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Memorandum

To: Phil Bosco, Evaluation Manager, Independent Electricity System Operator

From: Benjamin L. Messer & Paul Schwarz, Research Into Action, Inc.

Date: May 18, 2015

Re: Western Climate Initiative Research Questions

Research Into Action, Inc. conducted research on how energy efficiency (EE) programs are treated under cap and trade programs in U.S. states and Canadian provinces in an effort to answer questions posed by the Independent Electricity System Operator (IESO). As Ontario builds interest in participating in the cap and trade program under the Western Climate Initiative (WCI), the IESO is seeking a better understanding of how ratepayer EE incentive programs will be impacted. Specifically, the IESO asked:

- What is the impact of WCI with ratepayer incentive programs, particularly vis-à-vis attribution of [energy] savings?
- Have impacts from EE programs (or other ratepayer funded programs) traditionally been excluded from WCI?
- How are gas demand side management (DSM) program handled in relation to WCI?
- How have associated greenhouse gas savings from electric EE measures been treated?
- What confidence/precision levels for savings would be needed from the project/portfolio level?
- Is there a need for ongoing monitoring of savings to keep the current? How long can you count savings with respect to cap and trade rules?

The WCI was established in 2007 as a regional collaboration of seven U.S. states and four Canadian provinces with the goal of reducing greenhouse gas emissions (GHGs) to 15% below 2005 levels by 2020.[1,2] In 2010 the WCI published a framework for a regional cap and trade program, which initially included facilities that exceeded 25,000 metric tons of CO_2 equivalent emissions ($mtCO_2e$) from electricity generation and industrial and commercial combustion. The

[1] These include California, Oregon, Washington, Arizona, New Mexico, Utah, Montana, British Columbia, Manitoba, Ontario, and Quebec, but all the U.S. states except California have since exited the WCI.

[2] [CORE] Carbon Offset Research & Education, "Western Climate Initiative" 2011. Stockholm Environmental Institute and Greenhouse Gas Management Institute *http://www.co2offsetresearch.org/policy/WCI.html*

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framework was extended in 2015 to include residential, commercial, and industrial fuel combustion facilities and transportation fuel combustion.[3]

In 2012–2013 California and Quebec became the first jurisdictions to implement the WCI cap and trade program and begin enforcing compliance. The *California Air Resources Board* (CARB) is the primary agency responsible for designing and implementing the cap and trade program in California, as established in policy *AB 32*.[4] In Quebec, the primary agency is the *Minister of Sustainable Development, the Environment, and the Fight Against Climate Change*, under the Quebec *Climate Change Action Plan*. There are a few technical differences in the design and implementation of the WCI cap and trade program between the two jurisdictions, but the overall frameworks are the same.[5] We will focus on California since there has been much greater activity and progress in its cap and trade program compared to Quebec.[6]

Even though California and Quebec have begun enforcing compliance under the WCI cap and trade program, the program is still in the early development stages and EE program activities are not currently included in the regulatory framework according to the documentation we reviewed.[7] As a result, there remains a dearth of information regarding many of the details regarding how EE programs and activities will be treated under the program. Thus, to answer some of the questions posed by IESO, we researched another similarly designed cap and trade program in the northeastern U.S., the Regional Greenhouse Gas Initiative (RGGI).

Established in 2005, RGGI is the first mandatory cap and trade program in the U.S. The nine currently participating states are Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont. Pennsylvania, Quebec, New Brunswick, and Ontario currently act as observers. The participating RGGI jurisdictions began enforcing compliance in 2009.[8] RGGI proceeds have been used by participating jurisdictions to fund EE programs, and jurisdictions have policies regarding which EE activities should be accounted for under the RGGI program. The RGGI program has a more limited scope than WCI program – it covers only CO_2 emissions from fossil fuel electricity generation sources of 25 megawatts or more within the RGGI region—but otherwise, the RGGI and WCI frameworks are very similar. In fact, RGGI, WCI, and the Midwest Greenhouse Gas Reduction Accord (MGGRA) are

