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Additional submitted attachment is included below.

**Comments of Eagle Crest Energy Company submitted in response to
Joint CEC-CPUC November 20, 2015 Bulk Storage Workshop**

Eagle Crest Energy Company (“ECE”) respectfully submits these Comments on the Joint Energy Commission (“CEC”) and Public Utilities Commission (“CPUC”) Long-Term Procurement Plan Workshop on Bulk Energy Storage. Eagle Crest appreciates the leadership shown by the CEC, the CPUC, and the California Independent System Operator (“CAISO”) in advancing the understanding of the role of bulk storage in the State’s ambitious energy and climate objectives, and in addressing head-on the challenges confronting large storage projects such as Eagle Crest’s Eagle Mountain Pumped Storage Project (“Eagle Mountain” or “the Project”). As detailed below, ECE believes, and feels that the recent workshop reinforced, that now is the time to move forward with actions to foster new pumped storage development.

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OVERVIEW

- ***California is at a crossroads.*** SB 350 establishes a 50% renewables portfolio standard throughout California by 2030.¹ Coupled with the Governor’s 2030 and 2050 GHG reduction targets (40% and 80% below 1990 levels, respectively),² these initiatives pose both challenges and opportunities for the State. Among the challenges is deciding *in the very near term*, on the basis of incomplete information, which resources and renewable integration solutions, including pumped storage, will be the right ones for California in 2030 and beyond.
- ***Large pumped hydro storage should be an integral part of the solution.*** Given the proven ability of large pumped storage facilities like Eagle Mountain to integrate renewable energy on a massive scale and provide low-carbon electricity around the clock, these facilities should be a critical part of the State’s energy infrastructure going forward to meet the goals of SB 350 and the Governor’s 2030 and 2050 GHG reduction targets. Because of their long lead time to develop (10-15 years), the CPUC should take steps now to ensure that such resources remain in the mix, even while the State continues to pursue other renewable integration solutions in parallel. The analyses done by the CAISO, E3

¹ Cal. Pub. Util. Code § 359 et seq.

² California Executive Orders S-3-05 (June 1, 2005) & B-30-15 (April 29, 2015).

and others suggests pumped storage provides a potentially cost effective solution. Whether it is an available option, however, depends on a recognition of its lengthy development timeframe and the need for a procurement environment that can attract capital.

➤ ***Eagle Mountain is well suited to California's needs.*** As the only FERC-licensed CAISO interconnected pumped storage project under development in California, Eagle Mountain is perfectly positioned to be part of the solutions mix to meet the State's 2030 energy and climate objectives given its ability to:

- Provide upward and downward ramping rates as fast as 20 MW per second as well as the full suite of ancillary services to the grid;
- Time shift up to 1,300 MW of either load or generation for up to 17 hours;
- Provide up to 22,000 MWh of storage and discharge at full capacity;
- Integrate and store the output of the vast number of renewable energy projects interconnecting to the Devers-Palo Verde transmission line;
- Meet the State's goals without significant adverse environmental impacts; and,
- Have minimal impacts on water resources by employing a closed-loop design and making use of non-potable water from a non-adjudicated water basin.

➤ ***Eagle Mountain and projects like it require a new procurement paradigm to proceed.***

Absent a change in the status quo, the extent to which Eagle Mountain and projects like it can be part of the solution in California is in doubt. The typical ten year planning horizon used in the CPUC's Long Term Procurement Proceeding ("LTPP") is too short to justify the long term investment required for pumped storage facilities. Relatedly, the competitive solicitation process currently utilized by the utilities is ill-suited to such investments, given substantial capital costs that cannot be known with certainty at the outset and which demand long term (*i.e.*, 25 years or longer) commitments.

