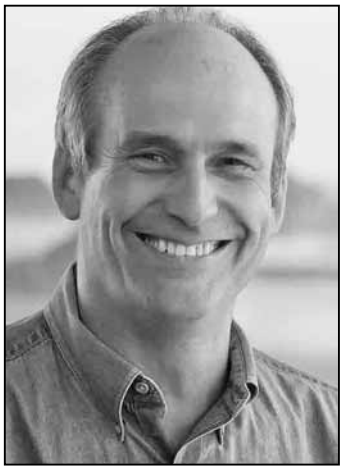
Regional Technical Forum
2012 Annual Report

AND 2013 PROGRESS UPDATE

Regional Technical Forum

Northwest Power and Conservation Council



Letter From the Council Chair

I am pleased to present the third annual report of the Regional Technical Forum, a unique organization that plays a vital role in the Northwest's continuing quest to identify and measure cost-effective energy efficiency measures and technologies.

The Northwest energy system has a long tradition of cooperation and participation among its various constituencies, and the RTF is a shining example of how people with different professional backgrounds and perspectives are able to work together to reach solutions that benefit the region as a whole. This cooperative spirit is responsible, in part, for the impressive list of accomplishments that are detailed in this year's report.

Of course, the greatest measure of success is the fact that efficiency now represents about 17 percent of the regional power supply, second only to hydropower. We expect that percentage to grow as the RTF, the Bonneville Power Administration, the region's utilities, the Council, and others continue working together to achieve the energy efficiency targets in the Sixth Power Plan.

I like to tell people that energy efficiency has become a way of life in the Pacific Northwest. Not only is it one of our largest sources of energy, it also saves us money and reduces the amount of electricity we consume.

Bill Bradbury, Chair
Northwest Power and Conservation Council

Letter From the RTF Chair

The RTF has officially entered the era of the guidelines. Over the past year, we wrapped up the arduous task of documenting the procedures we use to determine energy savings, estimate cost, and establish measure life. The RTF's *Roadmap for the Assessment of Energy Efficiency Measures* is a major achievement and the culmination of three years of effort.

The roadmap includes detailed guidelines for estimating measure savings, the costs and benefits, and measure lifetime. While we all agree the roadmap is a living document that will evolve over time, right now it provides a fully vetted and transparent description of how we classify, calculate, and update savings.

We've given every measure in the RTF catalog a good scrub and determined if it complies with our new guidelines. If not, we've identified where it falls short and whether and how it can be brought into compliance. We made good progress on that compliance work last year and are continuing a strong effort in 2013.

In addition to nailing down the nuts and bolts of our process, we tightened up our organizational structure. The RTF added a full-time manager early in 2012 and we've ramped up work activities by hiring four full-time contract staff members, who started early in 2013. At the end of the last fiscal year, we had very little budget carryover, a good sign we are accomplishing our work plan and getting the budget invested in what our sponsors want in the timeframe they want it.

Once again, the RTF could not have served the region without the financial support of our sponsors and the time and expertise contributed by our members and other parties across the Northwest. We invite you to read on for a recap of another productive RTF year.

Tom Eckman,
Chair Regional Technical Forum

Introduction

Energy efficiency is a major resource in the region's energy portfolio. The Northwest has been adding over 200 average megawatts (aMW) of conservation annually in recent years, about the generation equivalent of a gas-fired power plant. With energy efficiency taking such a central role in the region's electricity supply, the work of the RTF continues to be key in providing an unbiased estimate of energy savings, incorporating new research into engineering models and calculations, and keeping up to date on standards and technologies that affect regional conservation programs and potential savings.

Since 1999, the RTF has served the role of reviewing and helping to establish energy savings estimates that may be gained through conservation measures. The RTF's knowledge and analytical prowess are crucial to helping the region meet the conservation targets in the Council's power plans and assuring we know what we are gaining for the dollars invested in a broad range of efficiency programs.

The RTF also contributes significantly to the region's energy efficiency ethic and to its status as a national leader in efficiency. In addition to carrying out a full slate of periodic measure reviews, the RTF has given considerable attention in recent years to formalizing and cataloging the methods by which it determines measure attributes and savings.

The RTF significantly increased its workload in 2012 and brought on new staff to help with management and detailed measure analysis. A three-year funding agreement finalized in 2011 added financial stability to the RTF's mission, and the Policy Advisory Committee (PAC) continues to support the RTF with its guidance and insights on policy related issues. With a recap of 2012 and an update on 2013, this report highlights the RTF's most recent activities.

Accomplishments in 2012

A Revised Set of Rules

The RTF now operates with a polished set of guidelines that clearly lay out the methods for analyzing the savings, cost, and life of energy efficiency measures. Over the three-years during which the guidelines were developed, revised, and tested, the RTF accomplished much more than simply recording how it does what it does. This was an opportunity to examine its practices and consider and implement improvements.

