

Things that Go Bump in the Night: Managing Risk in Energy Conservation Programs in Oregon

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ABSTRACT

Energy efficiency organizations constantly adjust to changing markets, government policy, technologies, and economic conditions. Efficiency programs' risk exposure may be rising as program goals accelerate, budgets grow, scrutiny increases, and "old reliable" program measures (e.g., compact fluorescents) become business-as-usual and are replaced by complex, or harder-to-measure approaches (e.g., behavioral and market transformation).

How can these risks be managed so that they do not frustrate energy conservation goals? Enterprise risk management has attracted interest as it became clear that some businesses were running disastrous, underappreciated risks (think Lehman Brothers). Is it useful for energy efficiency organizations, or are we already doing an adequate job of identifying and managing risk?

This paper describes the Energy Trust of Oregon's experimentation with risk management. Concerned that risk was rising, Energy Trust assessed risk at several levels: strategic/policy risk, market risk, and organization-wide risk.

These assessments suggested that we manage most risks reasonably well using tools that are well known in the energy efficiency world: balancing objectives, diversifying our portfolio of efficiency measures and programs, monitoring results, and protecting our ability to respond quickly to new information. However, we also identified areas where Energy Trust needed to be less analytically conservative and reluctant to deliver bad news about appealing concepts.

Overall, we found that paying closer attention to risk can improve communication, focus attention on shortcomings, build confidence in the organization's ability to deliver, and minimize surprise. We still have much more to learn about how risk management should work in an organization like ours.

Introduction

Energy efficiency programs have grown dramatically in recent years. Energy-saving goals in the realm of 1-2% of load per year or more are now established by law or under discussion in several states. Many more states are initiating large-scale efficiency programs, and budgets have climbed (Kushler, York, and Witte 2009). The growth of these programs is explained in part by the risks of supply-side options: fuel-price volatility, new generation construction cost, shrinking reserve margins, financing, carbon risk, and other factors. Energy efficiency programs balance out these risks.

Yet, energy efficiency programs face risks of their own, due in part to their growth. Innovation, more complex programs and less-proven measures are required to meet higher efficiency goals. Bigger budgets and prominence bring more scrutiny and accountability. To get a better idea of how these developments may increase risk, and how well Energy Trust is managing them, we organized a three-part assessment: An assessment of strategic/policy risk,

such as eroding political or constituent support, major shifts in law or industry structure, or major internal failures. We convened a small group of board members and senior staff to plot risks of this kind in terms of severity and likelihood. We concluded that, while it was a good way for board and staff to communicate, we didn't see risks that we wouldn't have seen in our normal strategic planning processes.

An Assessment of Market-Related Risk Associated with Programs in Particular Sectors

Energy Trust industrial, commercial and residential programs encounter uncertainties specific to their particular markets. We used our sector planning process to probe the risks posed by these uncertainties. This process revealed several, primarily risks relating to changing tax credits, codes and standards; the down economy, which particularly hits high-capital efficiency measures; and the growing complexity of our programs. Identifying these risks allowed sector managers to develop responses in sector plans, which in turn shape programs and budgets.

An Empirical Test

We surveyed our organizational structures to see how, on paper, we are organized to deal with risk. We then subjected these paper structures to a test, asking whether and where we had encountered problems that we had thought these structures would avoid. We did not turn up many issues in this part of the exercise, but we did learn some important lessons: we need to be quicker to identify patterns of inferior work by contractors, and want earlier indicators of when measures are not working as expected.

Our Conclusions

We do not need a new process to assess strategic/policy risk, we can rely on strategic planning for this. We found it useful to build risk assessment into sector -specific plans, which may be the best place to ensure that risk is factored into programs and budgeting. Finally, we found it worthwhile to identify where problems have actually arisen notwithstanding risk management controls. Overall, we learned enough from these exercises to take them into further rounds of strategic planning, sector planning and empirical testing.

Discussion

Energy Planning as Risk Management

In Northwest regional energy planning, energy conservation is *the* priority resource (Northwest Power Act of 1980). Northwest energy planning approach is fundamentally risk-based, and has been for the past 30 years (Northwest Power & Conservation Council 2011). Over that entire time, energy conservation has been the primary option in the region's energy plan. The same logic has guided investor-owned utility plans overseen by the Oregon Public Utility Commission (Oregon Public Utility Commission 1989), which is the level of planning that has the most direct influence on Oregon energy efficiency programs. From the perspective of regional and state long-term plans, energy conservation has demonstrated its value in lowering cost and reducing risk.