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3 California Code of Regulations, Division 3 Air Resources, Chapter 1 Air Resources Board, Subchapter 10 Climate Change. *http://www.arb.ca.gov/cc/capandtrade/capandtrade/unofficial_c&t_012015.pdf*

4 California Global Warming Solutions Act of 2006, Assembly Bill No. 32, Chapter 488. *http://www.arb.ca.gov/cc/capandtrade/capandtrade.htm*

5 Hernandez. S. *A Close Look at the California & Quebec Cap-and-Trade Linkage.* 2014 *Climate Action Reserve. http://www.climateactionreserve.org/wp-content/uploads/2009/05/CA-Quebec-Slidedeck.pdf.*

6 Hernandez. S. *A Close Look at the California & Quebec Cap-and-Trade Linkage.* 2014 *Climate Action Reserve. http://www.climateactionreserve.org/wp-content/uploads/2009/05/CA-Quebec-Slidedeck.pdf.*

7 California Code of Regulations, Division 3 Air Resources, Chapter 1 Air Resources Board, Subchapter 10 Climate Change.*http://www.arb.ca.gov/cc/capandtrade/capandtrade/unofficial_c&t_012015.pdf*

8 Bifera, L. 2013, Regional Greenhouse Gas Initiative. Center for Climate and Energy Solutions *http://www.c2es.org/docUploads/rggi-brief-12-18-13-updated.pdf*

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engaged in a joint effort to share experiences regarding the design and implementation of regional cap and trade programs.[9]

In California, electric utilities and natural gas suppliers are mandated to comply with WCI cap and trade rules and are issued free emissions allowances to reduce costs of compliance and guard against rate increases.

Electric utilities and natural gas supplies in California with 25,000 mtCO_2e emissions must be in compliance with the WCI cap and trade program.[10] California allocates allowances, or permits, equal to the amount of GHG emissions allowed under the cap. For California electric utilities, free allocation of allowances is set to about 90% of average emissions and any allowances needed above this level, but still under or equal to the cap, must be purchased at quarterly auctions; for natural gas supplies, the free allocation of allowances is based on the quantity of natural gas supplied in 2011 (the baseline year) to entities not covered under the cap and trade rules, and the remainder must be purchased at quarterly auctions, if needed.[11]

At the end of each quarter utilities and natural gas suppliers can sell allowances at auction and/or can trade or bank allowances.[12] These policies are in place to help protect ratepayers from potential rate increases resulting from utilities' and natural gas suppliers' compliance under WCI. California further stipulates that utilities and natural gas suppliers use a portion of the value of the allowances for the benefit of ratepayers, including investments in EE programs.[13] A similar framework is in place under RGGI.

Under California's WCI cap and trade program framework, EE upgrades are not currently treated as offsets.

In general, under cap and trade programs, regulated facilities can offset their GHG emissions in a number of ways, including hypothetically making EE upgrades. For example, if a facility covered under cap and trade is going to exceed its GHG emissions cap, the facility could install EE upgrades to reduce its energy consumption and thus offset associated GHG emissions. Similarly, a utility regulated under cap and trade could implement EE programs to reduce its

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9 [CORE] Carbon Offset Research & Education, "Western Climate Initiative" 2011. Stockholm Environmental Institute and Greenhouse Gas Management Institute *http://www.co2offsetresearch.org/policy/WCI.html*

10 California Code of Regulations, Division 3 Air Resources, Chapter 1 Air Resources Board, Subchapter 10 Climate Change.*http://www.arb.ca.gov/cc/capandtrade/capandtrade/unofficial_c&t_012015.pdf*

11 "Allowance Allocation" *California Air Resources Board*. 2015, *http://www.arb.ca.gov/cc/capandtrade/allowanceallocation/allowanceallocation.htm*; "Distribution of Allowance Allocation" *California Air Resources Board*. 2015, *http://www.arb.ca.gov/cc/capandtrade/allowanceallocation/EDU-NG-allowancedistribution.htm*

