

DOCKETED	
Docket Number:	18-IEPR-07
Project Title:	Doubling Energy Efficiency Savings
TN #:	223901
Document Title:	COMMENTS OF VARENTEC ON THE IEPR COMMISSIONER WORKSHOP ON DOUBLING ENERGY EFFICIENCY SAVINGS
Description:	N/A
Filer:	System
Organization:	Varentec/Michael Jung
Submitter Role:	Public
Submission Date:	6/21/2018 3:10:52 PM
Docketed Date:	6/21/2018

Comment Received From: Michael Jung
Submitted On: 6/21/2018
Docket Number: 18-IEPR-07

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WORKSHOP ON DOUBLING ENERGY EFFICIENCY SAVINGS**

Additional submitted attachment is included below.

**BEFORE THE ENERGY COMMISSION OF THE STATE OF
CALIFORNIA**

IEPR Commissioner Workshop on Doubling
Energy Efficiency Savings, 2018 IEPR Update

18-IEPR-07
Doubling Energy Efficiency Savings

**COMMENTS OF VARENTEC ON THE IEPR COMMISSIONER WORKSHOP ON
DOUBLING ENERGY EFFICIENCY SAVINGS**

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Submitted: June 21, 2018

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IEPR Commissioner Workshop on Doubling
Energy Efficiency Savings, 2018 IEPR Update

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COMMENTS OF VARENTEC ON THE IEPR COMMISSIONER WORKSHOP ON DOUBLING ENERGY EFFICIENCY SAVINGS

I. Introduction

Varentec, Inc. (“Varentec”) respectfully submits the following comments on the recent California Energy Commission (CEC) Integrated Energy Policy Report (IEPR) Commissioner Workshop on Doubling Energy Efficiency Savings. We are encouraged to see the CEC exercising leadership by convening stakeholders and gathering collective wisdom to chart a collaborative path toward this ambitious, yet vital, goal of doubling California’s energy efficiency. We also are excited to participate in the effort to include, for the first time, Volt-Var Optimization (VVO) and Conservation Voltage Reduction (CVR) into the state’s energy efficiency paradigm.

Our comments here focus specifically on 1) highlighting the massive potential for energy savings that VVO/CVR can deliver across the state, which can be further enhanced by innovations in low (Secondary) voltage control technologies, and 2) illustrating the affordability and cost-effectiveness of next-generation VVO/CVR technologies, especially at the low (Secondary) voltage level.

In summary, next-generation VVO/CVR technologies are poised to deliver large-scale, low-cost energy efficiency. We look forward to engaging the CEC and its community of stakeholders to bring VVO/CVR to bear on California’s energy efficiency challenges and opportunities.

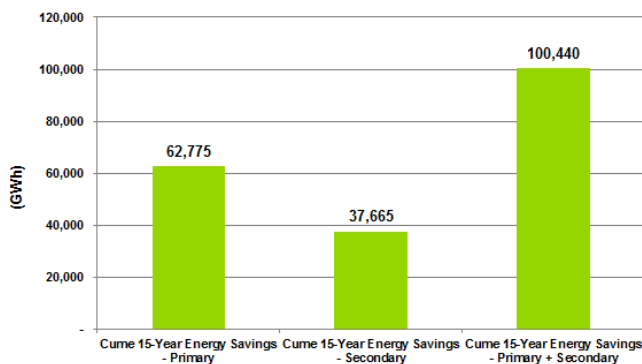
II. VVO/CVR can deliver massive new energy savings

Independent analysis conducted by Navigant Research indicates that VVO/CVR could reduce electricity consumption by 2.18% and deliver over one-fourth of the savings required from electric utilities by SB-350 to double statewide energy efficiency.

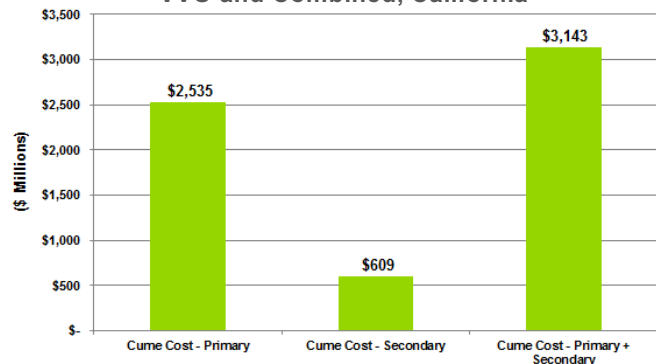
CALIFORNIA: TOTAL POTENTIAL ENERGY SAVINGS AND COSTS WITH VVO

- Deployment of Primary VVO to all eligible circuits (60% of total) would save 62.8 TWh of energy over 15 years, at a cost of \$2.5 billion.
- The addition of Secondary VVO to all eligible circuits saves an additional 37.7 TWh of energy over 15 years, with an incremental cost of \$609 million.
- Combined, California could **cut energy consumption by 100.4 TWh over 15 years**, for ~\$3.1 billion. This is based on projected load for 2032. *This is the equivalent of 94 million tons of coal generation.*
- *The **average annual potential energy savings of 6.3 TWh** is more than one-fourth of California's new SB-350 2x Energy Efficiency target savings of 27.6 TWh by 2030 for IOUs and public utilities. (The total new EE target is 82.9 TWh)*

Cume 15-Year Energy Savings with Primary VVO, Secondary VVO and Combined, California



