Energy Risk Management Policy

May 10, 2017

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1 Overview

Silicon Valley Clean Energy's (SVCE) Energy Risk Management (ERM) policies and procedures is a comprehensive framework to manage the strategic, operational, regulatory and reporting risks associated with the acquisition of power supply. SVCE's ERM Policy and related framework sets out a methodology and process for identifying risks, defining responsibilities, and establishing controls and procedures for reporting on risks and results against metrics to the SVCE Risk Oversight Committee and appropriate SVCE staff and management.

ERM encompasses the implementation of cost-effective controls and contingency plans with the intent of exceeding goals and objectives subject to approved risk tolerances, including the minimization of costs and liabilities.

The SVCE Board is responsible for review of the ERM policies and procedures. Periodically, but no less than once every two years, the Board is responsible for verifying that any updates to the ERM policies and procedures are consistent with SVCE's mission and risk tolerance, as well as those that may be required to address industry and regulatory changes.

The ERM Risk Oversight Committee is responsible for establishing and reviewing SVCE's risk tolerance, reviewing risk exposures, adequacy of controls and reporting mechanisms, limit breaches, and financial adequacy to support trading objectives. In addition, the ERM Risk Oversight Committee is responsible for attesting to the adequacy of procedures and controls required to comply with outside entities' rules, regulations and requirements for risk monitoring and control. The ERM Risk Oversight Committee also reviews all major strategies and positions for their impact on the risks facing SVCE.

The Trading Group (Front Office) is responsible for developing and implementing strategies designed to fill SVCE's Net Open Position (NOP), while comporting to boundaries and limits established by the trading and credit policies. NOP is based on forward forecasts of load and supply volumes over a future period (next month, next quarter, next year and beyond) and the value at risk for the unhedged open position based on forward price curves and volatility.

The Front Office is also responsible for complying with all controls and procedures including the capture of executed transactions, notifying the Middle Office of market trends, and changes to market rules or procedures that affect market dynamics. Finally, the Front Office is tasked with immediately reporting to the Middle Office discrepancies or deviations from accepted practices, policies or procedures, including breaches of established trading and risk limits, unauthorized trading activities and failure of controls.

The Risk Group (Middle Office) is responsible for overseeing the risk management framework and reviewing the effectiveness of key mitigation strategies. This includes determining SVCE's NOP, value of the NOP relative to current market prices, costs and revenue relative to expected costs, contract performance, hedging effectiveness,

investigation of trade discrepancies, monitoring risk limits and ensuring that trades can be tracked from cradle to grave. The Middle Office conducts quarterly reviews to ensure that emerging risks, such as those from changes in market structure and design, organizational restructures and operational issues, are identified and responses are developed.

The Settlement Group (Back Office) is responsible for ensuring that trades executed by the Front Office are settled in accordance with the terms and conditions of the contract and payment of invoices and receipt are consistent with timing specified by the governing documents. The Back Office is also responsible for ensuring that trades captured by the Front Office are transferred correctly to the settlement system. Finally, the Back Office is responsible for providing feedback to the Front Office of other charges or payments that affect the value of the trading strategy and monitoring changes in rules, regulations and procedures that affect the value of trading strategies.

2   Energy Risk Management Objective

SVCE is committed to providing competitively priced power to its customers, serving the following objectives:
- Maintaining risk within desired tolerances for a defined period in the future
- Participating in the energy markets primarily for hedging purposes, while taking advantage of market opportunities within defined policy limits
- Mitigating the effect of price volatility to its customers
- Maintaining stable cash flow

3   Governance Structure Roles and Responsibilities

3.1   SVCE Board

The SVCE Board consists of the following representatives:

- Campbell
- Cupertino
- Gilroy
- Los Altos
- Los Altos Hills
- Los Gatos
- Monte Sereno
- Morgan Hill
- Mountain View
- Santa Clara County
- Saratoga
- Sunnyvale

The SVCE Board is responsible for:
- Reviewing and approving ERM policies and procedures
- Annually affirming that the ERM policies reflect changes to SVCE's mission and risk tolerance
- Reviewing, and if warranted approving, participation in commodity markets and derivative instruments
- Establishing guidance by which counterparty credit limits are set and monitored, and delegating development and implementation to SVCE's Risk Oversight Committee

3.2   Risk Oversight Committee

The Risk Oversight Committee (ROC) is formed by SVCE's Chief Executive Officer to:

- Define and ensure that all transaction strategies are consistent with SVCE's risk tolerance
- Develop the framework for the Middle Office to develop risk management controls, practices and procedures that are sufficient to monitor and maintain potential loss of value and increased costs within acceptable tolerances
- Report risks, procurement activities and financial information to its SVCE Board of Directors

3.3   Front Office

The Trading Group (Front Office) is established to transact within the Western Electricity Coordinating Council (WECC) to satisfy SVCE's load obligations and resultant NOP. The Front Office is responsible for transacting within limits established and authorized by the ROC, recording all transactions in the deal capture system and reporting activities to the Middle Office, including potential Risk Policy violations.