12 California Code of Regulations, Division 3 Air Resources, Chapter 1 Air Resources Board, Subchapter 10 Climate Change; "Allowance Allocation" *California Air Resources Board*. 2015, *http://www.arb.ca.gov/cc/capandtrade/allowanceallocation/allowanceallocation.htm*; "Distribution of Allowance Allocation" *California Air Resources Board*. 2015, *http://www.arb.ca.gov/cc/capandtrade/allowanceallocation/EDU-NG-allowancedistribution.htm*

13 *California Code of Regulations, Division 3 Air Resources, Chapter 1 Air Resources Board, Subchapter 10 Climate Change. http://www.arb.ca.gov/cc/capandtrade/capandtrade/unofficial_c&t_012015.pdf*

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electricity generation needs, thus avoiding GHG emissions, which in turn, could count as emissions offsets. However, GHG offsets, in general, under cap and trade programs must meet several criteria, as discussed below, in order for the offsets to be accounted for in the program.

Under California's WCI cap and trade program framework, offsets are currently limited to 8% or less of a facility's compliance obligation and are restricted to projects in five areas.[14] These are forestry, urban forestry, dairy digesters, destruction of ozone-depleting products, and mine methane capture. At present, it appears from the documentation we reviewed that EE program activities are not acceptable as a source for offsets. Under the RGGI framework, participating jurisdictions do have offset policies in place regarding how to treat EE programs and activities.[15] Since WCI is collaborating with RGGI, EE programs could be included in California's implementation of the WCI cap and trade program framework in the future.

GHG reductions and offsets must meet an additionality requirement to be accounted for under the WCI cap and trade program.

Reductions or offsets in GHG emissions under the WCI cap and trade program (as well as under the RGGI program) have to be real, additional, verifiable, enforceable, and permanent in order to be accounted for in the program.[16] Participating jurisdictions are required to establish evaluation, measurement and verification (EM&V) protocols and contract with independent cap and trade EM&V organizations to meet these criteria.[17] Of these, the criterion with the most flexibility and applicability to EE offsets, is additionality, which stipulates that offsets under cap and trade must be additional to what would have occurred in a business-as-usual scenario (i.e., a scenario in which the cap and trade program did not exist). This can be a difficult requirement to meet, depending how additionality is specified and measured.

The specifics of additionality requirements have been established by participating RGGI jurisdictions.

RGGI and WCI do not have regulatory authority over participating jurisdictions and thus allow jurisdictions to establish their own additionality requirements in cooperation with other jurisdictions and the cap and trade program organization.[18] RGGI jurisdictions created a Model Rule, or framework, that broadly specifies some minimum additionality requirements regarding

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14 "Compliance Offset Program" *California Air Resources Board.* 2015. *http://www.arb.ca.gov/cc/capandtrade/offsets/offsets.htm. California Code of Regulations, Division 3 Air Resources,; Chapter 1 Air Resources Board, Subchapter 10 Climate Change. http://www.arb.ca.gov/cc/capandtrade/capandtrade/unofficial_c&t_012015.pdf*

15 *Regional Greenhouse Gas Initiative Model Rule. 2008. Regional Greenhouse Gas Initiative."Ensuring Offset Quality" Offset Quality Initiative. 2008. Regional Greenhouse Gas Initiative.*
http://www.rggi.org/docs/Model%20Rule%20Revised%2012.31.08.pdf

16 "Compliance Offset Program" *California Air Resources Board.* 2015. *http://www.arb.ca.gov/cc/capandtrade/offsets/offsets.htm. California Code of Regulations, Division 3 Air Resources,; Chapter 1 Air Resources Board, Subchapter 10 Climate Change. http://www.arb.ca.gov/cc/capandtrade/capandtrade/unofficial_c&t_012015.pdf*

