedural inequities in program design and prioritize equitable development.	Perhaps the most significant combined equity-and-energy gains can be made through planning. The state has an opportunity to help guide clean and equitable development of programs and funding that support development.
7. Address nexus issues of affordable housing, livable communities and displacement in energy policy.	Work with housing policy experts to address unhoused and displaced communities through energy policy design, especially focusing on cost burdens.

Source: Washington State Department of Commerce



# Resources

- [NREL: The challenges of achieving a 100% renewable electricity system in the United States](#)
  - Summary: [On the Road to 100% Clean Electricity: Six Potential Strategies To Break Through Last Few Percent](#)
- DOE: [On The Path to 100% Clean Electricity](#)



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# Discussion Questions

- How is your state refining its RPS or CES in response to new federal policy?
- Does our framework capture activities happening in your state?
- What new technologies are under consideration in your state? E.g. green hydrogen, long-duration storage.
- What challenges to 100% CES is your state best prepared to address currently? How will BIL and IRA help?
- What other support from DOE or the Federal government would be helpful as your state moves forward with its 100% CES?