# Integrated Resource Planning 2nd Workshop: Reliable and Clean Power Procurement Program Staff Proposal

Energy Division

R.20-05-003

June 24th, 2025

California Public Utilities Commission

# Emergency Information

- In the event of an emergency, please proceed calmly out the exits.
- The evacuation site is the Garden Plaza area between Herbst Theater and the War Memorial Opera House Buildings, on Van Ness
- Exit the building at the Main Entrance at Van Ness and McAllister streets, cross McAllister Street, pass Herbst Theater and enter the plaza.

# Logistics

- Workshop slides are available at the Reliable and Clean Power Procurement Program (RCPPP) webpage.
- This workshop **will be recorded**, and the recording will be posted to the same webpage.

# Clarifying Questions

- We invite clarifying questions using the "Q&A" feature of WebEx throughout the workshop.
  - Write your question in the "Q-and-A" box and direct it to “All Panelists”.
- All attendees have been muted. At the end of the presentation, stakeholders may ask verbal clarifying questions.

# Agenda: Day 2

| Tuesday, June 24th, 9:00am – 4:00pm | |
|---|---|
| 9:00 – 9:10am | Welcome |
| 9:10 – 11:10am | Presentation Set #1: CalCCA, CESA, VISTRA |
| 11:10 – 11:40pm | Discussion on Set #1 |
| 11:40 – 12:40pm | Lunch |
| 12:40 – 1:40pm | Presentation Set #2: ACP, CRC, AVA, Sierra Club |
| 1:40 – 2:10pm | Discussion on Set #2 |
| 2:10 – 2:20pm | Break |
| 2:20 – 3:20pm | Presentation Set #3: FERVO/SCP/PCE, SCE, GPI |
| 3:20 – 3:50pm | Discussion on Set #3 |
| 3:50 – 4:00pm | Close |

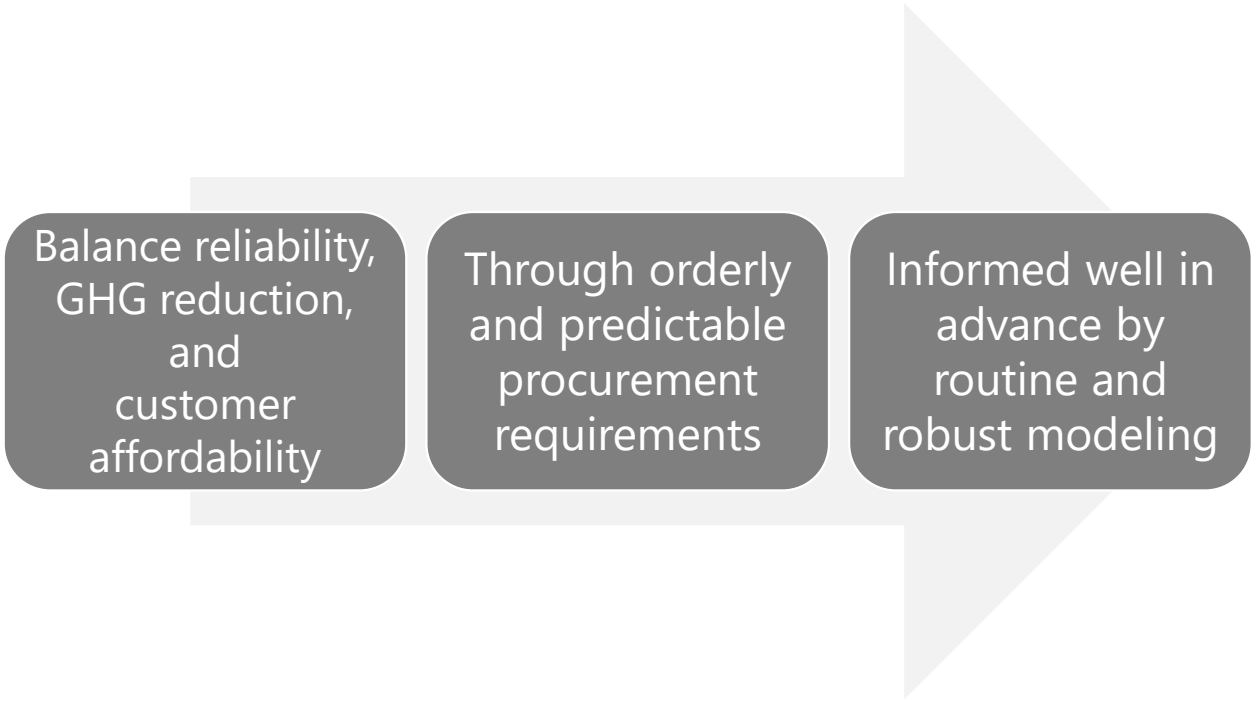
# CalCCA's Preliminary Feedback on Reliability Options and CES

CPUC Workshop

June 23-24, 2025

# Overall Feedback and Objectives

*CalCCA Supports Development of a Programmatic Approach to Procurement*



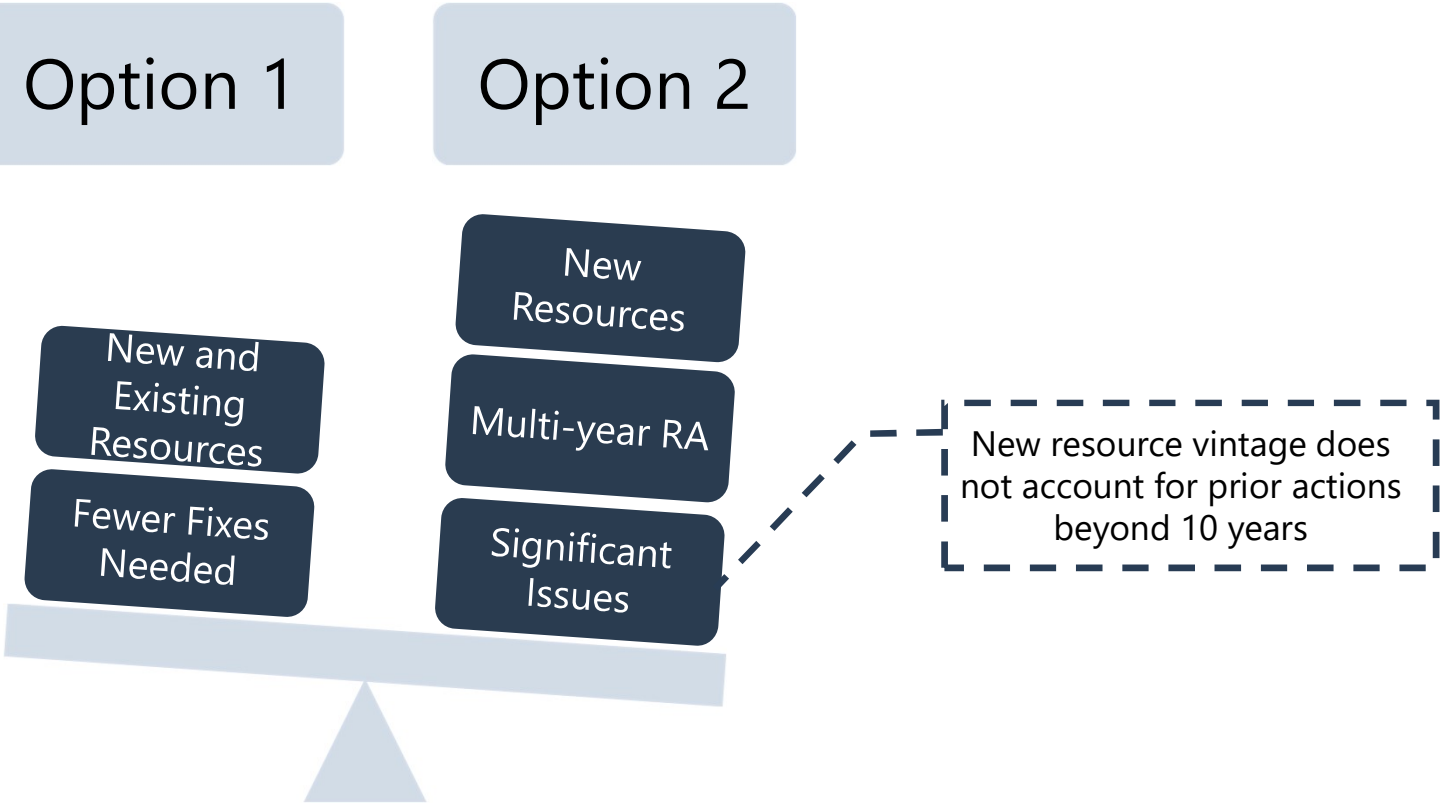
# Summary of CalCCA's Initial Leanings


- Slice-of-Day (SOD)
- Five-years forward
- Rethink buffers

- Define resource eligibility & other conditions to ensure CES incents new clean build
- Consolidate with other programs

# ED's Proposal Advances Two Reliability Options

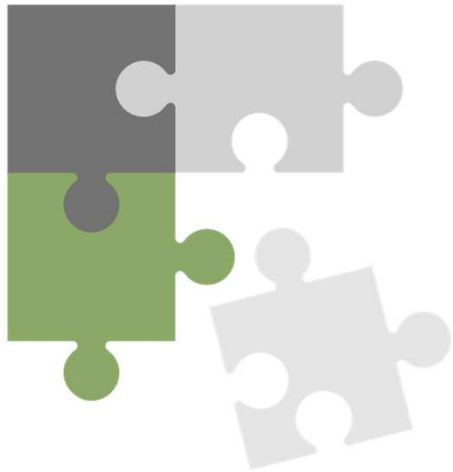
*While both require modifications, Option 2 would require significant overhauls*



# Marginal ELCC vs. Slice-of-Day

*RCPPP Design Must Fit with the RA Program*

- Two different methodologies for determining and allocating need, counting resources, and assessing compliance could increase costs
- Marginal ELCC values are much more uncertain than SOD values
- Marginal ELCC values depend upon other LSEs' actions and system as a whole
- SOD values depend on historical performance and needs depend upon individual LSE load shapes
- SOD program is complex
- Either method can ensure that reliability objectives are met



# Marginal ELCC vs. Slice-of-Day

*RCPPP Design Must Fit with the RA Program*

- Leaning toward SOD for RA and RCPPP to:
  - Avoid increased costs associated with meeting two different frameworks
  - Ensure stable resource counting
  - Prevent layering on to an already complex SOD framework
- Focus on critical months and hours in out years to avoid unnecessary complexity for long-term procurement

**Example Multi-Year SOD Requirements for RCPPP**

| Compliance Year | Requirement (%) | Hours | Months |
|---|---|---|---|
| T+0 | 100 | 24 hours | All |
| T+1 | 90 | 24 hours | YA RA Showing Months |
| T+2 | 75 | 24 hours | YA RA Showing Months |
| T+3 | 65 | Critical Hours | YA RA Showing Months |
| T+4 | 50 | Critical Hours | YA RA Showing Months |

For illustrative purposes only – Recommendation on requirements, hours, and months subject to change.

# Buffers Should be Removed or Replaced with More Targeted Solutions

## Buffers are Not Necessary

- SOD RA program establishes PRM to account for uncertainty (e.g., load forecast uncertainty)
- LSEs evaluate compliance risk and build in necessary buffers depending on their portfolios
- Penalties plus rolling compliance incentivize such risk management
- Solution: Allow LSEs to determine the risk of a resource achieving COD with penalty mechanisms sufficient to guide LSE procurement levels, consistent with MTR enforcement

## Buffers Could Lead to Significant Over-Procurement at the Expense of Customers

- 7 GWs/year is needed to meet SB100 goals by 2045 (SB 100 Joint Agency Report)
- If LSEs met their requirements and both buffers over the next 20 years, California customers would fund 7.7 GWs of excess capacity
- At $15/kw-month, a single year expense of this quantity would represent $1.386 Billion

## The CCR is Inequitable

- An IOU-specific buffer creates uneven playing field among LSEs
- Allowing IOUs to shift resources to and from the buffer and their bundled portfolio gives the IOUs an unfair advantage of shifting most costly procurement to LSEs

# CalCCA is Leaning Towards Clean Energy Standard; Requires Additional Development to Ensure Adequate Incentives to Build New Clean Resources

**Clean Energy Standard**

- ✓ Backwards looking model based on actual energy sales, which is more consistent with renewable portfolio standard (RPS) and SB 100
- ✓ Simpler implementation; potential to consolidate with other compliance programs (e.g., RPS and Power Source Disclosure)

**Mass-Based Approach**

- X Forward looking portfolio emissions-based model dependent upon assumptions that could lead to inaccurate representation of emissions

# Additional Development Needed to Ensure CES Provides Adequate Incentives to Build New Clean Resources

**Resource Eligibility**

**Compliance Consolidation with RPS and Power Source Disclosure**

**Conditions for Meeting Zero Emissions Credit**

E.g., how much must come from long-term commitments, bundled v. unbundled, banking

# Summary of CalCCA's Initial Leanings


- SOD
- Five-years forward
- Rethink buffers

- Define resource eligibility & other conditions to ensure CES incents new clean build
- Consolidate with other programs

# Establishing a structured long-term forward procurement market

## Reliable and Clean Power Procurement Program (RCPPP)

June 23-24, 2025

CESA
CALIFORNIA ENERGY STORAGE ALLIANCE

# CESA's Board of Directors














## CESA General Membership


## CESA Start-Up Membership


## CESA Associate Membership

# Key design elements for consideration

- **Accreditation**
- **Evaluating new only or new plus existing**
- **Requirements for clean resources**
- **Resource retention/repower**
- **Contracting requirements and timeline**

*CESA to discuss these design elements during this workshop*

# Topics for today's discussion

- Ensuring accuracy and alignment between reliability and clean power value
- Maintaining clear and actionable retention/repower signals
- Sufficiently supporting new resource development as needed

## Purpose of IRP: Get resources built.
## Purpose of RA: Deliver capacity to the BAA to meet month-to-month operational needs.