What began in 2010 with a proposal to review and record the RTF's measurement and verification protocols became in 2012 and 2013 a comprehensive explication of best practices and standards to determine reliable and uniform savings estimates. The final product is a multi-chapter treatise that encompasses not only the savings estimation methods for several categories of measures, but also standards for determining the costs and benefits and useful life for each measure, plus a guide for navigating the topics.

The refining of the guidlines was a central focus for the RTF throughout the year. In late 2012, the RTF agreed to consolidate all of the guidelines pieces, a main volume and several appendices, into a single document, wrapped together with a roadmap.

At its April 2013 meeting, the RTF adopted the complete consolidated guidelines. The current edition incorporated significant changes to language and content from the previous versions. It is now the operative guide the RTF applies to judge the quality of data and analytical methods used to produce savings estimates for efficiency measures. The guidelines will be revised on an annual basis as necessary.

Measure Updates

With adoption of an initial version of the guidelines in 2011, the RTF began reviewing all measures in its database to verify that they comply with the standards in the guidelines. These "legacy" measures were designated as either out of compliance or under review with respect to the guidelines' quality and reliability standards, and a plan was drawn up for addressing the data and analytical deficits for each. In most cases, a measure was rendered out of compliance because of a lack of data or flawed analytics and no clear way to get data needed to comply with the guidelines. In addition, several measures were deactivated due to changing codes and standards or market saturation that canceled out any potential measure savings. RTF staff plans to update all measures marked as under review prior to their established sunset dates.

Table 1: Current category and status designations for the RTF's portfolio of unit energy savings (UES) measures.

Measure Category*	MEASURE STATUS				Grand Total
	Active	Deactivated	Out of Compliance	Under Review	
(none)	–	10	–	–	**10**
Proven	32	1	24	8	**65**
Provisional	4	–	2	1	**7**
Small Saver	5	–	–	6	**11**
Grand Total	**41**	**11**	**26**	**15**	**93**

* Proven savings estimation methods are those the RTF considers reliable; Provisional methods are those the RTF approves with special conditions requiring the collection of additional data; Small Saver are measures for which likely savings are too small to warrant the resources needed to meet the Proven or Provisional standards.

In addition to bringing legacy measures into compliance with the guidelines, the RTF addressed six new measure proposals in 2012. The RTF staff has developed an online proposal form that sponsors can use to submit new measures for review or propose modifications to existing approved measures. The proposal form is intended to replace the informal process by which requests came forward previously and seeks to make the process more accessible, transparent, and efficient for RTF staff to review requests.

Why a New End-Use Study?

In 2012, the RTF engaged a consulting firm to develop a business case for obtaining new end-use metering data in the Northwest. The region has long been using end-use data from a nearly 30-year-old study as inputs to the analytical models that calculate efficiency savings. Concern has mounted that data collected so long ago is no longer applicable to current end-uses. Many of the region's energy planning functions incorporate this data as a key assumption, yet significant change has occurred in the way people use electricity, including the areas of heating and air conditioning, appliances, lighting, and electronics.

The business case developed and presented to the region in 2012 set out key reasons why updated end-use data are important. It included cost estimates for various levels of study that could be pursued to gather new data, ranging from a *Business As Usual Case with Enhanced Analytics* to a *Comprehensive End-Use Metering Option.* The costs for the options ranged from $1.8 million to $28.5 million, depending on the extent and length of a study.

Since the business case was delivered to the RTF, regional stakeholders have been discussing how to proceed. The study would require a significant investment of resources, and the potential funders are considering whether, when, and how to move ahead.

Tailor Made for Small/Rural Utilities

The RTF continues to devise ways to help small and rural utilities in the region achieve their energy efficiency goals. In June 2012, RTF staff traveled to Missoula, Montana, to meet with representatives from utilities and co-ops to discuss the role of the RTF and how it could better serve Montana stakeholders. The group identified several opportunities to strengthen communications between the RTF and its constituents.

As a result of its effort to engage more actively with small and rural utilities, the RTF staff now uses a checklist to screen all approved measures for potential barriers to implementation in small and rural utility service territories. In addition, some measures are being targeted specifically at the needs of small and rural communities. For example, the RTF's Small/Rural Subcommittee developed a plan to explore savings opportunities in rural schools. This effort helped quantify which measures should be pursued and which measures were unlikely to bear fruit because of their small savings potential or difficulties with implementation.

The subcommittee contracted for the analysis in 2012, and in the first half of 2013. It met to discuss the next stage for the schools measures, as well as other efficiency efforts that could be developed and analyzed. Activities in the Small/Rural work plan are currently under way, and with help from the subcommittee, the RTF expects to see new measures in 2013 geared to this segment of program providers.