17 California Code of Regulations, Division 3 Air Resources, Chapter 1 Air Resources Board, Subchapter 10 Climate Change.*http://www.arb.ca.gov/cc/capandtrade/capandtrade/unofficial_c&t_012015.pdf*

18 "Ensuring Offset Quality" *Offset Quality Initiative.* 2008 *http://www.c2es.org/publications/ensuring-offset-quality*

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energy efficiency, but jurisdictions are allowed to establish more stringent additionality requirements if desired.[19] There are many types of additionality requirements but the three most common are:[20]

- Regulatory, in which offsets are additional if they are not required by law, mandate, or regulation,
- Financial, in which offsets are additional if they would not have occurred without financial incentives from the cap and trade program or proceeds from the program, or
- Technological, in which offsets are additional if the technology used to create the offset is not readily available in the market.

RGGI jurisdictions primarily employ regulatory and financial additionality requirements to EE upgrades and programs, and WCI jurisdictions appear to be following suit with regard to what offsets are currently allowed, but the details regarding EE activities are currently unavailable.[21]

Under the RGGI program framework, additionality requirements exclude EE upgrades made through ratepayer funded programs and energy efficiency programs funded by proceeds from RGGI auctions.

In RGGI jurisdictions, as described below, the additionality requirements largely exclude the use of ratepayer incentive programs, even those that receive RGGI funds through auction proceeds from being used as offsets. RGGI's Model Rule stipulates that offsets are not awarded to projects that:[22]

a. Are required due to state, local, or federal laws, regulations or administrative/judicial order,
b. Include electric generation components unless the project sponsor transfers legal rights to attribute credit generated from the operation used for compliance with a renewable portfolio standard or other regulatory requirement, to the regulatory agency or its agent,
c. Receives funding or other incentives provided from any system benefit fund(s), or other incentives provided through the consumer benefit or strategic energy purpose allocation required pursuant to subdivision 5.3B, which states that the regulatory agency will allocate a minimum of 25% of the participating jurisdiction's CO_2 Budget

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19 *Regional Greenhouse Gas Initiative Model Rule. 2008. Regional Greenhouse Gas Initiative. http://www.rggi.org/docs/Model%20Rule%20Revised%2012.31.08.pdf*

20 Gillenwater, M. "What is Additionality?" *Greenhouse Gas Management Institute* Version 03 (2012).*https://ghginstitute.org/wp-content/uploads/content/GHGMI/AdditionalityPaper_Part-1(ver3)FINAL.pdf*

21 California Code of Regulations, Division 3 Air Resources, Chapter 1 Air Resources Board, Subchapter 10 Climate Change.*http://www.arb.ca.gov/cc/capandtrade/capandtrade/unofficial_c&t_012015.pdf*

22 *Regional Greenhouse Gas Initiative Model Rule.*2008*. Regional Greenhouse Gas Initiative. http://www.rggi.org/docs/Model%20Rule%20Revised%2012.31.08.pdf*

Trading Program to the consumer benefit or strategic energy purpose set-aside account, and

d. Is awarded credits or allowances under any mandatory or voluntary GHG program (except with regard to forestry allowances).

In practice, this means that the New York State Energy Research and Development Authority (NYSERDA), for example, tracks but does not count its EE program savings and associated GHG reductions, even those from RGGI-funded projects, as offsets under RGGI, with one exception. Under Subpart 242-10 of New York's RGGI policy and xx-10.5(d)(1)(i) of RGGI's Model Rule, projects that reduce or avoid CO_2 emissions from natural gas, oil, or propane end-use combustion due to end-use EE, and that meet the additionality and other criteria, including some performance standards, are eligible for offset allowances.[23] Eligible projects must reduce CO_2 through one of the following:

a. Improvements in the EE of combustion equipment that provides space heating and hot water, including the use of solar and geothermal energy,

b. Improvements in the efficiency of heating distribution systems,

c. Installation or improvement of energy management systems,

d. Improvement in the efficiency of hot water distribution systems and reduction in demand,

e. Measures that improve the thermal performance of the building shell,

f. Measures that improve the passive solar performance of buildings and utilization of active heating systems using renewable energy, and

g. Fuel switching to less carbon-intensive fuel for use in combustion systems, provided conversions to electricity are not eligible.