Traditional Risk Management in Energy Efficiency Program Delivery

In Oregon, delivery of energy efficiency programs was a utility function until 1999, when the legislature enacted a three-percent charge for large investor-owned electric utilities, and allowed the Oregon Public Utility Commission to direct most of the proceeds to a non-utility entity to invest in energy conservation, renewable energy and market transformation (State of Oregon 1999). Energy Trust of Oregon, a non-profit, was organized to invest this funding, then about \$50 million per year.

When Energy Trust started up in 2002, it used familiar management tools to balance risks: a diversified portfolio of programs and measures, pre-deployment engineering estimates of measure savings, QA/QC protocols for installations, and *post-hoc* evaluations of programs and their impacts. The organization also developed multiple administrative and financial controls, some of which are unique to a non-profit with a quasi-public mission: annual financial audits, reports to the measuring performance against board goals and Public Utility Commission metrics, biennial independent expenditure reports to the legislature, and independent five-year management reports to the Public Utility Commission.

Between 2002 and 2008, Energy Trust programs met or exceeded expectations, saving increasing amounts of energy at a fraction of the cost of generation (Energy Trust of Oregon 2009).

Growth in Efficiency Goals and Funding and New Sources of Risk

In 2008, programs accelerated sharply in response to legislation and regulatory changes (Eckman 2011). Energy Trust's 2009 strategic plan showed that efficiency programs had saved utility ratepayers hundreds of millions of dollars in avoided generation, transmission and distribution costs, and could save much more with higher efficiency goals (Energy Trust of Oregon 2009). Energy Trust's efficiency program budget jumped, and has continued to grow.

At the same time, the complexity, cost and uncertainty in efficiency programs increased. Many of the easiest and least costly measures were already developed. The economic downturn dampened appetite for capital projects, and low cost O&M measures, whose savings persistence is hard to estimate, have been attractive. Market transformation programs had produced large amounts of low-cost savings with new lighting technology, but as codes and standards "lock in" those savings, what new technologies will deliver comparable savings? Finally, Energy Trust faced challenges managing bigger, more complex programs with decentralized delivery systems.

New Models of Risk Assessment

In light of these new risks, in 2009 Energy Trust asked what seemed like a simple question: do we have the right tools to understand and manage these risks? We turned to the large body of risk-management literature and practice seeking an answer.

In exploring how to approach this question, we reviewed the business literature on "enterprise risk management" a methodology that aims to identify risk, assess how it can be managed, and make choices about how much irreducible risk to take. Organizations such as the Risk and Insurance Management Society (Risk and Insurance Management Society 2012) and the International Organization for Standardization (International Organization for

Standardization 2012) have developed a large number of risk management tools for different situations. The subject's profile rose after the near-collapse of the financial industry in 2008, when it became obvious that many large-scale organizations were taking much bigger risks than they thought.

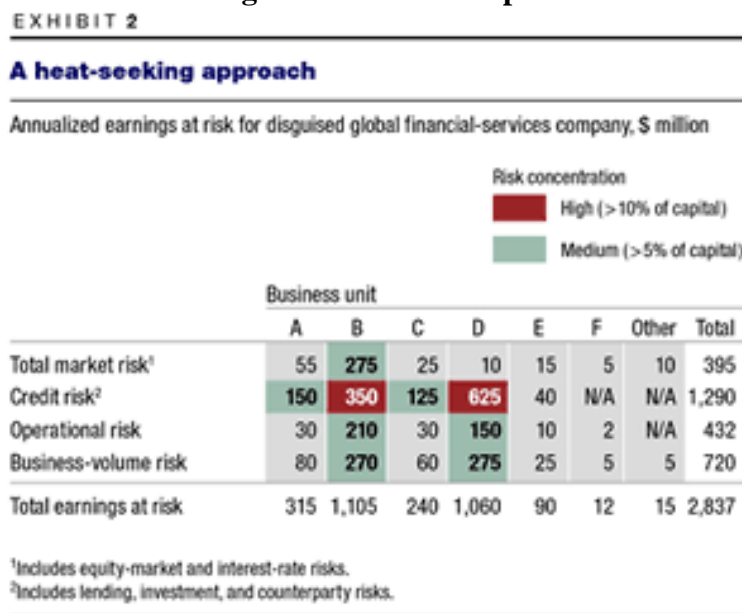
One of the premises of enterprise risk management is that no single approach works for every business, and sub-branches have developed for specific industries -- health care, finance, etc. – and for various types of risk, e.g., climate change (Jones 2010).

