Briefing Paper
Managing Risk in Renewable Energy Projects

May 14, 2008

Summary

This paper responds to the board's request for a review of Energy Trust's approach to managing risk in renewable energy projects.

Background

Under Oregon law, Energy Trust may pay the above-market cost of renewable projects. The board has developed an above-market cost policy that guides staff's analysis (http://www.energytrust.org/library/policies/4.07.000_060525.pdf). In brief:

- After a technical review of the proposal, staff begins the financial analysis by comparing project costs to customary and usual costs and returns for the same or comparable technology and installation circumstance.
- Staff use a series of spreadsheets to link capital costs, expenses, equity, debt, revenue from power sales (or reduced power purchases), tax rates, tax credits and benefits, capital upgrades, reserves, inflation, depreciation and revenues or savings from secondary products, if any. We do the analysis for multiple years based on an operating life typical of the technology or application.
- We determine incentive offers after considering the net present value of all acceptable project costs and revenues and a range of appropriate returns on investment. When the technology, installations and costs do not vary much for a similar class of projects (e.g. solar electric) we calculate a standard incentive, which is then updated periodically. Where the technology or application is variable and costs are site-specific, we analyze the above-market cost on a case by case basis.
- We account for the value of "green tags" pursuant to the board's green tag policy (http://www.energytrust.org/library/policies/4.15.000.pdf). Renewable energy generation produces environmental and renewable energy credits, sometimes called "green tags," which can be sold in specialized markets separate from project power. The policy defines the share of green tags Energy Trust retains in exchange for its funding.

Discussion

Energy Trust's approach to risk in renewable programs is generally consistent with its approach to energy efficiency programs, with differences noted below.

Risk in renewable energy projects is of several types:

1. Development risk (Energy Trust takes limited risk)
2. Opportunity cost (Energy Trust takes limited risk)
3. Securing equipment and construction (Energy Trust does not take risk)
4. Changes in actual project cost (Energy Trust does not take risk)
5. Performance risk (Energy Trust takes limited risk)

Descriptions of each of these risk areas follows:

Development risk involves such expenses as resource assessment, feasibility studies, site studies, environmental reviews, project design, construction planning, permitting, legal and financial analysis. These expenses are incurred before a projects' merits are well understood, and play a key role in getting projects on the ground.

- In its first years, Energy Trust identified a number of pre-studied, off-the-shelf projects with limited development risk. With these projects now developed, Energy Trust has incurred more risk in recent years to support development studies to kick-start other good projects.
- Energy Trust does not fund development expenses beyond the resource assessment and feasibility study level for two reasons: First, costs beyond the study level increase significantly. Second, we think good projects will progress if their management teams invest time and ingenuity in them, which allows projects to prove themselves.
- The Energy Trust role of funding energy analyses and reviews is similar to the one we play in the commercial and production (industrial) efficiency programs. However, because renewable studies are typically more expensive and complex, we limit the number we fund. For larger studies, we pay only part of the costs, generally up to half. If a renewable project is built but does not provide power to PGE or Pacific Power, the funds must be repaid. Efficiency programs pay more of the study costs, and if a customer does not act on any of the recommendations, the next study the customer requests may require cost-sharing.
- Energy Trust also manages our risk in renewable projects by leveraging funds from other sources, e.g., from the USDA Farm Program's and the Oregon Department of Community and Economic Development's Renewable Energy Feasibility Fund.

Opportunity cost risk: If a renewable project proves itself in the development phase, a formal application is made to Energy Trust. Staff evaluates the application as outlined in the background section above, secures appropriate approvals and enters into contracts. It can then take at least 18 months for projects to go online, and during this timeframe, some projects are delayed or fall through**.**

- There is a risk of tying up funds that could have gone to other projects.
- In actuality, this risk has not been much of an issue. In evaluating projects, we: weed out those that are not ready; limit the time we will reserve funds; withdraw funding if projects stall; and, limit the number of projects for any one entity.

Performance risk: Energy Trust takes limited performance risk, and also shares such risk with the project sponsors in several ways:

- Energy Trust incentives provide a limited share of all project costs, ranging from 5 to 20%. The bulk of revenues for most projects are from power sales, which provide the largest incentive for projects to maximize generation.
- Standard security requirements in utility power-purchase agreements mitigate Energy Trust's performance risk by: (1) helping to demonstrate whether a project owner is creditworthy; (2) providing projects with incentives to produce power as agreed in order to avoid the exercise of default security; and (3) projects 10 MW and less that cannot demonstrate creditworthiness can give a utility step-in rights, which provide some assurance that the project will continue to produce power at expected levels.
- In all energy efficiency and renewable energy programs, Energy Trust pays financial incentives only when projects are commissioned. Projects have had historically high levels

of performance, and we reduce payment if a project is built to less-than-expected capacity or cannot produce as much energy as was forecasted.

- For renewable energy projects, we require incentives to be repaid on a pro-rata basis if the project under-produces or is damaged, destroyed, abandoned or decommissioned before the end of its useful life. Energy efficiency projects do not have these "take-back" arrangements; there, risk is managed through higher project volumes.
- In large or non-standard renewable projects where we cannot find an adequate way to secure repayment obligations, we may pay incentives over time based on energy production.
- When incentives are paid over time, total funding is typically set aside at the outset in an amount that reflects the time value of future, discounted payments. This maintains the same net present value as a single payment on commissioning.
- In accord with board policy, staff leverages the market for green tags, which may provide an additional incentive for project performance. By sharing tag ownership, we give projects additional incentives to maximize generation. And, as noted above, we can require repayment if generation falls short.

Summary

Risk category	Nature of risk	Mitigation
Development	•Lack of quality resources Infeasibility •Environmental issues •Poor project management	•Limit ET support to resource assessments and feasibility studies •Cap contributions •Require cost-share
Opportunity	•Uncompleted projects	•Screen for most likely projects •Limit time funds are held •Establish milestones
Secure equipment & fund construction	•Owning equipment for cancelled projects •Project delays •Change in project size/scope •Incomplete project	•Do not take these risks
Project costs	•Cost over-reruns	•Do not accept
Performance	•Project fails •Project is dismantled, or abandoned •Project under-delivers forecasted energy	•Fund only after inspection and commissioning. •Fund a smaller portion of the project •Require pro-rata payback of incentives •Rely on leverage of power sales contract &/or green tag sales