Briefing Paper
Draft Strategic Plan

June 12-13, 2009

Introduction

Background

Energy Trust came into being in the aftermath of the 2000-2001 energy crisis. The crisis hit when a decade of underinvestment in energy efficiency and resources coincided with drought and market manipulation, and the Northwest economy lost several billion dollars in power-purchase costs and corresponding economic activity. (Northwest Power and Conservation Council, *Fifth Power Plan*, volume 1, page 9 (2004)). The first lesson power planners drew from the crisis was that if the region's investment in energy efficiency had not stalled in the 1990s, it would have weathered the crisis much better than it did. Going forward, planners said:

> "the region [must] increase and sustain its efforts to secure cost-effective conservation immediately. . . . [I]mproved energy efficiency costs less than construction of new generation and provides a hedge against market, fuel, and environmental risks. To achieve these benefits fully, however, stable and sustained investment in conservation is necessary. Although conservation may result in small rate increases in the short term, it can reduce both cost and risk in the long term. (*Fifth Power Plan*, volume 1, page 4)

In Oregon, the Legislature had already acted to establish steady funding for energy efficiency and renewable energy. In 1999, the Legislature required investor-owned electric utilities to collect a three-percent charge on electric rates, approximately the level of conservation investment before electric industry restructuring. The funds were to be directed by the Oregon Public Utility Commission to investments in new energy efficiency, market transformation, and the above-market cost of new renewable energy. In addition to stable funding, the Legislature's further insight was that the funds should be invested by an entity whose sole interest is in energy conservation and renewable energy. The economic pressures that made it rational for utilities not to invest in energy efficiency during the 1990s demonstrated the Legislature's point: the three-percent charge should be managed by an entity focused exclusively on the ratepayers' interest in energy efficiency and renewable energy.

The experience of the last seven years has validated this legislative foresight. In 2001, Energy Trust, a non-profit organization, was created with guidance from the Oregon Public Utility Commission to invest the majority of revenue from the three-percent charge in energy efficiency and renewable energy programs.[1] Every dollar invested in electric energy efficiency is now saving residential, commercial and industrial ratepayers more than five times as much in avoided generation and transmission costs.

[1] Energy Trust invests about 74 percent of the three-percent fund. Another 16 percent goes to low-income housing and weatherization under the oversight of the Department of Housing and Community Development, and 10 percent goes to weatherization in K-12 schools under the direction of educational service districts.

Appreciating these benefits, gas companies asked Energy Trust to provide service to their customers – NW Natural in 2003 and Cascade Natural Gas in 2007. Natural gas efficiency costs about one-third of the cost of gas generation, transportation and storage. These arrangements stemmed from settlement agreements reached in Oregon Public Utility Commission processes.

In 2007, the Legislature determined that the three-percent charge should be expanded to capture more electric energy efficiency than the three percent charge could reach. As part of the Oregon Renewable Energy Act, the life of the three-percent charge was extended from 2012 to 2026. This allowed electric utilities to increase rate collections for energy efficiency above three percent. This increase, combined with revenues from gas utilities, grew Energy Trust revenues from about $30 million in 2002 to an expected $95 million in 2009. Increases in energy savings have been comparable. Starting from early program accomplishments of 15 average megawatts in 2002, Energy Trust expects to save 41 average megawatts and 2.5 million therms of gas in 2009. The combined annual savings value to customers stemming from all Energy Trust programs is $144 million as of 2008.

Since 2002, Energy Trust programs have met almost as much energy demand as an average coal power plant would have. Total electricity savings and renewable energy equal 285 average megawatts, enough clean energy to power 221,000 Oregon homes. Total gas savings of 8.9 million therms provides enough heat for approximately 18,300 Oregon homes.

These programs do more than just meet energy needs. Importantly, they avoid carbon dioxide emissions, a consideration that became much more important when the Legislature adopted greenhouse gas reduction goals.[2] By avoiding the need for fossil generation, Energy Trust programs avoid an estimated one million tons of carbon dioxide emissions, equivalent to removing 175,000 cars from Oregon roads. As the Legislature determines how best to achieve greenhouse gas reduction goals, accelerating gains in energy efficiency and renewable energy will be key.

Finally, the programs the Legislature first authorized in 1999 are building a clean energy economy in Oregon. Energy Trust programs have created more than 1,800 Oregon jobs, stimulated a $60 million net increase in wages and $9.1 million in new business income. In addition, the Energy Trust program delivery model developed and strengthens a trade ally network of more than 1,200 contractors, largely small business people located throughout the state who install energy-efficient equipment, weatherization, solar systems, and other clean energy improvements.

A 2009-2026 strategic plan

Given the new 2026 sunset for the three-percent charge and the momentum of interests that drive investment in clean energy – bill savings, avoided generation and transmission cost, reduced carbon emissions and a growing clean energy economy – it only makes sense for Energy Trust to take a long-term perspective. The first elements of this plan, its vision, mission and goals, comprise this long-term perspective. These elements are unquantified because, while we can envision what we would like to accomplish by 2026, the funding decisions, legislation, economic conditions, technological developments, and other factors that will actually determine what we accomplish are beyond anyone's

[2] By 2010, begin to reduce greenhouse gas emissions, by 2020 achieve greenhouse gas levels 10% less than 1990 levels and by 2050 achieve greenhouse gas levels 75% below 1990 levels.

capacity to predict. This plan describes *how* we expect to leverage the developments we can reasonably foresee, while not attempting to foresee specific conditions beyond five years.