Region Sets Conservation Record, Again

The RTF surveys the region's utilities, Bonneville Power Administration, and Systems Benefit Charge administrators, like the Energy Trust of Oregon, every year for their conservation achievements. In 2011, the region developed 277 average megawatts of new energy efficiency, an annual record that tops the 254 aMW record set in 2010. The 2011 target for efficiency in the Council's Sixth Power Plan was 220 aMW of efficiency, and the region exceeded it by 26 percent.

In all, 92 utilities submitted surveys with their 2011 results. Other results were gathered from utility and efficiency organizations. The total responses represent about 93 percent of the region's retail sales and give a clear picture of how hard the region has worked to make efficiency a major part of the resource mix. Based on the data, the region invested over $420 million in efficiency in 2011, and the electricity savings came at about one-fourth the cost of power from the most efficient new generating plants.

The Northwest is known throughout the country for its commitment to energy efficiency, and the region has been on a roll for nearly a decade in making efficiency gains. In every year since 2005, the region's utilities and consumers have exceeded the Council's annual targets. The 2011 savings bring the region's 1978 to 2011 total to 5,000 aMW. Since 1980, efficiency has met 50 percent of the region's load growth.

Figure 1: Accomplishments Have Exceeded Plan Targets Every Year Since 2005

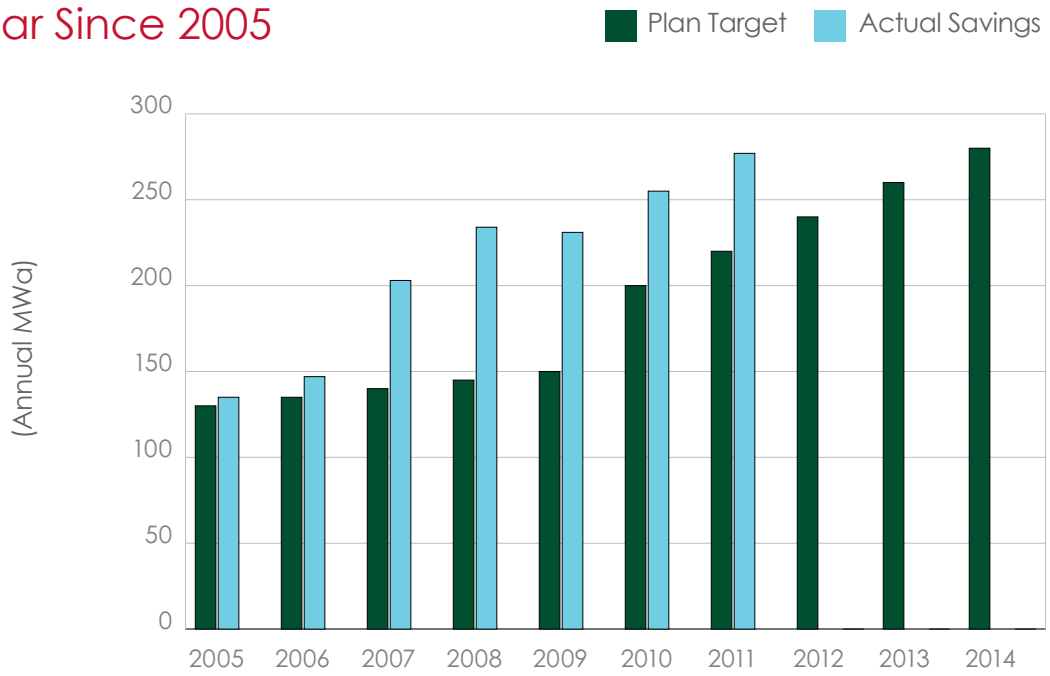
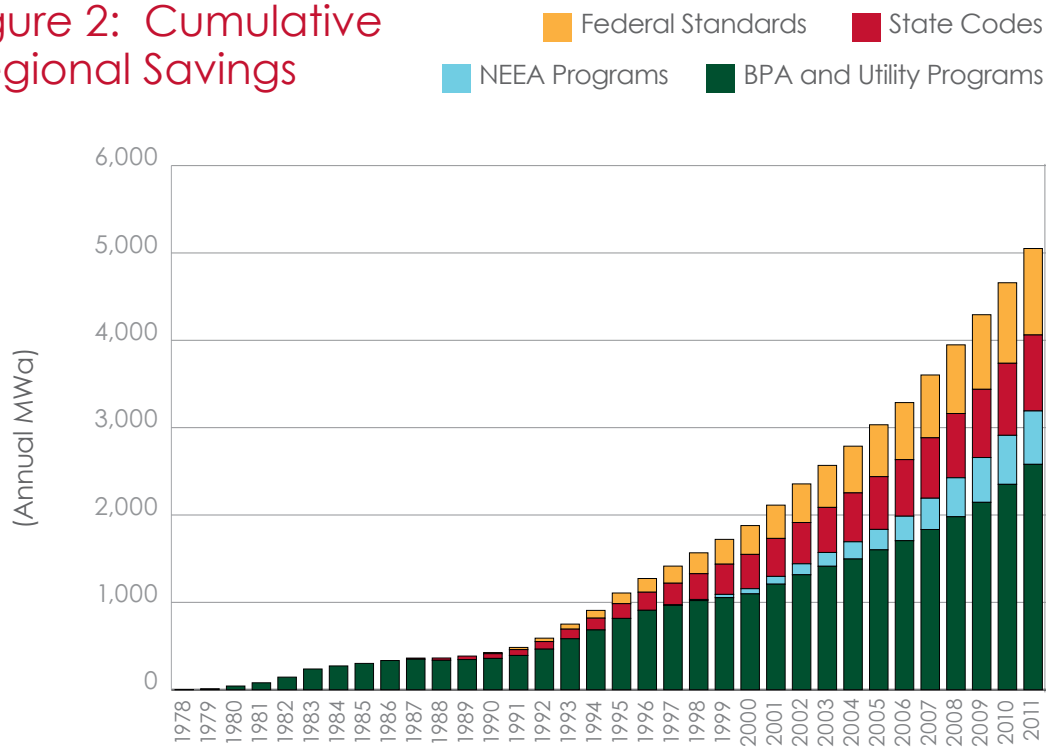


