California State Assembly

UTILITIES AND ENERGY

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BACKGROUND

Wednesday, February 18, 2026
1:30 p.m.
State Capitol, Room 437

Assessing Progress in Developing Clean Energy

Findings

- *Gaps in coordination across agencies and jurisdictions create challenges, as developers and utilities must navigate multiple permitting authorities, transmission upgrades, and interconnection requirements without a unified process. This fragmentation slows decisions and project timelines, which, due to federal tax rules, changes cannot afford to be delayed.*

- *As federal clean-energy tax credits approach eligibility deadlines, both Pacific Gas & Electric (PG&E) and Southern California Edison (SCE) indicate that delays in transmission and interconnection are making it difficult for otherwise ready projects to move forward on schedule.*

- *State clean energy planning timelines and federal incentive deadlines are not yet fully aligned with how projects move forward in practice. Local permitting capacity, site-specific land use issues, and community review processes can extend timelines beyond those assumed in planning and federal eligibility windows, underscoring the need for cross-agency coordination and near-term implementation actions.*

The Investment Tax Credit (ITC) and Production Tax Credit (PTC) represent the most significant federal policy tools for accelerating the transition to clean energy, providing both immediate financial relief and long-term market signals that enable developers to plan and execute projects at scale. These credits substantially reduce financial barriers to entry, making clean energy projects economically viable by offsetting initial capital costs (ITC) or providing predictable per-kilowatt-hour revenue (PTC) for the first ten years of operation. For developers, this enables the build out of projects that would otherwise be financially infeasible.

Following the passage of H.R. 1 (119th Congress)[1] on July 4, 2025, the timeline for ITC and PTC eligibility for clean energy projects – specifically solar and wind projects – was dramatically compressed. Solar and wind projects must now either begin construction no later than July 4, 2026, or – if that window is missed – be placed in service by December 31, 2027, to remain eligible for federal tax credits. For projects that begin construction before July 4, 2026, they must still demonstrate "continuous construction" to qualify for the ITC under longstanding Internal Revenue Service (IRS) guidance. A project is deemed *continuous* if it is placed in service within four calendar years of the year construction began. So, a project that begins

[1] https://www.congress.gov/bill/119th-congress/house-bill/1

construction in 2025 must be placed in service by December 31, 2029, and a project that begins construction in 2026 (before July 4) must be placed in service by December 31, 2030. For project developers that were counting on these ITC or PTC tax credits to make their projects financeable, these new timelines have effectively established a 4-year development sprint.

Without the ITC or PTC, the user cost of capital for investments in wind and solar could be up to 70% higher in 2025 and 2026, according to Congressional Budget Office estimates.[2] The Levelized Cost of Energy (LCOE) – i.e., the "all-in" average price per unit of electricity that a power plant needs to charge over its lifetime to break even – also increases substantially, with the PTC reducing the LCOE for onshore wind by 20-35%[3] and the ITC is reducing the LCOE for photovoltaic solar by approximately 15%.[4] Without these credits, project costs could escalate dramatically – and be passed through to ratepayers – or contracts may be renegotiated or cancelled entirely. These federal tax changes are already playing out in resource selection modeling at the California Public Utilities Commission (CPUC), where the CPUC's recent proposed decision on resource procurement for transmission planning (in the 2029-2032 cycle) reduced the amount of onshore, in-state wind by 5.3 gigawatts (GWs), a dramatic change largely justified by the loss of federal tax credits for these projects.[5]

Recognizing that these federal tax changes threatened project viability through potential cancellations and cost increases, Governor Newsom signed Executive Order N-33-25 in August 2025,[6] directing California energy agencies and the California Independent System Operator (CAISO) to prioritize actions within their purview to support projects capturing expiring federal tax credits. The EO asked these energy entities to identify at-risk projects and find opportunities to support streamlining efforts to accelerate their project development. A summary of actions by a joint-entity group – the "Energy Working Group" – was due November 27, 2025. While agencies and the CAISO have led workshops and instituted streamlining (as discussed in more detail below), the comprehensive report from the Energy Working Group is still outstanding or otherwise not publicly available.

The purpose of this hearing is to review California's progress in developing clean energy following recent federal actions and the all-of-government response spurred by Executive Order N-33-25. California's clean energy buildout faces a critical deadline. Federal tax law changes mean that projects beginning construction before July 2026, must be placed in service by December 31, 2029, (for 2025 starts)[7] to qualify for tax credits worth billions of dollars. Missing these deadlines threatens project cancellations, results in cost increases of 15-35%, and poses potential loss of financing – jeopardizing California's ability to meet its climate goals while maintaining grid reliability and affordability. This hearing will review California's response to recent federal actions, including tariff changes, funding uncertainty, and compressed tax incentive timelines that have upended project economics and development schedules. While the Executive Order directed agencies and CAISO to report on implementation, that report has not yet been released. This hearing gives the Committee an opportunity to assess current progress, identify remaining bottlenecks, and demand concrete actions to ensure projects stay on track to meet 2029/2030 in-service deadlines. The state cannot afford delays – billions in investments and thousands of jobs are potentially at risk.

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[2] Figure 3, pg. 16, Congressional Budget Office, *Business Tax Credits for Wind and Solar Power*, April 2025; https://www.cbo.gov/publication/61329

[3] Table A1a, pg 17, U.S. Energy Information Administration, "Levelized Costs of New Generation Resources in the *Annual Energy Outlook 2022*," March 2022; https://www.eia.gov/outlooks/aeo/pdf/electricity_generation.pdf

[4] Lazard's Levelized Cost of Energy Analysis – Version 17.0, June 2024; https://www.lazard.com/media/xemfey0k/lazards-lcoeplus-june-2024-_vf.pdf

[5] Compare the January 14, 2026, proposed decision in R. 25-06-019 with the CPUC's D. 25-02-026. https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M595/K083/595083681.PDF

[6] https://www.gov.ca.gov/wp-content/uploads/2025/08/Clean-Energy-EO_8.29.25_Formatted.FINAL_ATTESTED.pdf

[7] or December 31, 2030, (for 2026 starts)