The integrated resource planning analysis done by utilities in the Oregon Public Utility Commission does allow Energy Trust to project quantitative goals and objectives for the coming five years within relatively clear limits. Those analyses assume that utilities will collect, and Energy Trust will invest, sufficient funds to capture all cost-effective energy efficiency. Integrated resource plans, then, would have Energy Trust programs grow steadily over the coming five years.

Integrated resource plans are not rate proposals, however, and it will take rate proposals to determine how these programs will be funded. Because Energy Trust does not propose or review rates, this plan describes two scenarios for energy efficiency: one in which program funding is essentially static, at the 2009 level, and a second in which program budgets grow to capture all cost-effective energy efficiency.

It is harder to see beyond five years. Utility integrated resource plans consider only *known* energy efficiency measures and technologies. This “known resource” for existing homes, buildings, and industry is largely deployed by 2016 and, in the analysis, forecasted savings diminish beyond that point. However, based on past experience and the dynamic nature of technology development, there is little doubt that significant savings from technologies that are now in development will prove cost-effective, new measures will be discovered, and efficiency resources will be replenished. While we cannot estimate the size, cost or value of this resource, the plan’s five-year objectives include development activities to help ensure that new efficiency resources will be there when needed.

Energy Trust’s role in renewable energy, which the Legislature changed in 2007, is different than energy efficiency. In 2007, the Legislature limited Energy Trust renewable energy funds to projects of 20 megawatts and less. As a result, Energy Trust programs evolved away from large-scale utility projects, which are now mandated under the Oregon Renewable Energy Act. Energy Trust is now focused on demonstrating newer technologies and smaller, community-scale and distributed generation models. Because the renewable energy fund has no legal mechanism for expansion, this plan assumes relatively flat funding over the coming five years. Demand for renewable energy projects is expected to outstrip projected funding by 2011, at which point Energy Trust would reassess its investment strategy, and perhaps focus limited renewable energy dollars on fewer technologies and/or program areas.

Looking backward and forward from 2009, the Legislature’s original premise in enacting the 1999 law remains compelling. Energy efficiency is still the best energy buy – it costs a fraction of the cost of new fossil fuel generation and delivers considerable and persistent savings to consumers. While it is true that the acquisition costs are expected to increase over time, so will the cost of generation. Moreover, energy efficiency and renewable energy are largely invulnerable to volatile fuel prices and mandates to reduce carbon emissions. While the cost of much renewable energy remains above-market, its cost is expected to come down with accelerated efforts to acquire more sustainable, carbon-neutral, domestic energy resources. We envision a future where homes, buildings and factories have integrated renewable energy and efficiency features, which meet energy needs more intelligently, cleanly and economically. In the following plan, Energy Trust elaborates this vision.

Vision

A healthy climate and environment, a vibrant economy and a high quality of life for generations to come, built with renewable energy, efficient energy use and conservation.

Mission

Provide integrated and sustainable clean energy solutions to those we serve.

Long-term goals

1. *Accelerate clean energy investments* to help address climate issues
2. Provide excellent customer service to help participants maximize energy savings and renewable energy
3. Encourage innovative technologies and practices that create significant, additional, and diversified renewable generation and efficiency opportunities
4. Bring a broad perspective to action plans and budgets by considering their overall balance
5. Help businesses thrive in a clean and sustainable energy economy

Five-year goals

1. Five-year electric efficiency goals

Utility integrated resource plan analysis shows a range of potential energy efficiency savings over the coming five years. The following graphs show per-year and cumulative Energy Trust program savings at both ends of the range: the bottom line shows continued funding at 2009 rates, and the top line shows sufficient funding to capture all cost-effective energy efficiency:

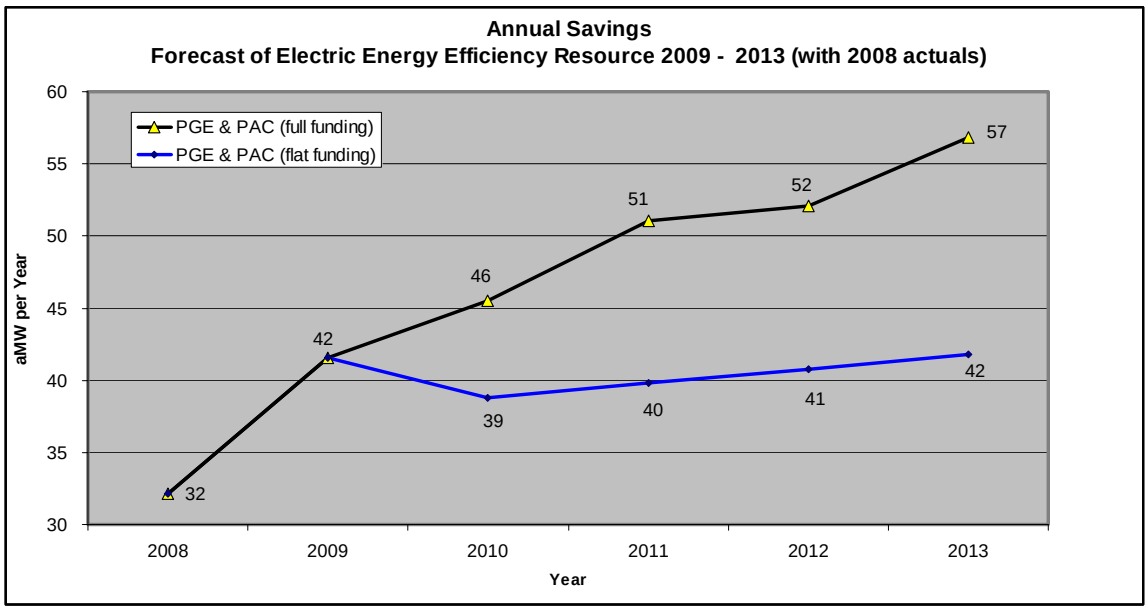

Figure 1

Note: Both the flat-funding and full-funding lines are "stretch" goals that aim for high-case energy savings, although at different funding levels. In any given year, actual savings could be lower by 25 percent or so.

Finally, by the end of 2013 cumulative energy savings would be 435 aMW in the full-funding case or 391 aMW in the flat-funding case:

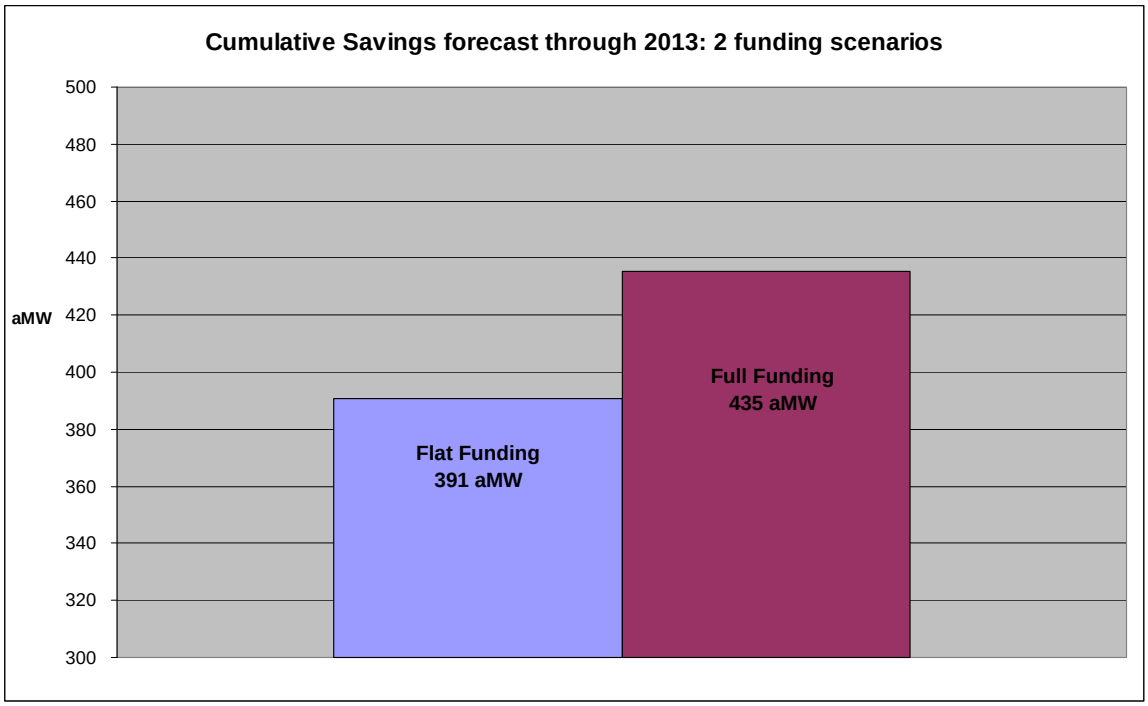

Figure 2

Flat funding scenario (2009 funding):

- Energy savings/cost: 203 aMW (2009-2013) at a cost of $353 million
- Ratepayer savings: By investing in energy efficiency at this level, ratepayers avoid paying more than $1.2 billion for generation and power delivery. After deducting the cost of achieving these efficiencies, ratepayers save about $885 million.
- Effect on load growth: energy demand declines modestly in the low-load-growth scenario (see figure 3)
- Effect on carbon: avoids about 680,000 tons of CO_2 that would be emitted to generate equivalent amounts of grid energy (comparable to taking 120,000 cars off the road)

The flat-funding case represents a “stretch” savings goal given current revenues. To achieve it, Energy Trust would continue to refine its programs, streamline internal processes, seek to maximize energy savings for residential, commercial and industrial customer sectors, and dedicate modest effort to identify new efficiency technologies.