3.4   Middle Office

The Risk Group (Middle Office) is responsible for:

- Ensuring that SVCE's accounting, financial and treasury function, internal control, risk management and compliance systems satisfy the ERM policies
- Overseeing and monitoring the accountability process and the quality of internal and external reporting
- Reporting regularly to the ROC on each of its purposes and duties and notify the ROC immediately upon findings of discrepancies or breach of limits or procedures that are of material significance or have the potential to result in material significance
- Performing routine internal audits
- Not less than annually, reviewing Front Office resources, including qualifications, skills, experience, funding and equipment
- Developing and approving procedures consistent with this policy
- Ensuring that key risk profiles, material changes to the profiles, trends, emerging risks, and the risk management program are reported to the ROC
- Reviewing with the ROC the effectiveness of internal controls, compliance and risk management systems
- Reviewing the controls in place for unusual transactions and significant risk exposures
- Publishing a quarterly risk report that notifies the ROC of any issues of concern and requires an annual assurance from the ROC that effective risk management processes in relation to material business risks are in place

3.5   Back Office

The Settlement Group (Back Office) is responsible for:

- Settling transactions based on agreed upon terms and conditions specified by the agreement governing the transaction
- Receiving amounts owed and paying amounts due, and ensuring that collateral and postings are sufficient to allow the Front Office to effectively perform its functions
- Ensuring that trade details (price, location, product, tenor, counterparty) transacted by the Front Office and recorded by the trade capture system are accurately reflected in the settlement system and reporting any discrepancies to the Middle Office and if necessary, the ROC

4 Hedging

4.1 Hedging Policy and Objectives

SVCE's hedging policy is designed to satisfy the following objectives:
- Effectively identify and quantify financial and regulatory risks to SVCE
- Accurately monitor those risks
- Execute transactions to appropriately balance risk with minimizing cost and price stability to SVCE's customers
- Provide transparency of the procurement process as appropriate throughout the SVCE organization

4.2 Net Open Position (NOP) Definition and Assessment

The NOP is defined as the difference between demand obligations and supply relative to market prices over a forward period. The NOP is calculated consistent with Risk Management procedures with the following results:
- NOP capacity, energy, renewable portfolio standards (RPS) and carbon-free volumes by period from prompt month through the next five years
- Conversion of NOP to tradeable products (for example, on-peak and off-peak blocks)
- Expected dollar value of the NOP
- Forward price curves
- Volatility of forward prices
- Load obligation forecast in MW and MWh
- Supply expectation in MW and MWh

4.3 NOP Management

NOP is to be managed to ensure stable, competitive rates to SVCE customers. To achieve that goal, the management of the NOP requires a matching of supply with load at rates designed to minimize exposure to price volatility while ensuring compliance with RPS mandated volumes. NOP shall be closed consistent with percentages established in the ERM Policy over periods as shown below:
- Prompt month
- Prompt quarter
- Remaining quarters over the next 12 months (four quarters)
- Year after the next 12 months

- Next five years after the next 12 months

4.4 Measuring NOP
The Middle Office shall calculate SVCE's NOP based on the following criteria:
- Supply contracts expected delivery
- Failure rate of supply contracts
- Load forecast and customer acquisition/retention outlook
- Forward market prices
- Forward market price volatility
- Optionality of supply and demand contracts (dispatchability based on market prices)
- Contract tenor
- Contract delivery and customer load location
- RPS compliance period requirements
- Greenhouse gas allowances and obligations
- Type of revenue streams (fixed vs. floating)
- Type of contract costs (fixed vs. floating)

4.5 Monitoring NOP
Results of monitoring SVCE's NOP shall include the following:
- Volume in MWh, MW by standard on-peak and off-peak periods for the following periods:
  - Prompt month
  - Prompt quarter
  - Balance-of-year
  - Prompt calendar year
  - 2-5 years
- Value in dollars
- Impact to rates to SVCE customers
- Renewable Energy Certificates (RECs) by compliance period
- Greenhouse gas emissions-free energy volume

4.6 Closing NOP
There are two processes for closing SVCE's NOP: the first is a result of the NOP being out of tolerance; the second is implementing a hedging strategy to maintain the NOP within tolerances.