Natural gas DSM is subject to additionality requirements under the WCI cap and trade program framework in at least one jurisdiction within California but not currently at the state-level; both natural gas DSM and demand response are positioned to expand under California's cap and trade program.

In 2014 California released the first update to the Climate Scoping Plan, the first to be released following the successful launch of California's WCI cap and trade program.[24,25] The report fails to mention natural gas DSM directly, but includes many developments in demand response

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23 *Regional Greenhouse Gas Initiative Model Rule. 2008. Regional Greenhouse Gas Initiative. http://www.rggi.org/docs/Model%20Rule%20Revised%2012.31.08.pdf*; New York State Department of Environmental Conservation Regulation, Chapter 3 – Air Resources, Subpart 242-10: CO2 Emissions Offset Projects. *http://www.dec.ny.gov/regs/47190.html*

24 The Climate Scoping Plan is a report discussing regulatory and implementation progress required by the California Global Warming Solutions Act of 2006 and is to be submitted to the Governor every five years.

25 "First Update to the AB 32 Scoping Plan" *California Air Resources Board.* 2014. *http://www.arb.ca.gov/cc/scopingplan/document/updatedscopingplan2013.htm*

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(DR). In its efforts to meet overall energy targets—including WCI—California established a "loading order" to ensure high impact implementation, compelling regulated entities to meet electricity demand first by utilizing energy efficiency and demand response, then renewable energy resources, and finally clean and efficient natural gas power plants.[26]

In addition, in 2013 the California Public Utility Commission (CPUC) initiated new rulemaking for DR with the intention of deepening its role in future resource planning.[27] The new rules drastically improved the position and visibility of DR by allowing DR to be bid into California Independent System Operator as a dispatchable resource in the wholesale market. Although DR makes up only one piece of DSM, if California's treatment of DR can be taken as a guide to the overall priority level to be afforded DSM under the WCI cap and trade program, recent history suggests an integrated and deepening role in the future.

At least one well-reported example of natural gas DSM has been demonstrated under the WCI cap and trade program in California. In 2007 the City of Palo Alto developed a Climate Action Plan, which has become its overarching strategic vehicle for meeting and exceeding its mandated and voluntary GHG commitments. In 2014 the City of Palo Alto Utilities (CPAU) released an overview of its DSM efforts to date, including its treatment of electric and gas DSM under the WCI cap and trade program. Between 2008 and 2013, CPAU achieved natural gas savings totaling 1.13% of its load, attributing 64% of these savings to business customers and 31% to residential customers.[28] For its part, CPAU has increased its gas efficiency per DSM program dollar spent between 2008 and 2013 and has done so relying primarily on third-party program administrators.[29] In its 2014 "Comprehensive Plan Update, Greenhouse Gas Emissions" CPAU includes its natural gas DSM programs as part of in attainment of its GHG reduction goals, though accounting for only about 3% is the City's total emission savings.[30] Nonetheless, in this case natural gas DSM has played a prominent role in implementing the WCI cap and trade program framework.

In sum, Ontario's participation in the WCI cap and trade program will affect the IESO's EE programs depending on how Ontario defines and implements its additionality requirements.