Full-funding scenario (all cost-effective savings):

- Energy savings/cost: 247 aMW (2009-2013), 44 aMW more than with flat-funding, at an additional cost of $142 million
- Ratepayer savings: By investing in energy efficiency at this level, ratepayers avoid paying about $1.5 billion for generation and power delivery. After deducting the cost of achieving these efficiencies, ratepayers save about $1.01 billion, $126 million more than the flat-funding line.
- Effect on load growth: Loads decrease in all but high-growth scenarios (see figure 3)
- Effect on carbon: avoids about 820,000 tons of CO2 (comparable to taking 145,000 cars off the road)

	Energy savings	Economic savings to ratepayers (millions)			Avoided carbon	Load-growth offset
		Cost of equivalent generation	*ETO program cost*	***Net savings***		
Flat funding	**203 aMW**	$1,238	$353	**$885**	680,000 tons	Meets low-growth case
Full funding	**247 aMW (+ 44 aMW)**	$1,506 (+ $268)	$495 (+ $142)	**$1,011 (+ $126)**	820,000 tons (+140,000)	Meets low- and medium-growth cases

The full-funding case shows a 77% increase in annual energy savings between 2008 and 2013. To achieve these savings, over five years Energy Trust would require about $142 million of additional funding compared to 2009 revenue levels. Energy Trust would still streamline its processes and maximize savings for residential, commercial and industrial customer sectors, but it also would broaden and deepen its program portfolio by expanding efforts to test new markets, technologies and approaches.

Effect on load growth and fossil fuel use:
The following graph compares projected electric savings under the flat-funding and full-funding cases to a range of Oregon loads, which were forecast by the NW Power and Conservation Planning Council. The load forecasts cover both investor-owned and consumer-owned utility territories (Energy Trust serves primarily investor-owned utility customers), but they are nevertheless helpful in understanding the significant difference between the flat-funding and full-funding scenarios.

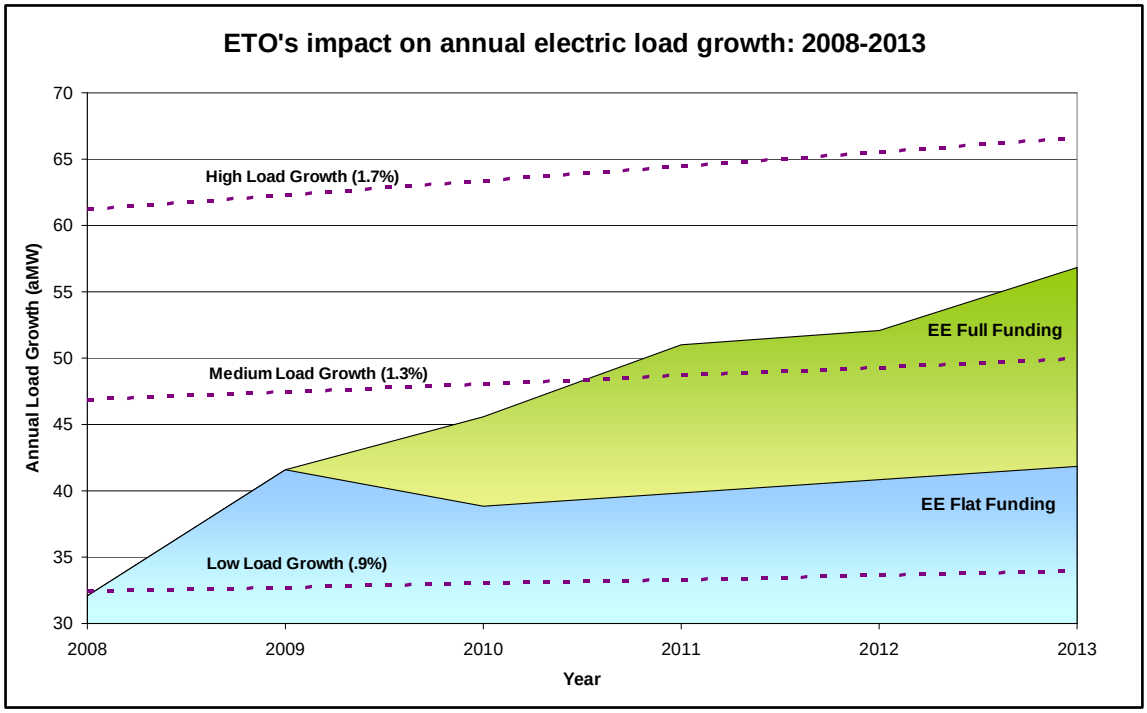

Figure 3

In the full-funding case, Energy Trust's efficiency programs more than offset electric growth in all but the high-load-growth case. In terms of Oregon's greenhouse gas

reduction and renewable energy goals, the full-funding case would avoid increasing fossil fuel use in most growth scenarios and help minimize the investment necessary to achieve renewable energy goals. A combined strategy in which energy efficiency is fully-funded and Oregon's renewable energy goals are met would not just offset growth in fossil-fuel energy use, but would reduce Oregon's carbon emissions in absolute terms.