➤ ***As part of the new paradigm, the CPUC should require the utilities to negotiate with ECE to facilitate continued project development.*** The CPUC's prior strong encouragement that utilities explore opportunities with pumped storage project

developers has not produced results.³ The Commission should nudge the utilities forward to advance projects like Eagle Mountain that may prove critical for reducing GHGs and integrating renewables even as analytical work assessing pumped storage is on-going. In this vein, the Commission should order the utilities to commence negotiations for licensed projects like Eagle Mountain that cannot otherwise access the capital markets without a procurement path. As discussed below, any such order need not commit the utilities to do anything more than commence negotiations and propose a possible transaction for Commission consideration. This would enable Eagle Mountain to move forward and provide to the CPUC a proposal for its consideration.

- ***As another part of this effort, the energy agencies should explore other means to spread the costs of pumped storage across all ratepayers.*** The benefits from large scale pumped storage projects would be enjoyed by all users of the grid. Thus, the CPUC, CEC and CAISO should explore ways to promote multilateral contracting arrangements as well as other ways to spread the costs across all grid users, perhaps by use of the CAISO Transmission Access Charge or other means.

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DISCUSSION

1. The Case for Large Pumped Storage in California

Large pumped hydro storage projects have provided electric grid services and acted as a natural complement to intermittent renewable energy around the world for decades. Indeed, this proven technology accounts for 99% of global electric storage capacity.⁴ Energy experts have repeatedly recognized it remains the best form of storage to integrate renewable energy at a massive scale.⁵ Likewise, the CAISO has long since recognized the value that new pumped storage capacity can add to the California grid as renewable energy penetration increases.⁶

³ See Decision Adopting Energy Storage Procurement Framework and Design Program D.13-10-040 (“Storage Decision”) at 35 (“We strongly encourage the utilities to explore opportunities to partner with developers to install large-scale pumped storage projects where they make sense within the other general procurement efforts underway in the context of the LTPP proceedings or elsewhere.”).

⁴ Electric Power Research Institute, “Bulk Energy Storage Impact and Value Analysis” at 1 (December 31, 2012). Abstract available at: <http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?ProductId=000000000001024288>.

⁵ As the Under Secretary for Science at the U. S. Department of Energy testified before the U. S. Senate, “Currently the best form of energy storage to handle really large quantities of energy is pumped hydro.” Statement of Dr. Steven E. Koonin, Under Secretary for Science, U. S. Department of Energy, Before the Committee on Energy and Natural Resources, United States Senate (Dec. 10, 2009), at p. 5. Available at:

California has a handful of pumped storage facilities in operation. As was clear from the workshop, some of these facilities are already serving to integrate renewables. As detailed by the presenters from both PG&E and the Los Angeles Department of Water and Power (“LADWP”), both Helms and the Castaic pumped storage facilities are shifting to daytime pumping operations because of increasing periods of renewable over-generation.⁷ It is commonly accepted that the need for bulk storage or other renewable integration solutions to avoid curtailing renewable resources will increase significantly as the State moves beyond 33% renewables in 2020 and approaches 50% by 2030. Given the current trajectory, this need could be critical as soon as 2023, and perhaps sooner. Given the 12-15 year development timeline for pumped storage projects, only those projects well down the permitting and development path have any chance of playing a useful role on this timeline, and even those only if the State takes action now to move them along. As discussed below, Eagle Mountain is one of the very few projects that can meet this challenge.

Recognition that pumped storage has an important role to play in the integration of renewables is nothing new. In 2010, PG&E sought CPUC approval for funding to explore a new pumped storage facility with a capacity of up to 1,200 MW to address the intermittency issues

[http://energy.gov/sites/prod/files/ciprod/documents/12-10-09_Final_Testimony_\(Koonin\)_S4.pdf](http://energy.gov/sites/prod/files/ciprod/documents/12-10-09_Final_Testimony_(Koonin)_S4.pdf). See also Testimony of Jon Wellenough, Chairman, Federal Energy Regulatory Commission, Before the Committee on Energy and Natural Resources, United States Senate (Dec. 10, 2009) ”), at 4 (“To date, the most used bulk electricity storage technology has been pumped storage hydroelectric technology”). Available at: <http://www.ferc.gov/EventCalendar/Files/20091210101921-12-10-09-wellenough-testimony.pdf>; Statement by Shin-Ichi Inage, Energy Analyst, International Energy Agency, “Prospects for Large-Scale Energy Storage in Decarbonised Power Grids” (2009), at p. 47 (“More than 200 pumped hydro plants are operating worldwide. There are few technical bottlenecks and it is the most mature and reliable technology among large-scale energy storage systems.”) Available at: https://www.iea.org/publications/freepublications/publication/energy_storage.pdf.