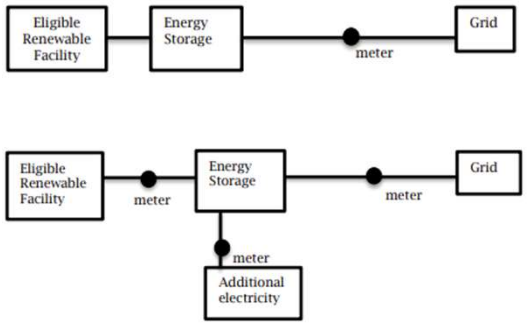
- **IRP is intended to ensure sufficient resources are developed to meet reliability and GHG emissions reduction objectives**
- **Clear procurement signal necessary to support new development cost-effectively**
  - If its valuable to the system, it should get built
- **RCPPP design must send clear procurement signals to get new resources built as needed**

Desire to keep design as clear, simple, and adaptable as possible

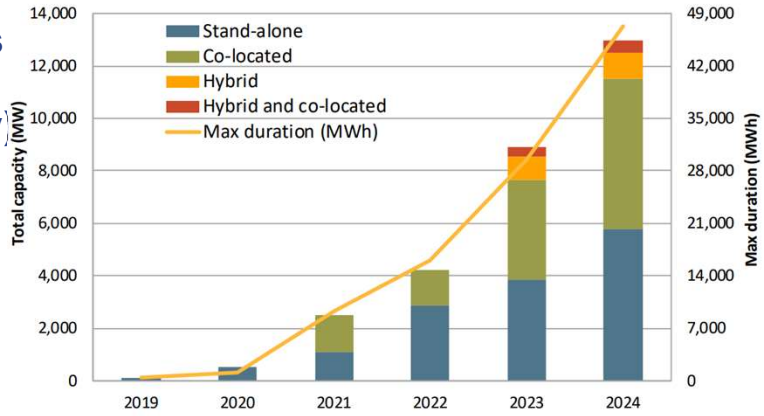
# Ensuring accuracy and alignment between reliability and clean power value

# The current proposal vastly undervalues LSE investment in energy storage and emissions reduction contributions

- **Energy storage is essential to meeting state goals**
  - Recently approved IRP plan brings over 19 GW of energy storage by 2035 and SB100 emphasizes the need for 100% clean electricity
  - Irresponsible for the Commission to now disincentivize storage.
- **Storage provides emissions reduction value**
  - Reducing reliance on emitting resources in net load peak
  - Reducing renewable congestion-related curtailment
- **An hourly accounting is needed to accurately value each resource's contribution to emissions reduction**
  - Annual summations allow RECs to be banked (the grid is your battery)
  - No direct "emissions avoidance" REC – discharging at net load peak with stored solar avoids non-renewable system power consumption
- **Storage is only valued to the extent that it can avoid renewable curtailment behind the main meter**
  - Nearby standalone storage provides the same service




*Current RPS Storage Accounting*



# Align with existing methodologies or processes where possible

- **Power Source Disclosure Program will provide accurate accounting by 2028**
  - Ex-post, hourly accounting, meter-based, CEC jurisdiction
- **Clean System Power Calculator provides accurate accounting of resource contribution to emissions reduction**
  - Ex-ante, hourly accounting, portfolio-based, CPUC jurisdiction

## Failure to meet emissions reduction targets must be met with sufficient penalties to encourage development of the resources needed to meet targets

- **The clean content requirements are as important as the reliability requirements**
- **If it is cheaper to forgo clean content requirements than to develop clean resources, LSEs will forgo development**

*Net CONE penalty may be necessary, rather than $50/MWh*

## Closer alignment between reliable and clean aspects will send a clearer development and procurement signal

- **Existing ex-post system was successful at getting a lot of clean resources developed over the years**
  - In theory, an ex-post system could continue to send clean development signals
- **However, RCPPP is establishing a structured forward procurement market with explicit objectives**
- **Immediate signals may better align needed resource development with procurement activity**
  - Would it make sense to align the clean and reliability evaluations to occur ex-ante?
  - Is there a way to design it with sufficient flexibility/transactability?
  - Can this be done in a way that's not too burdensome?

***LSEs either bring a reliable AND clean portfolio, or they incur penalty***

# Maintaining clear and actionable retention/repower signals

# Retention and repower decision making

- Decisions are based on resource economics including market and RA revenue potential, including export potential
- Retirement/mothball process takes less than a year and typically would be triggered for uneconomic resources lacking RA contracts
- Repower decisions occur on a slightly longer horizon, with repowers happening in less than 3 years

# How to sufficiently support retention/repower decision making?

- **Reliability Option 1 attempts to manage retention/repower decisions through IRP program**
  - Not clear that a 100% contracting requirement in T+2 would clearly signal retention/repower
- **Reliability Option 2 attempts to manage retention/repower decisions through the RA program**
  - Not clear that an 80% contracting requirement by T+2 would clearly signal retention/repower
- **Uncontracted resources will continue to wait for the RA program to signal that they need to stay in service**

# The RA program better signals retention/repower

- **The RA program operationalizes the fleet of built resources**
  - If the IRP process fails to get sufficient resources developed in aggregate, existing resources would be retained by RA contracts
  - If IRP resource commercial operations are delayed, existing resources would be retained by RA contracts
- **Resource owners will typically wait for RA prospects before giving notice to retire/mothball**
  - As RA prospects decline, resource owners will consider repower
- **To the extent that IRP must make baseline assumptions, flexibility is needed to accommodate repowers**

# Retention/repower design take-aways

***The RA program is best suited to signal retention/repower***

***3-year forward RA program may help in repower decisions, but not retention decisions***

***A clean hand-off from IRP (to build) to RA (to retain) would provide clearer signals***

# Sufficiently supporting new resource development

## Contract requirements as currently proposed will not result in projects coming online on time considering lead time required

- **Projects need contracts at least 3 years in advance of Commercial Online Date (COD) to ensure cost efficient projects and timely construction**
- **While actual construction may take less than 2 years, significant investments such as equipment procurement and construction contracting need to take place at least 2-3 years in advance of COD**
  - Long-lead time equipment procurement (e.g. GSU) – 3+ years before COD
  - Storage equipment procurement – 2-3 years before COD
  - EPC Contractor – 2-3 years before COD
  - Break ground and project construction - 12-18 months before COD.
- **Investments are unlikely to occur without a contract in place.**
- **Additionally, to receive/retain Transmission Plan Deliverability (TPD) at CAISO, projects need to show commercial contracts 5-6+ years in advance of COD.**

# RCPPP timelines and penalties must sufficiently support new resource development

- **Focus IRP on its core objectives**
  - Get resources developed as needed to support reliability and emissions reduction
- **IRP timeline should include 100% contracting requirement by T+3**
  - Allow RA program to operationalize the built fleet
- **Penalties must be aligned with potential need for new resources to meet IRP objectives**
  - It must not be cheaper to incur penalty than to forgo new development that meets the IRP objectives

# Examining a hypothetical simplified approach to reliability compliance

| | HYPOTHETICAL NEW-ONLY PROCUREMENT CONSTRUCT | | | | | | |
|---|---|---|---|---|---|---|---|
| | **June Compliance Showing** | **T+0** | **T+1** | **T+2** | **T+3** | **T+4** | **T+5** |
| RA | RA Program Requirements (Slice-of-Day) | 100% MA | 90% YA | 80% YA | N/A | N/A | N/A |
| | | | Retention/Repower Coordination | | | | |
| RCPPP | Meet Summer RCPPP RPR (new res.) | | | | 100% | 80% | Set ELCCs for year T+0 |
| | Offtake Contract (new res.) | | | | • | • | |

RA Manages Retention/Repower

Clean Cut-Over to RA

Set Compliance Year ELCCs Once

**This example is provided to explore whether key design elements can be incorporated in a clear and simple manner.** CESA is also evaluating a similar approach under a new + existing procurement construct, because issues related to baseline assumptions remain under a new-only approach.

# On this timeline, saturation effects are fairly contained and there are incentives for earlier procurement

| 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 |
|---|---|---|---|---|---|---|
| *Set ELCCs for 2031 compliance* | 80% contracted for **2031 (new)** | 100% contracted for **2031 (new)** | 80% YA RA showing | 90% YA RA showing | 100% MA RA showing | |
| | *Set ELCCs for 2032 compliance* | 80% contracted for **2032 (new)** | 100% contracted for **2032 (new)** | 80% YA RA showing | 90% YA RA showing | 100% MA RA showing |
| | | *Set ELCCs for 2033 compliance* | 80% contracted for **2033 (new)** | 100% contr. for **2033 (new)** | 80% YA RA showing | 90% YA RA showing |

**Consider LSE with 100 MW RPR in 2031**
**Consider if 100 MW RESX has 60% 2031 ELCC and a 50% 2032 ELCC**

- If RESX **is** contracted in 2027 for 2031, LSE gets 60MW value towards 80 MW requirement
  - Under new-only approach, RESX does not count towards 2032 requirements (it is in 2032 baseline)
- If RESX **is not** contracted in 2027, it maintains greater value towards 2031 compliance
  - LSEs needing to meet **2031 compliance** will value RESX at 60 MW
  - LSEs needing to meet **2032 compliance** will value RESX at 50 MW

# Key take-aways

- Accurate emissions reduction contribution accounting necessary
- Penalties must be aligned with supporting new resource development as needed (both reliability and clean content)
- Earlier contracting requirement necessary to support new resource development as needed
- Clean hand-off from IRP to RA desirable, allow RA to manage retirement

# Appendix

# Reliability Option 1 versus Option 2

| OPTION 1 COMPLIANCE (NEW AND EXISTING) | | | | | |
|---|---|---|---|---|---|
| **June Compliance Showing** | **T+0** | **T+1** | **T+2** | **T+3** | **T+4** |
| RA Program Requirements (Slice-of-Day) | 100% MA | 90% YA | | | |
| Contracted (new or existing) | | | ● | ● | ● |
| % of required procurement shown in Offtake Contract (new or existing) | | | 100% | 75% | 50% |
| Interconnection Agreement (new) | | | ● | | |
| Commercial Operations | | | | | |

| OPTION 2 COMPLIANCE (NEW ONLY) | | | | | |
|---|---|---|---|---|---|
| **June Compliance Showing** | **T+0** | **T+1** | **T+2** | **T+3** | **T+4** |
| RA Program Requirements (Slice-of-Day) | 100% MA | 90% YA | 80% YA | 70% YA | N/A |
| Meet Summer RCPPP RPR (new res.) | 100% Online | 90% | 80% | 70% | 60% |
| Offtake Contract (new res.) | | | ● | ● | ● |
| Interconnection Agreement (new res.) | | | ● | | |
| Commercial Operations | ● | | | | |

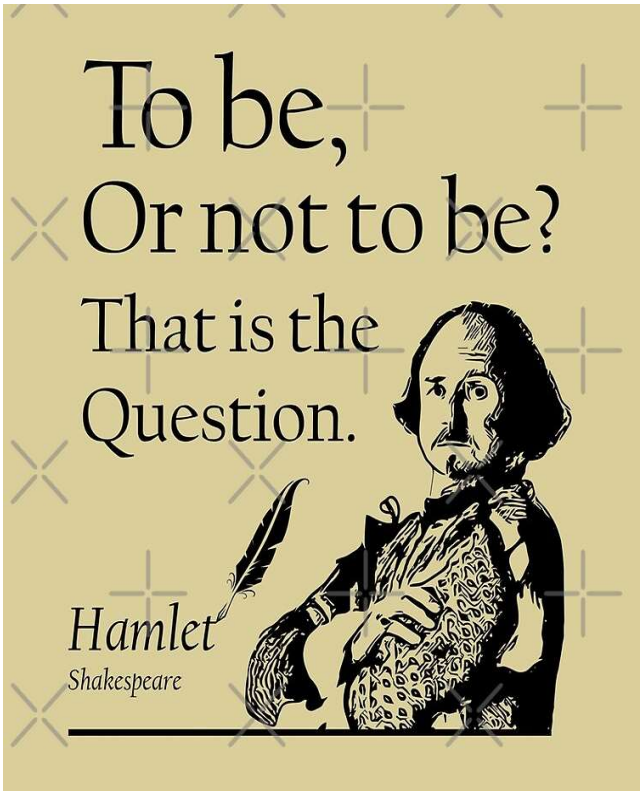
# Reliable & Clean Power Procurement Party Workshop CPUC R.20-05-003

June 23-24, 2025

Cathleen Colbert
Senior Director, Western Markets Policy
Regulatory Affairs, Vistra Corp.
cathleen.colbert@vistracorp.com
412-720-7016

# Reliable & Clean Power Procurement Program

- Vistra supports RCPPP
- Vistra prefers Option I as it should:
  - –Lead to more efficient outcomes achieving reliability and environmental goals at least cost
  - –Send superior augmentation signals
  - –Send superior retirement signals
- Targeted refinements needed to both options to achieve collective goals
- CES element needs additional development including which resources are eligible and ensuring long-term portfolio captures evolving reliability needs
- Important to recognize additional refinements will be needed



# Proposed refinements to reliability requirements

# Design principles & RCPPP-RA efficiencies

- Adding to design principles
  - –Simplicity & Transactability
    - Ease contracting burdens
    - Facilitate trading to most affordably reach goals
  - –Minimizes program conflicts between RA and RCPPP
  - –Leveraging existing frameworks to build on progress
  - –Durable and adaptable as grid needs evolve

- RCPPP should integrate w/ RA by:
  - –Replacing IRP
  - –Reframing CPE as central buyer for backstop local RA
  - –Expanding CPE scope to include Collective Capacity Requirements
- Require long-term RA contracts
- Adopt accreditation rules that apply consistent rules to all resources based on marginal ELCC to send accurate new entry/augmentation or exit signals

# RCPP interactions with RA

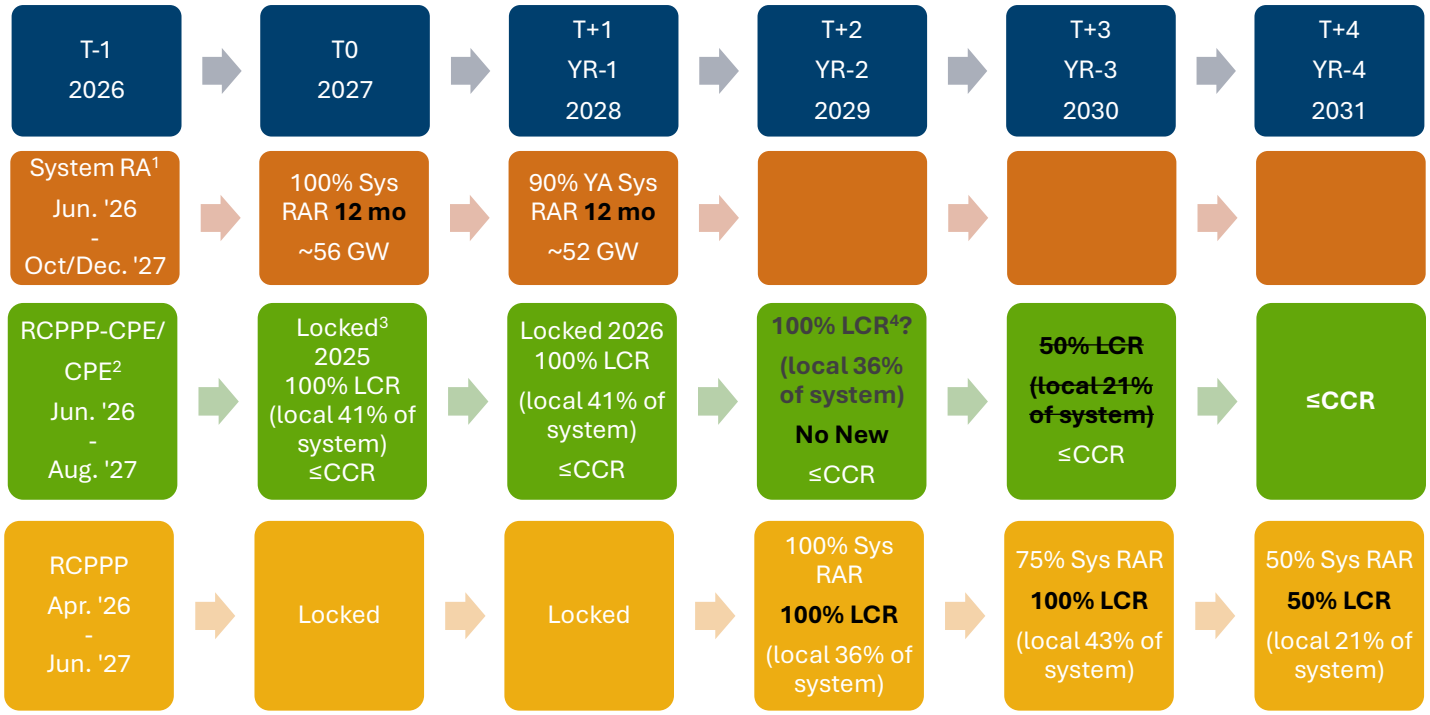
- Commission considered CPE reform (D.24-12-003) in past that in tandem with RCPPP may improve its workability
- Options for local RA under RCPPP Option I or Option II:
  a) Maintain local CPE with addition of RCPPP CCR where no local requirements are allocated under RCPPP
  **b) Allocate to each LSE share of system RPR and local RAR and then rely on CPE to backstop any unmet LCR**
- Vistra recommends **Option I.b** ideally but alternatively Option II.b that'd **include RCPPP local requirements to mitigate over-procurement risks** if relying too heavily on non-local RA
  – If forward procurements at 100% of system RPN meet less than 100% local need then additional capacity will be needed locally to cure leading to unnecessarily increasing capacity costs.