Beyond five years

Although it is more difficult to predict costs and savings beyond 2013, the utility integrated resource plans suggest the following savings through 2016:

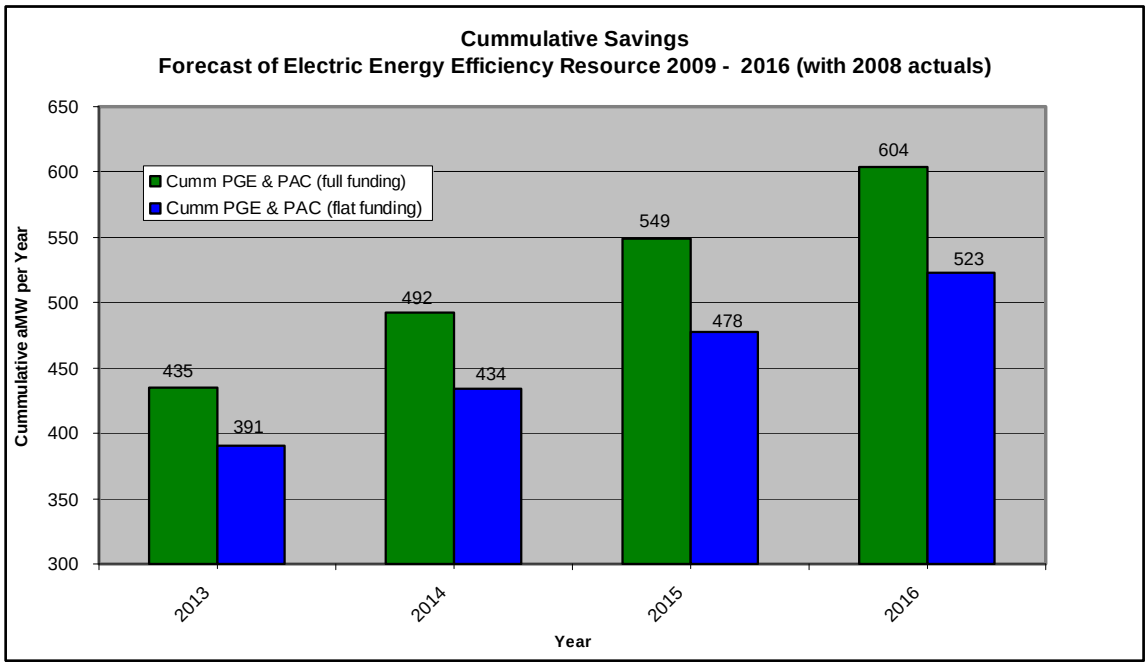

Figure 4

Savings beyond 2016 are yet more difficult to predict. Efficiencies in new buildings can be estimated, but for existing structures integrated resource planning considers only *known* energy efficiency measures and technologies. Most of this "known resource" for existing homes, buildings, and factories is deployed by 2016, and the post-2016 known resource therefore looks smaller. However, we consider this supposed decline to be artificial because additional savings from new technologies are highly likely to emerge in the coming years.[3] Some measures being tested now will be validated, new measures will be discovered, and efficiency resources will replenish. This limitation in the integrated resource planning analysis underscores the importance of investing in innovation, so that these resources regenerate into the future.

2. <u>Five-year gas efficiency goals</u>

The following graphs show per-year and cumulative Energy Trust natural gas program savings at both ends of the range:

[3] E.g., ductless heat pumps, heat pump water heaters, efficient electronic equipment, advanced gas water heaters and condensing boilers for rooftop heating in commercial buildings.