⁶ In one of its first renewable integration studies, completed in 2007 when only a 20% renewables portfolio standard (“RPS”) was contemplated, CAISO recognized that pumped hydro “is the most widespread energy storage system on power networks” and highlighted it as a key component of renewables integration in California going forward. CAISO, “Achieving California’s 20% Renewables Portfolio Standard,” September 2007, p. 14. Available at: <http://www.caiso.com/Documents/Presentation-AchievingCalifornia’s20PercRenewablePortfolioStandard25-Sep-07.pdf>.

⁷ See Transcript of Proceeding at 59 & 69-72, available at: http://docketpublic.energy.ca.gov/PublicDocuments/15-MISC-05/TN206891_20151208T105549_Transcript_of_the_11202015_Joint_Workshop_with_the_California_E.pdf. (testimony from representatives of PG&E and LADWP on the Helms and Castaic projects, respectively, are already being called on to mitigate overgeneration conditions by doing midday pumping.); see also presentation of PG&E entitled “Understanding Current State of Pumped Storage Benefits and Barriers” at 4, available at: http://docketpublic.energy.ca.gov/PublicDocuments/15-MISC-05/TN206696_20151119T101527_PGE_Bulk_Storage_Presentation.pdf.

PG&E recognized would be caused by renewables.⁸ PG&E noted then that pumped storage was “uniquely qualified to integrate large quantities of intermittent renewable resources into the electricity grid” and that the project, which PG&E estimated would cost approximately \$2.5 billion, would yield benefits to ratepayers ranging from \$1.8 billion to \$7.3 billion.⁹ The Commission denied PG&E’s application without prejudice, noting that the need for pumped storage was still “unknown,” making speculative any estimate of potential benefits.¹⁰

Much has happened in the five plus years since then. First and foremost, the case *for* pumped storage is far stronger than it was in 2010. The “Duck Curve,” with its prediction of growing amounts of renewable generation curtailment, did not yet exist. There was no 50% RPS codified in California law nor the prospect of having to curtail renewable generation because of overgeneration. Yet all of the arguments PG&E raised then remain true today, only more so.

It is no longer “unknown” whether there is a need for bulk storage. The only question, if there is one, seems to be around qualitative measures – how much bulk storage should the State procure after considering the other integration solutions? This is certainly the subject of ongoing studies that turn on the complex interplay of multiple variables.

That said, while the magnitude of curtailments under a 50% RPS and the amount of pumped storage required is the subject of study, work already done by the CAISO and others points to substantial benefits coming from the development of long duration bulk storage like Eagle Mountain.¹¹ ECE expects the 50% RPS scenario study results CAISO is releasing in January will underscore the need.

2. The Eagle Mountain Pumped Storage Project

ECE is developing the 1,300 MW Eagle Mountain Project near Desert Center, California in Eastern Riverside County, roughly half way between Palm Springs and Blythe, California, and a short distance north of Interstate 15. Given its size and design, the Project will be able both to displace high-emission peaking facilities and time shift generation and load over multiple hours,

⁸ “Application of Pacific Gas and Electric Company to Recover Pumped Storage Study Costs (U 39 E),” Application No. 10-08-011 (August 20, 2010), available at: <http://docs.cpuc.ca.gov/PublishedDocs/EFILE/A/122326.PDF>.

⁹ *Id.* at 4, 12-13.

¹⁰ Decision 11-09-025, at 2 (issued Sept. 23, 2011) (denying without prejudice Application of Pacific Gas and Electric Co. to Recover Pumped Storage Study Costs).