Figure 2: Cumulative Regional Savings



Guidance from the PAC

The RTF's policy guidance arm was chartered in 2011 as an advisory committee to the Council. The PAC advises the Council on RTF policy and governance issues and meets as needed during the year. The PAC met in October 2012 to review the RTF's proposed 2013 work plan, business plan, and budget and subsequently recommended the Council adopt them.

In addition, the PAC began a discussion in 2012 of the RTF's conflicts of interest policy and made a number of recommendations for revisions to it. The PAC suggested the RTF expand the scope of persons subject to the policy and the financial relationships that could be considered conflicts, and more clearly describe the procedure for declaring conflicts and the consequences.

The RTF reviewed and discussed the PAC's recommendations and voted to approve them. In order to smooth the way for the policy changes and the Council's approval, the RTF also voted to adopt a related change to its operating charter. The Council subsequently approved the revised conflicts of interest policy and the charter amendment.

Among its objectives, the PAC is tasked with identifying regional priorities to recommend to the Council. In 2013, the PAC began exploring the possibility of conducting a qualitative survey to gauge the region's perspective on the RTF. A PAC subcommittee has presented various approaches to such a survey and it is under discussion for possible implemenation in 2013.

Financial Information

In 2011, the RTF PAC recommended funding commitments at the rate of $1.5 million annually for each year from 2012 through 2014. The PAC also recommended the funding shares from each of the RTF sponsors follow the allocation method developed for the current Northwest Energy Efficiency Alliance (NEEA) funding cycle. Thanks to the diligence of the PAC, the RTF was able to secure letters of agreement with all of its funders for a three-year commitment. This allowed for stable long-term budget planning and removed the uncertainty of funding for budgets from year to year.

Table 2: Summary of 2012 Budget

Recommended Budget	$1,500,000
Funding Received	$1,473,000*
Actual Budget	**$1,473,000**

*Adjustment for NorthWestern Energy service territory

The RTF's final 2012 budget was $1,473,000. By the end of 2012, the RTF had obligated in contracts 100 percent of its budget, a marked improvement from previous years. When the last of the 2012 contracts were completed in March 2013, the RTF had spent a total of $1,413,320.56 or 96 percent of its budget. (By contrast in 2011, the RTF spent only 77 percent of its budget by the close of all contracts.) The remaining $59,679.44 unspent in 2012 will be credited towards funders' 2014 contributions.