Energy Trust's survey turned up no enterprise risk management models unique to energy efficiency organizations. Given this, the question was whether techniques developed for other businesses were worth adapting. Several features of enterprise risk management appealed to us:

The emphasis on transparency: To build trust with our overseers, funders and constituents, Energy Trust needs to be clear and candid about the challenges that face us. We cannot afford to build unrealistic expectations.

The allure of an integrated view of risk and contingency across programs: One risk management tool is a "heat map" showing risk across organizational lines. In the example below, McKinsey illustrated the idea for a hypothetical financial services company. The types of risk that are most important to a firm run down the left side of the matrix, business units run across the top, and degrees of risk are portrayed in colors – red indicating the riskiest position:

Figure 1. A Heat Map



Source: Buehler and Pritsch 2003

We also liked the idea of a management discipline that would test our optimism. Energy efficiency organizations are filled with doers, We have important things to accomplish and new ideas about how to go about it, many of them good. Risk management could strengthen us by challenging our assumptions and managing for inevitable surprises.

At the same time, a deep dive into enterprise risk management would entail its own risks:

- For one thing, the risk-management literature made clear that this would not be a well-marked path. The literature is littered with models and complex heat-maps for different

settings. Coming up with Energy Trust-appropriate models and maps could take a lot of effort.

- We are in the business of pushing the efficiency envelope, and we have to take risks to do it. Would risk assessment undermine our ability to innovate?

Enterprise risk management appears to be more of an aspiration than a widespread fixture in American business. McKinsey's findings were sobering:

- [T]he corporate meltdowns of recent years suggest that many companies neither manage risk well nor fully understand the risks they are taking. Moreover, our research indicates that the problem goes well beyond a few high-profile scandals. . . . A 2002 survey . . . showed that 36 percent of participating directors felt they didn't fully understand the major risks their businesses faced. An additional 24 percent said their board processes for overseeing risk management were ineffective, and 19 percent said their boards had no processes (Buehler and Pritsch 2003).

We had to wonder: if enterprise risk management were effective, why hasn't it spread more widely? It appeared that even businesses that are persuaded by the logic of risk management use it less as a central business principle than as an organizational unit – a separate risk-management staff or department consulted on high-risk initiatives.

Finally, the energy efficiency business really is different. Energy conservation is data-and-analysis-oriented; Amory Lovins' adage, "In God we Trust; all others bring data," is a living principle. As the International Energy Agency has noted, "[e]valuation cultures have emerged in many EE organisations and energy utility companies in North America," and Energy Trust is no exception (International Energy Agency 2010). In efficiency organizations, many risks are policed by the process of cost-effectiveness analysis, QA/QC, and monitoring and evaluation. What would enterprise risk management add?

Trial Runs

Energy Trust decided to dip a toe in the water rather than diving in, and that meant starting with basics. To structure a risk map, we would need to define risk we want, identify the types of risk that are most important to our business, establish a system for distinguishing levels of risk, and identify ways to manage them.

Risk definitions tend to be broad, generally anything that may drag a company's performance below expectations. The more important distinctions start to emerge in identifying types of risk -- the left-hand column the McKinsey's heat map. In most businesses, these risk types relate to loss of revenue, market-share and the like. In an efficiency organization, risk types would inevitably be different than in an investment house.

Because Energy Trust carries out quasi-public functions and operates in something of a fish-bowl, it already had systems for risks associated with legal, accounting and financial management. The risk types we were concerned with were in other areas, in particular:

- Policy/strategic risk: Changes in law, policy and industry structure can have a big impact not just on our ability to meet goals, but on our mission and organizational framework.

- Market-specific risk. Because Energy Trust programs are market-based, risk derives from changes in technology and economic conditions in several sectors.

We embarked on three trial-runs: a policy/strategic risk evaluation; a sector-specific evaluation; and an organization-wide assessment of risk management.