¹¹ See “A CAISO Bulk Energy Storage Case Study” presented at presented at the Joint CEC/CPUC Workshop, available at: http://docketpublic.energy.ca.gov/PublicDocuments/15-MISC-05/TN206656_20151117T120924_Bulk_Storage_Workshop_ISO_Presentation.pdf; see also study results of Energy+ Environmental Economics entitled “The Role of Energy Storage as a Renewable Integration Solution under a 50% RPS,” available at: <https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=15-MISC-05>.

thereby maximizing the net amount of low-carbon electricity supplied to the grid around the clock. Both services will result in substantial GHG reductions in California's power sector and facilitate achievement of 2030 and 2050 policy objectives.

a. Overview of the Project and Its Benefits for the California Grid

The Project will be sited near the existing Palo Verde-Devers transmission corridor and interconnected to the CAISO-controlled grid via a 16.4-mile generation tie line to the Southern California Edison ("SCE") Red Bluff Substation. The Project is adjacent to two utility scale solar projects (the 550 MW Desert Sunlight project and the 100-150 MW Desert Harvest project) and is electrically close to the many other utility-scale renewable energy projects located along the Devers-Palo Verde transmission line.

Eagle Mountain is well suited to the evolving needs of the California grid. California's power system is no longer comprised predominately of fast-moving dispatchable resources; thus bulk system reliability is no longer merely a function of the amount of generation resources available to meet peak loads. With the grid's current and future composition, quick-ramping long-duration storage projects such as Eagle Mountain can provide cost-effective solutions to each of the grid's four distinct operational needs: downward ramping capability, minimum generation flexibility, upward ramping capability, and peaking capability.

The highly flexible nature of modern pumped storage projects, as well as their substantial capacity, positions resources like Eagle Mountain to integrate massive amounts of intermittent solar and wind generation, especially in areas with high renewable penetration. As California moves toward 50% renewables by 2030, cost-effective integration solutions will become increasingly important. ECE is designing the Project to provide fast ramping response (both in energy generation mode and in energy storage / pump mode), with the ability to provide the CAISO with up or down ramps as fast as 20 MW per second. In so doing, the Project will be able to provide ancillary services and integrate wind and solar production in Southern California, especially during the critical morning and evening ramp periods.¹²

¹² In this regard, Eagle Mountain is different from most existing pumped storage projects in California because it will have variable speed pumps, enabling the Project to offer the same flexibility in pumping (charge) mode as generating (discharge) mode. The presenters for PG&E and LADWP both noted at the workshop that neither the Helms nor Castaic pumped storage facilities were built with variable speed pumps and that it was not economic to retrofit these projects with them either. Workshop Tr. At 59 (PG&E) and 69-72 (LADWP), available at: http://docketpublic.energy.ca.gov/PublicDocuments/15-MISC-05/TN206891_20151208T105549_Transcript_of_the_11202015_Joint_Workshop_with_the_California_E.pdf.

Once in operation, the Project will be able to provide maximum generating discharge for over 17 hours and will also provide an effective “sink” for energy at times of projected periods of renewable over-generation conditions, with total maximum storage and discharge of 22,000 MWh at full capacity. With ramping capabilities of 20 MW per second, the Project performs as a zero-emission peaking plant.¹³

b. Permitting and Environmental Considerations

Eagle Mountain has received virtually all of its major permits and approvals, including a hydroelectric generation license from the Federal Energy Regulatory Commission (“FERC”)¹⁴ and a Section 401 water quality certification from the State Water Resources Control Board (“SWRCB”).¹⁵ The only material outstanding permit is a right-of-way grant approval from the Bureau of Land Management, which is well underway.