Transactions to bring the NOP into tolerance shall be executed by the Front Office as soon as practical upon notification from the Middle Office. The Front Office shall notify the Middle Office that the transactions have been executed no later than the close of business on the day that the transactions were executed.

Transactions that are executed as a result of strategies designed to maintain the NOP within tolerances shall be consistent with the strategies. The resultant NOP shall be

updated to reflect the new transactions as soon as practical but no later than the next business day.

NOP energy tolerances shall be set at the following:

Period	Minimum Tolerance	Maximum Tolerance	Obligation
Prompt month	90% of load	105% of load	n/a
Prompt quarter	85% of load	105% of load	n/a
Balance-of-year	85% of load	105% of load	n/a
Prompt calendar year	80% of load	105% of load	n/a
Second calendar year	70% of load	90% of load	n/a
Third calendar year	55% of load	75% of load	n/a
Fourth calendar year	40% of load	60% of load	n/a
Fifth calendar year	0% of load	50% of load	n/a

NOP RPS tolerances shall be set at the following:

Period	Minimum Tolerance	Maximum Tolerance	Obligation
January 1, 2017 to December 31, 2017	90% of forecast	110% of forecast	25% of 2017 of retail sales
January 1, 2018 to December 31, 2018	80% of forecast	100% of forecast	25% of 2017 and 2018 retail sales
January 1, 2019 to December 31, 2019	70% of forecast	90% of forecast	25% of 2017 through 2019 retail sales
January 1, 2020 to December 31, 2020	55% of forecast	75% of forecast	25% of 2017 through 2019 retail sales + 33% of 2020 retail sales
Post 2020	40% of forecast	60% of forecast	33% of retail sales

NOP Capacity tolerances shall, at a minimum, be set at the following:

Period	Minimum Tolerance	Maximum Tolerance	Obligation
Prompt month +1	100% of req'd	100% of req'd	115% of peak load
Prompt month +2	100% of req'd	100% of req'd	115% of peak load
Prompt quarter	100% of req'd	100% of req'd	115% of peak load
Balance-of-year	75% of req'd system and flex; 100% of req'd local	100% of req'd	115% of peak load
Prompt calendar year (as of August)	50% of req'd	90% of req'd	n/a
Prompt calendar year (as of October)	75% of req'd system and flex; 100% of req'd local	100% of req'd	103.5 % of summer months peak load for system and flexible capacity; 100% of obligation for local
Post Prompt Year	0% of req'd	50% of req'd	n/a

5 Authorized Transaction and Trading Limitation

5.1 Energy Trading and Authority Policy Objectives

SVCE's Energy Trading and Authority (ETA) policy is designed to satisfy the following objectives:

- Ensure that market participation is consistent with SVCE's customer needs
- Provide SVCE with viable market tools with which to transact without exposing SVCE to undue risk
- Provide SVCE's traders and origination team with structure upon which to transact
- Ensure that agreements that govern transactions and allow for trading are suitable for transacting and do not expose SVCE to undue risk

5.2 Trader and Origination Team Authorization Process

The Front Office shall request that the Middle Office begin the trader authorization process. The Middle Office shall verify that the trader's background is consistent with the criteria established by the ERM Risk Oversight Committee. Criteria shall consist of the following:

- Trader name
- Experience
- Verification that trader is not currently under investigation for market manipulation
- Verification that trader has not been previously investigated for market manipulation
- Verification that trader has read and understands SVCE's trader policies regarding closing SVCE's NOP, and prohibition of speculation and market manipulation

Once the trader is authorized to transact on behalf of SVCE, the Middle Office shall then notify the Front and Middle Offices of that decision. The Middle Office shall add the trader to the trade capture system with the appropriate limits and authorizations. The Middle Office shall maintain documentation indicating SVCE's authorized traders, origination team members along with markets, trading instruments and term for which they are approved.

