



# Energize Fresno Inventory of Verification Protocol & Technical Resources Memorandum

November 2016

The Local Government Commission

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## **Abstract**

The following memorandum represents the first step in completing the Verification Toolkit. The Verification Toolkit defines a comprehensive evaluation methodology and data recording infrastructure that will be used to assess the resource-saving impacts of the Energize Fresno project pipeline during project build out in Phase II of the grant funding.

The information presented in this memorandum reflects the work accomplished by the Energize Fresno team as of the publication date, and may not necessarily reflect the program's design in its most recent form.

## **Project Specifics**

<b>Contractor:</b>	Local Government Commission
<b>Partners:</b>	Tierra Resource Consultants, City of Fresno, CalSTART, Fresno Metro Ministry
<b>Amount:</b>	\$1,500,000
<b>Co-funding:</b>	\$12,445 in-kind support
<b>Term:</b>	May 2016 - March 2018



**Memorandum**

**To:** Neil Matouka, Kif Scheuer, Local Government Commission  
**From:** Mike Yim, Floyd Keneipp, Steve Kromer, Sound Data Management, the Tierra team  
**Date:** November 7, 2016  
**Re:** Inventory Verification Protocol and Technical Groups Memorandum

**Memorandum Content Summary**

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## 1. Task Summary

The following Memorandum represents the first step in completing Task 4, the Verification Toolkit. The Verification Toolkit (“Toolkit”) defines a comprehensive evaluation methodology and data recording infrastructure that will be used to assess the resource-saving impacts of the Task 2 Project Pipeline (the ‘project pipeline’) during project buildout in Phase 2 of the grant funding. The Toolkit will develop industry-standard, cost-effective, best practices for estimating and reporting project savings accruing communitywide for all resources; the results of which will be addressed through the following project deliverables:

1. Inventory Verification Protocol and Technical Groups Memo
2. Verification Methods for Inclusion Memo
3. Verification Implementation Specification
4. Data Recording Infrastructure Design
5. ICRM Platform Gap Analysis
6. Verification Toolkit Supplementary Tasks and Resources Memo
7. CPR Report

When fully developed, the Verification Toolkit will reflect the interests of project stakeholders, funding organizations, and regulators. This Inventory Verification Protocol and Technical Groups Memorandum addresses the following research tasks:

1. Develop an inventory of verification protocols
2. Define a data verification and data collection framework
3. Identify a Verification Technical Advisory Group (TAG) that can be used to address verification topics associated with the Task 2 Project Pipeline.

The following section discusses each task.

## 2. Tasks Discussion

### Task 1. Inventory of Verification Protocols

Research was completed by the team to develop a comprehensive inventory of verification methodologies, by resource (e.g., electricity, water, GHG, etc.). These protocols will be reviewed to develop the inputs, outputs, and resulting performance metrics that will be profiled in the second Toolkit deliverable, the Verification Methods for Inclusion Memo. The Verification Methods for Inclusion Memo will provide the team with a comprehensive understanding of the most important metrics to verify, and the current inventory of metrics being recorded through the various participating agencies. This review will also identify other reporting aspects of the project pipeline such as funding sources and requirements that funders might have to verify savings, what legislative or agency goal is being impacted and their reporting requirements, etc.

Table 1 provides a subset of industry-prevalent evaluation methods to assess resource savings for the projects currently identified in the Project Pipeline. We note that many of these methodologies are cross-cutting and may be applicable to a broad range of resource impacts so long as a pre-installation and post-installation case can be accurately established.

As the ICRM project progresses, the project pipeline is continuing to expand, and will include projects for which we require additional verification protocols. Accordingly, the inventory verification process is fluid and we will continue to build upon this taxonomy throughout the development of the Verification Toolkit.