I. Recent Federal Changes Impacting Project Development

Federal Tax Credits for Clean Energy. Tax incentives for renewable energy in the United States have existed for more than four decades, beginning with the ITC[8], established in 1978 to support energy alternatives following the 1970s oil embargo.[9,10] Since then, these incentives have primarily taken the form of either the ITC, which applies to eligible capital investment costs, or the PTC,[11] which is calculated based on the amount of electricity generated. The PTC, enacted under the Energy Policy Act of 1992,[12] has primarily supported wind projects, while the ITC has mainly supported solar projects, reflecting their differences in generation profiles.[13] As part of subsequent refinements to federal energy tax policy, Congress passed the Energy Policy Act of 2005, which increased the ITC for eligible solar installations from 10 percent to 30 percent. This expansion reduced upfront project costs and has been widely credited with supporting the significant expansion of solar capacity nationwide.[14]

In August 2022, Congress enacted the Inflation Reduction Act (IRA),[15] which significantly restructured clean energy tax credits. Some of the key changes include:

- Replacing the existing ITC and PTC with technology-neutral clean electricity credits and extending their availability through 2032, or until specific emissions-reductions are met;

- Allowing the credits to be transferred and, for certain entities, made refundable, hence expanding access beyond traditional tax-equity capital structures;

- Establishing "bonus" credit amounts to incentivize the use of domestic content and the siting of projects in designated communities, and for certain credit projects located in environmental justice communities.

Several bonus credits can apply to a single project, allowing projects that meet more than one eligibility to receive more total credits, in some cases, offsetting approximately 60 to 70% of eligible project costs.[16] The

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[8] The ITC allows a project sponsor to earn a percentage-based tax credit for capital invested in qualified clean energy property. A project sponsor is the entity that owns the project at the time the credit is claimed and may include the original developer, a utility, an independent power producer, or a holding company.
[9] Congressional Research Service, Energy Tax Policy: History and Current Issues (October 30, 2008), https://www.everycrsreport.com/reports/RL33578.html
[10] Lips, Brian. *"The Past, Present, and Future of Federal Tax Credits for Renewable Energy."* NC Clean Energy Technology Center, November 19, 2024. https://nccleantech.ncsu.edu/2024/11/19/the-past-present-and-future-of-federal-tax-credits-for-renewable-energy/
[11] The PTC, which has been modified several times, allows a facility owner to earn a production-based tax credit tied to the amount of electricity generated by a qualifying facility. The credit is earned annually, based on kilowatt-hours of electricity produced, for the first ten years after the facility begins commercial operation, and has applied to technologies such as wind, biomass, geothermal, solar, hydropower, municipal solid waste, and marine or hydrokinetic energy.
[12] Enacted in 1992, the Energy Policy Act of 1992 created the Production Tax Credit (PTC), a federal tax credit calculated on a per-kilowatt-hour basis for electricity generated and sold by qualifying renewable energy facilities
[13] Wind projects generate electricity at varying levels depending on wind conditions, making production-based incentives more appropriate. Solar projects require higher upfront investment and produce electricity in a more predictable daily pattern, making incentives that reduce initial construction costs more beneficial.
[14] Jay Bartlett, "*Beyond Subsidy Levels: The Effects of Tax Credit Choice for Solar and Wind Power in the Inflation Reduction Act";* December 12, 2023, https://www.rff.org/publications/reports/beyond-subsidy-levels-the-effects-of-tax-credit-choice-for-solar-and-wind-power-in-the-inflation-reduction-act
[15] The Inflation Reduction Act of 2022 is a comprehensive federal legislative package that provides tax credits, loans, and grants to support the transition to a low-carbon economy, with significant emphasis on clean electricity generation, energy storage, electric vehicles, manufacturing, and energy efficiency. The Act authorizes approximately $369 billion in climate- and energy-related federal support over a ten-year period, primarily through tax incentives, many of which are non-capped and therefore driven by market uptake rather than fixed appropriations. Federal agencies and independent analysts estimate that the Act's provisions could reduce U.S. greenhouse gas emissions by roughly 40 percent below 2005 levels by 2030, relative to baseline projections.
[16] Jay Bartlett, *Beyond Subsidy Levels: The Effects of Tax Credit Choice for Solar and Wind Power in the Inflation Reduction Act; December 2023;* https://www.rff.org/publications/reports/beyond-subsidy-levels-the-effects-of-tax-credit-choice-for-solar-and-wind-power-in-the-inflation-reduction-act

IRA also created the Clean Electricity Investment Credit and the Clean Electricity Production Credit for qualifying clean electricity and energy storage facilities that begin operation after December 31, 2024, and meet a greenhouse-gas emissions-rate standard specified in federal tax law. This change expanded eligibility beyond specific technologies and aligned federal incentives more closely with emissions performance rather than resource type.

Prior to the IRA, expiration timelines for the ITC and PTC generally limited credit availability, as eligibility depended on requirements that varied by technology between 2006 and 2024.[17,18] Several technologies were also subject to credit phase down schedules that reduced the credits available. Given that energy projects often require several years to progress from planning phase through financing to construction, this approach limited the extent to which projects could benefit from the credits. Therefore, developers seeking financing faced uncertainty about eligibility, even while the credits were in effect. Historically, the effectiveness of these credits was also limited by the need for recurring short-term and retroactive legislative extensions—the legacy PTC was extended 12 times between 1992-2020 and allowed to expire seven of those times, creating uncertainty for developers.[19] The IRA addressed this by providing long-term stability through at least 2035.

If implemented as designed, these tax incentives can potentially reshape clean energy financing. For instance, the Joint Committee on Taxation and the Congressional Budget Office estimated that the IRA would result in approximately $391 billion in climate-and energy-related spending and tax expenditures. By contrast, private financial forecasts, assuming broad use of the credits, estimate that total federal support could reach approximately $1.2 trillion and with the incentives supporting roughly $3 trillion in additional private capital investment over time.[20] As such, California was expected to capture a significant share of the IRA's clean energy tax incentives, particularly for solar, energy storage, clean electricity generation, and related infrastructure such as transmission. The extent to which federal incentives translate to investments and emission reductions depend on whether California addresses persistent challenges, such as interconnection delays, transmission availability, and permitting complexities.