Figure 3: Allocation of Final 2012 Budget Compared to Work Plan

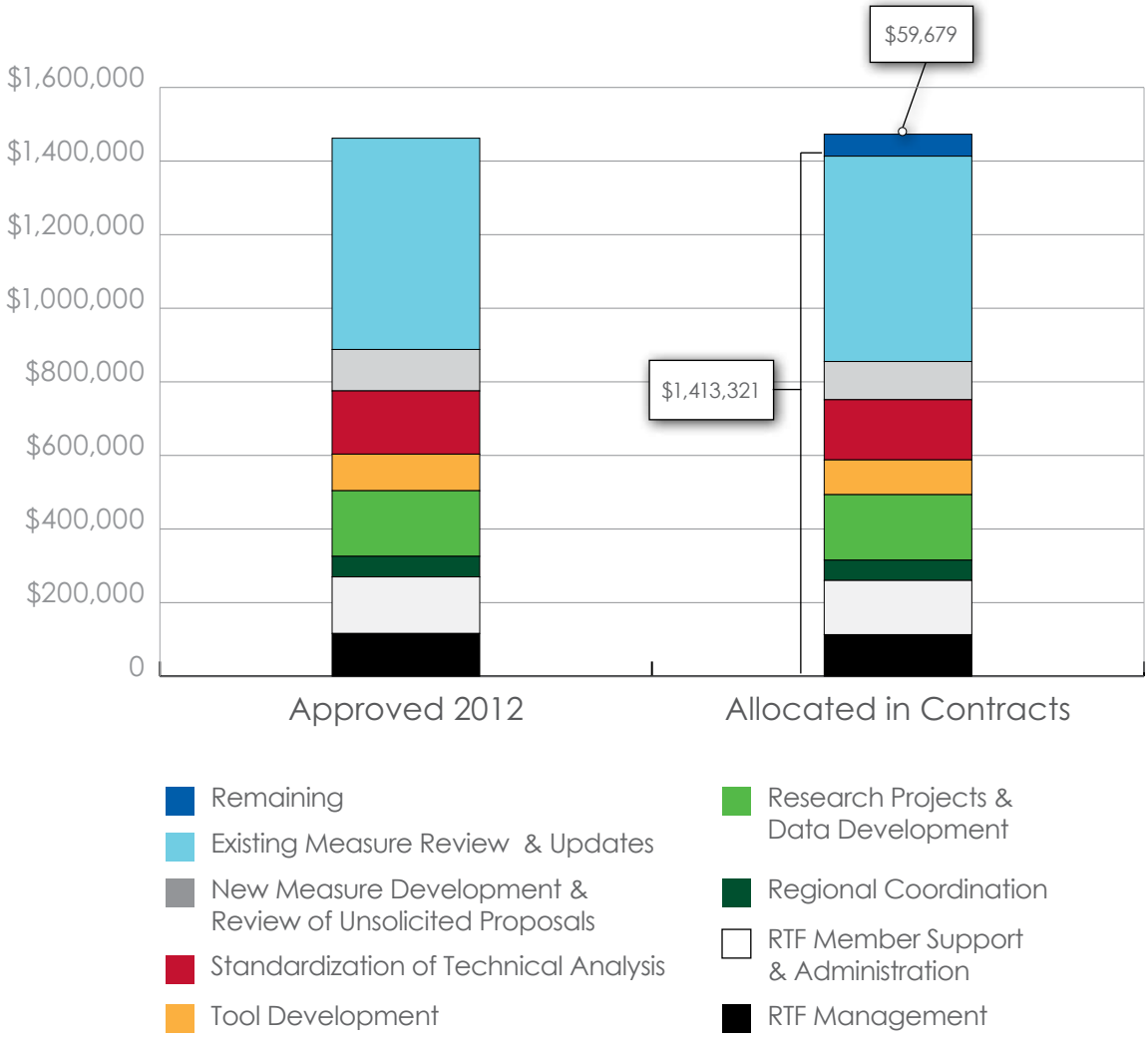


Table 3: The 2012 budget allocated into general categories of the work plan, along with actual funds spent.

Category	Projected Allocation in Work Plan	Actual Funds Spent	% Spent Compared To Allocated
Existing Measure Review & Updates	$487,000	$558,036	115%
New Measure Development & Review of Unsolicited Proposals	$138,000	$103,857	75%
Standardization of Technical Analysis	$176,000	$163,591	93%
Tool Development	$134,000	$94,479	71%
Research Projects & Data Development	$228,000	$177,822	78%
Regional Coordination	$58,000	$55,301	95%
Website, Database Support, Conservation Tracking*	$0	$0	100%
RTF Member Support & Administration	$174,000	$147,269	85%
RTF Management	$105,000	$112,965	108%
Total	**$1,500,000**	**$1,413,321**	**-**

* Council in-kind contribution

An OMB Circular A-133 audit for fiscal year 2012 was conducted by Moss-Adams. The auditor's report did not identify any deficiencies. A copy of the report can be found on the Council's website: http://www.nwcouncil.org/reports/financial-reports/2012audit/.