Policy/strategic risk. A small group of board and senior staff, facilitated by a consultant with risk management expertise, carried out a policy/strategic risk evaluation exercise in three sittings: A first meeting brainstormed the range of policy/strategic risks, identified overarching themes in these risks, and evaluated which of them was worth capturing in an assessment. After this meeting, a survey was sent to the group for each individual to rate risks according to likelihood and severity. These results were compiled, and in a second meeting, categorized risks in the following matrix:

Figure 2. A Risk Matrix

<i>Severity of impact</i>	<p>Quadrant 2: Less likely to occur, yet impact severe</p> <p><i>Requires some management</i></p>	<p>Quadrant 1 (critical risk): Likely to occur, impact severe</p> <p><i>Requires aggressive management</i></p>
	<p>Quadrant 4: Less likely to occur, impact less severe</p> <p><i>Requires monitoring</i></p>	<p>Quadrant 3: Likely to occur, impact less severe</p> <p><i>Requires some management</i></p>
<i>Likelihood of occurrence</i>		

The group first assigned many risks to quadrant 1, then down-graded them in a second meeting, and in a third meeting identified mitigation strategies, including signposts of when a risk requires more attention. A final meeting considered whether and how risk assessment should be done in the future.

What did we learn? First, it was obvious that the group’s composition had an important effect on ratings. Having someone with real information about the risk under discussion could change a risk’s location in the grid. Where we didn’t, ratings could only highlight areas for further investigation. Second, most of the risks identified were already on our radar screen, and the value of the exercise was in communication: it confirmed that we were all worried about the same things, focused attention on whether we had initiatives and systems in place to cover the risks we were seeing.

We concluded that strategic/policy risk assessment could be adequately handled in strategic planning processes that were already in place, in a larger context of strengths, weaknesses, and opportunities. Risk assessment could be somewhat more systematically addressed in that process, but a separate and distinct strategic/policy risk assessment didn’t seem warranted on an on-going basis.

Market-specific risk. Energy Trust updates its strategic plan at least every five years, which is appropriate for high-level direction. However, it also develops “sector plans” for commercial buildings, homes, industrial efficiency, and changes in markets can render these plans obsolete more quickly. Each sector plan encompasses several markets. Sector plans can then be compared the strategic plan and evaluated at the overall portfolio level.

We used the consultants that helped with strategic/policy risk to work with sector and program managers to incorporate risk-management in sector planning. We did not ask managers to use the risk matrix developed in the strategic/policy exercise because this was the first time they had developed sector plans and the process was challenging enough.

Program managers defined risk in terms of external factors that influence market demand for program offerings, positively or negatively. These factors included changes to tax credits, unfavorable economic climate for investment, and changes to codes, standards, and policies.

With one important exception and another modest exception, the sector plans that emerged taught a lesson similar to the one we learned in the strategic/policy trial: by and large, the programs were managing for risk. All sectors saw risk in the poor economy, and all had developed low-cost approaches to address this risk. All programs were aware of their limited ability to forecast market behavior, and were making effort to understand market drivers and monitor changes in policy and economic conditions.

The important exception was that the programs’ growing complexity is a real issue, and puts the programs at risk of creating confusion for customers. In response to this perception, Energy Trust added a quick-feedback element to its evaluation program and made other adjustments. Keeping a close eye on participation and customer feedback speeds up the feedback loop and helps us respond quickly if we see customer confusion.

The modest exception was a heightened sense of the importance of understanding market drivers. Staying in the loop on policy developments such as tax credit changes, understanding their implications for individual programs, and integrating it back into program design and implementation quickly has to be a priority. And it is equally important that decision makers understand the program impacts of potential policy changes.

An empirical test. We considered whether to try to take risk assessment to an even finer level, in the annual program budgeting process. However, this would have required us to develop standardized terms and procedures for managers working in almost 40 different markets, each subject to different conditions. We had little confidence that this would produce a meaningful result, and were concerned that it would throw a monkey-wrench into a budget process that is already arduous.

Instead, we undertook a survey of how we thought we were managing risk organization-wide (did we have risk management built into our organizational structure?), and how in fact things seemed to be working.

As a first step, we developed a more specific schema of risk types applicable to all programs in the efficiency portfolio, based on our review of the sector plans:

- *Demand for programs* will be insufficient to meet goals.
- *Revenue* will differ significantly from projections
- *Multiple performance expectations* from the Energy Trust board, the PUC, the legislature and the utilities will misalign or become unmanageable
- The pipeline of *new technologies and strategies* will be empty
- Our *trade ally network* will under-perform
- We will be unable to affordably *serve all customers* (e.g., urban/rural)
- *Communications* will not effectively reach customers and constituencies

Planning staff then assessed where, on paper, Energy Trust thought it was managing these risks.