***Standing on Shaky Ground*.** After the IRA expanded and extended these largely uncapped tax credits in 2022, subsequent federal legislative efforts sought to reassess their duration and cost. As mentioned earlier, analyses by the Congressional Budget Office and the Joint Committee on Taxation estimated the cost of the IRA's energy-and climate-related tax credits and spending at approximately $391 billion over a ten-year period, including approximately $121 billion in direct spending and $271 billion in tax credits. This made them a sizable pool of financing to redistribute to other priorities under a new federal administration.

As such, in July 2025, Congress introduced H.R.1 – commonly referred to as the "One Big Beautiful Bill (OBBB)"[21] – as a budget reconciliation measure proposing changes to the clean electricity tax credits expanded and restructured under the IRA. The legislation proposed to tighten eligibility timelines for certain facilities, particularly wind and solar, by narrowing the period during which projects could qualify for the credits. Rather than repealing the credits or altering their rates, the bill focused on statutory construction-start and operation-related deadlines as the basis for eligibility.

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[17] Samantha Strimling, Inflation Reduction Act Clean Energy Tax Credits, Environmental & Energy Law Program, Harvard Law School, November 20, 2023; https://eelp.law.harvard.edu/clean-energy-tax-credits-changes-made-by-the-inflation-reduction-act/
[18] Ryan Wiser, Mark Bolinger, and Galen Barbose, Using the Federal Production Tax Credit to Build a Durable Market for Wind Power in the United States, The Electricity Journal, vol. 20, no. 9 (November 2007); https://www.sciencedirect.com/science/article/abs/pii/S1040619007001170
[19] Brian Lips, "The Past, Present, and Future of Federal Tax Credits for Renewable Energy," NC Clen Energy Technology Center, November 19, 2024; https://nccleantech.ncsu.edu/2024/11/19/the-past-present-and-future-of-federal-tax-credits-for-renewable-energy/
[20] Goldman Sachs Research, The U.S. Is Poised for an Energy Revolution; Goldman Sachs, April 2023; https://www.goldmansachs.com/insights/articles/the-us-is-poised-for-an-energy-revolution
[21] H.R. 1, 119th Cong., Pub. L. No. 119-21, 139 Stat. 72 (2025)

With federal eligibility deadlines in place, the U.S Department of the Treasury and the IRS issued implementing guidance, including IRS Notice 2025-42,[22] clarifying how projects must demonstrate compliance with federal timing requirements for purposes of claiming the tax credits. Projects must demonstrate significant construction work by July 4, 2026, to remain eligible for the credits, consistent with statutory requirements. Projects that do not meet the requirement to have begun construction by the applicable deadline are generally required to be in operation by December 31, 2027, to qualify. In effect, eligibility depends on compliance with the construction-start or in-service deadline.

However, those grandfathered projects still need to demonstrate "continuous construction" to qualify for the ITC under longstanding IRS guidance. The continuity safe harbor provides that a project is automatically deemed continuous if it is placed in service within four calendar years of the year construction began. So a project that begins construction in 2025 must be placed in service by December 31, 2029, and a project that begins construction in 2026 (before July 4) must be placed in service by December 31, 2030. Projects that miss the four-year window aren't necessarily disqualified — they can still try to prove continuous construction on a facts-and-circumstances basis — but that's a less certain path. Additionally, the July 7, 2025, federal Executive Order directing Treasury to "strictly enforce" the termination of Sections 45Y (PTC) and 48E (ITC) for wind and solar has raised concerns that forthcoming IRS guidance could tighten the beginning-of-construction rules or the continuity safe harbor itself.

The law also introduced stringent "material assistance" restrictions that deny the ITC and PTC to any facility that received support from a sanctioned or foreign entity of concern after December 31, 2025, with compliance requirements that trace the origin of individual subcomponents and critical minerals throughout the supply chain. Notably, the accelerated phaseout does not apply uniformly: nuclear, geothermal, energy storage, and hydropower projects retained their original IRA timelines, and the zero-emission nuclear production credit under Section 45U was actually extended through 2031.[23] The net effect of H.R. 1 is a sharp narrowing of ITC and PTC eligibility that most acutely targets wind and solar projects while preserving incentives for other clean energy technologies.

The Tariff Ripple Effect: Additional Cost Increases to Customers. Beginning in early 2025, the Trump Administration implemented tariff-related changes under existing federal trade authorities affecting imports of steel, aluminum, copper, and certain critical minerals. The tariffs on steel and aluminum imports increased from 25% to 50% for most trading partners beginning in June 2025, along with the initiation of separate trade investigations examining imports of copper and certain critical minerals.[24,25,26] These metals are essential for electricity infrastructure, electric vehicles and data centers. Within the electricity sector, steel and aluminum provide support for structural components of transmission towers and substations, while copper is used for wiring, and transformer windings. Additionally, minerals such as lithium, cobalt, graphite, and manganese are essential for battery cells, and associated power electronics in energy storage and

[22] Internal Revenue Service, *Notice 2025-42: Beginning of Construction for Clean Electricity Production and Investment Credits;* U.S. Department of the Treasury, August 2025, https://www.irs.gov/pub/irs-drop/n-25-42.pdf

[23] Laurie Abramowitz, et al., "From IRA to OBBBA: A New Era for Clean Energy Tax Credits," *Arnold & Porter Advisory*, July 22, 2025; https://www.arnoldporter.com/en/perspectives/advisories/2025/07/from-ira-to-obbba-a-new-era-for-clean-energy-tax-credits

[24] *Fact Sheet: President Donald J. Trump Increases Section 232 Tariffs on Steel and Aluminum*, White House, June 3, 2025 (announcing an increase in steel and aluminum tariffs from 25 percent to 50 percent for most trading partners beginning in June 2025); https://www.whitehouse.gov/fact-sheets/2025/06/fact-sheet-president-donald-j-trump-increases-section-232-tariffs-on-steel-and-aluminum/

[25] David Lawder, Andrea Shalal, "Trump orders new tariff probe into U.S. copper imports," *Reuters*, February 25, 2025; https://www.reuters.com/world/us/trump-orders-new-tariff-probe-into-us-copper-imports-2025-02-25/

[26] Ernest Scheyder and Costas Pitas, "Trump orders tariff probe on all U.S. critical mineral imports," *Reuters*, Updated April 16, 2025; https://www.reuters.com/markets/commodities/trump-signs-order-launching-probe-into-reliance-imported-critical-minerals-2025-04-15/

renewable generation facilities.[27,28] To the extent that tariffs and trade restrictions increase the cost of these materials, overall project costs could also rise. For utility-owned infrastructure, higher capital costs are typically recovered through rates and ultimately borne by ratepayers.