Cume 15-Year Costs for Primary VVO, Secondary VVO and Combined, California



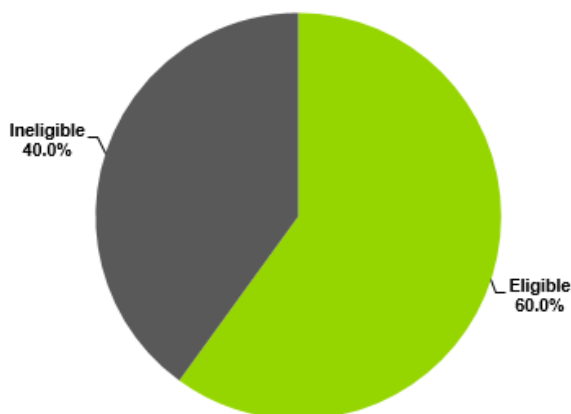
Source: Navigant Research

The addition of low (Secondary) voltage control technologies can further expand the number of circuits that can be cost-effectively upgraded with VVO/CVR capabilities by over 20%, resulting in even deeper potential savings. This result raises the maximum achievable savings potential from VVO/CVR to nearly one-third of the amount of energy reductions necessary from the utility sector to achieve the SB-350 statewide goal of doubling energy efficiency by 2030.

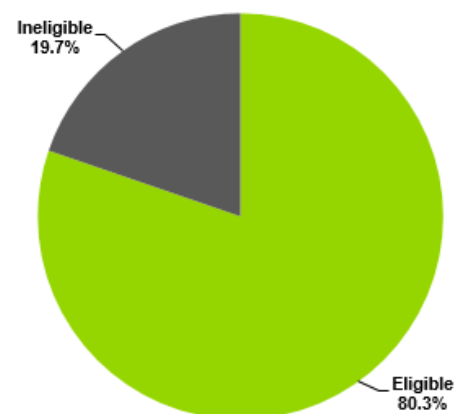
CALIFORNIA: SECONDARY VVO RAISES THE NUMBER OF ELIGIBLE CIRCUITS

- The addition of Secondary VVO increased the BCR by 38% versus Primary only (1.81/1.35).
- In California, this means an additional ~3,100 circuits are eligible, or 20.3%.
- *The potential energy savings under this expanded deployment scenario would be another 36.3 TWh over 15 years, or 2.4 TWh per year on average. If all eligible circuits were built out under this expanded scenario, VVO (Primary + Secondary) could save ~8.7 TWh per year, or 31.5% of the 2x Energy Efficiency target savings of 27.6 TWh for IOUs and public utilities.*

VVO Eligible Circuits with Primary Only



VVO Circuits with Primary + Secondary VVO



Source: Navigant Research

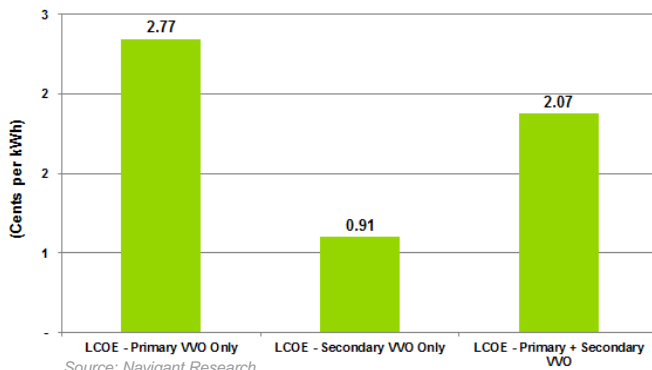
III. VVO/CVR is affordable and cost-effective

In addition to being capable of delivering as much as nearly one-third of the energy savings necessary to double energy efficiency across California, VVO/CVR also proves to be an affordable and cost-effective efficiency measure.

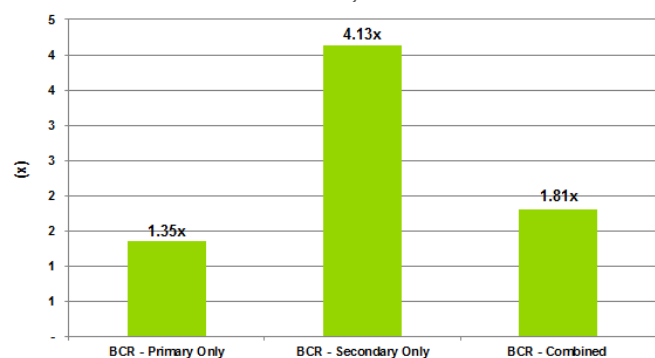
CALIFORNIA: TRC BCR AND LCOE MODEL RESULTS

- The LCOE of energy saved via Secondary volt-VAR optimization (VVO) technologies is just **0.91 cents/kWh**, vs. 2.77 cents/kWh for Primary VVO only deployments. The addition of Secondary VVO reduces overall LCOE to 2.07 cents/kWh.
- Assuming a 1.35x total resource cost (TRC) benefit cost ratio (BCR) for Primary VVO deployments, the implied **BCR for Secondary VVO exceeds 4x** and raises the overall BCR for combined deployments to 1.8x.
- *Key Assumptions: 60% of total circuits eligible, accounting for 65% of load; 3.0% average voltage reduction with Primary VVO and 1.8% with Secondary VVO, CVR factor 0.70. 100% of Primary VVO circuits deploy Secondary VVO.*

LCOE Primary VVO, Secondary VVO,
and Combined, California



BCR Primary VVO, Secondary VVO,
and Combined, California



IV. Summary

VVO/CVR represents a powerful opportunity to help California achieve its ambitious goal of doubling statewide energy efficiency by 2030. VVO/CVR today benefits from innovations that enable increasingly distributed voltage control to deliver cost-effective, large-scale energy savings. We at Varentec look forward to contributing to the CEC's ongoing and tireless work toward doubling California's energy efficiency by 2030.