Ontario and the IESO should have substantial leeway in specifying its additionality requirements and other criteria under the WCI cap and trade program framework. The WCI cap and trade program allows Ontario to decide whether to include its ratepayer funded EE programs, even those funded by WCI auction proceeds, under its implementation of WCI cap and trade program

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26 "AB 32 Scoping Plan", *California Air Resources Board.* 2015. *http://www.arb.ca.gov/cc/scopingplan/scopingplan.htm*

27 "AB 32 Scoping Plan", *California Air Resources Board.* 2015. *http://www.arb.ca.gov/cc/scopingplan/scopingplan.htm*

28 "Informational Report on City of Palo Alto Utilities Demand Side Management Achievements for Fiscal Year 2013" *City of Palo Alto Utilities* 2014. *http://www.cityofpaloalto.org/civicax/filebank/documents/43191*

29 "First Update to the AB 32 Scoping Plan" *California Air Resources Board.* 2014. *http://www.arb.ca.gov/cc/scopingplan/document/updatedscopingplan2013.htm*

30 "Informational Report on City of Palo Alto Utilities Demand Side Management Achievements for Fiscal Year 2013" *City of Palo Alto Utilities* 2014. *https://www.cityofpaloalto.org/civicax/filebank/documents/43239*

framework, as has been done in the RGGI program. This also includes natural gas DSM programs and gas savings from electric measures. The IESO should discuss whether to include some of its energy efficiency programs under the WCI cap and trade program during the open comments period prior to implementation.

In addition, Ontario should also strongly consider which additionality requirements to put in place, particularly which baseline(s) will be used to measure additionality. The stringency of the baseline used to measure additionality will determine which project types will be able to use EE improvements as offsets under the WCI cap and trade program. A conservative business-as-usual baseline (e.g., one that includes regulatory and financial additionality requirements, as RGGI does) will place more limits on the types of projects that are eligible compared to a less conservative baseline (e.g., includes only financial additionality requirements). The RGGI framework and, possibly in the future, California and Quebec under the WCI program, may serves as models.

GHG savings must be permanent, which is defined as at least 100 years under the WCI.

As mentioned previously, GHG offsets must be permanent in order to be accounted for under WCI cap and trade program. The WCI and other cap and trade programs define permanence as at least 100 years, which will require ongoing monitoring and reporting for verification on an annual basis.[31] Covered entities register with the Compliance Instrument Tracking System Service (CITSS) to establish compliance accounts.[32]

California recommends 5% confidence intervals for measuring GHG emissions at the project/portfolio level.

All cap and trade programs, including California under the WCI program, recommend 5% confidence intervals, or 95/5 confidence/precision, for measuring GHG emissions reductions at the project or portfolio level.[33] However, according to the Intergovernmental Panel on Climate Change (IPCC), less stringent requirements are permitted for projects that involve specific key categories that are difficult to measure; for these project types, an uncertainty analysis is recommended.[34]

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31 California Code of Regulations, Division 3 Air Resources, Chapter 1 Air Resources Board, Subchapter 10 Climate Change.*http://www.arb.ca.gov/cc/capandtrade/capandtrade/unofficial_c&t_012015.pdf*

32 California Code of Regulations, Division 3 Air Resources, Chapter 1 Air Resources Board, Subchapter 10 Climate Change.*http://www.arb.ca.gov/cc/capandtrade/capandtrade/unofficial_c&t_012015.pdf*

33 "Measurement Accuracy and Missing Data Provisions for California's Mandatory Greenhouse Gas Reporting Regulation" *California Air Resources Board*. 2015*http://www.arb.ca.gov/cc/reporting/ghg-rep/guidance/guidance.htm*

34 Winiwater, W. et al. *2006 IPCC Guidelines for National Greenhouse Gas Inventories Volume 1 Chapter 6: Quality Assurance/Quality Control and Verification. Intergovernmental Panel on Climate Change.* 2006. *http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/1_Volume1/V1_6_Ch6_QA_QC.pdf*; Hiraishi, T. et al. *2006 IPCC Guidelines for National Greenhouse Gas Inventories Annex 1: Conceptual Basis for Uncertainty Analysis. Intergovernmental Panel on Climate Change.* 2006 *http://www.ipcc-nggip.iges.or.jp/public/gp/english/A1_Conceptual.pdf*; *The GHG Protocol for Project Accounting. World Business Council for Sustainable Development and World Resources Institute. http://ghgprotocol.org/files/ghgp/ghg_project_accounting.pdf*