II. Project Development: Resource & Transmission Buildout

***California's Clean Energy Boom*.** California has made substantial progress in developing clean energy resources over the past several years. This progress reflects coordinated planning, procurement, permitting, and interconnection of new generation and storage resources among a broad set of state entities.[29] including CPUC, the California Energy Commission (CEC), the CAISO, electric utilities, local governments, tribal governments, applicable federal agencies, independent power producers, and community choice aggregators (CCAs). As shown in Table 1, since January 2020, nearly 400 clean generation and storage resources have been added or interconnected within the CAISO footprint, totaling approximately 27 GWs of new nameplate capacity**.**

Table 1: Total New MW Online between 1/1/2020 - 12/31/2025[30]

	Nameplate Capacity (MW)	Estimated Sept. Net Qualifying Capacity (NQC) MW	Number of Projects by Resource IDs
New SB 100 Resources, In - CAISO	27,106	17,082	407
New Resources, In CAISO (includes Natural Gas)	26, 658	18,580	426
Total New Reliability Resources, including imports	30,999	19,700	449

Note: SB100 resources include all eligible renewable energy resources and zero-carbon resources for compliance with California's SB 100 clean energy goals.

In 2024 alone, California added nearly 7 GW of clean energy capacity – predominantly solar paired with battery storage – marking the largest single-year increase in clean capacity in the state's history.[31] In parallel, CAISO has taken steps through its transmission planning and interconnection processes to integrate these resources into the electric grid faster. To support projected load growth, the CPUC has identified the need for more than 14.8 GW of new clean resources to come online by 2026.[32] As such, the scale and pace

[27] The World Economic Forum notes that *copper and aluminum are the principal conductors in transmission and distribution cables, supported by steel for sheathing and structural reinforcement.*

[28] The International Energy Agency identifies copper as essential to electricity networks more broadly, noting its critical role in electricity transmission and networks alongside other critical minerals.

[29] California Air Resources Board (CARB) — sets statewide climate targets and policies that drive electricity-sector decarbonization, California State Lands Commission — oversees leasing and permitting for projects on state lands, including offshore wind and some transmission corridors, California Department of Fish and Wildlife — conducts environmental review and permitting related to habitat and species impacts, State Water Resources Control Board and Regional Water Boards — issue water-related permits for generation and infrastructure projects.

[30]CPUC, *Resource Tracking Data* (Energy Division), December 2025 release, "Part 1: New MW Online – SB 100 Resources (In-CAISO)," tracking clean generation and storage resources added or interconnected since January 1, 2020; https://www.cpuc.ca.gov/industries-and-topics/electrical-energy/summer-2021-reliability/tracking-energy-development

[31] Gavin Newsom, "New Data Shows California Is Adding More Clean Energy Capacity to the Grid Faster Than Ever Before," Office of Governor Gavin Newsom, June 4, 2025, https://www.gov.ca.gov/2025/06/04/new-data-shows-california-is-adding-more-clean-energy-capacity-to-the-grid-faster-than-ever-before/

[32] CPUC, Decision D.21-06-035: Ordering Clean Energy Procurement to Ensure Electric Grid Reliability; June 24, 2021, https://www.cpuc.ca.gov/news-and-updates/all-news/cpuc-orders-clean-energy-procurement-to-ensure-electric-grid-reliability; and CPUC, Decision D.23-02-040: Supplemental Mid-Term Reliability Procurement; Feb. 23, 2023, https://www.cpuc.ca.gov/news-and-updates/all-news/cpuc-augments-historic-clean-energy-procurement-goals-to-ensure-electric-reliability

of new resource deployment underscore the need to expand associated infrastructure, including transmission capacity. If any of these projects already in the pipeline were to miss their federal tax credit eligibility windows, that could dramatically alter both project costs and even the likelihood of project completion, putting this much needed capacity at risk.

Consequently, on January 14, 2026, the CPUC issued a proposed decision recommending California order an additional 6 GW of clean energy capacity to be procured between 2029 and 2032, specifically to capture expiring federal tax credit benefits before they phase out under H.R. 1.[33] Multiple parties, including The Utility Reform Network (TURN), recommended the CPUC "lock in pre-sunset pricing" for projects needed to meet clean energy goals, noting that recent federal policy changes are expected to increase costs significantly for utility-scale solar and onshore wind. Some parties warned that too large a procurement push could increase ratepayer costs "due to a frenzy of procurement by a large number of [Load Serving Entities] in an already tight market." The CPUC acknowledged that "some amount of this procurement may be a year or two premature but would likely still be needed to achieve long-term goals." Comments on the proposed decision were due last week. According to many developers, adoption of this proposal would provide much-needed project certainty to the majority of ITC/PTC-eligible solar projects.

The CAISO Interconnection Process. To secure financing, developers also need to clearly understand when they can interconnect and whether the electricity, they generate can reliably reach customers. As illustrated in Figure 1, Interconnection projects are divided into two main queues: the Distribution Interconnection Queue, managed by individual utilities, and the Transmission Interconnection Queue, overseen by the CAISO. The queue a project enters is determined by its voltage level; specifically, projects exceeding a threshold of 20 MW set by the local utility are directed to the transmission queue, where CAISO manages the interconnection process.

Figure 1: The Parallel Interconnection Queues for Transmission and Distribution-level Projects[34]

The interconnection process begins when a developer submits an interconnection request to the relevant utility or the CAISO. This request includes several elements, such as the selection of a specific point of interconnection and an initial determination of whether sufficient transmission capacity exists to reliably deliver power from that location. Once deemed complete, the interconnection request is entered into the interconnection queue for studies conducted under the CAISO tariff, which governs the requirements for interconnection, operation, and metering.

Interconnection studies[35] can be grouped into three categories:

i) Cluster Studies evaluate multiple projects together within a defined study window and apply to both smaller projects (generally < 20 MW) and larger projects (> 20 MW).
ii) Independent Studies may be requested when the timing of a cluster study does not align with a project's targeted commercial operation date.
iii) Fast Track Studies apply to projects of 5 MW or less.