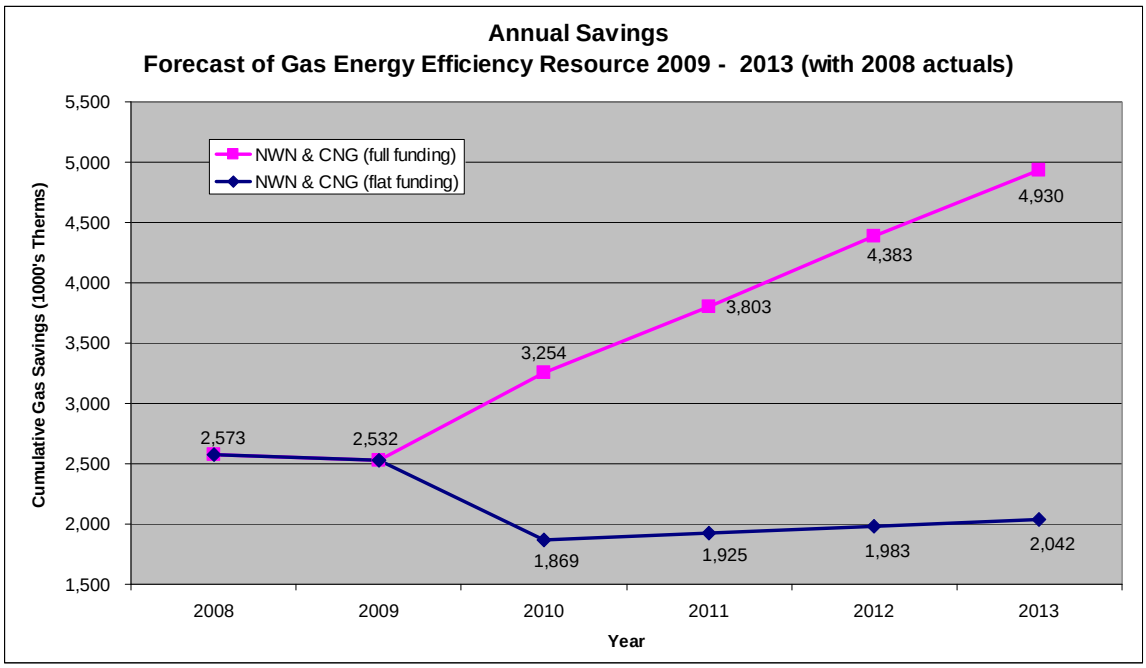

Figure 5

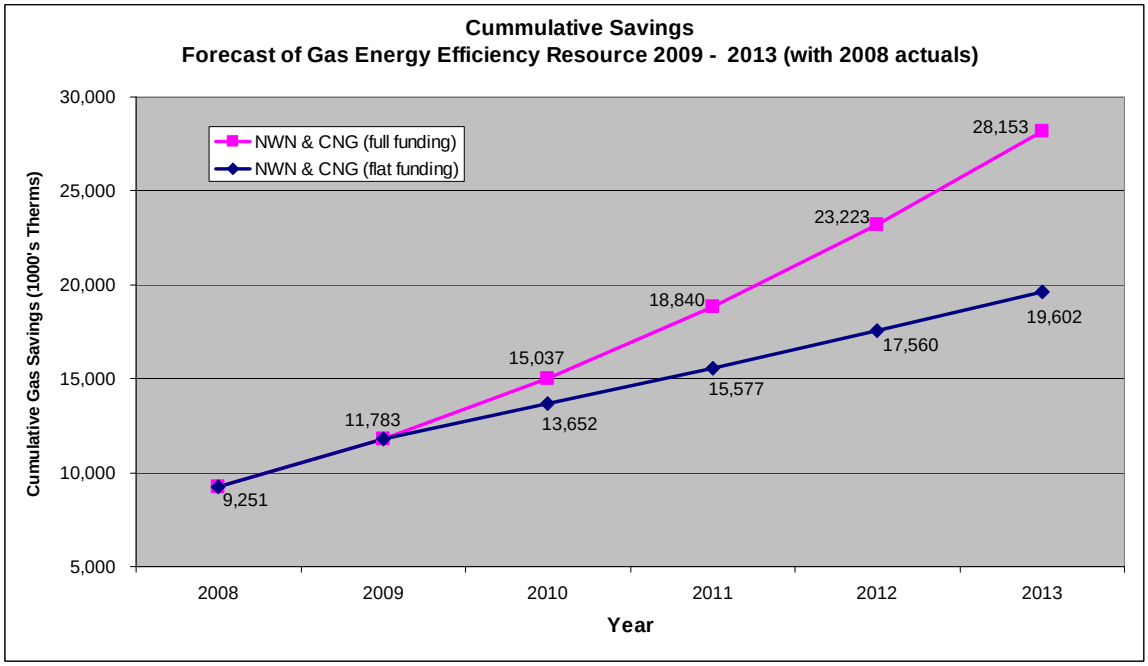

Figure 6

Flat funding (2009 funding):

- Energy savings/cost: 10.4 million therms (2009-2013), at a cost of $63 million
- Ratepayer savings: $38 million (net of cost)
- Avoided energy cost: $101 million to purchase, store and deliver this amount of natural gas on the open market
- Effect on carbon: avoids about 61,000 tons of CO_2 that would otherwise be emitted (comparable to taking 11,000 cars off the road)

The flat-funding line shows savings declining by 2010 as gas carry-over funds are exhausted, and then experiencing incremental growth. Discussions with NW Natural are underway to explore additional funding to maintain or increase savings beyond 2009.

As with the electric goal, the flat-funding case represents a "stretch" goal given 2009 revenues, and would require similar refinements, streamlining, and level of effort to identify new efficiency technologies.

Full-funding (all cost-effective savings):

- Energy savings/cost: 19 million therms (2009-2013), 8.6 million more than flat-funding, at a cost of $120 million
- Ratepayer savings: $64 million (net of cost), $26 million more than flat-funding
- Avoided energy cost: $183 million to purchase, store and deliver this amount of natural gas on the open market
- Effect on carbon: avoids about 111,000 tons of CO_2 that would be emitted to generate equivalent amounts of energy (comparable to taking 19,000 cars off the road)

The full-funding case would achieve a 92% increase in annual savings between 2008 and 2013. It would capture all the cost-effective savings identified in the gas utilities' integrated resource plans, and require an estimated $57 million more funding (spread over five years). Energy Trust would still streamline its processes and maximize savings for residential, commercial and industrial customer sectors, but it also would broaden and deepen its program portfolio by expanding efforts to test new markets, technologies and approaches.