# RCPP interactions with RA Cont.

- Under Option I or Option II **any system RA year-ahead showings should meet X% for all 12 months**.
- **For local RA, CPE would no longer need new procurement authority because RCPPP will cure local deficiencies.**
- Under Option 1.b could address local RAR interplay by:
  - **Removing CPE's T+3 local RAR while allowing T+2 to overlap between RCPPP and CPE (recommended)**
    - *–May need to also remove CPE T+2 if the timing does not allow marketing to RCPPP until the June annual deadline (T+1 backstop)*
  - Pushing RCPPP years to T+3 through T+5 to avoid any overlap with CPE where CPE serves as RCPPP local in T+2 and T+3
- Under Option II.b, **RCPPP should incorporate new local requirements to cure local deficiencies**.

# Option 1.b preferred to meet system and local needs from any RA-eligible resource while minimizing change to staff proposal

Black font proposed changes to Staff Proposal shown with overlapping LCR.




1 CEC's CED 2024 1-in-2 Peak Forecast for each year with 18% PRM assumed for illustrative purposes.
2 Estimating of % of system based on PD 2026-2028 LCR and 2030 5-YR LCR technical study values for 2029-2030. For simplicity, assuming 2031 held to 2030.
3 While CPE can still procure for incremental changes between YR-2 and YR-1 for ease assuming no changes and fully locked to illustrate.
*4 Potentially remove T+2/YR-2 CPE requirement if RCPPP is meeting T+2/YR-2 needs and* ***make T+1 locked but for incremental & any backstop.***

# Option 2 alt. while minimizing changes to staff proposal

Black font proposed changes to Staff Proposal shown with overlapping LCR.


1 CEC's CED 2024 1-in-2 Peak Forecast for each year with 18% PRM assumed for illustrative purposes.
2 Estimating of % of system based on PD 2026-2028 LCR and 2030 5-YR LCR technical study values for 2029-2030. For simplicity, assuming 2031 held to 2030.
3 While CPE can still procure for incremental changes between YR-2 and YR-1 for ease assuming no changes and fully locked to illustrate.

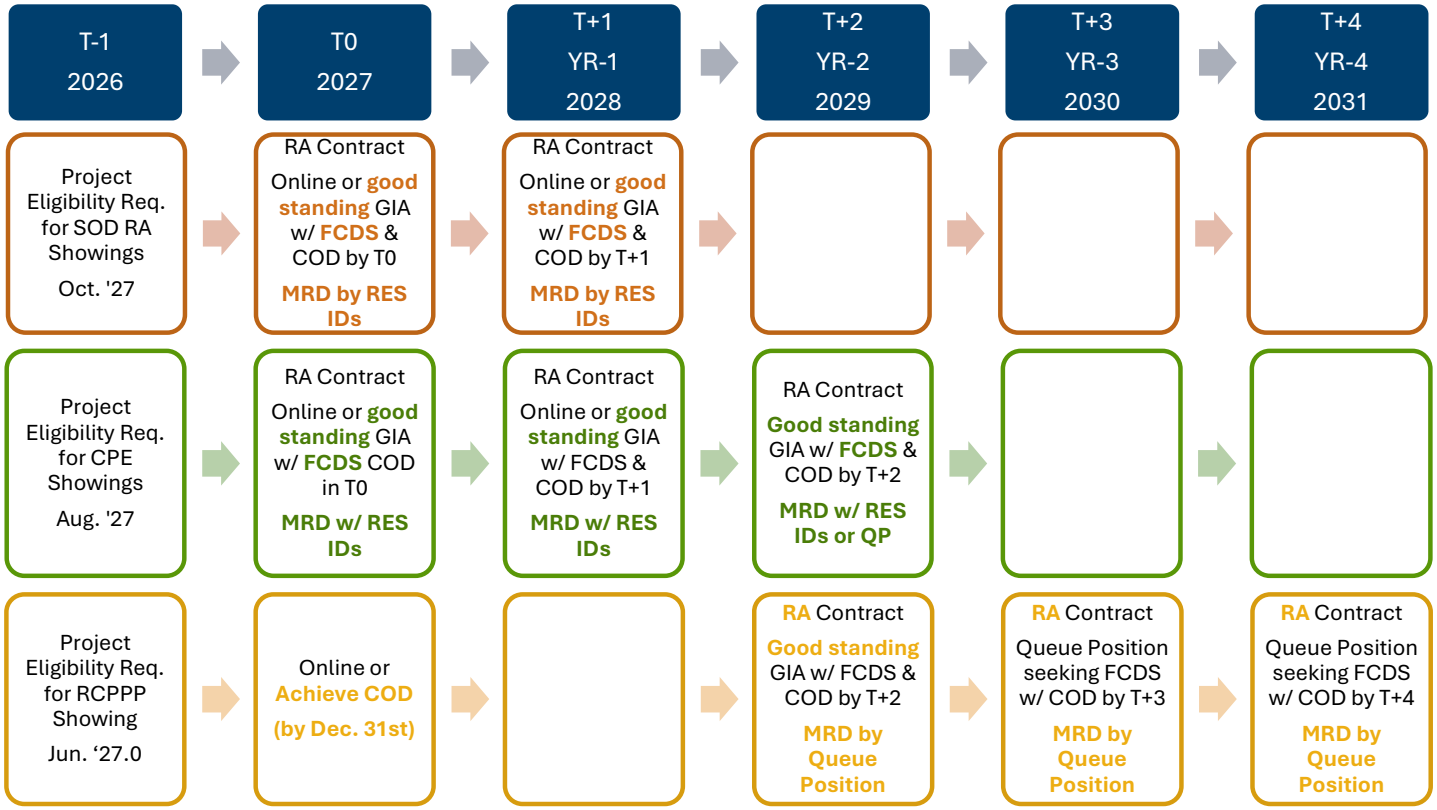
# Contracting/showing requirement clarifications

- Under RCPPP, Vistra proposes requiring executed RA agreement beyond just being RA eligible for entire contract term.
- Leverage CPE rules (Option I) or MTR rules (Option II) on term/approvals:

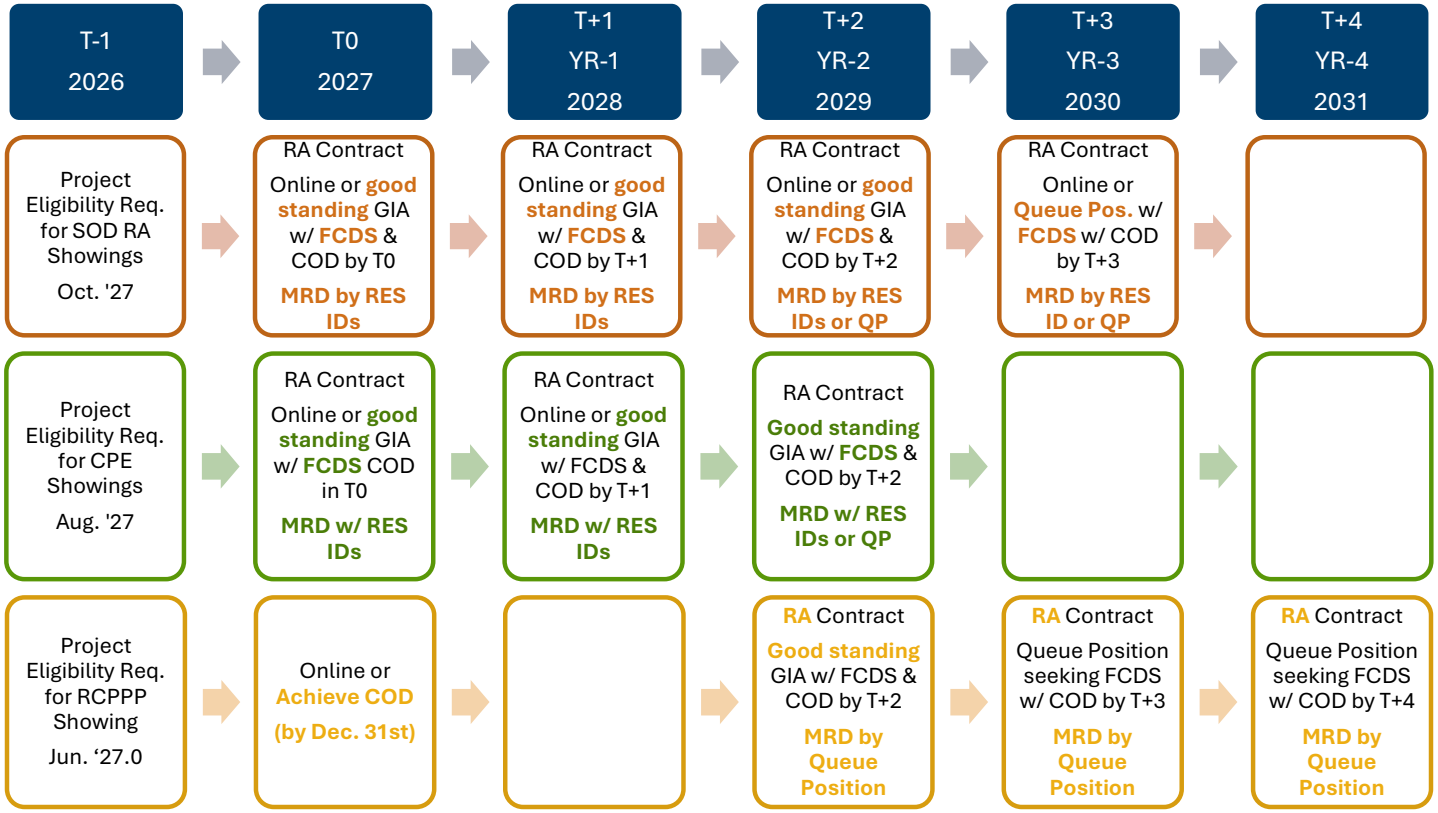
| Elements | Option I | Option II |
|---|---|---|
| Minimum Contract Length | Consider bids of any contract term length greater than or equal to one month (D.22-03-034 OP10) for existing and greater than or equal to 10 years for new (D.21-06-035 OP9) | Consider bids of any contract term greater than or equal to 10 yrs (D.21-06-035 OP9) |
| Approvals | Contracts ≤ five-year deemed reasonable and pre-approved under certain conditions and contracts > five years (existing or new) subject to Tier 3 advice letters (D.22-03-034 OP12, D.21-06-035 OP13) | Subject to Tier 3 advice letters (D.21-06-035 OP13) |

- For new project to be eligible for MRD at either queue position or RES ID level also require GIA in good-standing with FCDS & COD in that year (n)

# Eligibility requirements under Option I.b (proposed clarifications in bold color)



# Eligibility requirements under Option II.b (proposed clarifications in bold color)



# Reliable & clean in tandem

# Reliable & Clean Procurements

- Reliable and clean portions need to work in tandem
  - –Achieve portfolio with attributes needed to meet reliability (energy, uncertainty, and AS) and clean energy (GHG reduction) requirements
- Vistra directionally supports Clean Energy Standard (CES) as it would apply a more technology-agnostic approach than limiting to IRP planning track's candidate resources.
- CES need proposed to be set by "calculating annual CES-eligible generation" based on IRP modeling, which can be translated into a minimum capacity requirement within RPN (X% RPN are clean)
- CES design should have an ex-ante contracting sufficiency and online sufficiency penalty at Net CONE ($18.52/kW-mo) to incent procure new clean resource to meet a the CES% of RPN
  - –Allocated consistently with the RPN as a sub-need

# Stakeholder discussions needed on CES

- IRP modeling to determine RPN and the share of that made up of by CES-eligible generation must be able to capture need to meet operational reserves including uncertainty
- CES% should not be set to 100% if that does not allow demand response or load shifting assets (storage)
- Load modifying and load shifting emission reduction value must be accounted for in ex-ante or backward-looking compliance
- Further discussions needed on whether reliability & clean program will tackle problem through either options:
  - Ensure IRP modeling enforces reliability including uncertainty resulting in CES% of RPN where % may be less than 100
  - Set load modifiers or load flexibility resources as ZEC-eligible

# Proposed refinements to enforcement proposals

# Compliance & enforcement refinements

- For Option I or II paired with CES to be effective send signal where opportunity cost of deficiency is no less than net Cost of New Entry

  Net Cost of New Entry for CAISO 4-hr BESS is $18.92/kW-mo[1]

  – If penalty less than net CONE signals better off deferring procuring new resources in lieu of penalty **(unintended consequence)**
- Support assessment timing and administrative penalties
- Online sufficiency and backward-looking penalties

**Contracting & online sufficiency penalties recommended**:

| Penalty | Program | Option I or Option II and CES |
|---|---|---|
| Contracting Sufficiency | Reliability & Clean | Net CONE ($18.92/kW-mo). Waived if cured w/in 30 days. |
| Online Sufficiency (by Dec. 31st) | Reliability | |
| Backward-looking CES | Clean | $50/MWh |

Lazard's Cost of Energy, June 2025,Page 30, footnote 1, https://www.lazard.com/media/eijnqja3/lazards-lcoeplus-june-2025.pdf.

# Durable and adaptable as grid needs evolve

# Evolving grid adding new uncertainty reserves requirements for day-ahead participation

- Need to plan and procure a fleet that can be brought to the operational horizon to meet CAISO resource sufficiency needs
- Under EDAM each BAA needs to meet requirements to pass Resource Sufficiency Evaluation
  - –Stated goal to apply a “common mechanism…without supplanting existing resource adequacy frameworks in the West”
- BAAs will be subject to upward and downward requirements across three day-ahead components:


- If CAISO fails BAA RSE test it will have to pay a RSE failure surcharge with multiplier increasing surcharge if BAA repeatedly fails RSE
- WEIM RSE ensures sufficient 5-min ramp but assume not planning issue

# Evolving grid adding new uncertainty reserves requirements for day-ahead participation Cont.

- If resource planning incorporated 15-min flexibility into requirements we may be able to better evaluate whether it is more economic and in line with long-term goals to build or retain 15-min ramp capable eligible resources or rely on imports.
- Eligibility requirements more restrictive than Generic RA:
  - –Any resource capable of adjusting energy output on **15-minute basis** eligible for day-ahead RSE
  - –Resources must be scheduled to be online or have a start-up time of 15 minutes or less (may include Pmin of ≤15min SUT)
- Over time it will be important for planning to ensure sufficient resources are online that can help balance a zero-carbon future
  - –E.G., retain load modifying or load shifting assets (storage)

# Future discussions on reliability needs

- May be premature initially
- If RSE failure risks due to uncertainty requirements, or other RSE inputs, materialize under EDAM review should be prioritized
- Integrating uncertainty requirements into RCPPP or RA will be complex and suggest begin party discussions in near future on:
  - How should IRP planning be enhanced to be based on “load plus operating reserves” that include the new day-ahead reserve product?
  - How should RCPPP needs be adjusted to ensure sufficient min 15-min ramp capability for day-ahead RSE uncertainty test?
  - Alternatively, or in combination, how should RA be adjusted?