[33] CPUC, Proposed Decision Requiring 2,000 MW by 2030 and an Additional 4,000 MW of Net Qualifying Capacity by 2032, Order Instituting Rulemaking (R.25-06-019), January 14, 2026, https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M595/K083/595083681.PDF
[34] California ISO; "Getting started - exploring interconnection to the grid"; http://www.caiso.com/participate/Pages/ResourceInterconnectionGuide/default.aspx
[35] 54Pg .11 Via Slide CAISO Slide Presentation on "Interconnection Application Options and Process," March 11, 2020

Simply, interconnection studies are comprehensive technical assessments that analyze how new generation will interact with the existing electrical grid. They evaluate resource adequacy to ensure that new resources can reliably meet demand while studying their impacts on neighboring systems. Key areas of impact analysis include voltage stability – ensuring steady voltage levels during changes in electricity demand – and load balancing, which distributes electricity across the grid to prevent transmission congestion.

As part of this process, interconnection studies are coordinated with CAISO's Transmission Planning Process (TPP),[36] which identifies network upgrades needed to integrate new generation and ensure long-term system reliability. Where upgrades are required, the interconnection process specifies the necessary facilities and estimates associated costs in accordance with the CAISO tariff, while coordinating construction schedules with the project**.** After a resource completes the required study phases, an interconnection agreement is signed. The resource must then be modeled in CAISO's market systems and install and test the required metering before it may participate in the wholesale electricity market.[37]

III. Challenges: Interconnection & Transmission

Interconnection. Between 2012 and 2020, CAISO received an average of 113 interconnection requests per year.[38] That pattern drastically changed beginning in 2021, as state procurement directives, resource adequacy requirements, and clean-energy targets spurred a sharp increase in interconnection demand. This surge also coincided with the passage of the IRA in August 2022, which significantly expanded and extended federal tax incentives for clean energy generation and energy storage. In the 2022 interconnection application window alone, CAISO received approximately 373 requests, more than triple historical averages.[39] This caused CAISO to evaluate an unusually large number of interconnection requests simultaneously, including a substantial volume of energy storage and hybrid storage-plus-generation projects.[40] This required more analysis to account for overlapping impacts on constrained transmission facilities. As study results developed, the scope and cost of required network upgrades were refined over time rather than resolved within a single study cycle.[41] As a result, developers faced longer study timelines, changes in preliminary cost estimates, and uncertainty regarding the scope, cost, and timing of required transmission upgrades, contributing in some cases to withdrawal from the interconnection queue, or deferral to later study clusters.[42]

In response, CAISO amended its tariff in September 2022, with approval from the Federal Energy Regulatory Commission (FERC), to temporarily extend interconnection study deadlines in light of the unprecedented volume and technical complexity of pending requests.[43] The tariff amendment was intended

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[36] CAISO; "CAISO Interconnection Study";
http://www.caiso.com/planning/Pages/GeneratorInterconnection/InterconnectionStudy/Default.aspx

[37] California ISO; "Getting started - exploring interconnection to the grid";
http://www.caiso.com/participate/Pages/ResourceInterconnectionGuide/default.asp

[38] California Independent System Operator, Decision on Cluster 14 Interconnection Procedures, presentation; July 15, 2021;slide 2, stating that "in the last decade, the ISO has received an annual average of 113 queue cluster interconnection requests," https://www.caiso.com/documents/decision-cluster-14-interconnection-procedures-presentation-july-2021.pdf

[39] Marissa Evans, "As California Grid Interconnection Requests Triple, Analysts Assess CAISO's Response," Utility Dive, March 30, 2023, https://www.utilitydive.com/news/as-california-grid-interconnection-requests-triple-analysts-assess-caisos/642591/

[40] California Independent System Operator, Memorandum; Decision on Cluster 14 Interconnection Procedures; July 7, 2021, https://www.caiso.com/Documents/Decision-Cluster-14-Interconnection-Procedures_Memo-July-2021.pdf

[41] California Independent System Operator, Decision on Cluster 14 Interconnection Procedures, presentation; July 15, 2021; slides 3–4, explaining that Phase I cost estimates are "advisory" and Phase II establishes cost caps for network upgrades; https://www.caiso.com/documents/decision-cluster-14-interconnection-procedures-presentation-july-2021.pdf

[42] California Independent System Operator, comments on Improvements to Generator Interconnection Procedures and Agreements, October 13, 2022, 23–24, stating that most interconnection customer withdrawals occur immediately prior to financial security posting deadlines, https://www.caiso.com/documents/oct-13-2022-comments-notice-proposedrulemaking-improvements-generatorinterconnectionprocedures-agreements-rm14-22.pdf

[43] Federal Energy Regulatory Commission**,** *Order Accepting Interconnection Process Enhancement Tariff Amendment*, 180 FERC 61,143 (Aug. 31, 2022), accepting revisions to CAISO's Open Access Transmission Tariff effective September 1, 2022; https://www.caiso.com/documents/aug31-2022-orderacceptinginterconnectionprocessenhancementstariffamendment-er22-2018.pdf

to provide CAISO with additional time to complete studies already underway while maintaining existing tariff requirements. Building on that effort, CAISO proposed and implemented further procedural adjustments related to interconnection studies in 2023 following completion of Cluster 14. These actions have occurred alongside broader interconnection reforms undertaken by FERC to address interconnection queue backlogs nationwide.

Transmission. The CAISO leads statewide transmission planning through its annual Transmission Planning Process (TPP), which identifies needed transmission projects to maintain system reliability and support state policy goals. According to the CEC, projects approved through the TPP currently account for approximately 22% of California's transmission projects, with the remainder consisting primarily of utility self-initiated repair and replacement work that is not reviewed through the TPP.

For projects approved through the TPP, transmission facilities are generally financed, constructed, and owned by the incumbent utility within the applicable service territory. Projects above 200 kilovolts (kV), as well as those that cross multiple utility service areas, are subject to competitive solicitation, allowing independent developers to propose, build, and own these facilities. Both utilities and third-party developers recover capital and ongoing maintenance costs through the Transmission Access Charge, which appears on ratepayers' monthly electricity bills.