**Table 1. Examples of Evaluation Methods**

<b>Evaluation Methodology</b>	<b>Development Entity</b>	<b>Scope of Data Recorded</b>
International Performance and Measurement, Verification, and Protocols (IPMVP)	Efficiency Valuation Organization	<a href="http://www.evo-world.org">www.evo-world.org</a>
American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Standards and Guidelines	American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)	<a href="https://www.ashrae.org/standards-research--technology/standards--guidelines">https://www.ashrae.org/standards-research--technology/standards--guidelines</a>
Clean Power Plan	Environmental Protection Agency (EPA)	<a href="https://www.epa.gov/cleanpowerplantoolbox/draft-evaluation-measurement-and-verification-guidance-demand-side-energy">https://www.epa.gov/cleanpowerplantoolbox/draft-evaluation-measurement-and-verification-guidance-demand-side-energy</a>
Uniform Methods Project (UMP)	U.S. Department of Energy (DOE)	<a href="http://energy.gov/eere/about-us/ump-home">http://energy.gov/eere/about-us/ump-home</a>
CA EE Evaluation Protocols and Framework	California Public Utilities Commission (CPUC)	<a href="http://www.cpuc.ca.gov/General.aspx?id=5399">http://www.cpuc.ca.gov/General.aspx?id=5399</a>
California Air Resources Board (CARB) Reporting Standards	California Air Resources Board (ARB)	<a href="https://www.arb.ca.gov/cc/reporting/ghg-rep/regulation/mrr-2014-unofficial-02042015.pdf">https://www.arb.ca.gov/cc/reporting/ghg-rep/regulation/mrr-2014-unofficial-02042015.pdf</a>
National Action Plan Energy Efficiency Protocols (NAPEE)	Environmental Protection Agency (EPA)	<a href="https://www.epa.gov/sites/production/files/2015-08/documents/evaluation_guide.pdf">https://www.epa.gov/sites/production/files/2015-08/documents/evaluation_guide.pdf</a>
Water Management Planning Guidebook	California Public Utilities Commission (CPUC)	<a href="http://www.water.ca.gov/wateruseefficiency/agricultural/docs/Approved%20Final%202015%20AWMP%20Guidebook%20June%202015.pdf">http://www.water.ca.gov/wateruseefficiency/agricultural/docs/Approved%20Final%202015%20AWMP%20Guidebook%20June%202015.pdf</a>
Alternative Fuel Life-Cycle Environmental and Economic Transportation Tool (AFLEET)	Department of Energy (DOE)	<a href="https://greet.es.anl.gov/afleet">https://greet.es.anl.gov/afleet</a>
Grant Funded Water Savings Calculator	California Public Utilities Commission (CPUC)	<a href="http://www.water.ca.gov/wuegrants/Final-2015-PSP-Exhibits-1-27-2016.pdf">http://www.water.ca.gov/wuegrants/Final-2015-PSP-Exhibits-1-27-2016.pdf</a>
CA Water Conservation Reporting Guidelines	California Public Utilities Commission (CPUC)	<a href="http://www.waterboards.ca.gov/water_issues/programs/conservation_portal/conservation_reporting.shtml">http://www.waterboards.ca.gov/water_issues/programs/conservation_portal/conservation_reporting.shtml</a>
Energy Efficiency Program Impact Evaluation Guide	State and Local Energy Efficiency Action Network (SEE Action)	<a href="https://www4.eere.energy.gov/seeaction/publication/energy-efficiency-program-impact-evaluation-guide">https://www4.eere.energy.gov/seeaction/publication/energy-efficiency-program-impact-evaluation-guide</a>
PVWatts Solar Photovoltaic Calculator	National Renewable Energy Laboratory (NREL)	<a href="http://pvwatts.nrel.gov/">http://pvwatts.nrel.gov/</a>
Solar Advisor Model (SAM)	National Renewable Energy Laboratory (NREL)	<a href="https://sam.nrel.gov/">https://sam.nrel.gov/</a>
Operational Analysis Methods	Federal Highway Administration (FHA)	<a href="https://www.fhwa.dot.gov/">https://www.fhwa.dot.gov/</a>

Source: Tierra Resource Consultants

The Verification Toolkit and corresponding evaluation methodologies for various resources / fuel types provides an accurate, consistent, and industry-accepted framework for assigning savings to the gamut of AEC projects. These attributes of analyzed projects will serve to ensure the legitimacy and credibility project savings when reporting project accomplishments to the appropriate local, state, and federal conservation initiatives (e.g., AB32, SB350, etc.). Moreover, the repository of evaluation methodologies will continue to evolve with the market as improvements and updates to these protocols are made.

## **Task 2. Data Verification and Data Collection Framework**

The approach and rigor of existing verification methodologies vary based on several factors, such as the mix of activities in the project pipeline, type of financing authority supporting a particular project, etc. A key component of the Verification Toolkit will involve exploring unique requirements and overlapping elements of each verification methodology, and where this data will be reported in a data reporting framework.

The Inventory Verification Protocol and Technical Groups Memo research identifies resource savings reporting databases presented in Table 2. These databases will be reviewed for the Verification Methods for Inclusion Memo to inform the data collection architecture and framework, including the following elements:

- Optimal evaluation methodologies for assessing project resource savings, along with the supporting data inputs for each methodology.
- Reporting requirements of local, state, and federal conservation initiatives.
- Existing resource reporting databases used across the state. Table 2 provides an overview of some of the most relevant and active reporting databases that informed this effort.