5.3 Approved Market Participation

Approved markets in which SVCE authorized traders and origination team members can participate are as follows:

- Bilateral energy and capacity within the WECC
- Bilateral renewable energy within the WECC
- Bilateral transmission and associated services within the WECC
- Bilateral carbon and emissions within California
- California Air Resources Board (CARB) emissions/carbon auctions
- Bilateral financial energy
- California Independent System Operator (CAISO)

- o Day-Ahead energy and ancillary services
- o Real-Time energy and ancillary services
- o Congestion Revenue Rights (CRRs)
- o Virtual bidding

5.4   Trading Instruments

Approved trading instruments in which SVCE authorized traders and origination team members can utilize are as follows:

- Physical energy, capacity and transmission transactions
- CAISO energy, ancillary services, inter-scheduling coordinator trades (ISTs), CRRs and virtual bidding
- Financial energy fixed-for-floating swaps
- Financial contracts-for-differences
- Basis transactions
- Greenhouse gas emissions allowances
- Renewable Energy Certificates (RECs)
    - o Portfolio Compliance Category 1 (PCC1)
    - o PCC2
    - o PCC3

5.5   Enabling Agreements

Approved enabling agreements under which SVCE transactions are governed are as follows:

- Western System Power Pool (WSPP)
- Edison Electric Institute (EEI)
- CAISO Tariff
- Individual Power Purchase Agreements approved by the SVCE Board of Directors

5.6   Authorized Trading Limits

The table below lists authorized trading limits for personnel authorized to transact on behalf of SVCE[1].

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[1] Note that except for CRRs and Convergence Bids, all limits are expressed in notional value of the contract, that is price times quantity. For example, 5 MWh x $20/MWh is a notional value equal to $100. CRRs and Convergence Bids are expressed in Value at Risk, that is the amount that the value of the CRR can expected to vary within a confidence interval. The confidence interval for CRRs and Convergence bids is 95%.

Product	Transaction Horizon	Transaction Length	Purchases		Sales	
			$ Limit (Authorized Personnel)	MW Limit (Authorized Personnel)	$ Limit (Authorized Personnel)	MW Limit (Authorized Personnel)
Energy	Real-Time	Balance-of-period until next unscheduled Day-Ahead Period	Amount necessary to balance SVCE load and resources	Amount necessary to balance SVCE load and resources	Amount necessary to balance SVCE load and resources	Amount necessary to balance SVCE load and resources
Capacity						
Transmission						
Financial Energy						
Energy	Day-Ahead	Balance-of-period until next unscheduled Day-Ahead Period	Amount necessary to balance SVCE load and resources	Amount necessary to balance SVCE load and resources	Amount necessary to balance SVCE load and resources	Amount necessary to balance SVCE load and resources
Capacity						
Transmission						
Financial Energy						
Energy	Balance-of-Month	Next unscheduled Day-Ahead Period until end of current month	$5,000,000	100	$2,500,000	50
Capacity						
Transmission						
Financial Energy						
Energy	Prompt Month	One Month	$7,500,000	200	$2,000,000	50
Capacity						
Transmission						
Financial Energy						
Energy	Balance-of-Year	One Year	$25,000,000	250	$6,250,000	50
Capacity						
Transmission						
Financial Energy						
Energy	Current Month through 36 Months	Three Years	Approval Required by SVCE CEO	Approval Required by SVCE CEO	Approval Required by SVCE CEO	Approval Required by SVCE CEO
Capacity						
Transmission						
Financial Energy						
Energy	Current Month through 60 Months	Five Years	Approval Required by SVCE CEO	Approval Required by SVCE CEO	Approval Required by SVCE CEO	Approval Required by SVCE CEO
Capacity						
Transmission						
Financial Energy						
CAISO Energy	Real-Time and Day-Ahead	Through Next CAISO Day-Ahead Period	Amount necessary to schedule SVCE load and resources	Amount necessary to schedule SVCE load and resources	Amount necessary to schedule SVCE load and resources	Amount necessary to schedule SVCE load and resources
CAISO Ancillary Services						
CAISO Convergence Bids	Day-Ahead	24 Hours	$0	0	$0	0
CAISO CRRs	Month	1 Month	$5,000,000	1,000 MW per on-peak and off-period	N/A	N/A
	Quarter	3 Months	$15,000,000	1,000 MW per on-peak and off-period		
	Year	1 Year	Approval Required by SVCE CEO	Approval Required by SVCE CEO		
	Long Term	Up to 10 Years				

6   Counterparty Credit

6.1   Credit Risk Policy Objective

SVCE's Energy Credit Risk policy is designed to satisfy the following objectives:

- Ensure that counterparty risk is recognized and managed to prevent financial loss and regulatory noncompliance due to nonperformance
- Provide SVCE with a broad range of viable counterparties
- Provide SVCE with enough counterparty diversity to obtain market-representative products, prices and location

6.2   Credit Authorization Process

For each potential new counterparty, the Middle Office will develop a counterparty credit template that will be used as the basis for vetting the counterparty's suitability for transacting with SVCE. The counterparty credit template shall consist of the following:

- Counterparty name
- Investment grade
- Financial measures such as assets-to-liability ratio and debt-to-equity ratio
- Organization's size (personnel, assets, dollars)
- Payment history
- Reputation in industry
- Depth of resources
- Enabling agreement type (WSPP, EEI, or custom)
- Litigations in progress and concluded
- Government entity
- Counterparty limits as described in Section 6.5 below (if counterparty is approved)

Once the credit template is completed, the Middle Office is responsible for determining whether the counterparty is suitable for transacting with SVCE and if so, corresponding limits and collateral if necessary. The Middle Office shall then notify the Front and Middle Offices of their determination. For approved counterparties, the Middle Office shall add the counterparty to the trade capture system with the appropriate limits.

6.3   Counterparty Credit Limits

Counterparty credit limits that are entered in the trade capture system and monitored are as follows:

- Total dollars owed or are owed
- Total volume sold or purchased (MW and MWh) remaining to be delivered or received
- Total dollar value of transaction
- Total transaction volume sold or purchased (MW and MWh)
- Percentage of dollars owed or are owed relative to all counterparties

- Percentage of volume sold or purchased relative to all counterparties

Prior to entering into any new transaction, the effect of the potential transaction shall be incorporated to ensure that limits prescribed to the potential counterparty shall not be breached. If any of the limits are breached, the transaction shall not be executed.

6.4 Counterparty Credit Monitoring

Counterparty credit monitoring shall be originated using the counterparty credit monitoring template. All pertinent information shall be included and updated using the counterparty credit template. The counterparty credit template shall be used by Middle Office personnel to enter relevant information into the trade capture system for tracking against transactions and settlements.

The transaction capture system shall compare the effect of potential transactions prior to executing a transaction. Transactions that are within limits can then be executed. Transactions that exceed limits shall not be executed.

6.5 Counterparty Credit Limit Exceedances

Counterparty credit limit exceedances shall result in immediate suspension of trading with that specific counterparty. Should that occur, the following actions to remedy shall be performed:
- No new transactions shall be executed with the affected counterparty
- Middle Office shall be notified immediately
- Middle Office shall investigate and identify the root cause of the exceedance
- Middle Office shall notify the ERM Risk Oversight Committee
- The exceedance shall be rectified as soon as possible via actions recommended by the Middle Office and reviewed by the ERM Risk Oversight Committee
- A comprehensive report shall be developed by the Middle Office and provided to the ERM Risk Oversight Committee and subsequently the SVCE Board of Directors

7 Reporting

As described in the ERM procedures, the Middle Office will develop reports to provide feedback to the SVCE Risk Oversight Committee regarding NOP management, risk management and pertinent issues affecting SVCE. They will also develop reports for the Front Office to state how well the contracts and transactions performed relative to expectations. At a minimum, reports shall consist of the following:
- Summary of energy risk management meetings
- NOP summary
  - NOP by period and type (energy, capacity, RPS, and carbon-free)
  - Value of NOP in dollars
  - Transactions executed and resultant change to NOP during the month
  - Strategies for closing NOP
  - Transactions that were required to close NOP as a result of tolerance exceedance

- o Result of transactions on NOP
- Contract performance
- Summary of new transactions
- Financial report (costs and revenues associated with load obligations, contracts, resources and resultant NOP)
- Identification of violations of the Risk Policy along with mitigation measures
- Counterparty summary
  - o List of counterparties
  - o Credit limits (approved values)
  - o Current dollar and volume amounts and remaining limits
  - o Current credit rating
  - o Total dollar value and quantity of transaction by counterparty
  - o Ratio of contract value per counterparty to all contracts
  - o Transactions that exceeded limits
    - o Counterparty
    - o Transaction type
    - o Dollar amount of transaction
    - o Quantity of transaction
    - o Limit that was exceeded
    - o Root cause of exceedance
    - o Resolution
- RPS status
- Transaction Summary Report (quarterly or as requested by CEO to Risk Oversight Committee)
  - o List of transactions
  - o Volume and dollar amounts of transactions
  - o Types of transactions
  - o Effect of transactions on NOP
- Exceptions (as requested by CEO to Risk Oversight Committee)
  - o Transactions that exceeded limits
  - o Counterparty
  - o Transaction type
  - o Dollar amount of transaction
  - o Quantity of transaction
  - o Limit that was exceeded
  - o Root cause of exceedance
  - o Resolution

Reviewed and Approved by:

Rob Rennie – Chair, Silicon Valley Clean Energy Authority Board of Directors

5/12/17

Date

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