The Project will be located on the site of the largely inactive Eagle Mountain mine, using two former mine pits as the upper and lower reservoirs. Because the Project is located on a brownfields site and employs a closed-loop system for the water, meaning that it will not be located on a perennial river or have a surface water connection to other bodies of water, Eagle Mountain can provide the State with substantial amounts of energy and load with minimal adverse environmental impacts. The Project’s reservoirs will be filled using non-potable water from the Chuckwalla Valley, a non-adjudicated water basin. Potential impacts on the water basin have been studied exhaustively by FERC and the SWRCB. Initial filling and operation of the Project will require less than 1% of the total Chuckwalla Valley aquifer volume, and the Project will employ mitigation to protect neighboring wells.¹⁶

c. Timing Considerations and Constraints

Like all pumped storage projects, Eagle Mountain will require a long lead time to reach commercial operation. ECE began the FERC licensing process in 2007 and, from start to

¹³ See Eagle Crest Energy Company, Order Issuing Original License, 147 FERC ¶ 61,220 (June 19, 2014); See Presentation of Eagle Crest Energy entitled “Eagle Mountain Pumped Storage Project, p. 3, available at: http://docketpublic.energy.ca.gov/PublicDocuments/15-MISC-05/TN206695_20151119T101528_ECE_Pump_Storage_Presentation.pdf .

¹⁴ 147 FERC ¶ 61,220.

¹⁵ In the Matter of Water Quality Certification for ECE’s Eagle Mountain Pumped Storage Hydroelectric Project, Water Quality Certification for Federal Permit or License (issued July 15, 2013), available at: http://www.waterboards.ca.gov/waterrights/water_issues/programs/water_quality_cert/eaglemtn13123_certification071513.shtml.

¹⁶ FERC Order Issuing Original License, Project No. 13123-002 (Jun. 19, 2014) at 8, available at: <https://www.ferc.gov/whats-new/comm-meet/2014/061914/H-7.pdf>.

finish, spent seven years obtaining its FERC license. The next step is to complete geotechnical analyses and detailed engineering, which will require an additional two years, followed by construction, which will require an additional 4-5 years. Assuming the Project can continue with development, it could be placed in service by late 2023. If the Project were to achieve commercial operation by then, that would mean ECE spent roughly sixteen years in the process. That is probably not an atypical timeframe for development of a large pumped storage facility.

There is nothing certain about the 2023 commercial operation date, however. That date is contingent on completing the geotechnical and engineering work, which, in turn requires continued development financing. Obtaining that financing will depend on whether investors see a possible procurement path that will allow them to recoup their investment. Currently, no such path exists, making it difficult to move the Project forward.

Further complicating project finance is the limited shelf life of the FERC license, which requires that construction commence within two years of its issuance.¹⁷ FERC issued ECE a hydroelectric license in July 2014. While that license can be extended for an additional two years by FERC and further still by Congress,¹⁸ the absence of a procurement path makes it that much more difficult for ECE to tap the capital markets for the capital intensive geotechnical and engineering phases of the Project that must now begin.

The result is something of a limbo for the Project, one which ultimately results in not only pushing back any chance of achieving the 2023 commercial operation date also but undercuts the Project itself given the limited shelf life of the FERC license.

3. Overcoming Procurement Challenges for Eagle Mountain and Others Like It

In its ground breaking 2013 Storage Decision, the CPUC excluded pumped hydro facilities greater than 50 MW from the utilities' storage procurement mandates in order to hasten the development of new storage technologies.¹⁹ The Commission noted, however, that it would "continue to track the development of pumped storage technologies over 50 MW in size, and may consider including them in the Storage Framework in the future."²⁰ At the same time, the Commission recognized that "pumped storage provides many benefits" and "strongly

¹⁷ 147 FERC ¶ 61,220, para 152, at 41.

¹⁸ Federal Power Act Section 5, 16 U.S.C. § 798(b).

¹⁹ Storage Decision, D.13-10-040 at 35. One of the subjects to be considered in the upcoming Track 2 of the current storage proceeding is whether to include large pumped storage projects. See Assigned Commissioner and Administrative Law Judges' Scoping Memo and Ruling Seeking Party Comments, R.15-03-011 at 11.