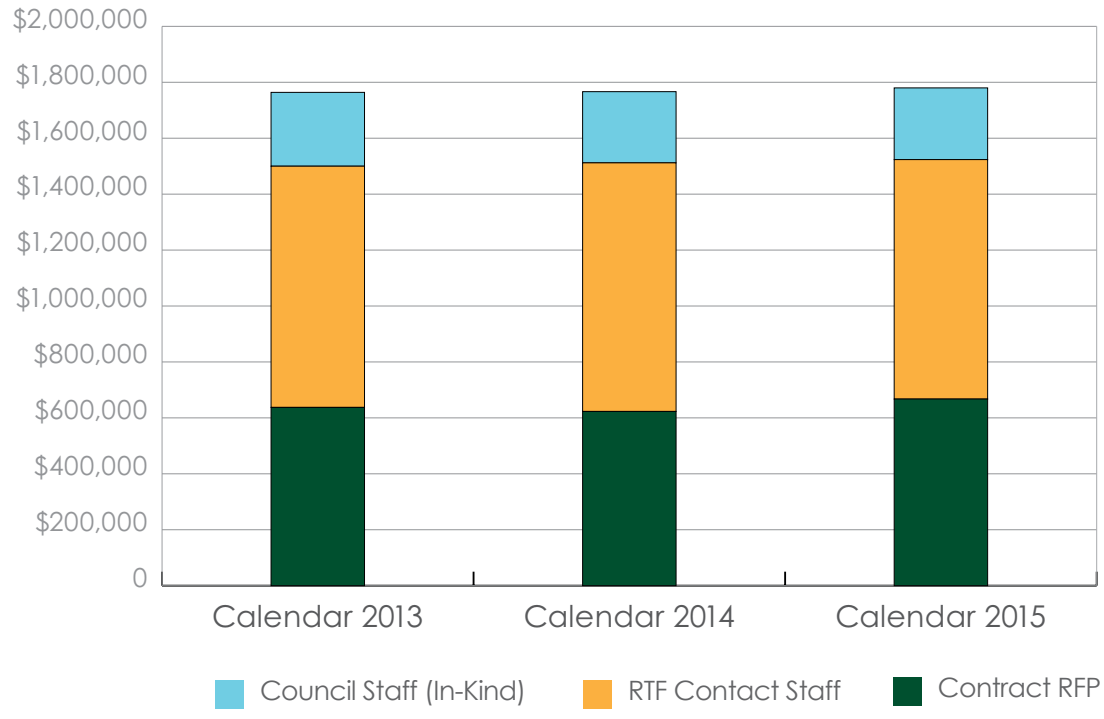
The budgets for 2013 and 2014 are part of the three-year funding agreements that the RTF PAC secured. Since the current agreements only go through 2014, the budget for 2015 is currently a staff estimate based on projected work plan items. Table 4 shows budget projections over the next three years assuming that a stable multiyear funding agreement can again be reached. Over the next year or so, the RTF PAC will review the budgets and make funding recommendations for the next three-to-five-year cycle.

Table 4: Budget Projections for 2013-2015

CY 2013 Budget	CY 2014 Budget	CY2015 Budget (Estimated)
$1,500,000*	**$1,500,000***	**$1,523,550**