# Appendix

# Vistra's RCPPP Reliability Reflections

| Interests | Option I | Option II |
|---|---|---|
| Avoids over-procurements | **Risk** If local is not also required then RCPPP could meet requirements but from more non-local than can meet both requirements in T0 or T+1. This would necessitate additional local capacity procurements driving up total RA costs unnecessarily. **Recommending coordinating with local.** | |
| Incents meeting requirements | **Risk** Proposed penalties are too low to incent new resource contracting and increasing may skew market signals. **Recommending Net CONE based on LAZARD's 2025 LCOE assessed for contracting or online sufficiency and maintaining penalty but assessing year over year if continued deficiency.** | |
| Ensures viable new projects in showings | **Risk** Showing requirements for new/planned resources can be largely aligned depending on which years apply. **Recommending clarifications in line with intent.** | |
| Ensures reliability needs | **Risk** Forward showings that only meet 5 mo of the year are insufficient to support planning for reliability needs**. Recommending showings meet 12 mo at X% but the contracts by resource can be ≥ 1 month for existing resources or ≥ 10 for new/planned resources used for RA showings.** | |
| Effectiveness and accuracy of retirement signals | Market signals to retire resulting from competition between existing and new resources | **Risk** Staff assumed retirements – higher margin of error if actual retirements deviate |
| Effectiveness and accuracy of BESS augmentation signals | **BESS Issue** For BESS there needs to be a path to compensate for BESS augmentation if capital costs change over time. Either option needs to contemplate handling incentives to augment if RA contract does not cover the obligation or cost. | |
| Orderly versus disorderly net additions of capacity | Sending aligned entry and exit signals to incent retirements and additions via competition | **Risk** New need based on assumptions may lead to actual retirements out of sync w/ assumptions |
| Best equipped to communicate future capacity value | All resources on level playing field through applying marginal ELCC consistently | **Risk** New eligible resources have transparent mELCC but existing resources may be over or understated in multi-year RA |
| Most flexible for delays | Best suited for trading to cure delays or other risks | Requires maintaining bridge capacity framework |

# Option 1.b Illustration: MW need based on 2024 CED 1-in-2 Forecast, 18% sPRM, and CAISO LCR

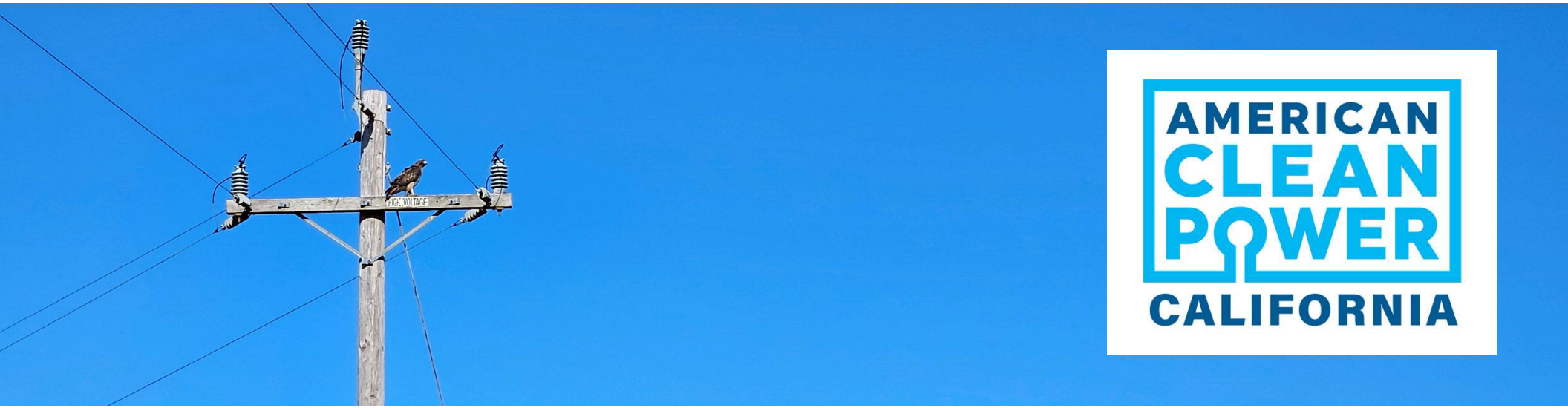
Black font proposed changes to Staff Proposal shown below.

| | T-1<br>2026-2027 | T0<br>2027 | T+1<br>YR-1<br>2028 | T+2<br>YR-2<br>2029 | T+3<br>YR-3<br>2030 | T+4<br>YR-4<br>2031 |
|---|---|---|---|---|---|---|
| System RA[1] | Jun. '26 - Dec. '27 | ~56 GW | ~52 GW | | | |
| 2027 Local CPE[2] | Jun. '26 - Aug. '27 | Locked<br>~23 GW<br>(local 41% of system) | Locked<br>~24 GW<br>(local 41% of system) | **~22 GW**<br>**(local 36% of system)**<br>**no new** | ~~**~13 GW**~~<br>~~**(local 21% of system)**~~ | |
| RCPPP | Apr. '26 - Jun. '27 | Locked | Locked | ~60.5 GW<br>**~22 GW**<br>(local 36% subset of system) | ~47 GW<br>**~27 GW**<br>(local 43% subset of system) | ~32 GW<br>**~13 GW**<br>(local 21% subset of system) |

1 CEC's CED 2024 1-in-2 Peak Forecast for each year with 18% PRM assumed for illustrative purposes.
2 Estimating of % of system based on PD 2026-2028 LCR and 2030 5-YR LCR technical study values for 2029-2030. For simplicity, assuming 2031 held to 2030.
3 While CPE can still procure for incremental changes between YR-2 and YR-1 for ease assuming no changes and fully locked to illustrate.
*4 Potentially remove T+2/YR-2 CPE requirement if RCPPP is meeting T+2/YR-2 needs and* ***make T+1 locked but for incremental & any backstop.***

# Discussion (30 minutes)

# Lunch Break (1 Hour)




# RCPPP Emissions Framework

**ACP-California RCPPP Workshop Presentation 3**

**June 23-24, 2025**

# Emissions Framework: Robust Forward Requirements and Review

- ACP-California strongly supports establishing a structured clean energy procurement framework to implement SB 100, including:
  - **IRP Integration:** CES should leverage existing IRP data collection and forward analysis frameworks to assess LSE- and system-level progress and compliance.
  - **Forward Requirements:** Establish clear forward procurement requirements ensuring LSEs have explicit plans and executed contracts to meet their requirements.
  - **Terms and Eligibility:** CES should incorporate key terms and eligibility requirements from SB 100 and the RPS program.

*Establishing a robust forward procurement framework for clean energy resources will improve both policy and market outcomes, improving project financing and ratepayer costs while mitigating risks associated with just-in-time procurement and interconnection.*

# IRP Integration

- **Integrating IRP Infrastructure:** Forward planning, analysis, and progress review are key elements of resource planning and should be incorporated into the CES framework
  - **Data Collection:** LSEs should submit data on CES procurement and forward contracts in parallel with submissions on reliability procurement (e.g. RDT submissions)
  - **Forward Analysis:** LSE submissions should be evaluated individually and collectively for progress toward emissions reduction targets:
    - **LSE-Level Review:** RDT submissions should assess individual LSE progress toward meeting LSE-level greenhouse gas emissions targets utilizing simplified showing tools
    - **System-Level Review:** RDT submissions should be aggregated for more advanced analysis utilizing SERVM, and, as necessary, RESOLVE to identify resources necessary to fill gaps
  - **Interventions:** In addition to forward procurement requirements, Commission should establish triggers for mitigating deficiencies arising from system-level analysis, e.g. insufficient total procurement or insufficient procurement of storage, diverse resources

# Forward Requirements

- **Benefits of Forward Requirements:** Forward CES showing requirements ensure LSEs proactively plan and contract for sufficient clean energy resources with sufficient time for new resource development, reducing the risk of overreliance on market resources.
- **Requirements:** Align requirements with proposed Reliability Option I (Portfolio):
  - T+0, T+1, T+2: 100%
  - T+3: 75%
  - T+4: 50%
- **In-Development:** Forward showings to include resources in development using MTR "milestones" construct.
- **Compliance Teeth:** Failure to demonstrate required progress toward requirements could directly incur penalties or incur penalty escalation for ex post showings.

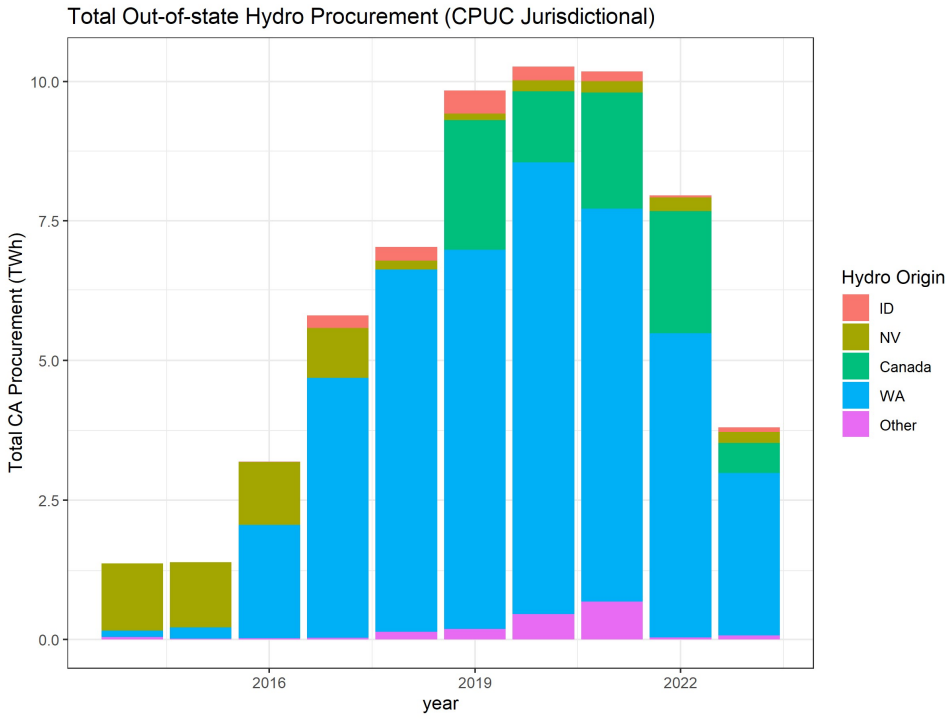
# Contracting Terms and Resource Eligibility

- **Robustness and Additionality:** CES should incorporate key RPS and SB 100 terms and eligibility requirements:
  - Maintain Long-Term Contracting Minimums – 10+ Years for 65% of CES Compliance
  - Delivery to a California Balancing Authority
  - Require bundling for energy + RECs/ZECs
  - Establish a framework to oversee product eligibility and tracking
  - Exclude resource shuffling procurement strategies (e.g. OOS hydro, nuclear)
- **Building the Clean Energy Transition:** In parallel with forward requirements, establishing robust, firm, upfront eligibility requirements ensure LSEs place appropriate emphasis on new build resources identified in IRP and SB 100 studies.

*Application of RPS eligibility terms and oversight constructs to the CES would significantly improve policy outcomes by ensuring LSEs focus on additional, long-term contracts supporting incremental clean resources and mitigating the potential for resource shuffling and/or low-quality attributes.*

# Terms and Eligibility: Lessons from Voluntary Market

- Since 2016, Zero Emissions Credits ("Carbon Free Attributes") have surged in LSE voluntary claims in the Power Source Disclosure Program
- Reallocating legacy out-of-state hydroelectric resources into California portfolios:
  - Provides no environmental benefit
  - Violates resource shuffling prohibitions in SB 100
  - Diverts significant ratepayer funds away from clean energy investments
- Voluntary procurement from a small segment of LSEs elevated out-of-state hydroelectric claims from <2 to ~10 TWh annually, equivalent to:
  - ~4GW Solar / Wind (30% CF)
  - ~1.5GW Geothermal (80% CF)




Sources: PSDP Data 2014-2023

# Resource Shuffling: A Zero-Sum Game

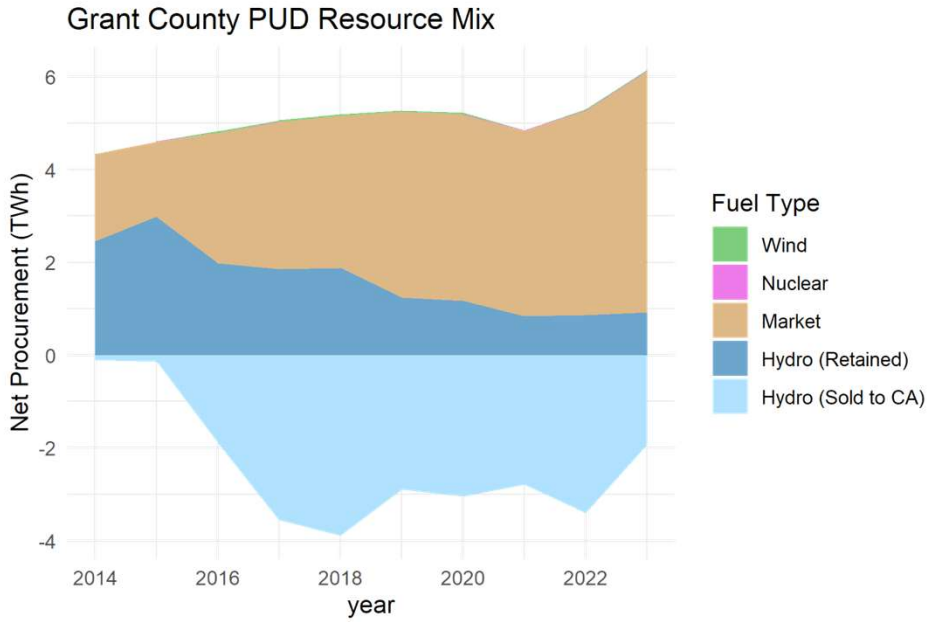
- **Statutory Requirement:** SB 100 specifically directs the Commission to prevent resource shuffling transactions from being used for SB 100 compliance:

  "The achievement of this policy for California **shall not increase carbon emissions elsewhere in the western grid** and shall not allow resource shuffling.

  **The commission… shall take steps to ensure** that a transition to a zero-carbon electric system… does not cause or contribute to greenhouse gas emissions increases elsewhere in the western grid."

- **Regional Emissions Impact:** Reallocating hydroelectric resources from regional portfolios (e.g. Washington utility portfolios) plainly increases emissions "elsewhere in the western grid" under any policy structure which recognizes the transferability of emissions attributes, such as a CES

- **Example – Grant PUD:** Since 2015, Grant County PUD has substantially expanded its sales of specified carbon-free hydroelectricity to California LSEs, displacing its self-consumption – and instead relying on emitting market purchases




Sources: California PSDP Data 2014-2023, Washington State Fuel Mix Disclosure Data 2014-2023

# Annual Clean Energy or Hourly Emissions: Considerations

ACP-California recognizes the simplicity of annual clean energy accounting, which requires LSEs and developers to manage operational risks (e.g. curtailment). However, we recognize that evolving grid complexity and the need for more granular analysis may be necessary as the energy transition advances.

**Annual CES (RPS+)**

- Retains straightforward annual (multiyear) compliance framework
- Limited transactional complexity
- Market participants incentivized to pursue storage, diverse resources to manage curtailment risk
- Operational risks managed through market participation (bidding)
- Compliance tools well-developed and ready for implementation

**Hourly Emissions ("CSP-Lite")**

- Directly incentivizes LSEs to pursue load-resource balanced portfolios
- May elevate transaction complexity
- Market participants endogenously incentivized to pursue storage, diverse resources to achieve modeled emissions reductions
- Operational risks irrelevant to GHG compliance assessment
- Current tools for LSE-level emissions analysis lack sophistication and vetting

# RCPPP Emissions Framework Recommendations

- The Commission should:
  - **IRP Integration:** Integrate clean energy procurement under RCPPP into existing IRP analytical and modeling frameworks to assess and manage decarbonization progress.
  - **Forward Requirements:** Require forward showings demonstrating LSE progress toward meeting CES requirements with long-term contracts covering at least 65% of allocated need from existing resources and resources in development.
  - **Eligibility Terms:** Adapt key eligibility terms from RPS and implement new terms to align with statutory directives for SB 100 emissions integrity.