3. Five-year renewable electric goals

Since 2008, Energy Trust's renewable energy program has been limited by the 2007 Oregon Renewable Energy Act to projects of 20 MW or less. Unlike efficiency, the Act provides no additional sources of funds for renewable energy development. Thus, the graph below assumes flat funding, current programs, and modest increments of new generation. Given these assumptions, Energy Trust estimates that it can achieve another 36 aMW of renewable energy between 2009 and 2013, for a cumulative total of 133 aMW:

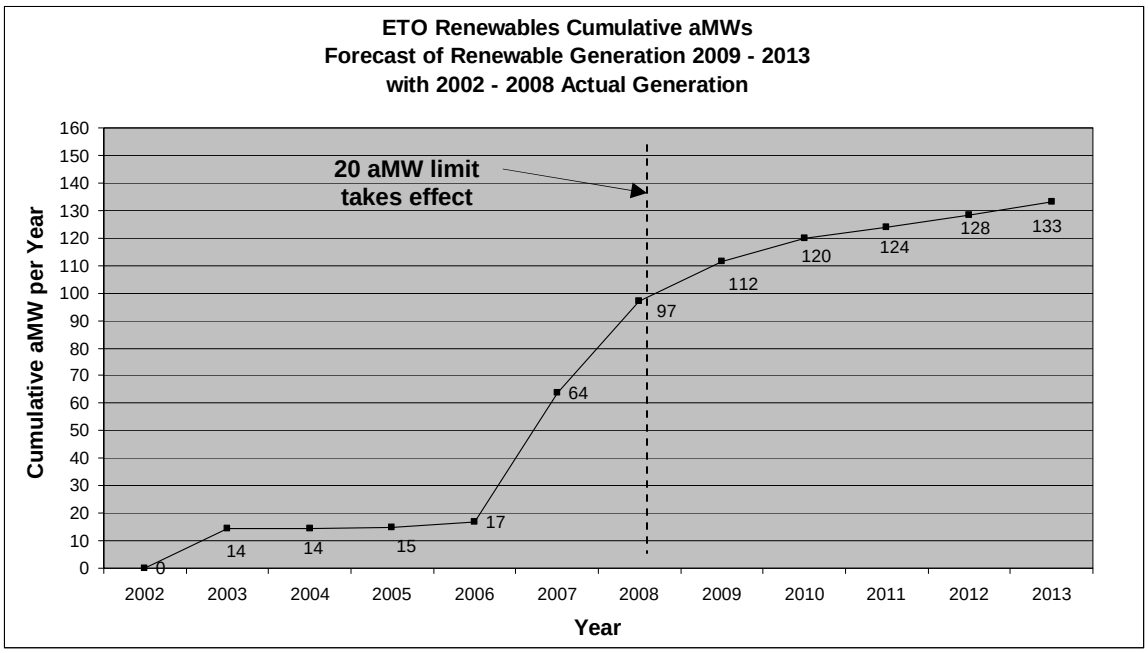

Figure 7

Demand for renewable energy projects is expected to outstrip projected funding by 2011. Before then, Energy Trust will need to reassess its investment strategy, and may focus limited renewable energy dollars on fewer technologies and/or program areas. This prospect warrants discussion.

The renewable program could be affected by bills being considered by the Oregon Legislature. Proposed changes in the business energy tax credit (BETC) could increase demand for Energy Trust funds, exacerbating the funding dilemma in future years. On the other hand, a bill that would require utilities to pay customers directly for solar energy production (sometimes called a feed-in tariff) could have the opposite effect. The feed-in tariff could reduce demand for Energy Trust funding for solar photovoltaic projects.

Five-year objectives

Energy Trust seeks to provide integrated clean energy solutions to those it serves. Because Energy Trust has plans in place to streamline and refine programs and operations over the coming five years regardless funding, some of the objectives below apply in all cases. Other objectives are more contingent on funding:

1. Accelerate clean energy investments. Achieving this objective will depend to a great extent on funding levels, and so the approaches outlined below are described in terms of contingencies:

a. Acquire **more standard efficiency measures** through retrofit and new building and facility programs
   - Flat funding: Maintain, refine and gradually expand Energy Trust programs, which are well-geared to reach these savings.
   - Full-funding: Simultaneously expand efforts in multiple, additional markets. As necessary, invest significantly more per kWh or therm in information, technical assistance and/or incentives to reach smaller markets and those with more barriers to action.

b. Acquire efficiency savings through **existing supply chains** for equipment and services (e.g., designers, distributors and contractors) for equipment and services that are generally sold directly to customers at times of initial purchase or replacement and reach niche markets:
   - Flat funding: Energy Trust programs are well geared to work with the largest and most promising supply customers and niche markets. Develop approaches for additional supply chains and customer opportunities at a modest pace.
   - Full-funding: Make significant, multi-year investment effort in developing relationships and supplying efficient products through a greater array of supply chains and work with additional customer associations, chains, and individual customers, including more extensive regional or national coordinated intervention, e.g., electronics sold business-to-business, hospital equipment, specialized industrial production equipment, advanced design in national chains.

c. Acquire efficiency through behavioral and operational measures
   - Flat funding: Continue limited, gradual research-intensive efforts to explore home energy monitors, smart power strips, tune-up of commercial rooftop systems and other approaches.