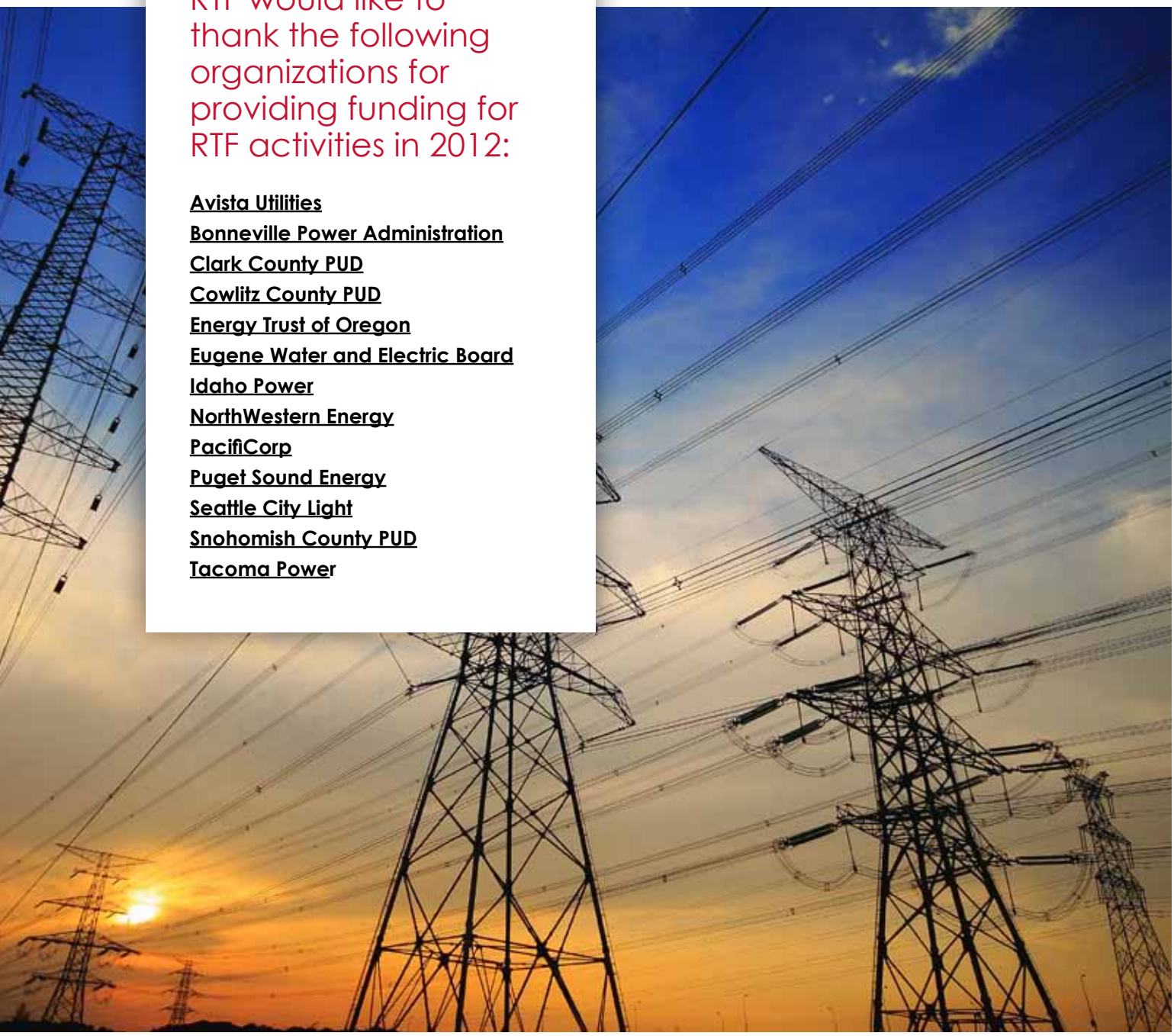
* Actual budget is $1,473,000 based on funding received. The Council makes an in-kind contribution to the RTF each year in terms of staff and meeting resources and the RTF webpage. Although the annual RTF work plan attempts to quantify this staff time and associated in-kind funding, it is not included in the budget figures above.

Figure 4: Funding (Including Council) for 2013-2015



The work of the RTF is made possible due to the funding it receives from its sponsors. The RTF would like to thank the following organizations for providing funding for RTF activities in 2012:

Avista Utilities
Bonneville Power Administration
Clark County PUD
Cowlitz County PUD
Energy Trust of Oregon
Eugene Water and Electric Board
Idaho Power
NorthWestern Energy
PacifiCorp
Puget Sound Energy
Seattle City Light
Snohomish County PUD
Tacoma Power



Making Progress in 2013

The RTF changed its staffing approach in 2012 and with new stable funding and a hefty work plan added a full-time manager to the small contract staff. In 2013, additional full-time contract staff members were brought on board to add analytical muscle and strengthen the engagement with RTF subcommittees. This approach, consistent with the Council-approved 2013 work plan and business plan, allows dedicated staff to focus on the tasks required for measure updates and subcommittee management. The additional staff has added flexibility in developing items to bring forward on the RTF meeting agendas.

Full-time members of the Council's Power Division staff continue to contribute significant time to RTF activities. The larger RTF staff is available now to take the lead on technical work and engage with Council staff more effectively.

Subcommittees contribute valuable review and technical guidance on measure analysis and development. Subcommittees are measure/topic specific and meet as needed. Currently, there are a dozen active subcommittees, including those listed below.

Ag/Irrigation Hardware
Automated CVR
Fan & Pump VFD
Guidelines
IT Sector
Lighting
Operations
Research and Evaluation
Residential Weatherization & HVAC
Rooftop Unit Working Group (RTUG)
Small/Rural Utilities Efficiency Measures
Variable Capacity Heat Pump

Follow the links to read about the purpose of the subcommittee and get a status report on its recent activities and to find past meeting materials.

New Members Enter the Forum

In 2013, the RTF seated 10 new members and 20 returning members for three-year terms. The members were selected from among 45 applicants who responded to a solicitation.

According to its charter and by-laws, the RTF solicits nominations every three years for voting members. Members serve three-year terms and may be reappointed for successive terms without limitation. The list of sources for new members are the Bonneville Power Administration, Northwest utilities, state energy offices, energy efficiency professionals, resource developers, public interest groups, customers, and other experts from within and outside the region. Prospective members are chosen by the Council for their expertise and experience with economic and engineering analysis, and planning, implementation, and evaluation of conservation programs.

Prior to the RTF's first 2013 meeting, staff held a half-day orientation session for new and returning members. There were presentations on the forum's primary functions and procedures, and its 2013 work plan. The orientation featured an overview of the guidelines that establish standards for categorizing measures and determining unit energy savings. The new members also learned the ins and outs of navigating the RTF website and finding information on past decisions, minutes, and subcommittee material in preparation for their term.