# ACP-California: Summary of Proposals

- **Reliability**
  - **Initiate Near-Term Needs Assessment for Reliability and Clean Energy**
  - **Reliability Framework:**
    - **Multi-Year RA with SOD**
    - **New-Build Requirements**
  - **Managing Deliverability Affidavit Timelines**
- **Emissions**
  - **IRP Integration**
  - **Forward Requirements**
  - **Terms and Eligibility**

*ACP-California strongly supports the Commission's efforts to bring enhanced structure and planfulness to the state's resource procurement framework through RCPPP.*

**Alex Jackson**
Executive Director
**American Clean Power – California**
Ajackson@cleanpower.org

**Molly Croll**
Policy Director
**American Clean Power – California**
mcroll@cleanpower.org

**Nick Pappas**
Consultant to ACP-California
**NP Energy**
Nick@NPEnergyCA.com

**Jon Martindill**
Consultant to ACP-California
**NP Energy**
Jon@NPEnergyCA.com

**Brian Biering**
Attorney to ACP-California
**Biering & Brown LLP**
bbiering@b2energylaw.com

**Caitlin Liotiris**
Consultant to ACP-California
**Energy Strategies**
ccollins@energystrat.com

CALIFORNIA
RESOURCES CORPORATION

# Defining Zero-Carbon Resource Eligibility & ZEC Incentives

CPUC RCPPP Workshop
June 24, 2025

# CRC: A Different Kind of Energy and Carbon Management Company

**California Resources Corporation, through its Carbon TerraVault (CTV) line of business, is leading the development of CCS projects in California**

Received the first US EPA Class VI permits for $CO_2$ injection wells in the state (Dec 2024)

Class VI permit applications for an additional seven (7) $CO_2$ storage reservoirs in California currently under EPA review

Issued and pending Class VI permits represent ~15 million metric tons per annum of $CO_2$ injection capacity

Developing a CCS project at CRC's 550 MW Elk Hills power plant in Kern County; captured $CO_2$ will be stored in co-located depleted oil and gas storage reservoir

With an expected $CO_2$ capture rate of 95%, natural gas generation + $CO_2$ capture and storage can be a source of both firm baseload and dispatchable clean power

## Gaps in the Clean Energy Standard

**Clean Energy Standard (CES) does not define zero-carbon resource eligibility or zero emission credit (ZEC)**

Design of CES should promote grid reliability and affordability while advancing fastest GHG reductions

Achievement of these goals requires a technology agnostic, all-of-the-above approach that promotes both zero-emission and low-emission technologies

Promotion of low-emission technologies incentivizes decarbonization of existing generation as well as new builds and provides source of reliable and affordable power

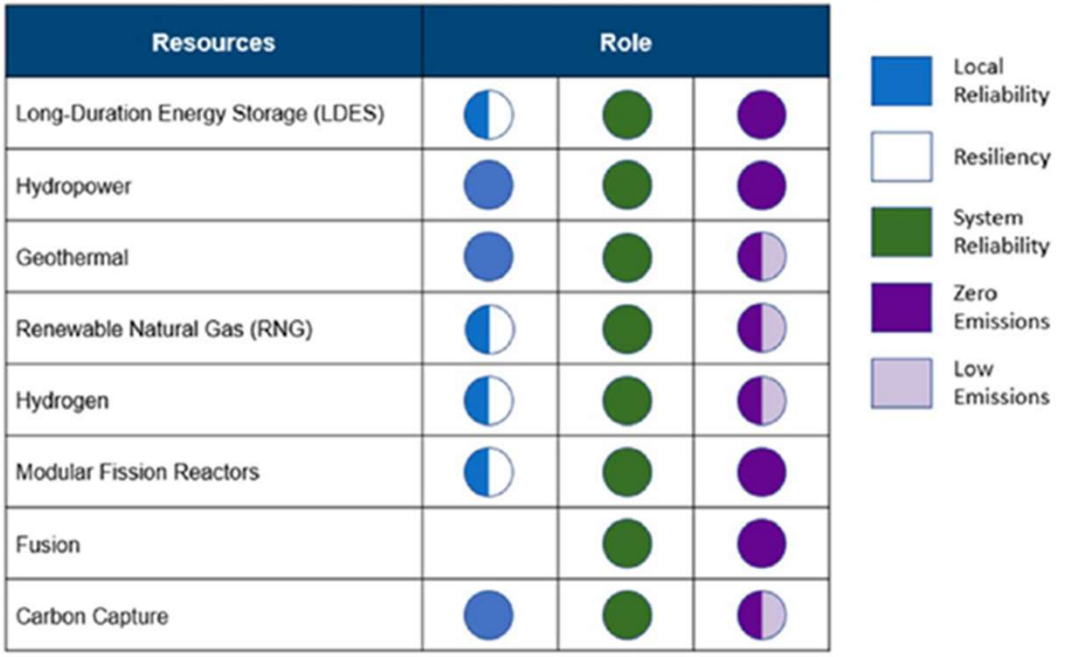
**Solutions should strive for alignment with five program design principles of *fairness, effectiveness, affordability, feasibility and predictability***

## To expedite GHG reductions and ensure grid reliability and affordability, RCPPP and CES must incorporate low-emission firm resources, both baseload and dispatchable

- Most recent SB 100 report (2021) identifies the benefits of resource diversity and clean, firm power to improve reliability and affordability

- SB 423 report (2024) considers both zero-emission and low-emission firm resources to address local reliability, system reliability, and emissions reductions

**Figure 1: Overview – Role of Firm Zero-Carbon Resources**




*From CEC's SB 423 Report (Dec 2024)*

## Potential Definitions: Zero-Carbon Resource Eligibility – Carbon Intensity

**Need a technology neutral eligibility criteria that incentivizes rapid emission reductions across a swath of generation resources that can power a reliable and affordable grid**

Develop an emissions benchmark under which resources are eligible for ZECs

Could align with SB 1020 targets

e.g., 90% clean by 2035

Benchmark could be Scope 1 (easier to implement) or Scope 1-3 (more robust GHG evaluation aligning with CA SB 253 Scope 1, 2, and 3 reporting requirement)

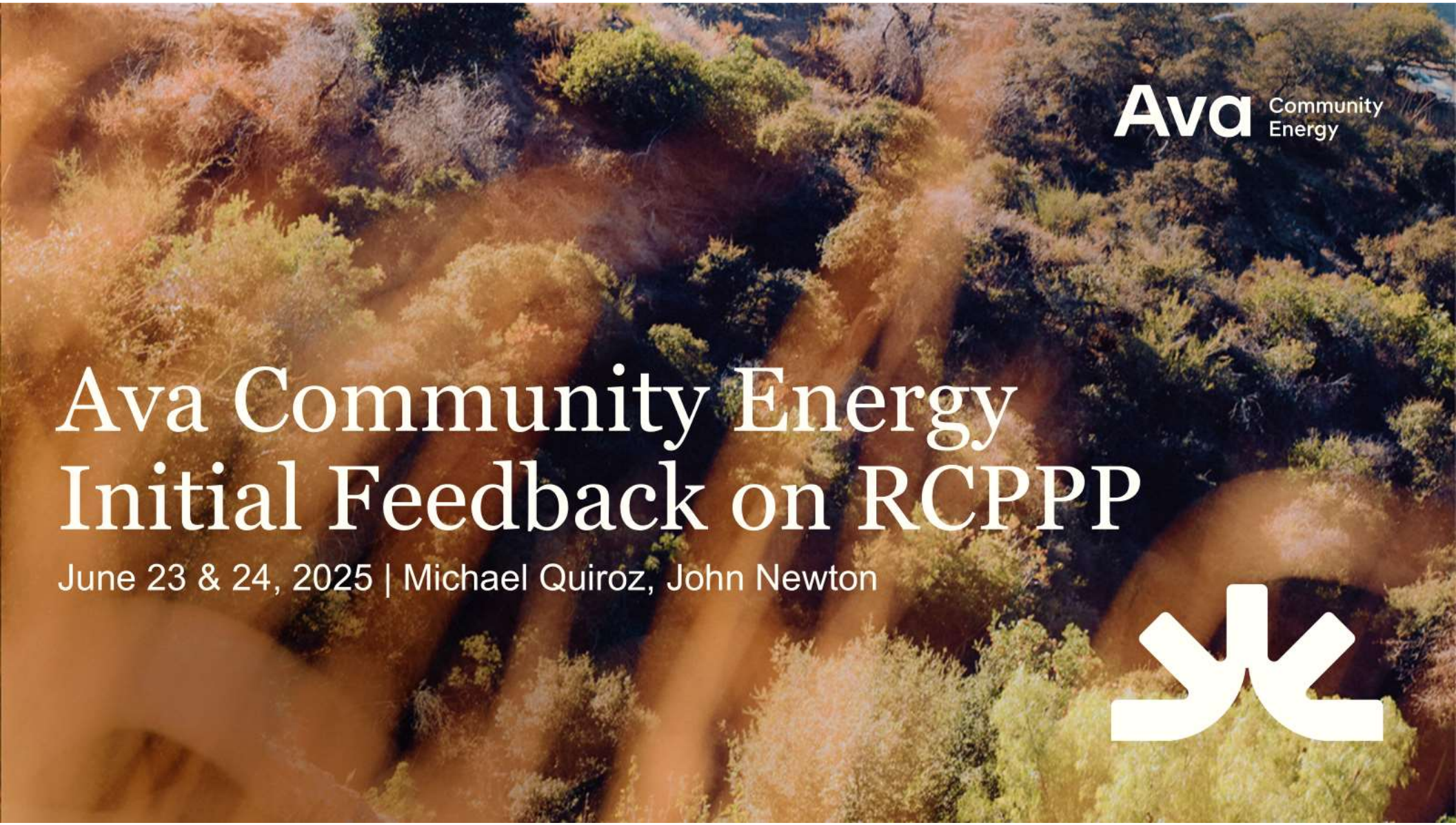
**CRC continues to evaluate these and other definitions and will provide a recommendation in its comments**

# Potential Definitions: ZEC Incentive for Clean Electrons

- **Focus on incenting rapid, affordable decarbonization that is technology-neutral and supports both existing and new resources**

- ZEC is an incentive to preserve or create clean firm baseload or dispatchable power generation
- Similar to NY and Illinois, the ZEC $/MWh incentive could be set using a societal cost of carbon (e.g., CA C&T allowance price) and the avoided emissions from the zero-carbon resource (e.g., avoided emissions from Scope 1 or Scope 1-3 carbon intensity of natural gas power plant)
- Like many RPSs, and the NY CES, ZEC tiers could be established that recognize the different reliability value of firm zero-carbon resources (e.g., firm baseload versus firm dispatchable)
- Like the Illinois ZEC and California RPS, some portion of ZECs could be awarded on a long-term basis to provide investor certainty and obligating continued operations
- Consider customer protections: a ZEC phase out if power prices (for "fixed" fuel resources) or spark spreads (for variable fuel resources) increase
- Economic studies on the NY and Illinois ZECs indicated significant customer costs savings and faster decarbonization by utilizing existing resources versus the cost and timing of new builds

**CRC continues to evaluate these and other definitions and will provide a recommendation in its comments**


Ava Community Energy
Ava Community Energy
Initial Feedback on RCPPP
June 23 & 24, 2025 | Michael Quiroz, John Newton

# GHG Reduction

# GHG Reduction Program Considerations

Any IRP approach to GHG reduction must incorporate the following elements from the Public Utilities Code:

| § 399.15 (SB 100) | § 454.52 (SB 350) | § 454.53 (SB100, SB 1020) | § 398.6 (SB 1158) |
|---|---|---|---|
| • CPUC to administer Renewable Portfolio Standard (RPS) program<br>• Indefinite 3-year compliance periods<br>• 60% renewable target by 2030; at least 60% thereafter<br>• Authorizes CPUC to augment RPS targets above prescribed levels | • LSEs meet CARB GHG reduction targets<br>• Consider existing renewables, storage, DERs, EE, when evaluating needs in peak hours while reducing need for new electric generation | • Establishes 100% renewable and zero carbon resources targets<br>• 2045: 100% of retail sales. Intermediary targets of 90% and 95% | • Retail sellers must report electricity sources and associated emissions to CEC on an hourly basis<br>• Authorizes the CPUC to use this data to assess whether LSEs demonstrating progress towards emissions targets |
| **RPS** | **IRP** | **RPS, RCPPP *proposal*** | **CEC PSD, RPS, RCPPP *proposal*** |

In any approach to GHG-reduction program design, the CPUC should prioritize the consolidation of requirements, emissions tracking, and compliance filings

# Options for Streamlining GHG-Reduction

1. **Incorporate CES into RPS**
   - PUC § 454.53 authorizes the CPUC and CEC to "use programs authorized under existing statutes" to achieve emissions targets
   - The CPUC should clarify that CES would augment the content of existing RPS compliance filings rather than duplicate RPS compliance filings
2. **Align emissions tracking with the CEC's Power Source Disclosure program**
   - M-RETS will not provide a REC tracking system to WREGIS after 2027
   - CEC required to share hourly energy and emissions data with CPUC
   - CPUC authorized to use this data to assess whether LSEs demonstrating progress towards emissions targets.
3. **Forward-looking Compliance via Clean System Power Calculator (Mass Based)**
   - Use CSP Calculator to evaluate expected emissions of an LSE's portfolio on a forward-looking basis; compare against CPUC-assigned emissions target
   - This option provides significant streamlining, but would require statutory changes to end the RPS program compliance structure

# CES GHG Compliance Concerns

RCPPP Workshop - June 24, 2025

CALIFORNIA ENVIRONMENTAL JUSTICE ALLIANCE
EARTHJUSTICE
SIERRA CLUB

## The Commission should not proceed with the CES at this time.

- CES as proposed lacks key features of a sound greenhouse gas reduction compliance program.
- Additional analysis and safeguards are needed to ensure California actually reduces its power sector GHG emissions consistent with state requirements and decarbonization goals.
- An improperly and hastily designed GHG compliance mechanism will create perverse incentives, thwart attainment of climate, air quality, and equity goals, and be a major step backwards for California.

Instead, develop a credible GHG reduction compliance mechanism that builds upon decades of lessons learned from the RPS program and the IRP proceeding. If necessary, the Commission can issue another mid-term procurement order that prioritizes least-regrets resources such as community solar.

# Sierra Club & CEJA Concerns

CALIFORNIA ENVIRONMENTAL JUSTICE ALLIANCE
EARTHJUSTICE
SIERRA CLUB

# Summary of Sierra Club & CEJA Concerns

The CES Proposal has major flaws and would be a step backwards for California's climate work.

The proposed CES:

1. Suggests that the Commission can define "zero-carbon resource" on its own, despite the SB 100 interagency process;
2. Does not require hourly emission matching;
3. Appears to allow unbundled credits;
4. Does not require that purchased electricity be delivered to California;
5. Does not comply with SB 100's resource shuffling prohibition;
6. Requires neither long-term contracts for new renewable development nor contract length limits for dirty facilities;
7. Proposed monetary penalty may not be effective;
8. Potentially enables new fossil fuel generation; and
9. Does not identify adequate staff and support to enforce the CES.

**Given these problems, the Commission should instead deploy a mass-based GHG standard.**

# 1. Defining "zero-carbon resource" through a future, undefined CPUC process runs counter to the SB 100 interagency process

- The lack of a state-wide definition of "zero-carbon resource" demonstrates why a CES will be difficult and time-consuming.
- The SB 100 interagency process for determining what counts as a "zero-carbon resource" is underway; the Commission does not have the authority to define "zero-carbon resource" or "clean energy" or for the State on its own.
- The CEC only developed detailed resources of RPS eligibility after a long process, and the development of a detailed guidebook; it could take years for the same process and guidance to be completed for a CES.
- Until there is a consistent and credible process for determining what a "zero-carbon resource" is, the Commission should not proceed with a CES.