**Table 2. Resource Savings Reporting Databases**

<b>Database Acronym</b>	<b>Ownership Entity</b>	<b>Scope of Database</b>
California Energy Data and Reporting System (CEDARS)	California Public Utilities Commission (CPUC) Energy Division (ED)	Statewide EE claims from IOUs and three Community Choice Aggregates (CCAs) / Regional Energy Networks (RENs)
California Energy Commission (CEC) Reporting Database	California Energy Commission (CEC)	Public Owned Utilities Energy Efficiency Reporting Database
Storm Water Multiple Application and Report Tracking System (SMARTS)	California Environmental Protection Agency (EPA)	SMARTS was developed as an online database for dischargers to electronically file their storm water permit documents. The system allows the Region and State Board staff, as well as the public, to access storm water data through submitted documents.
Drinking Water Information Clearinghouse (DRINC)	California Environmental Protection Agency (EPA)	A platform to submit information for a conservation standard adjustment and/or credit for water conservation
National Conservation Easement Database (NCED)	Initiative of the U.S. Endowment for Forestry and Communities.	A National database of conservation easement information
Building Energy Data Exchange Specification (BEDES)	U.S. Department of Energy (DOE)	BEDES facilitates the consistent exchange of building characteristics and energy use data between tools and databases in the building energy efficiency sector.
EPA GHG Data	Environmental Protection Agency (EPA)	A GHG database for large point sources such as landfills, wineries, power plants, etc.
DOE Fleet Sustainability Dashboard	U.S. Department of Energy (DOE) Office of Energy Efficiency and Renewable Energy (EERE)	Federal agency fleet fuel consumption, greenhouse gas emissions
USGS Water Use	United States Geological Survey (USGS)	Downloadable water use data by state and county
Building Performance Database	Lawrence Berkeley National Laboratory (LBNL)	Includes EUI
Energy Consumption Database (ECDMS)	California Energy Commission (CEC)	Electricity and Gas consumption by entity, county, and planning area
Database for Energy Efficiency Resources (DEER)	California Public Utilities Commission (CPUC) Energy Division (ED)	Estimates of energy and peak demand savings values, measure costs, and effective useful life
Energy Almanac	California Energy Commission (CEC)	Energy consumption by end use
Quarterly Fuel and Energy Report (QFER)	California Energy Commission (CEC)	Annual generation by county, plant unit, power plant stats
Annual Planning Renewables Net Short	California Energy Commission (CEC)	
Greenhouse Gas and Sustainability Data Report	Federal Energy Management Program (FEMP)	Electricity, water, greenhouse gas, sustainability metrics, etc. for all federal facilities
Standard Energy Efficiency Data (SEED) Platform	U.S. Department of Energy (DOE)	
Proposition 39	California Energy Commission (CEC)	Electricity and Gas consumption by entity, county, and planning area