ELCAP Online

Thanks to the RTF, the Bonneville Power Administration's End-Use Load and Consumer Assessment Program (ELCAP) data is now online and open for business. ELCAP was conducted from 1986 through 1989 to obtain hourly and subhourly information about residential and commercial electricity end-use. Data from the project, which is still in widespread use, has been stored in various digital and written formats that were not readily accessible.

In 2012, the RTF selected a contractor to compile all the various components of information from ELCAP into a usable format and store it in a single location. The end product, completed in March 2013, is a searchable database that covers individual site characteristic and end-use data for 499 residential and 126 commercial facilities, hourly energy and peak profile data for typical residential and commercial facility types, and a series of hard copy and scanned documents describing and documenting the ELCAP project. The ELCAP data and reports are now available for use by the RTF, the Council, Northwest utilities, and other analysts.

QA/QC Contract in Place

The RTF's 2013 annual work plan called for adding an independent third-party quality assurance/quality control (QA/QC) review for staff work products. The QA/QC contractor selected in early 2013 has begun reviewing the staff's analytical work and suggesting corrections to input assumptions, calculation or documentation errors, and application of methodologies approved by the RTF.

For every measure adopted by the RTF, the QA/QC contractor will complete a checklist to assure a thorough review has been conducted. Staff will make periodic

presentations on the QA/QC reviews to the Operations Subcommittee and discuss with the RTF any major issues that are uncovered. With the QA/QC process in place, the RTF intends to increase the reliability, completeness, and transparency of its work products.

Setting Research Priorities

In April 2013, a new Research and Evaluation Subcommittee met for the first time. The focus of the group will be to aid in planning and prioritizing research for measures that have been categorized as out of compliance with the RTF's newly minted savings guidelines.

The RTF designated approximately 27 measures as out of compliance with respect to the data quality and reliability requirements of the guidelines. Many of these measures will require primary research and substantial data collection in order to comply with the guidelines. The subcommittee will draw on the expertise of its members and others to develop research plans for measures that are important to the region's efficiency efforts and will provide guidance for that work.

In addition, the group will help to develop research plans for provisional measures and protocols that require additional study to move them from a provisional to proven category, as directed by the savings guidelines. Among the subcommittee's first activities, an online "Research Radar" spreadsheet was assembled to group common research needs among measures and provide an overview of every out-of-compliance measure and its status.

RTF Staff

The RTF is an advisory committee to the Council and shares several staff members. The asterisks on the list below indicate Council staff members who play a major role in RTF functions.

Tom Eckman, Chair*

Charlie Grist, Vice Chair*

Nick ONeil, RTF Manager

Gillian Charles, RTF Business Operations*

Aggar Assefa, RTF Administrative Assistant*

Adam Hadley, RTF Contractor

Christian Douglass, RTF Contractor

Josh Rushton, RTF Contractor

Mohit Singh-Chhabra, RTF Contractor

Ryan Firestone, RTF Contractor

In addition to RTF staff, several members serve on the Operations Subcommittee, which provides operational and administrative leadership to the forum. For 2013, those members are: Eric Brateng, Danielle Gidding, Tom Lienhard, David Nightingale, Eugene Rosolie, and Bill Welch.

2013 – 2015 Regional Technical Forum Members

Voting Members	Affiliation
Brad Acker	University of Idaho, Integrated Design Lab
Rich Arneson	Tacoma Power
Andie Baker	Cadmus
John Bogert	OPALCO Board
David Bopp	Flathead Electric
Eric Brateng	Puget Sound Energy
Wade Carey	Central Lincoln PUD
Bob Davis	Ecotope
Tom Eckman	Northwest Power and Conservation Council
Michele Friedrich	Oregon Department of Energy
Lauren Gage	Bonneville Power Administration
Danielle Gidding	Bonneville Power Administration
Charles Grist	Northwest Power and Conservation Council
Jeff Harris	Northwest Energy Efficiency Alliance
Erin Hope	Bonneville Power Administration
Mark Jerome	Fluid Market Strategies
Don Jones, Jr.	PacifiCorp
Ken Keating	Independent
Greg Kelleher	Eugene Water and Electric Board
Rick Knori	Lower Valley Energy
Bill Koran	NorthWrite
Tom Lienhard	Avista
Jim Maunder	Ravalli Electric Cooperative
Peter Miller	Natural Resources Defense Council
David Nightingale*	Washington UTC
Graham Parker	Pacific Northwest National Laboratory
Kerstin Rock	PECI
Eugene Rosolie	Cowlitz PUD
Paul Sklar	Energy Trust of Oregon
David Thompson	Avista
Bill Welch	Independent

*Ex Officio