# 2. CA law requires actual GHG reductions and hourly tracking and prohibits resource shuffling…

- Public Utilities Code Sections 454.51 and 454.52 mandate that the IRP procurement portfolio "be designed to achieve any statewide greenhouse gas emissions limit" and targets set by CARB.
- The Public Utilities Code Section 399.11 explains that "reducing emissions of greenhouse gases associated with electrical generation" is the purpose of the RPS program.
- Public Utilities Code section 398.6(g)(1) requires the Commission to track and evaluate hourly GHG emissions.
- Public Resources Code Section 454.53(a) states that "[t]he achievement of this [SB 100 clean electricity] policy for California shall not increase carbon emissions elsewhere in the western grid and shall not allow resource shuffling."

## 2. The proposed CES does not include hourly emission accounting requirements

- Hourly matching is essential to ensure actual GHG reductions.
- Without hourly matching, the program would not send the market signals needed to develop the new renewable resources needed to achieve California's climate goals.
- SB 1158 requires the Commission to track and evaluate hourly GHG emissions.
- CSP calculator is currently used in the IRP planning track.

# Without hourly matching, the CES could produce perverse outcomes

**LSE 1: Matches its hourly loads, including net peak load, with clean resources**

**LSE 2: Relies on system power during net peak and purchases ZECs to meet annual CES target.**

These two very different LSE procurement strategies present two very different outcomes for climate, the grid and air quality but, under the staff proposal, would perform identically under the CES.

# 3. The proposal allows unbundled attributes, undermining decades of CA policy making to encourage new, clean resource build

Use of unbundled RECs would allow existing resources, including existing out of state resources, to sell their unbundled credits to LSEs, taking away incentive to build new, clean resources in California.

This violates PUC decisions that have assigned no GHG value to unbundled attributes.

- LSEs currently can't use unbundled credits in the CSP or to meet current IRP procurement requirements.
- RECs cannot be used for carbon offset values.
- CEC's power source program does not allow unbundled RECs.
- CARB does not allow unbundled RECs to be used to make any emissions claims.

# 4. The CES Proposal does not require deliverability of electricity to California

- Unlike the RPS program, which requires that a high percentage of electricity be delivered to California, the Staff CES proposal has no such requirement.
- This lack of any deliverability specifications could discourage new clean resource build and encourage reliance on out-of-state existing resources and associated unbundled credits– exactly the opposite of what California seeks to achieve with its climate and clean air programs.
- We could see fewer clean energy imports → more dispatch of California gas plants to the detriment of impacted communities and air quality and in contravention of SB 350.
- The Commission should analyze these risks and its findings should inform future program design.

# 5. The CES Proposal does not prohibit resource shuffling, putting GHG reductions at risk

- Resource shuffling trades emissions reduction in California for an increase outside California, thereby nullifying any actual GHG benefit.
- Aware of this risk, the Legislature prohibited it in SB 100, which provides:

  > *"[t]he achievement of this [SB 100 clean electricity] policy for California shall not increase carbon emissions elsewhere in the western grid and shall not allow resource shuffling."*

- The CES ignores this important requirement.
- This omission from the Staff proposal is a major risk to the integrity of any GHG reduction compliance mechanism.

# 6. The CES Proposal requires neither long-term contracts for new renewable development nor contract length limits for dirty facilities

- New, clean resource build requires long-term contracting.
- IRP currently requires long-term contracts in the procurement orders, and it has largely been successful.
- One risk is that short-term contracts for ZECs could lead to supply scarcity and attribute price increases that then cause LSEs to request for waivers from their procurement obligations.
- The Commission should analyze this risk include a long-term contracting requirement for renewables.
- Conversely, it should also limit the contract length for dirty facilities that emit pollution in DACs.

## 7. The proposed monetary penalty may not be effective

- More analysis of the correct enforcement regime is needed to ensure actual compliance.
- There is a risk that LSEs will simply buy their way out of GHG reductions and/or ask for waivers if the price of compliance increases.
- The Commission should consider non-monetary "payment" options akin to backstop procurement of clean resources.

## 8. The CES Proposal could enable new fossil fuel generation

- By creating a "standard" based on the overall resource portfolio, the CES seems to envision the eligibility of fossil fuel or other emitting resources, contrary to decades of California policy making and multiple recent IRP decisions.
- Without clear prohibitions for new fossil fuels and other emitting resources, the CES will not be "clean" and would undo Commission precedent and create new harms on frontline communities.

## 9. The CES Proposal does not identify adequate staff and support to enforce the CES

- The Commission's IRP resources are already constrained, as evident by long delays in developing long-promised IRP tools.
- Developing and enforcing a new standard and compliance measure—rather than building off existing mass-based GHG systems—will require additional Commission staff.

# The Commission should instead adopt a mass-based GHG approach.

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EARTHJUSTICE
SIERRA CLUB

# The Commission should consider and adopt a mass-based approach

- More time is needed to develop a credible GHG reduction mechanism that builds on the decades of lessons learned from the RPS program and the IRP process.
- The mass-based approach avoids many of the inherent pitfalls of a CES that we described above.
- Especially at this critical time for the clean energy transition, we need California to launch a carefully designed program that does not require us to build key pieces of the ship while we are on it.
- As the Commission develops the GHG compliance portion of the RCPPP, it can issue another mid term order and consider no-regrets resources.

# Discussion (30 minutes)

# Break (10 minutes)

# CPUC RCPPP Workshop

## CES Alternatives to De-risk State Climate Progress

FERVO ENERGY

PENINSULA CLEAN ENERGY

Sonoma Clean Power

# Introductions

FERVO ENERGY

*Provides 24/7 carbon-free energy through the development of next-generation geothermal power. With breakthroughs in horizontal drilling, fiber-optic sensing, and advanced reservoir engineering, Fervo is making geothermal scalable, competitive, and ready to meet growing global demand.*

PENINSULA CLEAN ENERGY

*First utility to adopt a 24/7 time-coincident renewable energy matching goal, and explicitly prioritize procurement for clean resources that meet load needs across all hours of the year*

Sonoma Clean Power

*Adopted hourly marginal emissions targets for portfolio and leads Geothermal Opportunity Zone (GeoZone) initiative to build local clean firm resources to support state's decarbonization goals*

# CES Shortcomings

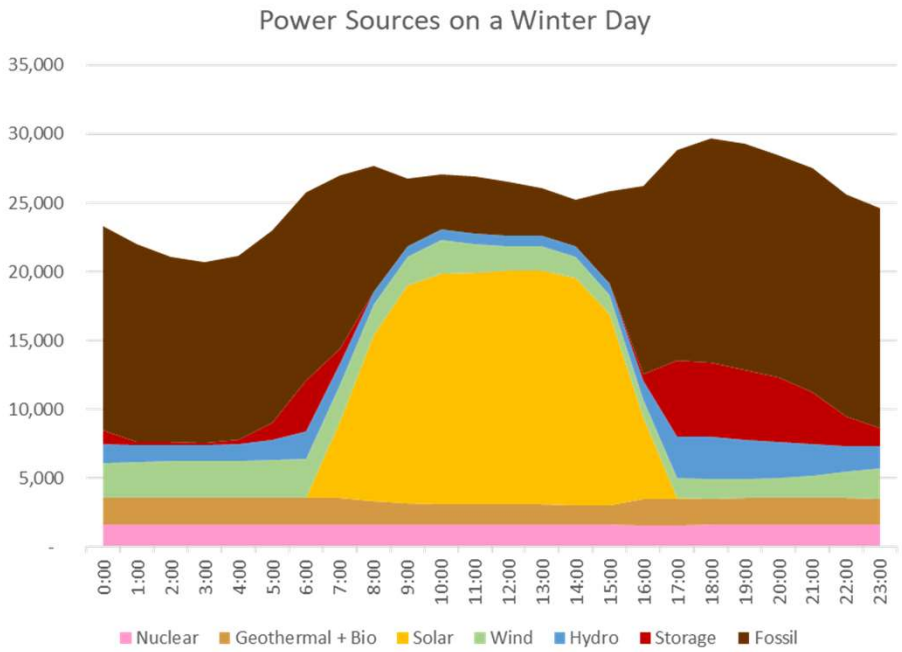
1. *CES doesn't incentivize the decarbonization of the most carbon-heavy hours.*
2. *CES incentivizes business-as-usual emphasis on least-cost generation without consideration of best-fit renewable integration and diversity, leaving residual fossil emissions and increasing risks of curtailment and operational challenges.*
3. *Clean firm technology is ready to meet this moment.*

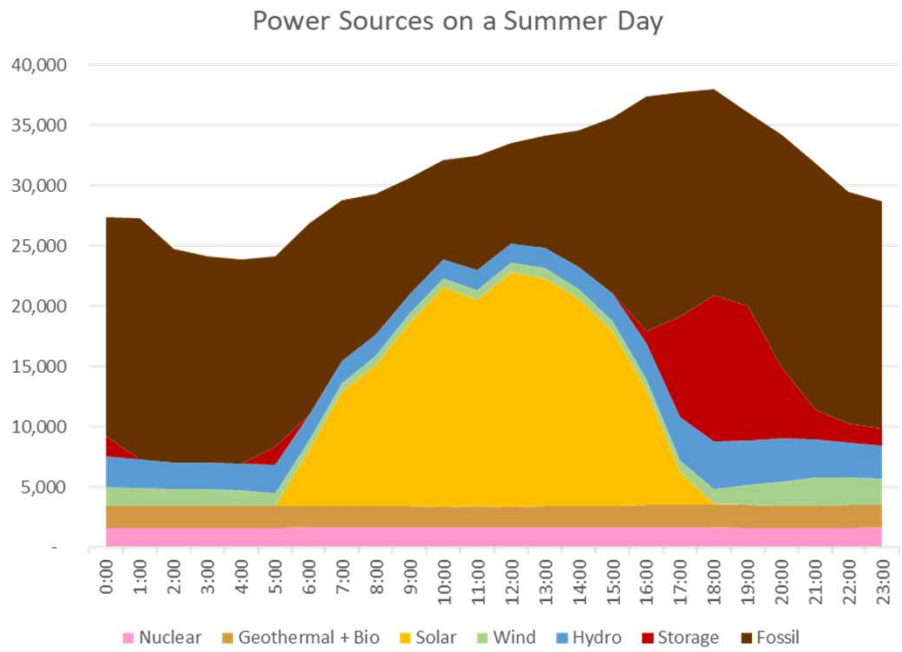
# Clean Firm Power Is Meeting The Moment: Recent News in EGS

- Fervo drilled a well to the vertical depth of 15,765 feet at a bottomhole temperature of 520 °F. This well was drilled in 16 days, representing a ***79% reduction in drilling time*** compared to US DOE baseline projections.
- The USGS announced in May that, with advances in EGS, the Great Basin could supply 10% of U.S. electricity demand. Their assessment shows potential for ***135 GW*** in the Great Basin if EGS scales.
- Earlier this month, Fervo secured an additional ***$206 Million in new financing*** to accelerate Cape Station development, one of Fervo's three current projects.
- As US power demand accelerates – driven by AI, electrification, and grid reliability needs – Fervo's ability to unlock firm, carbon-free energy from heat reservoirs miles underground positions it as a core contributor to the American energy mix

# This is our grid today

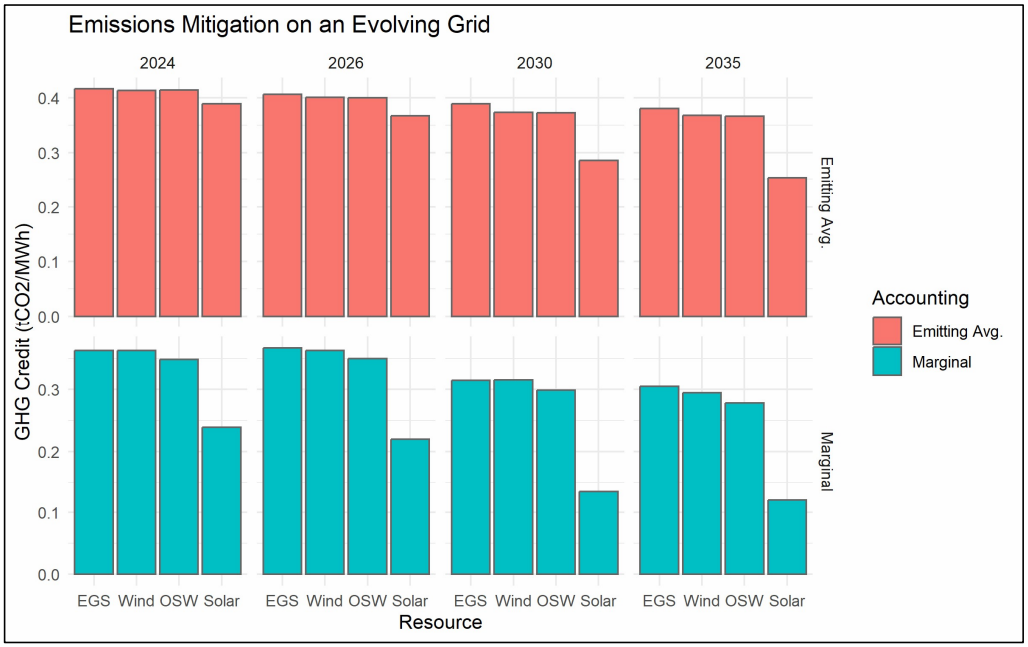
- How do we decarbonize all hours?



# Emissions impact over time

- Clean firm resources mitigate emissions in *all* hours.
- Clean firm resources are a *long-term investment* in grid decarbonization.