This assessment confirmed that, on paper, Energy Trust is organized to address these risks from a variety of perspectives: sector, program, and cross-organization. We appeared to be structured to see and respond to these risks.

The next question was whether these structures were actually working; was it reasonable for us to rely on these structures to manage risk? As opposed to the planning orientation of the first two trail runs, this exercise was retrospective, and empirically-based: regardless of how well we had structured our management, had we actually anticipated problems and responded when they arose?

In this review, we identified several issues:

- Some of our management approaches are not yet fully operating. For example, in 2011 we developed a new system for pilot programs -- field initiatives designed to answer research questions which inform crucial choices in technology selection or program design. The system was aimed at reducing the risk that fabulous new ideas would prove not to be fabulous. It incorporates documentation and coordination requirements: to clearly state research needs, communicate and reach consensus on those needs, assure that resources are dedicated from the right departments, and that the pilot is effectively managed toward its objectives. At the time of the risk survey, the pilot process was still in its shakedown phase. But people were learning how to use it, and a formal review was scheduled to consider enhancements. We called that result good enough.
- Inferior work by contractors. If contractors install a large number of measures, and do so quickly, how do we ensure the work is well done? Our review indicated that, even with our normal QA/QC protocols, aspects of program design allowed problems to happen more frequently. When incentives approached 100% of a measure's cost, for example, a creative contractor can do a lot of work badly, and, because the work was essentially free to the building or homeowner, it may not be noticed. With Energy Trust constantly balancing autonomy with quality control for our more than 2,000 trade allies, monitoring such situations would be difficult and expensive. However, we did find ways to spot quality problems that form a pattern, enabling us to respond quickly and assertively. We can also be careful in designing programs to avoid paying too much of the cost of measures delivered through autonomous contractors. And ultimately, customer investment in measures has to operate as a risk management mechanism.

- Insufficient triggers for scrutiny. We encountered areas where technologies were not performing as expected, cost-effectiveness of measures was in question, yet there was no final impact evaluation to “prove” a performance problem. We saw a need to develop earlier indicators of whether, for example, we had overestimated the size of loads.

As we reviewed these patterns of vulnerability, it became clear that some of our virtues also pose risks. Our decentralized delivery system creates flexibility, allows us to work at scale, and also creates complex management issues. Our public focus generates fresh ideas and support, but it can also produce rabbit holes – new ideas that go nowhere but take time and effort to explore. All of this is fine if we understand the risk, decide it is worth taking, and manage for it as best we can.

We concluded that this empirical review, evaluating the specific problems we have bumped into, was probably more productive than bringing risk-oriented grids into finer levels of planning and budgeting. In most cases we were anticipating and correcting for problems, but the empirical review allowed us to see patterns that we wouldn’t otherwise see, and develop more systematic solutions with organization-wide support.

Conclusion

Energy Trust approached risk assessment at three levels and reached tentative conclusions about how they work separately and together:

Strategic/policy risk assessment to identify major risks posed by shifts in policy or industry is primarily a way for people across the organization, board and senior staff, to confirm that what they are worried about is being addressed. This can be adequately done in normal strategic planning. Risk assessment may be more sharply focused in these processes, but a separate and distinct risk assessment doesn’t seem warranted.

Market-Specific Risks

Industrial, commercial and residential efficiency programs encounter unique risks. Because participants in strategic/policy risk assessment don’t necessarily have direct information about these risks, it is important that risk assessment reach into operational levels of programs. This may be done in the course of program, sector or other market-specific planning.

An empirical test to review problems that actually have arisen is a good way for an organization to see patterns that it wouldn’t otherwise, develop systematic solutions, and generate organization-wide support for them.

To a certain extent, the conclusions we drew reflected our *Small is Beautiful* organizational bias: “The fundamental task is to achieve smallness within the large organization.” (Schumacher 1989). We have to surface the large and aggregate risks for management attention, as we do in strategic and sector planning. But once the larger issues are addressed, we did not want to draw our diversified service organization into more complex annual planning, at least until a retrospective assessment tells us we have a larger problem.

We continue to scratch our heads about this process. Some of us would still like a nice, tidy heat-map like the one on page 4, and wonder if one couldn’t fall out of this process without inordinate effort. Others of us are convinced that tidy heat-maps are an illusion and we should

put this idea to bed. We have only been through all three steps once, however. We expect surprises and, perhaps, revelations the next time we do it.

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