Multiple reports conclude that transmission capacity will need to at least double by 2045 to interconnect new renewable generation and meet California's clean-energy goals. However, the transmission development process is generally lengthy and complex, and major projects can take more than a decade to move from initial planning to completion. A subset analysis of 21 transmission projects illustrates the extent of these implementation challenges.[44] On average, projects required an additional 6.1 years beyond their original estimated completion timelines, more than doubling originally estimated timeframes,[45] with delay drivers differing across utilities and projects.

SCE describes permitting, environmental review, and land access as factors that routinely affect timelines for both interconnection and transmission projects. Delays in securing easements or other land rights can interrupt project development, including instances in which transmission work has been suspended because required access could not be obtained. Additionally, environmental review and land access considerations can require changes to project routing and mitigation measures, affecting the pace of project development. They further note that extended manufacturing lead times for critical high-voltage transmission equipment, such as transformers, can delay construction and the availability of transmission capacity needed to support new interconnection.

As for PG&E, delays are most often attributed to the prioritization of other investments. They attribute this reprioritization to increased investment in wildfire mitigation efforts under its Community Wildfire Safety Program, as well as rising material costs and supply-chain disruptions affecting the procurement of transmission equipment such as transformers.

San Diego Gas & Electric (SDG&E) has reported that permitting challenges are a significant source of transmission project delays, particularly where local community concerns and compliance with the California Environmental Quality Act (CEQA) require extended review. They note that permitting timelines can vary widely based on project location, site-specific environmental issues, agency capacity, and the level of public participation, noting that permitting agencies often require sufficient resources to evaluate and resolve complex issues on time.

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[44] Vivian Yang, *Understanding California's Transmission Development Delays and Paths to Reform*; Union of Concerned Scientists, July 8, 2025; https://www.ucs.org/resources/understanding-californias-transmission-development-delays-and-paths-reform
[45] Ibid

IV. California in Action

Executive Order N-33-25. As California continues to expand clean-energy resources, recent federal actions discussed earlier have shortened timelines for how new generation and transmission projects are planned, financed, permitted, and developed. On August 29, 2025, Governor Gavin Newsom issued Executive Order (EO) N-33-25[46] to accelerate generation and transmission infrastructure by streamlining permitting, siting, and environmental review across state government.

The order directs the Governor's Office of Business and Economic Development (GO-Biz) to lead coordination through an Energy Working Group within the Infrastructure Strike Team. The Working Group includes the CPUC, the CEC, the CAISO, and other relevant state entities. The Working Group is responsible for coordinating state actions, identifying permitting and interconnection barriers, prioritizing critical projects, and recommending measures to improve overall project timelines.

The EO further directs state energy entities to take near-term initiatives to help eligible projects advance on schedules necessary to maximize the availability of expiring federal clean-energy tax credits, including projects able to begin construction by July 2026 or achieve commercial operation by December 2027. While the order calls for the Energy Working Group to produce a summary of actions within 90 days, that report has not yet been released or otherwise made publicly available.

For purposes of this hearing, the order includes the following agency-specific directives:

CPUC	-Identify critical generation and energy storage projects expected to come online within the next three years and request that utilities under its jurisdiction prioritize actions needed to enable timely interconnection. -Streamline project reviews by relying on recent updates to the CPUC's transmission siting and permitting processes.
CAISO	-Identify and prioritize the interconnection of commercially ready generation and energy storage resources, consistent with the CAISO tariff.
GO-Biz	-Work with local permitting authorities through the Clean Energy Permitting Initiative to identify opportunities to streamline permitting and accelerate deployment of large-scale clean energy infrastructure projects, particularly those eligible for expiring federal clean energy tax credits.
Energy Working Group	- Coordinate implementation of EO N-33-25 across state agencies; identify permitting and interconnection barriers; prioritize critical clean energy and transmission projects; recommend near-term actions to improve project timelines; and -Submit a progress summary to the Governor's Office within 90 days of the order.

CPUC Response to Executive Order N-33-25. In November 2025, President Reynolds wrote a letter to the three largest investor-owned utilities – PG&E, SCE, and SDG&E – requesting the utilities describe their efforts to expedite interconnection of new resources in 2025-2026.[47] The letter outlines the implications of

[46] Gavin Newsom, *Executive Order N-33-25: Accelerating Clean Energy Infrastructure;* Issued August 29, 2025; State of California, https://www.gov.ca.gov/2025/01/xx/executive-order-n-33-25/

[47] California Public Utilities Commission, Alice B. Reynolds, President, Letter to Pacific Gas and Electric, Southern California Edison, and San Diego Gas & Electric Regarding Interconnection and Transmission; November 21, 2025, https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/energy-division/documents/summer-2021-reliability/tracking-energy-development/cpuc_2025_letter_to_pge-(1).pdf and https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/energy-

federal legislation that eliminates certain tax credits for solar and wind projects, underscoring the need for deployment of clean energy resources in light of Executive Order N-33-25.

The letter requests that each utility submit a report by January 15, 2026, describing efforts to accelerate both interconnection and transmission for new generation in 2025 and 2026, while also identifying process improvements for future project developments. Utilities are further urged to identify measures taken to ensure that approved projects are on schedule to meet their scheduled in-service dates and to outline efforts to advance these timelines, when necessary, particularly in response to challenges associated with expiring federal tax credits. As referenced in the letter, these efforts are aimed at enabling the timely interconnection of more than 20,000 MW of new resources, a scale of capacity necessary to maintain grid reliability while supporting California's projected load growth and greenhouse gas reduction goals.

SCE's Response to CPUC. On January 15, 2026, SCE provided the following responses the CPUC, as summarized below:

- Staffing and Financial Resources. SCE states that it has made organizational changes to improve oversight and specialization within its transmission and interconnection teams, but acknowledges that these changes resulted in vacant positions, with hiring still underway. SCE also notes that significant increases in project volume or further accelerated schedules require additional authorized funding or reprioritization of work.

- Permitting and Environmental Review. SCE describes permitting and environmental review as main drivers affecting interconnection and transmission timelines. The utility emphasizes early coordination with developers and local agencies to ensure that SCE's infrastructure scope is incorporated into project-level CEQA documents, which can allow SCE to rely on those analyses to pursue CPUC licensing exemptions under General Order 131-E.[48] The letter also acknowledges that permitting and land access issues can affect schedules, noting that one project has been suspended due to the customer's inability to secure a required easement.