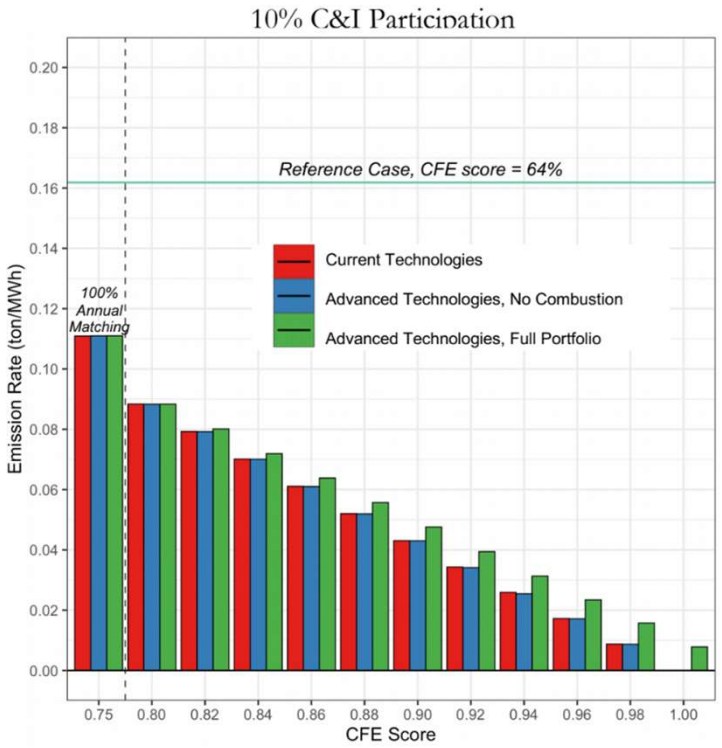



**Sources:**

- **Emitting Average Emissions from 2023 Clean System Power - 25 MMT Scenario**
- **Marginal Emissions from 2024 Avoided Cost Calculator**

# **Background:** Annual Targets

- Annual measurements become an unreliable measure of emissions mitigation as the grid decarbonizes
    - **Example:** Xu et al study of California equates 100% annual target with an emissions rate of 0.11 ton/MWh, far from a 100% decarbonized grid and equivalent to a 75% hourly matched grid
- Moving to annual targets is a step backwards in the IRP process, which currently uses hourly calculations in the Clean System Power tool



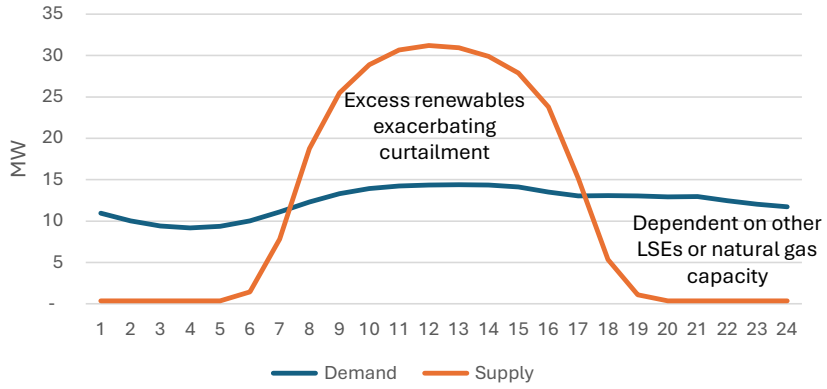

*CFE Score = % of MWh on an hourly basis matched with clean energy resources*

*From "System-level Impacts of 24/7 Cabon-Free Electricity Procurement" Xu et al (2022).*

# **Background:** Unfair Treatment for LSEs

As proposed, the CES would provide the same credit to a 100% solar portfolio as a diverse portfolio, despite a four-fold difference in hourly emissions performance

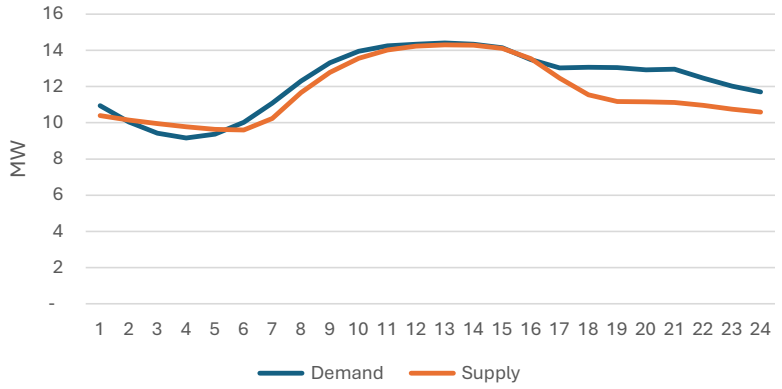
**100% Annual:** Hourly Demand vs. Supply




**CSP Emissions:** 0.173 tonnes/MWh

Could rely on 100% natural gas for reliability

**Diverse Portfolio:** Hourly Demand vs. Supply




**CSP Emissions:** 0.042 tonnes/MWh

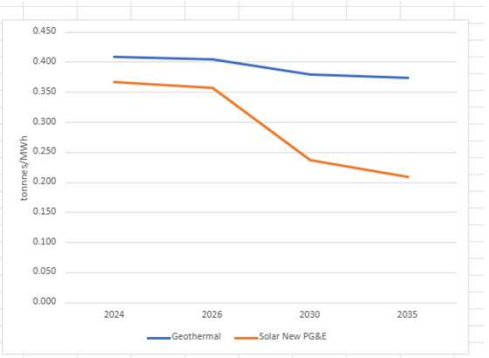
Contributes clean firm capacity for reliability

# **CES Solution #1:** Marginal Emissions Credits

- Marginal emissions credit assigned to each technology on a tonne/MWh basis similar to the development of ELCCs
- LSEs assigned an overall emissions target calibrated to the needed mitigation to meet state climate goals by load-share or marginal emissions impact of LSE's load shape

*Example calculations using 2022 CSP*

| | 2024 | 2026 | 2030 | 2035 |
|---|---|---|---|---|
| Imported Hydro | 0.416 | 0.415 | 0.411 | 0.409 |
| ACS | | | | |
| Large Hydro | | | | |
| Nuclear | | | | |
| Biogas | | | | |
| Biomass | | | | |
| Geothermal | 0.409 | 0.405 | 0.379 | 0.373 |
| Small Hydro | | | | |
| Hybrid or Paired Solar and Battery | | | | |
| Shed DR | | | | |
| Wind Baseline California | | | | |
| Wind New PG&E | 0.399 | 0.394 | 0.370 | 0.368 |
| Wind New SCE SDG&E | 0.403 | 0.399 | 0.380 | 0.376 |
| Wind Pacific Northwest | 0.400 | 0.395 | 0.370 | 0.368 |
| Wind Wyoming | | | | |
| Wind New Mexico | | | | |
| Wind Offshore Morro Bay | | | | |
| Wind Offshore Humboldt | | | | |
| Solar Baseline California | 0.3684 | 0.3582 | 0.2351 | 0.2090 |
| Solar New PG&E | 0.3675 | 0.3573 | 0.2364 | 0.2090 |
| Solar New SCE SDG&E | 0.3713 | 0.3611 | 0.2420 | 0.2170 |
| Solar Distributed | 0.3635 | 0.3525 | 0.2163 | 0.1891 |



# **CES Solution #2:** SB 1158 Target

- Leverage reporting and accounting system setup by SB 1158 to determine LSE's emissions performance
  - Consider including "Avoided GHG" credits
  - SB 1158 is a CEC process – CPUC would maintain process that mirrors methodology
- Add an enforceable tonnes/MWh ceiling for all LSEs calibrated to system emissions targets with penalties for non-compliance

*Example calculations from CEC's proposed 2028 reporting template*

**Annual Total of Hourly Load-Matching**

| | |
|---|---|
| Total Load | 12010 |
| Total Loss-Adjusted Load | 12575 |
| Total Inventory GHGs | 2176 |
| Inventory GHG intensity (MT CO2e/MWh) | 0.173 |
| Total Avoided GHGs | 141 |
| Total Oversupply | 341 |
| Total Oversupply GHGs | 1 |

# **CES Solution #3:** Enforceable CSP

- Use past IRP process of using the CSP to evaluate each LSE's contribution to system emissions
- Add near-term emissions targets (T+2 and T+4) that are aligned with trajectory for decarbonization and make compliance enforceable

*Example output from 2022 CSP on emissions performance*

***Emissions Summary***

| Emissions Total | *Unit* | 2035 |
|---|---|---|
| $CO_2$ | *MMt/yr* | 0.02 |
| PM2.5 | *tonnes/yr* | 0 |
| $SO_2$ | *tonnes/yr* | 0 |
| NOx | *tonnes/yr* | 1 |

***Emissions by resource type***

| $CO_2$ | *Unit* | 2035 |
|---|---|---|
| Coal | *MMt/yr* | - |
| CHP | *MMt/yr* | 0.00 |
| Biogas | *MMt/yr* | - |
| Biomass | *MMt/yr* | - |
| System Power | *MMt/yr* | 0.02 |
| Asset Controlling Supplier | *MMt/yr* | - |
| **Total** | ***MMt/yr*** | **0.02** |
| Average emissions intensity | *tCO2/MWh* | 0.173 |
| Oversupply Emissions Credits | *MMt/yr* | 0.01 |

# **CES Solution #4:** Hard-to-Decarbonize Target

- Add an overlay "Clean Peak Standard" requirement for clean MWh of procurement in hard-to-decarbonize hours (example: winter evenings)

- Assign a technology-specific contribution during hard-to-decarbonize hours and LSE requirement based on sales in hard-to-decarbonize hours
  - Storage would either be ineligible or have some type of charging sufficiency test

*2035 Net System Power (GW) from 2022 CSP – highlighting hours with most need*

| | HOUR ENDING | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Month | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| 1 | 5.78 | 5.64 | 4.98 | 5.44 | 6.14 | 5.51 | 4.45 | 4.07 | 3.29 | 3.89 | 3.52 | 3.06 | 2.80 | 2.30 | 2.14 | 1.95 | 4.40 | 5.31 | 5.99 | 6.51 | 6.50 | 6.15 | 5.90 | 5.55 |
| 2 | 4.52 | 4.43 | 3.89 | 3.80 | 5.52 | 5.42 | 3.70 | 3.83 | 2.70 | 3.08 | 2.17 | 1.96 | 1.47 | 1.71 | 1.08 | 0.97 | 2.03 | 4.79 | 5.35 | 5.73 | 5.73 | 4.91 | 4.28 | 3.87 |
| 3 | (1.38) | (1.23) | (1.27) | (1.29) | (0.38) | 1.29 | 0.48 | 0.71 | 1.23 | 0.46 | 0.49 | 0.33 | 0.19 | 0.30 | 0.12 | 0.18 | 0.25 | 1.88 | 1.18 | 0.70 | (0.28) | (1.76) | (2.54) | (2.97) |
| 4 | (1.92) | (1.43) | (1.40) | (1.50) | (1.08) | (0.05) | 0.19 | 1.57 | 0.53 | 0.12 | 0.08 | 0.14 | 0.13 | 0.09 | 0.12 | 0.15 | 0.33 | 1.60 | 0.69 | (0.75) | (1.63) | (2.66) | (2.83) | (3.07) |
| 5 | (1.75) | (1.03) | (1.08) | (1.24) | (1.37) | 0.38 | 0.26 | 1.45 | 0.56 | 0.68 | 0.40 | 0.30 | 0.18 | 0.08 | 0.10 | 0.18 | 0.41 | 1.95 | 1.27 | (0.51) | (1.47) | (2.26) | (2.27) | (2.35) |
| 6 | (0.18) | 1.23 | 1.01 | 0.94 | 0.75 | 3.81 | 0.96 | 2.01 | 1.69 | 1.28 | 0.71 | 0.20 | 0.11 | 0.14 | 0.18 | 0.40 | 0.51 | 1.90 | 0.98 | (0.10) | 0.53 | (0.92) | (1.02) | (1.47) |
| 7 | 5.13 | 5.52 | 5.29 | 5.97 | 5.88 | 5.20 | 2.79 | 3.93 | 3.93 | 2.98 | 3.18 | 2.28 | 1.42 | 0.86 | 0.79 | 1.28 | 2.33 | 4.57 | 2.97 | 4.24 | 4.22 | 2.61 | 3.73 | 3.73 |
| 8 | 9.84 | 8.66 | 8.39 | 8.80 | 8.87 | 7.90 | 5.72 | 5.29 | 5.66 | 5.02 | 4.36 | 3.99 | 2.70 | 2.14 | 2.34 | 2.78 | 4.72 | 7.05 | 6.42 | 5.83 | 5.78 | 5.55 | 6.98 | 7.47 |
| 9 | 10.77 | 10.49 | 9.86 | 10.32 | 11.20 | 8.42 | 7.37 | 6.20 | 5.85 | 5.37 | 5.37 | 4.69 | 3.33 | 2.28 | 2.48 | 3.20 | 7.14 | 5.61 | 5.71 | 4.25 | 4.32 | 5.26 | 6.62 | 8.12 |
| 10 | 2.64 | 2.34 | 1.79 | 2.03 | 3.58 | 2.41 | 1.78 | 2.97 | 2.99 | 2.06 | 1.76 | 1.52 | 1.13 | 0.76 | 0.20 | 0.38 | 3.42 | 3.56 | 3.83 | 3.80 | 3.49 | 2.69 | 2.44 | 2.15 |
| 11 | 6.53 | 5.92 | 5.11 | 6.08 | 5.42 | 4.54 | 2.41 | 2.37 | 3.13 | 3.39 | 3.46 | 3.23 | 2.83 | 1.81 | 0.67 | 1.74 | 4.66 | 4.28 | 4.82 | 5.21 | 5.42 | 5.55 | 5.89 | 5.32 |
| 12 | 10.08 | 9.99 | 9.19 | 9.62 | 9.05 | 8.70 | 7.33 | 7.51 | 6.80 | 5.94 | 5.19 | 4.82 | 4.72 | 4.59 | 3.69 | 5.75 | 8.63 | 9.10 | 9.62 | 9.94 | 10.09 | 10.00 | 10.10 | 9.93 |

# Other RCPPP Concerns

- Provide similar flexible treatment of Maximum Import Capability as with MTR
- Capacity dependent on deliverability during summer conditions; explore energy-only or more flexibility for winter needs
- Getting RCPPP right is important – let's take the time to do it right

# SCE's Preliminary Proposal for the RCPPP Clean Energy Program

June 23 – June 24, 2025

# SCE's Key Objectives for Clean Energy Framework

**Effective at Reducing Emissions**

Adopt a simplified mass-based program because the proposed CES is unworkable without significant modifications

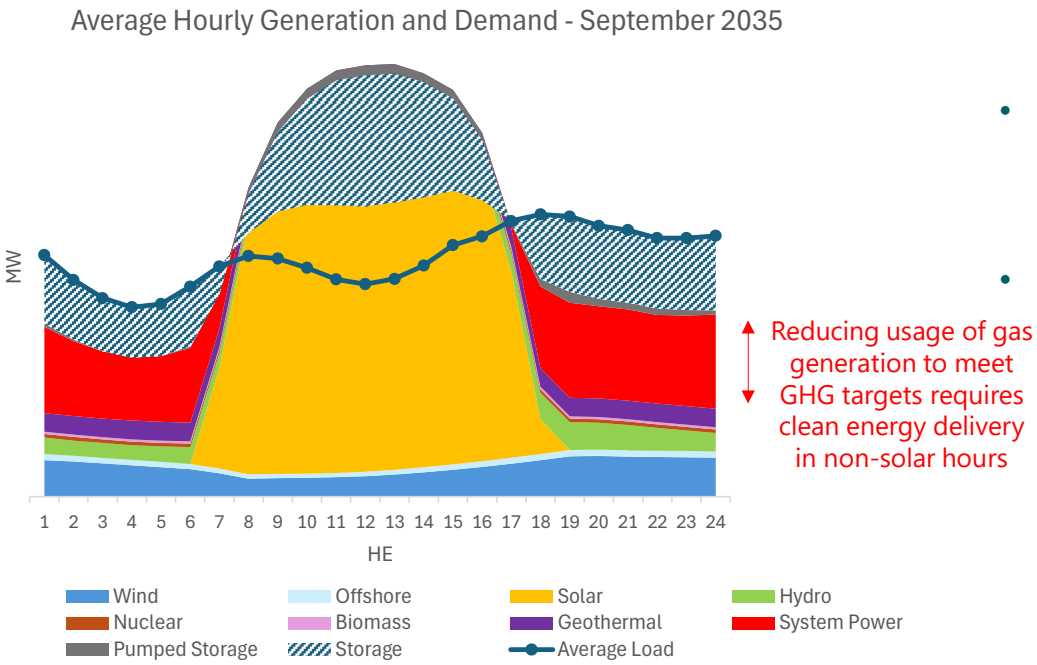
**Flexible Compliance**

Begin first compliance period in 2031, establish reasonable targets in upcoming IRP that consider current challenges around clean energy development, and adopt a waiver process based on LSE best efforts and/or an affordability metric

**Provide Certainty**

Finalize rules on how resources will "count" long-term so LSEs can make informed procurement decisions

