



Initiative #5: Evolving Energy Markets

INITIATIVE INFORMATION

Business Unit/Division	Power Supply & Strategic Planning BU/Power Management Division						
Initiative Executive Sponsor	Paul Laschober and Robert Cromwell						
Initiative Project Manager	Raman Vishwanathan, Joy Liechty & Sarah Davis						
Legally mandated/Required?	No						
(\$000's)	2019	2020	2021	2022	2023	2024	Total
O&M \$ Amount							
CIP \$ Amount							
Total \$ Request							
FTEs Added							

INITIATIVE SUMMARY

- a) **Description:** With declining load and fundamental changes to energy supply and wholesale power markets, City Light has been assessing how it manages its power supply portfolio, including both owned and contracted resources. This initiative strives to undertake a well-structured and comprehensive assessment of the current portfolio while exploring/identifying all available opportunities for cost savings or incremental revenue.

City Light has a highly valuable resource portfolio which is net surplus on an expected basis in an average water year, with considerable flexibility and desirable environmental attributes. However, low wholesale energy prices have resulted in long-term declining net wholesale revenues for City Light. We will evaluate whether revised approaches to power marketing and risk management could deliver additional value from the intrinsic flexibility and environmental quality of City Light’s resource portfolio.

Rapid growth in renewable wind and solar generation in the West coupled with unprecedented surplus in natural gas inventory has plunged energy prices to historic lows. This trend is expected to continue or remain steady, at the new lows, for the foreseeable future. Efforts to mitigate climate change through the California carbon cap and trade program, and carbon legislation also being considered in Washington and other states has the potential to recognize the value of clean hydro energy; but have not substantially changed prices to date. In addition to seeking opportunities for generating incremental revenues, this

initiative is also aimed at equipping City Light's wholesale operations team with new tools and expertise to successfully navigate anticipated changes in regional energy markets.

Component(s)/Objective(s) of initiative: As part of this initiative, City Light will:

- Move ahead with participation in the California Independent System Operator (ISO) Energy Imbalance Market (EIM) to monetize currently unrealized short-term market value in hydroelectric resources.
- Evaluate policies, procedures, metrics, and transactional authority to identify opportunities for prudent flexibility and additional revenue accrual.
- Propose amendments to risk policies (such as additional long-term transactional authority) to increase net wholesale revenue opportunity.

b) Business Value: This initiative seeks to generate new revenue and value from existing hydroelectric resources. In this context it is important to recognize the current and on-going transactional work such as selling frequency response, forward capacity sales, and similar products and services that have and continue to generate greater revenue than simply selling MWhs. Participation in the EIM will allow City Light to more efficiently use generation and transmission assets, buy and sell energy in shorter term increments, and use pricing to match loads and resources across more buyers and sellers than existing markets currently permit. Expected revenue is currently estimated at \$2.9 to 6.4 million per year. By doing this, City Light will more effectively integrate renewable energy across the West due to its flexible hydro capacity.

There is a widespread belief that Western energy markets are on the cusp of significant transformation. Both in California and Colorado, organized markets are seeking to expand, and there is a high likelihood of them doing so in the coming years. The EIM presents both a positive revenue opportunity for City Light customers, as well as an opportunity to support environmental policy objectives by aiding the region in variable energy resource (VER) integration. The purchase and integration of VERs such as wind and solar continues to accelerate in the West. These resources provide an increased societal value but are costly to integrate into the grid due to their variability. The EIM was developed in part to provide an efficient market solution for the integration of VERs. In practice, it also provides for a more efficient dispatch of resources across balancing areas and therefore a more cost effective regional generation dispatch solution. An additional benefit of the EIM project is providing for the professional development of the affected employees, in a manner that will make City Light resilient to anticipated market changes in the coming years. By joining the EIM, City Light will have done some of the "hard lifting" in preparing its people and systems for the market evolution we are witnessing today, and which appears to be accelerating.

c)

2019 - 2024 WHOLESALE REVENUE INITIATIVE MILESTONES AND DELIVERABLES

Milestone	Due Date	Milestone Definition and Comments
Initiative Start	05/2018	Evaluate alternative risk models to update existing approaches.

	06/2018	Request 60 month transactional authority from the Mayor and City Council.
	8/2018	Review potential modifications to existing risk tolerances and discuss with policymakers the potential risk and rewards of doing so.
	03/2019	Draft revised Risk Policies and Procedures to adjust City Light's current risk tolerance and authorize additional products and transactions.
	06/2019	Present revised Wholesale Energy Risk Management Policy to the Mayor and City Council for review and approval.
Initiative Complete	8/1/2019	

2019 - 2024 EIM INITIATIVE MILESTONES AND DELIVERABLES

Milestone	Due Date	Milestone Definition and Comments
Initiative Start	07/2019	Validation of Full Network Model- This milestone is completed upon modeling SCL into the ISO Full Network Model in the EMS in a non-production test environment using the ISO's network and resource modeling process and the complete validation of all SCADA points from SCL; completion of testing of the new Full Network Model; and validation of the Outage and State Estimator applications with the SCL Network Model included.
	09/2019	Connectivity Testing- CAISO makes available the Market Simulation ("MAP Stage") environment for connectivity testing prior to the start of Market Simulation; SCL Network Model and EMS functionality incorporated into CAISO Full Network Model and EMS in the Market Simulation Environment; Market Simulation for the 2019 Fall Release is stable such that SCL testing can begin.
	12/2019	Begin Market Simulation- Testing focuses on specific scenarios to ensure SCL and CAISO software applications are performing correctly and simulated settlements are correct under specific conditions (e.g. manual dispatches, mitigation, contingency events). Scenarios will be specified in the Market Simulation Plan. Transactions use a single recurring Operating Day. Structure Simulation is executed during normal business hours but requires continuous data feeds from SCL to keep the Market solving normally 24x7.
	02/2020	Begin Parallel Operations- Activate Parallel Operations to practice EIM activities with production grade systems, integration, market processes and operating procedures. Confirm compliance with the EIM readiness

		criteria set forth in the CAISO tariff. Parallel Operations is 24x7 and uses actual Production data (e.g. load forecast, VER forecast).
	04/2020	Go-live- Complete upon the first financially binding production energy imbalance market trade date. The SCL and the ISO may elect to perform a non-binding parallel production prior to the first binding production trade date.
Initiative Complete	4/1/20	

SOCIAL EQUITY

There are no discrete, geographic impacts to the Evolving Energy Markets Initiative and the EIM project as they will impact all customers equally via our retail rates, with the potential for making retail rates more affordable than they otherwise would be without these efforts. The EIM Project will utilize City Light's existing contracting and procurement process to obtain operational technology and supporting consulting services; which will include WMBE evaluation criteria, as is our standard practice.

METRICS FOR SUCCESS AND METHOD FOR MEASUREMENT

This initiative's success will be measured by whether City Light is successful in revising its approach to wholesale transactions and deliver greater than expected revenue as a result. Success with the EIM project will be based on joining the EIM market on time and within budget, all system and architectural changes are successfully implemented, testing and training have been completed, and SCL passes readiness criteria during parallel operations with the CAISO. Standard project management tools will be utilized for measurement.