- Equipment Procurement and Supply-Chain Constraints. SCE cites extended lead times for critical equipment as a significant challenge, noting lead times exceeding 30 months for high-voltage power transformers and 40 months for circuit breakers. To mitigate these delays, SCE has reserved manufacturing slots and, in limited cases, used customer-supplied production slots when equipment meets SCE safety and reliability standards.

- Queue Management. SCE identifies high interconnection queue volume as a key constraint prior to recent reforms and describes actions taken in response to FERC Order No. 2023, which revised federal interconnection requirements to address queue backlogs by modifying project readiness criteria, expanding the use of clustered interconnection studies, and establishing withdrawal penalties for projects that exit the queue at later stages. Beginning in August 2024, SCE implemented new Cluster 15 requirements aligned with these reforms, including withdrawal penalties. SCE reports that the number of active projects declined from 96 in September 2024 to 17 by May 2025, allowing resources to be directed toward projects that are more advanced in development. However, SCE notes that some projects cannot be accelerated due to customer readiness limitations or because earlier in-service dates are not feasible given the projects' current stage of development.

- Interconnection related to Transmission Upgrades. SCE reports that interconnection timelines depend on completion of related transmission upgrades. The utility reports interconnecting 24 large

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division/documents/summer-2021-reliability/tracking-energy-development/cpuc_2025_letter_to_sce-(1).pdf and https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/energy-division/documents/summer-2021-reliability/tracking-energy-development/cpuc_2025_letter_to_sdge-(1).pdf

[48] General Order (GO) 131-E sets forth the CPUC's rules for permitting electric transmission infrastructure. These rules include annual and quarterly reporting requirements for electric public utilities subject to the jurisdiction of the CPUC.

generator projects totaling more than 2,400 MW in 2025 and expects to interconnect 55 additional projects totaling more than 10,100 MW during 2026–2027. SCE references California Public Utilities Commission staff's 2025 assessment prepared pursuant to Senate Bill 1174, which required an evaluation of whether transmission development is keeping pace with state-authorized generation and storage procurement. That assessment found that more than 13 GW of expected new generation and storage resources in SCE's service territory are dependent on transmission projects that are currently delayed.

- Project Status. SCE indicates that while many generation and storage projects are on track to come online before the end of 2027, some cannot be accelerated beyond current schedules due to permitting, transmission dependencies, or customer readiness. On the transmission side, SCE identifies 26 major projects with planned in-service dates between 2026 and 2031, 9 of which are expected to be operational by the end of 2027, and subject to licensing and equipment procurement limitations.

PG&E's Response to CPUC. On January 15, 2026, PG&E provided the following responses, as summarized below.

- PG&E's Staff Capacity and Procurement: PG&E reports sufficient staffing and funding to manage a roughly 300% increase in transmission and interconnection workload. The utility has implemented process improvements, including earlier procurement of long-lead materials and strategic sourcing to tackle critical equipment constraints.

- Challenges in Project Scheduling**:** Despite these improvements, PG&E reports that approximately 80% of events affecting project schedules remain outside PG&E's direct control. The primary causes of delays are environmental permitting requirements and customer-side procurement decisions.

- CPUC Assessment Findings: The CPUC's 2025 assessment under Senate Bill 1174 found that nearly 8.5 GW of PG&E's anticipated new generation and energy storage resources depend on transmission projects and network upgrades that have experienced delays. Currently, around 2.75 GW across seven interconnection queues are projected to miss contractual in-service dates due to delays in seven network upgrades.

- Manufacturing and Equipment Constraint: Manufacturing shortages have significantly extended lead times for high-voltage transmission equipment. Historically, PG&E typically could meet in-service dates for most 115-kilovolt and 230-kilovolt projects when equipment orders were placed within a year of project start, as these projects typically require 48 to 56 months to complete. However, under current timelines, new projects initiated in 2026 that require 230-kilovolt or higher-voltage circuit breakers are not expected to become operational until at least 2030.

- Developer-Supplied Equipment Risks: While developers are allowed to work with manufacturers to accelerate production or secure manufacturing positions on PG&E's behalf—and can supply equipment when self-building greenfield switching stations—PG&E identifies significant risks in accepting developer-supplied circuit breakers. These risks include non-transferable warranties, and the potential use of equipment that does not conform to utility standards. Once accepted, PG&E assumes full responsibility for the equipment, although developers remain accountable for performance and warranty management through commissioning.

Go-Biz Response to Executive Order N-33-25. As discussed above, GO-Biz has been directed to coordinate state entities to help accelerate the permitting and development of clean-energy generation, energy storage, and transmission infrastructure. Through the Infrastructure Strike Team,[49] GO-Biz began developing a draft

[49]On April 29, 2019, Gavin Newsom issued Executive Order N-19-19, directing the creation of an Infrastructure Strike Team to coordinate state directives related to priority infrastructure projects. As established under the executive order, the Strike Team is structured around multiple issue areas, including energy and climate-related infrastructure, and is led by senior advisors to the

Clean Energy Permitting Playbook[50] to document how state agencies coordinate when a project requires approvals from multiple entities.

The draft Playbook documents findings informed by surveys, interviews, webinars, and other outreach conducted with local planning authorities, tribal governments, developers, community-based organizations, and other stakeholders. This outreach identified several recurring factors that affect permitting timelines, including limited staff capacity and experience within local planning departments**;** gaps in technical information for certain clean-energy technologies **(**particularly battery energy storage systems, or “BESS”**)**, community opposition and appeals, incomplete applications requiring resubmittal, and restrictive or inconsistent local ordinances. Across California’s 58 counties, local permitting approaches vary widely, shaping how The Playbook also notes that projects requiring approvals from multiple state, regional, and local agencies face additional complications, highlighting the need for better guidance, standardized documents, and earlier coordination. and where clean-energy projects are reviewed and approved.[51]

These findings help explain how local permitting conditions shape the implementation of California’s statewide clean-energy planning goals. While the CPUC’s Integrated Resource Plan (IRP) establishes long-term procurement targets and identifies statewide resource needs, whether projects advance in practice depends on transmission access, land availability, and local permitting capacity. When statewide planning priorities set through the IRP are not well aligned with local siting and permitting processes, projects can be delayed and progress toward clean-energy goals can slow.