²⁰ *Id.* at 36-37.

encourage[d] the utilities to explore opportunities to partner with developers to install large-scale pumped storage projects where they make sense within the other general procurement efforts underway in the context of the LTPP proceeding or elsewhere. . .”²¹

In the 2+ years since then, little, if any, progress has been made towards procurement of large pumped storage projects. ECE believes it is time for the CPUC to give the utilities a nudge forward so that the Project can continue development and the State’s energy agencies can better evaluate whether Eagle Mountain is a “least cost best fit” option for the State. Below, ECE suggests a number of useful steps that will create a procurement path and/or reduce the current obstacles to the Project’s development.

a. Create a New Procurement Framework

As discussed, the most significant barrier to the development of bulk storage projects in California – and particularly pumped hydro – is the lack of a viable procurement path. The current procurement framework fails to value these resources in a manner that allows their true cost-effectiveness and other attributes to be readily considered. For example, given the long development timeline for pumped storage, the complex permitting process, and the relative novelty of such projects in California, it is exceedingly difficult for pumped storage developers to establish and bid a firm price in the LTPP or other all-source request for offers (“RFOs”). The large bulk capacity, substantial capital costs, and system-wide benefits of projects like Eagle Mountain also make procurement by any single utility highly impractical. Thus, bidding into individual utilities’ LTPP-directed RFOs would likely be a wasted effort. Such projects are better suited to off-take agreements that are collaboratively developed with multiple load-serving entities.

The necessity of establishing a clear procurement pathway for even the initial stages of long duration pumped storage projects should not be underestimated. As noted, Eagle Mountain requires major upfront capital in order to finance the geotechnical and detailed engineering studies to continue with development. Whether Eagle Mountain is developed by 2023, 2030, or at all, will depend on whether that new framework is developed.

In recognition both of the benefits that bulk, long-duration storage can provide to the State in terms of grid optimization, renewable integration, and GHG emissions reduction, and of the unique procurement challenges these resources face, it is incumbent upon the State’s energy

²¹ *Id.* at 36.

agencies to change the status quo and begin to set out collaborative pathways for pumped hydro and other long-duration storage development in California. As discussed below, the CPUC should tee off of its earlier strong encouragement that the utilities move forward with pumped storage procurement efforts.

i. Facilitate Multi-Lateral Negotiations

Given the shortcomings of the current LTPP procurement process, the energy agencies generally, and the CPUC specifically, should actively promote and facilitate a framework for multi-lateral negotiations between ECE and the utilities. Ideally the CPUC would require that the utilities meet and confer with ECE and report back to the Commission within a limited time period the terms of a negotiated transaction which the Commission could then evaluate based on one or more utility applications.

Doing so in the near future would be opportune not only for Eagle Mountain's development but also for the Commission given the status of proceedings there. The new LTPP is scheduled to begin shortly. Meanwhile, Track 2 of the current CPUC Storage Proceeding is likely to begin now that Track 1 of that proceeding is winding down.²² Among the issues in Track 2 is whether the Commission should revise the energy storage procurement targets applicable for the 2018 and 2020 solicitations to include pumped hydro storage technology.²³ It would seem that having a fully negotiated Storage Purchase and Sale Agreement ("Agreement") as a result of this order would be extremely useful as the Commission considers revising the storage procurement framework.

This approach would be relatively narrow in its scope, requiring only that the utilities engage in a negotiation and bring back a transaction for the Commission's review, presumably by way of a typical application process. The Agreement would then undergo the normal Commission review processes, including receiving input from ratepayer advocacy groups and other key stakeholders from the relevant Procurement Review Group prior to submission. Such an approach would provide a procurement path that could unlock the capital markets and provide a procurement path to an Agreement in less than two years. At the same time, it would provide

²² Earlier this week, a Proposed Decision was issued addressing the Track 1 issues in the current Storage Proceeding. *See* Proposed Decision of Commissioner Peterman, R.15-03-011 (Dec. 15, 2015).

²³ *See* Assigned Commissioner and Administrative Law Judges' Scoping Memo and Ruling Seeking Party Comments, R.15-03-011 at 11.

the CPUC with the flexibility to reject the application if, upon review, the Commission concluded other renewable integration solutions were preferable.