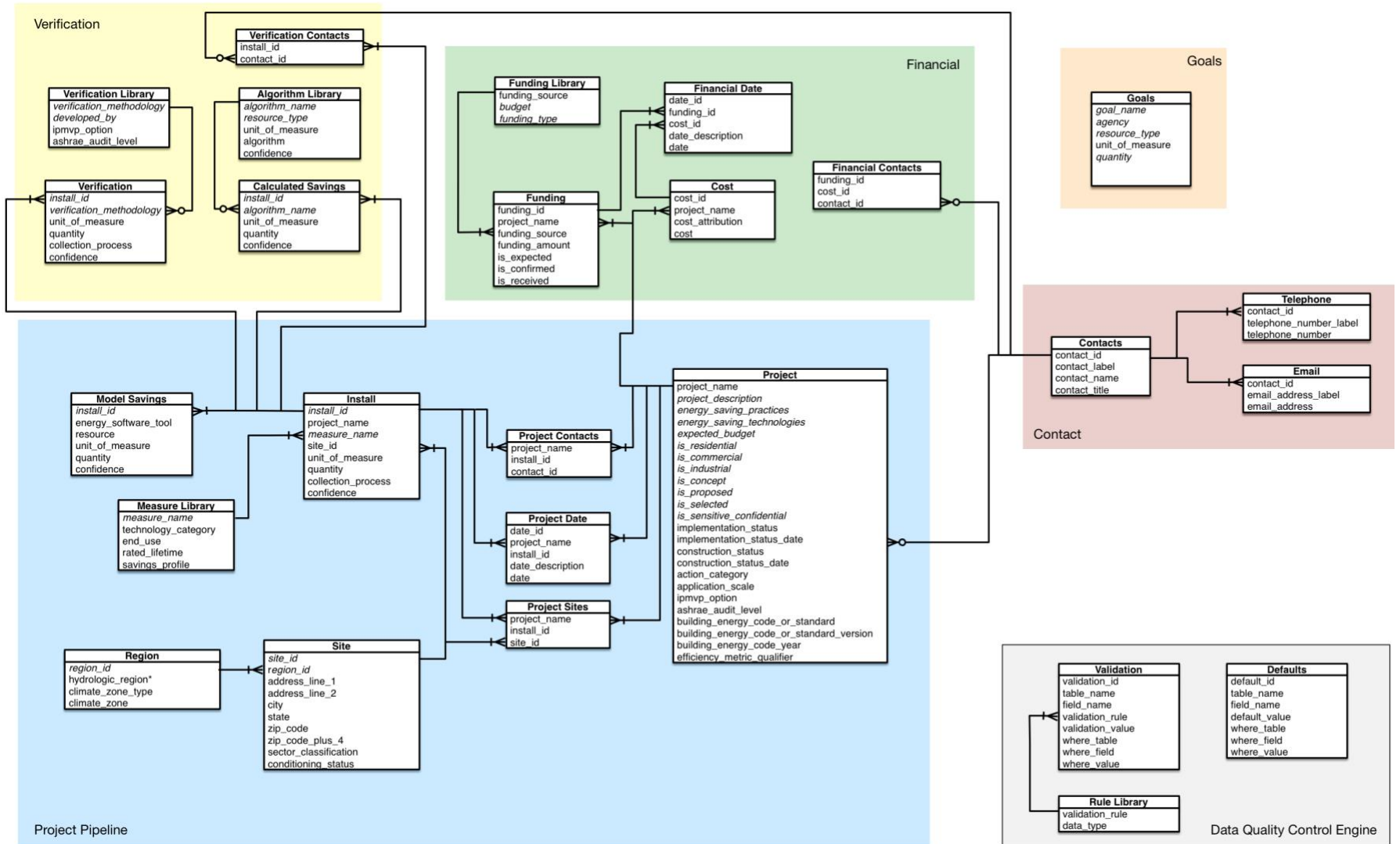
Source: Tierra Resource Consultants



Similarly, Figure 1 provides a draft data collection framework identifying unique and overlapping data elements of different verification methodologies in a relational schema. An ongoing task of the Verification Toolkit will be to continue and build upon this database schema as the optimal evaluation methods and reporting objectives become clearer.

However, we fully recognize the need to establish a balance that draws on the expertise of the EM&V process but does not overburden the financing process with data collection and verification requirements. In our upcoming deliverables, a critical objective will be to consolidate and streamline the data collection framework to capture only the most important data points that will inform resource savings potential.

Figure 1. Draft Data Collection Framework for the Verification Toolkit



Source: Tierra Resource Consultants

### **Task 3. Identification of Technical Advisory Group (TAG) Members**

The comparative assessment of verification procedures and their corresponding accuracy will benefit from the perspective of other industry professionals that may lend their expertise and insight to the ICRM team. Their experience will further inform our understanding of how similarities, overlaps, and gaps in current verification standards may be applied to the project pipeline to efficiently satisfy various reporting requirements, and how gaps might best be addressed in final Verification Toolkit.

To facilitate this process, the Tierra team has identified potential TAG members, and provided context on their areas of expertise in Table 3, below. This TAG will be engaged to inform the Verification Methods for Inclusion Memo and Verification Implementation Specification deliverables included in the Verification Toolkit.

Our next steps will be to review elements of this Memo with the broader project group and solicit feedback on the proposed TAG members such that we may leverage their insight on future Verification Toolkit deliverables.

**Table 3. Proposed TAG Members for the Verification Toolkit**

<b>Name</b>	<b>Title / Agency / Company</b>	<b>Additional Context on Contributing Areas of Expertise</b>
Paul Mathew	Lawrence Berkeley National Laboratory (LBNL)	Supported the Development of the Building Energy Data Exchange Specification (BEDES)
Fethi BenJemaa	Department of Water Resources (DWR)	Water (Agency and Project Reporting)
Bill Quirk	California Legislature	Assembly member Bill Quirk (D-Hayward) has contributed towards AB 2161, which provides for clearer codes statewide for safety barriers used in places such as parking lots (especially retail, and storefronts) and provides for insurers to give discounted rates to property owners and business owners who install approved protective devices.
Assembly-Member Thurmond	District 15 Assembly	Assembly member Tony Thurmond (D-Richmond), Chair of the Assembly Committee on Labor and Employment.
Kim Danko	California Office of Planning and Research	Operations & Programs Manager for the California Association of Councils of Governments (CALCOG)
Diane Pepitone	Consultant	Consultant to CEC on Prop 39
Carmen Best	California Public Utilities Commission	Efficiency Commercial Programs & Evaluation, Supervisor at California Public Utilities Commission.
Yoram Bernet	CEO of Scope 5	Created SaaS sustainability tracking, calculation, and reporting software (Scope5)
John Daly	CEO of Glasshouse	Momentum-builder for early-stage initiatives focused on sustainability
Jimmy Jia	CEO of Distributed Energy Management	Financial incentive motivated efficiency and investment

Source: Tierra Resource Consultants