For this reason, Executive Order N-33-25 directed GO-Biz to work with local permitting authorities through the Clean Energy Permitting Initiative to identify opportunities to streamline permitting and accelerate deployment of large-scale clean-energy infrastructure, particularly projects eligible for time-limited federal clean-energy tax credits. To date, however, the impact of GO-Biz’s efforts remains unclear to committee staff.

The Committee may wish to ask panelists to comment upon:

- *Which directives have agencies been able to act on right away, and which remain in planning or coordination? What are the factors that influence the pace of implementation?*
- *In day-to-day practice, what has changed since the executive order was issued, and how does that differ from how agencies operated before the EO?*
- *How are agencies coordinating across permitting, transmission, and interconnection responsibilities, and what processes are used to address overlapping authority, resolve disagreements, or keep projects moving when delays arise?*
- *SCE reports it will interconnect 10,100 MW during 2026-2027, but the CPUC's own SB 1174 assessment found 13 GW in SCE territory and 8.5 GW in PG&E territory depend on delayed transmission projects. How many megawatts of projects that began construction before July 2026 are at risk of missing their 2029/2030 placed-in-service deadlines due to interconnection or transmission delays? How many of these transmission project delays are the utilities’ responsibility (rather than a third-party transmission developer)? How are utilities coordinating their various departments to ensure a unified, streamlined approach?*
- *The CPUC sets procurement targets statewide, but permitting happens locally. How are the Commission and GO-Biz ensuring that local governments understand their role in meeting state*

Governor and Cabinet-level appointees, with support from an interdepartmental team of staff. For energy infrastructure, the Strike Team’s work has involved senior leadership and staff from the CPUC, the CNRA, and GO-Biz, with additional participation from the CEC, the CAISO, and the California Department of Finance. This coordination structure largely replaced earlier interagency efforts related to energy infrastructure, including the Tracking Energy Development Task Force.

[50] GO-Biz, Clean Energy Permitting Initiative Overview, Governor’s Office of Business and Economic Development; 2025; https://business.ca.gov/industries/climate-and-clean-energy/go-biz-renewable-energy-permitting-initiative/

[51] GO-Biz, Clean Energy Permitting Initiative Overview, Governor’s Office of Business and Economic Development; Pg 16; 2025; https://business.ca.gov/industries/climate-and-clean-energy/go-biz-renewable-energy-permitting-initiative/

climate goals and that they have the resources and incentives to approve projects on appropriate timelines?

- *As implementation continues, what specific indicators should the Legislature monitor to assess whether the EO is being carried out as intended, and projects currently on-track for ITC/PTC are still meeting their project timelines?*

V. Recommendation Considerations.

Increase Agency Resources and Capacity. While the CPUC typically serves as the lead CEQA agency for most transmission projects, timely progress depends on coordination with other agencies such as the CEC, the Department of Fish and Wildlife (CDFW), the State Lands Commission, and local permitting authorities. Permitting is a multi-step process that involves environmental review, public engagement, and approvals across multiple jurisdictions, each with its own timelines and requirements. As transmission investment has increased, agency staffing levels, technical expertise, and review capacity have not kept pace with growing workload. Therefore, targeted investments in staffing, early Tribal consultation, and meaningful community engagement may help reduce permitting bottlenecks and strengthen coordination across agencies. Past efforts to provide more resources to state agencies, particularly CDFW, have faced roll-backs due to the volatile state budget. Developers and policymakers may wish to explore whether modest, enhanced permit application fees – specifically dedicated to hiring additional permitting staff – could accelerate timelines while maintaining review standards for time-sensitive projects.

Expand Projects Eligible for Competitive Solicitation. California should examine expanding the use of competitive solicitation for CAISO-approved transmission projects. Under current CAISO rules, only projects above 200 kV or those that cross multiple service territories are eligible for competitive solicitation, leaving most transmission development under incumbent utilities. As a result, only 5 of 71 new projects approved in the 2022–2023 and 2023–2024 TPP cycles were subject to competition. Broadening eligibility would attract additional developers, help utilities manage existing project backlogs, reduce costs, and improve timelines as transmission investment accelerates. CAISO already has the authority to expand the set of projects eligible for competitive solicitation under existing rules. However, competitive bidding takes time and can sometimes add an additional 12 months to project timelines just to go through the solicitation. Moreover, non-incumbent developers unfamiliar with California's regulatory environment may face steeper learning curves, potentially causing further delays.

Prioritize Specific Transmission Infrastructure. In the past three TPP cycles, policy-driven transmission projects accounted for 36% of approved projects, compared to less than 1% across the prior eleven cycles. This change reflects a more deliberate effort to align transmission planning with California's clean-energy goals. Building on this progress, further assessments can help focus attention on projects that would bring the most clean resources online. Prioritizing these transmission projects could reduce the interconnection queue, support the state's clean energy goals, and improve air quality, particularly in overburdened communities. However, such prioritization could cause a "winners & losers problem" where those transmission projects not urgently needed to interconnect ITC/PTC projects are still needed to address critical grid reliability or economic needs; deferring them could create new bottlenecks or reliability risks.

Maintaining Focus. The committee should consider recommendations only if they can be implemented within the timelines critical to capturing expiring tax credits in 2029-2030. While long-term structural reforms may be sound, they risk being counterproductive in the near-term as they distract from the urgent effort needing immediate attention. The committee should view any actions – legislative or regulatory – through this lens and defer longer-term reforms until after the immediate issues of getting ITC/PTC-eligible projects online are resolved.

VI. Conclusion.

Federal clean energy tax credits have supported renewable development for decades, but recent federal actions have narrowed the window in which many projects can fully benefit from these credits. In California, those deadlines now intersect with ongoing challenges such as limited transmission capacity, lengthy interconnection studies, equipment procurement timelines, and local permitting processes that can extend project schedules beyond the federal eligibility timeframe. Executive Order N-33-25 establishes a structure to better coordinate agencies around these issues. However, the question for the Legislature is whether this coordination is meaningfully improving timeline certainty for projects expected to move forward between 2025 and 2027. Both the Legislature and regulators should maintain focus in their reforms, so as not to distract with important, albeit longer-term, efforts during this critical window. Finally, California ratepayers deserve transparency on whether billions in savings will be captured or lost. This hearing provides one clear, public checkpoint; however, sustained emphasis on the needed all-of-government approach will be critical to ensure projects – and associated tax-savings – are delivered.

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