- Full-funding:
  - Explore diverse opportunities to accelerate behavioral research and technology field testing, refine or reinvent program systems, test standards of proof, in coordination with demand management and AMI metering and regional efforts.
  - Work with utilities to help delay or reduce fossil load growth to meet peak or to integrate renewables by using demand response, load management, and storage technologies, as these resources become cost-effective (next 3-5 years).

d. **Increase comprehensiveness**: aim to provide more energy measures per customer served:
- Flat funding: Some deep-savings initiatives are in place (e.g., custom commercial) and more are developing (e.g., zero net energy new building, Portland residential pilot program), but many initiatives rely on vendors to sell efficiency. Continue and refine efforts to encourage vendors to increase number of energy measures per customer.
- Full-funding: Expand efforts to overcome limitations inherent in vendor-driven programs. Develop tools and business cases for vendors to sell technologies and design approaches with deeper savings. Work directly with larger and more sophisticated customers. Develop templates to simplify and standardize approaches to deeply-efficient design. Integrate efficiency and renewable opportunities for customers in holistic approaches to energy and resource management.

e. **Link activities to larger-scale initiatives**, including regional/interstate collaborations, natural partners, codes, standards, and interactions with clean energy markets:
- Flat funding: Energy Trust works extensively with other energy and carbon-related initiatives, but has investigated links to grid, land, water and transportation management only in limited ways.
- Full-funding: Integrate efficiency into related initiatives (e.g., demand reduction, smart growth, resource recovery/conservation, transportation, land use planning).

f. **Renewable energy**. Given flat funding**:**
- Target medium-to-large (up to 20 MW) renewable projects, such as biopower and hydropower for irrigation-districts and municipal water delivery systems.
- Continue standard photovoltaic (PV) and small wind programs, adjusting budgets in light of market conditions and legislation.
- If funding and/or tariff mechanisms allow, integrate PV into leading-edge construction projects to demonstrate innovative applications and/or in connection with initiatives such as zero-net energy.

2. Provide excellent service. While the level of effort will vary with funding, improving service is a priority in all events. In particular, Energy Trust will seek to provide excellent service by:

- Motivating all energy users and developers to generate small-project renewable power and cost-effectively conserve energy:
  - Understand consumer behavior and response through market research
  - Test and develop new messages focusing on the connection between energy and sustainability

- Pursuing innovation in program delivery:
  - Simplify participation in Energy Trust programs
  - Offer appropriate financing tools, including those that allow owners to invest in a full spectrum of clean energy improvements
  - Help interested customers see a spectrum of energy and resource efficiency, renewable, and (coordinating with utilities) demand management options at once
  - Build long-term relationships with customers, organizations with linked missions, and pivotal equipment and services supply organizations
  - Integrate program services across efficiency and renewable energy where appropriate to simplify consumer choices and achieve efficiencies.

3. *Encourage innovative technology*: Adding new technologies and methods that create significant, additional, and diversified renewable generation and efficiency opportunities key to moving beyond current energy efficiency resource projections, which are based on known technologies. This is also an area in which level of effort depends to a great extent on funding:

- Flat funding: Energy Trust dedicates considerable effort to a small group of high-priority measures, but constrains renewable energy efforts to encourage innovative technologies and applications.
- Full-funding: Explore a fuller range of innovations, and leverage the work of other organizations such as NEEA, ACEEE, CEE, USDOE, EPA, etc.

In deciding where to focus efforts in efficiency technology, consider whether it is likely to (as applicable):

- significantly reduce energy loads
- provide alternatives where there are no good ones (including commercializing a promising renewable technology like low-temperature geothermal or farm biomass)
- bring products to our market in the near term
- appeal to users
- not to develop or be demonstrated for our climate and building stock without our involvement
- produce measureable savings
- be cost-effective
- be critical for a key initiative (e.g., zero-net commercial buildings)

4. *Bring a broad perspective to action plans and budgets by considering their overall balance*

- Long-term and short-term perspectives: Do they include an appropriate mix of initiatives and measures with near-term (1-3 years) and longer-term benefits?
- Sector and geographic diversity: Will all customer sectors that contribute funding to Energy Trust have equitable opportunities to participate in Energy Trust programs? Is there sufficient emphasis on diverse geographic areas and customers whose participation has been limited previously?
- Reach upstream: In addition to customer-focused programs, is there appropriate emphasis on reaching upstream into markets and supply chains?

5. *Help businesses thrive in a clean energy economy*: Energy Trust seeks to help businesses thrive in a clean energy economy by:

- Supporting clean energy business infrastructure development:
  - Cultivating and training trade allies

  - Investing in market transformation to help develop future markets
- Helping businesses integrate efficiency and renewable energy profitably into their business plans.
- Providing responsive services to a wide array of businesses with different energy needs
- Working with businesses to identify efficiency investments with deeper energy benefits and longer paybacks (e.g., zero-net energy buildings), which may be achieved through incremental investments.