# Clean energy must be delivered during the evening and winter to effectively reduce GHG emissions




- System needs a diverse portfolio of resources (incl. clean firm) and/or solar plus a significant storage build-out to meet the 25 MMT GHG target
- Staff's proposed CES program is unlikely to lead to procurement of such diverse portfolios because CES prioritizes renewable output without consideration of load requirements or hours of need
- Risks associated with Staff's proposed CES program include:
  - Delayed achievement of GHG targets, resulting in the need for one-off procurement orders
  - Inequitable outcomes as some LSEs lean on other LSEs to manage system curtailment risk
  - Insufficient market signal for clean firm resources needed to meet decarbonization targets
  - Increased costs for customers as disconnected requirements incentivize LSEs to procure resources for clean energy and reliability separately rather than develop an optimal mix of clean resources that can meet both GHG and reliability needs

***SCE's mass-based proposal promotes development of the portfolio needed to meet the state's GHG reduction goals***

# A simplified mass-based program focuses on bringing needed clean resources online and allocating responsibility equitably

- Utilizes a ***simple*** hourly accounting tool with peak and off-peak emission rates (two vs. 8,760 distinct values)
  - Forward-looking program evaluates the "Expected Emissions" from an LSE's portfolio
  - Production from an LSE's clean energy portfolio and assumed storage dispatch will be compared to its hourly load to identify the LSE's hourly "system power usage"
  - **LSE's system power usage x peak/non-peak emission values = Expected Emissions**

| Input | Data Source | Update Cadence |
|---|---|---|
| Expected production profile for clean energy resources | IRP inputs | Fixed for CP |
| Peak/Non-peak hour system emissions values | IRP results | Fixed for CP |
| Hourly load forecast | IEPR | Annually |
| Contracted resources (nameplate) | LSE portfolio | Annually |

- Better aligns procurement framework with planning by establishing clear objectives for the clean energy program at the outset
  - Significantly reduces the likelihood of needing one-off procurement orders to "course correct"
  - Appropriately recognizes value and important role of clean firm and storage resources necessary to meet GHG reduction goals
  - Provides planning certainty to LSEs because accounting tool will largely be fixed for the compliance period (CP) and compliance will focus on whether resources came online rather than delivered energy
- Equitably allocates responsibility to all LSEs by appropriately considering each LSE's hourly demand and clean energy portfolio
- Promotes affordability by increasing alignment between clean energy and reliability programs
  - Hourly requirements should encourage LSEs to optimally procure resources that can meet both clean energy and resource adequacy (RA) needs

# Summary of SCE's proposed simplified mass-based program

| Element | Proposal |
|---|---|
| **Scope** | New and existing resources |
| **Need Determination** | Electric-sector MMT target from IRP |
| **Need Allocation** | LSE's load-share of system's MMT target |
| **Compliance** | **"Expected Emissions" is within X% of target**<br>• For T+1 through T+5, use contracted portfolio to calculate Expected Emissions<br>• For T-1 **procurement verification**, use actual online portfolio to calculate **"Updated" Expected Emissions**; all other inputs remain the same<br>• Compliance is measured based on "Updated" Expected Emissions metric (*i.e.,* T-1 procurement verification showing) without consideration of actual load, delivered energy, or CAISO emissions rates |
| | Other accounting tool mechanics:<br>• Includes "storage dispatching" function to maximize its utilization and effectiveness for GHG reduction<br>• Clean energy in excess of hourly demand can be used as charging power but does not count as "negative" emissions |
| | Timing:<br>• Five-year CPs should begin in 2031 (*i.e.,* 2031-2035, 2036-2040, 2041-2045)<br>• LSEs should begin reporting progress towards targets as soon as tool is finalized |
| **Enforcement** | Expected Emissions for T+1 through T+5 is a **reporting requirement** with no contract sufficiency penalties |
| | Compliance is measured based on "Updated" Expected Emissions (*i.e.,* T-1 procurement verification showing). Requirement can be satisfied by meeting the GHG target in the milestone year (2035, 2040, and 2045) or by showing average emissions over the compliance period is below the average target |
| | **Flexible compliance**—Program must consider current challenges around clean energy development<br>• Evaluate MMT compliance target in upcoming IRP cycle and/or establish soft targets<br>• Waivers based on LSE best efforts and/or an affordability metric |

# Alternative: modified CES+Storage addresses near-term gaps in Staff Proposal and maintains the compliance structure of RPS

- At a minimum, CES program must be modified to consider the need to shift clean energy to non-solar hours
  - LSEs must demonstrate their portfolios satisfy a 1 MW solar: X MW storage ratio ("Storage Ratio Requirement"), whereby X is set for the CP by the CPUC
    - RECs generated by standalone solar resources will be discounted if LSE fails to satisfy the Storage Ratio Requirement
    - Storage must be fully deliverable to count towards the Storage Ratio Requirement
    - Indicative ratios for future CPs will be based on IRP modeling and updated to reflect more recent curtailment and export rates
- CES+Storage requirement addresses near-term key flaws of CES by:
  - Preventing LSEs from exclusively procuring solar to meet their clean energy target and leaning on others to reduce curtailment risk
  - Promoting resource diversity by increasing market interest in other technologies like wind and/or co-located resources
  - Recognizing dual contribution of storage to both reliability and clean energy goals
- A mass-based program is ultimately more effective, durable, and equitable than CES+Storage
  - Under CES+Storage, additional central procurement or carve-outs for clean firm resources will likely be needed to meet emerging evening and winter needs
  - CES+Storage requirement reflects the storage ratio needed at the system level rather than considering LSEs' specific needs
  - Storage Ratio Requirement is portfolio dependent and may fluctuate between CPs

# Summary of SCE's proposed modifications to CES

| | Modified CES+Storage |
|---|---|
| **Need Determination** | CES target developed from IRP; CPUC to also use IRP to determine the Storage Ratio Requirement for the CP |
| **Need Allocation** | Same allocation methodology as currently used in the RPS program to set RPS target: LSE would be required to match a % of their annual retail sales. Each LSE's CES target is the same as need determination stage. |
| **Compliance** | LSEs must demonstrate their portfolios satisfy a 1 MW solar: X MW Storage Ratio Requirement (nameplate basis) in each year of the CP for all RECs generated by solar to count |
| | Allow banking of RECs and ZECs across compliance periods |
| | Timing<br>• Program should start after RPS CP6 in 2031<br>• 3-year compliance periods, aligned with RPS |
| **Enforcement** | Compliance is measured in the following manner:<br>• At the end of each compliance period based on LSE's Final Compliance report<br>• Backward-looking measurement of delivered energy from clean energy resource<br>• RECs generated by solar may be discounted if LSE fails to meet its Storage Ratio Requirement |
| | **Flexible compliance**—Program must consider current challenges around clean energy development<br>• Evaluate MMT compliance target in upcoming IRP cycle and update the corresponding CES target<br>• Waivers based on LSE best efforts and/or an affordability metric |

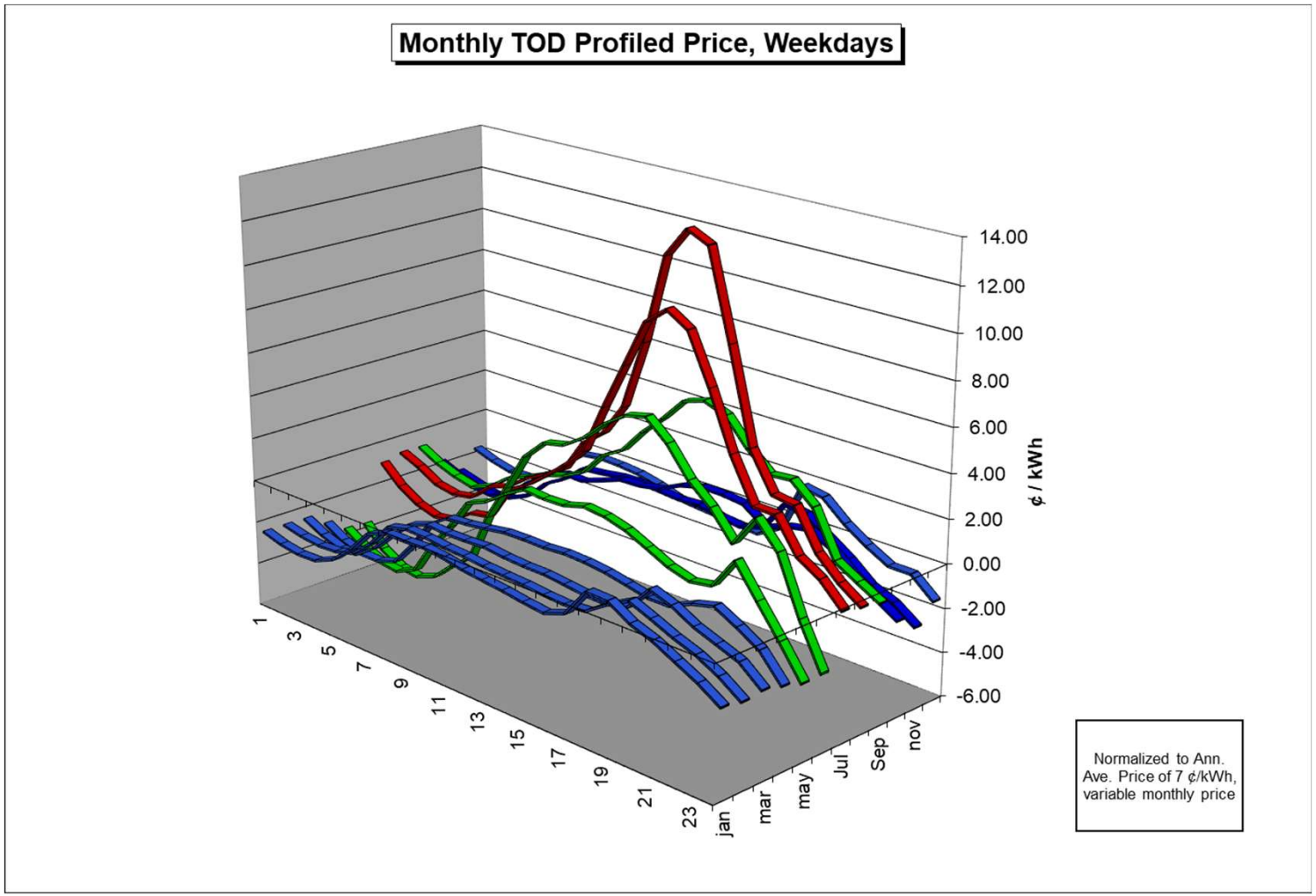
# GPI Proposal
# RCPPP Workshop

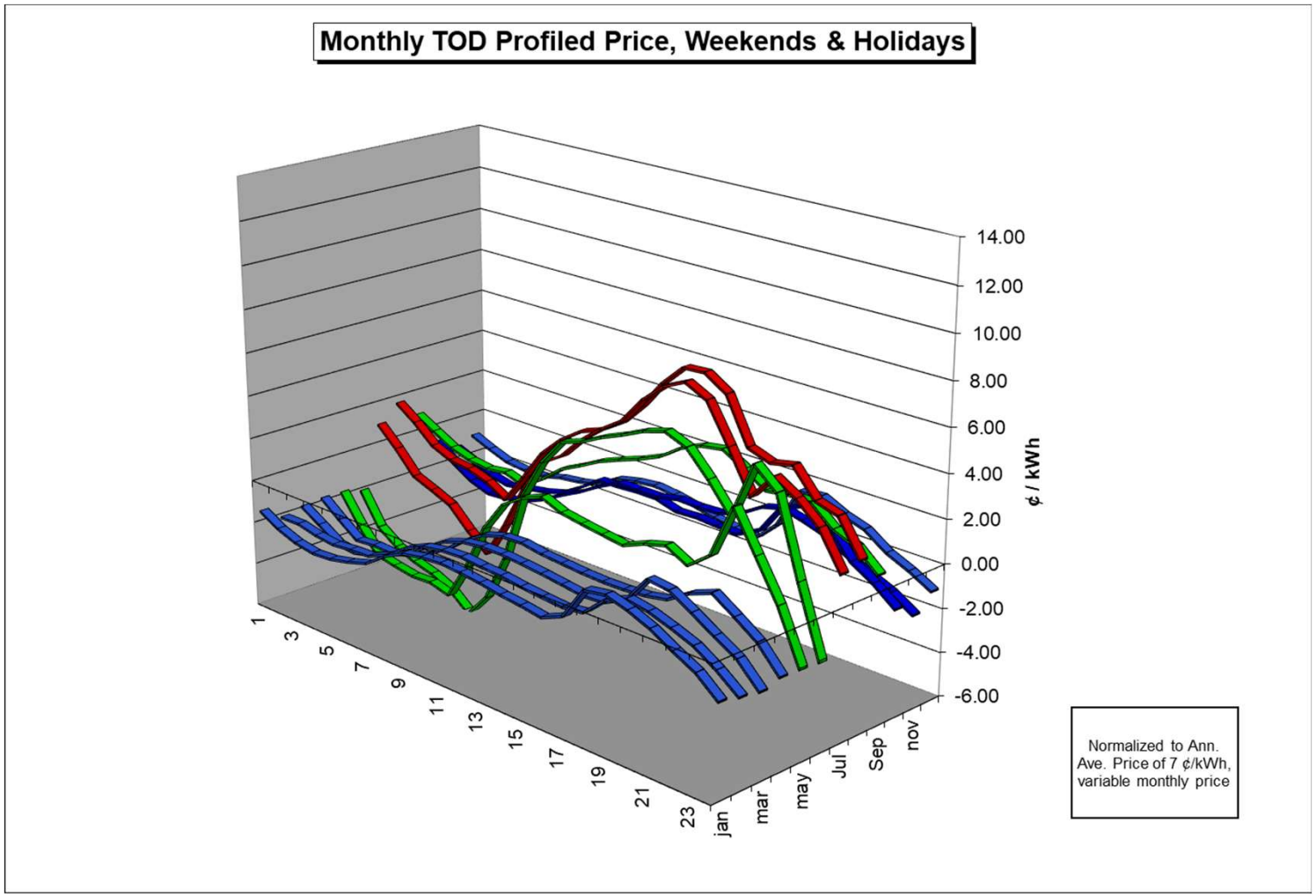
Integrated Procurement of Reliability and GHG-Free Energy

June 23-24, 2025

# Separate vs Combined Capacity and Energy Procurement

- The RCPPP proposal is split into two separate procurement tracks, capacity and energy
- Capacity always comes with an energy component
- Energy usually comes with a capacity component
- GPI proposes to combine and integrate the procurement of clean capacity and energy, rather than treating them as separate products with separate procurement processes


Monthly TOD Profiled Price, Weekdays
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
-2.00
-4.00
-6.00
¢ / kWh
1
3
5
7
9
11
13
15
17
19
21
23
jan
mar
may
Jul
Sep
nov
Normalized to Ann. Ave. Price of 7 ¢/kWh, variable monthly price


Monthly TOD Profiled Price, Weekends & Holidays
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
-2.00
-4.00
-6.00
¢ / kWh
1
3
5
7
9
11
13
15
17
19
21
23
jan
mar
may
Jul
Sep
nov
Normalized to Ann. Ave. Price of 7 ¢/kWh, variable monthly price

- The combined value of capacity and energy in California is highly skewed to the peak hours of the summer months, as illustrated in the graphics above
- The best way to accurately reflect these values is by profiling the price of a combined capacity and energy product on a 24-hr x monthly basis
- (Note that the data in the charts is representational only.)

# RECs and ZECs are a mechanism to guide procurement and portfolio attributes

- In the RCPPP, REC+ZEC targets are the regulatory tools that are used to monitor and reduce greenhouse-gas emissions.
  - REC: Existing, represent a MWh of eligible renewable generation.
  - ZEC: New, will represent a MWh of zero emissions but ineligible for RECs generation, such as large hydro and nuclear.
  - Energy Storage: Corrections for charging and discharging losses.

# Discussion (30 minutes)

# End of Day 2

Opening comments due July 15th

Reply comments due August 5th