In addition, the Commission could require that any arrangements negotiated by the utilities protect ratepayers and allow for “off ramps” should pricing be too high or need insufficient. To that end, it could direct the utilities to negotiate an Agreement with two phases, the first for an advanced development period and the second for construction and commercial operations, with the ability to terminate at the conclusion of the first phase with a reasonable return on ECE’s investment. The Agreement covering the initial phase would include a price window and triggers for adjustments, with the final price to be finalized at the end of the advanced development period.

ii. Promote Contingent Procurement

A slightly different possible approach would be for the CPUC to expressly authorize and direct some form of collaborative, contingent procurement of the project by one or more utilities that was limited to the initial geotechnical and engineering period to minimize ratepayer risk while ending the current procurement stalemate and allowing development and financing of the Project to move forward. During the first stage of this procurement approach, one or more IOUs would agree to fund initial project investment to cover design and engineering costs, without committing the utilities or their ratepayers to the full development and construction costs of the Project.

Meanwhile, as ECE completed the pre-construction studies and design, it would work with the relevant utilities to develop accurate project cost estimates and other key metrics. Before any of the utilities proceeded to the second stage of procurement and signed on to a full Storage Purchase and Sale Agreement, ECE would have to satisfy specified development and financing benchmarks, thereby giving the utilities clear off-ramps prior to full cost commitment.

The CPUC could also require that ECE demonstrate cost-effectiveness as compared to other renewable integration options that may have emerged in the interim prior to approving the final purchase agreement.²⁴ In addition, the CPUC could drastically minimize ratepayer risk by

²⁴ This model is premised on a proposal SCE advanced in the 2012 LTPP proceeding, in which it contemplated entering contingency contracts with gas-fired generators to provide a procurement backstop should some contracted resources fail to materialize in a timely fashion. Each contingency contract would govern the Seller’s early efforts to develop a power plant, including siting, permitting and other pre-development work short of actual construction. Then, if and when the need did arise for the power plants, full power purchase agreement terms would allow for the construction and operation of the power plant, with significant reductions in both

requiring the IOUs and ECE to negotiate “off ramp” arrangements so that in the event the CPUC approved the Agreement(s) but later decided to pursue other approaches, these “off ramp” provisions of the storage purchase agreements would provide the CPUC with a mechanism to pursue those alternative approaches to energy storage at minimal cost to ratepayers. These features would undercut much of the perceived risk associated with the long lead times of long duration energy storage projects.

b. Expand the Long-Term Planning Horizon

Long-term planning efforts at the CPUC and elsewhere have not considered a sufficiently long time horizon to identify procurement needs on the scale that could be met by large pumped storage projects. The LTPP proceeding has only focused on system and local needs looking 10 years into the future; accordingly, each biennial procurement authorization (if it occurs at all) bites off too small a chunk of the total resources that the grid may need by 2030 and beyond. In order to meet the State’s 2030 and 2050 renewables and climate objectives in a cost-effective and intelligent manner, the energy agencies should significantly expand the time horizons in their efforts to identify projected need. By looking now at potential need for 2030 (while recognizing the inherent uncertainty in such an approach), the State could then proceed with allowing low-regrets procurement of proven technologies like pumped storage that may address a substantial portion of the overall need in a cost-effective manner. As the CPUC and other agencies begin the challenge of implementing SB 350, and especially its requirement for integrated resource planning, it should take care not to succumb to the same temporally constrained vision that has limited LTPP proceedings in the past.

c. Consider Ways to Spread the Costs Among All Who Benefit

A large pumped storage facility such as Eagle Mountain benefits the interconnected grid as a whole, not just the individual utilities that may sign an offtake agreement. Accordingly, the State should consider mechanisms to spread the costs of constructing such facilities among a broader base of stakeholders and load-serving entities, commensurate with the benefits they receive. This could be achieved in a variety of ways. For example, the Project (or a portion of it) could be considered a transmission asset, such that construction costs would be funded in part by CAISO, subject to cost recovery via the Transmission Access Charge. The best mechanism

development risk and lead time. The CPUC noted the “potential value” in such an approach, subject to various uncertainties being addressed. Available at:

<http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M089/K008/89008104.PDF> at p. 105.

by which to appropriately spread the costs of a grid-wide resource such as Eagle Mountain need not be resolved definitively at this time, but the State’s energy leaders should start the conversation now so as to build the necessary momentum to procure such projects.

d. Refine the Interconnection Process

Finally, despite recent efforts to address the interconnection of utility-side storage resources, the CAISO interconnection process still effectively treats flexible energy storage projects as large generators. This can result in unrealistic modeling that may trigger unneeded system upgrades and unnecessarily increase the costs of such projects because, unlike a generator, pumped storage will never be operated on top of all other generation to meet peak electricity demand. It is instead intended to displace other more carbon intensive generation. Recent indications that CAISO and the CPUC will support more energy-only renewable resources may ameliorate this issue, but the energy agencies should continue to ensure that an ill-fitted interconnection process does not create false barriers to the development of large long-duration storage projects in California.

4. Final Observations: Now is the Time to Act

SB 350 creates a compelling vision for the next 15 years in California: a state powered by at least half renewable energy, while ensuring grid reliability, resiliency and environmental sustainability. On the timescale of energy infrastructure development, 2030 is not very far away. The State must act now to see the vision of SB 350 become a reality.

ECE recognizes that SB 350, especially when coupled with the Governor’s 2030 and 2050 GHG reduction objectives and other policy directives, creates a great deal of uncertainty. There is no way to know with complete confidence now which resources or solutions will ultimately prove the best suited for renewable integration and around-the-clock grid decarbonization. It is clear, however, that as the State moves toward 50% renewable power and beyond, some amount of long-duration bulk storage will play a key part of the resource mix, no matter what other solutions are also pursued.

Only a limited number of such projects – Eagle Mountain among them – are poised to be operational in time to contribute meaningfully to the substantial over-generation scenarios projected for 2023 and beyond as well as to meeting SB 350 objectives by 2030. The State should take the first significant steps to procure these resources *now*. Due to a pause in the procurement side of the 2014 LTPP cycle, the State is currently experiencing a significant lull in

energy resource procurement. The State could use this lull to move forward on bulk storage, resources for which the value has been recognized by the CPUC and others for years now.

The sooner the State invests in these projects, the sooner it can get to the enormous decarbonization of the grid that will be necessary to achieve both 2030 but 2050 climate objectives. Although this understandably involves placing some bets, there are ways the State can do so in a way that mitigates risks to ratepayers while potentially yielding big returns.

Eagle Mountain is certainly not the *only* storage or integration solution that will be needed to achieve SB 350 and long-term climate objectives, and the State should naturally promote innovation and pursue a range of viable options. But a “wait and see” approach that requires forgoing meaningful steps on cost-effective, proven bulk storage technologies until all the unknowns regarding SB 350 implementation become known would be at the risk of lost opportunities. Likewise, choosing now to undertake more years of study, followed by yet more years of procurement authorization processes, before allowing projects like Eagle Mountain to move forward, may well prevent development of the most viable projects, as permits expire and private funders remain on the sidelines. For new projects to emerge in time to meet 2030 objectives, considering the long development timetables for pumped storage project, a “wait and see” approach is very risky. Such an approach simply strikes the wrong balance between making bets on low-regrets solutions and avoiding the commitment of ratepayer funds. ECE urges the energy agencies to be proactive.

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Respectfully submitted,

J. Douglas Divine Chief Executive Officer Eagle Crest Energy Company 3000 Ocean Park Blvd., Suite 1020 Santa Monica, CA 90405 Tel: (310) 450-9090 Fax: (310) 450-9494 Email: ddivine@eaglecrestenergy.com	William D. Kissinger Morgan Lewis & Bockius LLP One Market, Spear Street Tower San Francisco, CA 94105 Tel: (415) 442-1000 Fax: (415) 442-1001 Email: william.kissinger@morganlewis.com Attorneys for Eagle Crest Energy Company
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