

# Green Tag Ownership for Solar Systems

October 13, 2004

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## Summary

As part of implementing the new policy on green tag ownership staff proposes to change the ownership for residential and small commercial systems. Analyses indicate that the Energy Trust's ownership of green tags should change for both residential and small commercial systems.

This paper outlines the results of a set of analyses calculating the Energy Trust's relative share of above-market funding and consequent share of green tags. Staff seeks input on the following changes:

- Current incentives for smaller commercial systems provide 100% of the above-market costs. For these systems Energy Trust will retain all the green tags. For systems above 7 KW the amount retained by the Energy Trust must be calculated on a case by case basis.
- Staff proposes to select from two options to allow residential owners to retain their green tags. The first option would be to allow the customer retain all the tags for a lower incentive. The second would be to allow the customer to retain the green tags for up to four years with no change in the up-front incentive.

## Background

The revised green tag policy establishes the principle that the Energy Trust owns green tags in proportion to its funding-share of the above-market costs of a project. This sharing may be a share of the yearly output or divided into periods. If Energy Trust's share is in the later years, the relative amount must reflect the risks of project underperformance over time.

Currently, The Energy Trust owns the green tags for the first ten years of any solar-electric system funded under the Solar Electric Program. Subsequently, the system owners have title. For other projects and other programs, the share is calculated on a case by case basis. The revised policy has already been implemented for these other projects.

There is an independent market for green tags in Oregon. Bonneville Environmental Foundation (BEF), Three Phases, Green Mountain and others all offer potentially significant purchase prices for tags from solar systems. Almost exclusively, their purchases are for the early years of a project's life. Some pay over time, others pay up-front. The Energy Trust currently works with BEF and Three Phases to share tags on co-funded projects through other programs.

Solar installations outside the Energy Trust's Solar Electric Program can sell their tags to add to other subsidies. The value of these sales is generally \$165 to \$330 per year for a 3 KW system. Over four years this represents \$660 to \$1,320 (without discounting).

The current ten-year sharing was based on older assumptions about costs. New data indicate this should be revised. Further, the option to own and re-sell tags can provide additional funds to bolster PV sales. Sales in the Solar Electric Program slowed after staff lowered the incentive and reduced the marketing efforts.

## Results

The table below summarizes the results of staff's analyses of green tag ownership. The technical appendix provides the assumptions and calculations involved in defining the relative share of green tags the Energy Trust should own over time.

Staff looked at both residential and commercial/industrial installations. We calculated the share of above market costs represented by the Energy Trust incentive. We assumed the owner of a system would prefer to retain ownership in the near years to be able to sell the tags to help further finance the project. Consequently we adjusted the share to reflect the risk of system underperformance over time.

<u>Customer</u>	<u>Net Share of Above-market Costs</u>	<u>Years</u>
Residential	79%	16
Commercial < 7 KW	100%	20
Commercial > 7 KW	variable, case-by case	varies

The table indicates that the residential customer should be able to keep the green tags for years 1-4, and then revert to the Energy Trust in years 5-20. The table also indicates that the Energy Trust should retain all green tags for the life of the small commercial systems.

## Legal Considerations

Owning tags in later years is risky from another standpoint. Unless we put some ownership lien on the equipment to maintain the green tag ownership, we can not guarantee we will be able to have the future benefits of the tags for ratepayers.

Under the Solar Electric Program the applicant agrees to inform any future owners of the property about our agreement. This is in lieu of a lien. Staff felt a lien would scare most homeowners and be too administratively burdensome. The industry agreed. So as not to burden the emerging solar market, we propose to continue the same practice with one modification.

Under the Open Solicitation Program, we take much clearer and tighter ownership of the green tags. One feature is to require any other purchasers of tags (those not owned by the Energy Trust) to have a provision in their contracts acknowledging the Trust's future ownership. This makes title very clear over time. We would propose the same for purchasers of green tags from residential systems the Energy Trust funds.

We propose that tags could be sold to only those entities that had language in their purchase contract acknowledging the Energy Trust's future ownership on behalf of ratepayers. The language would have to be approved by the Energy Trust.

## **Proposal**

The results for commercial systems easy to implement, going forward. The results for residential systems are not as easy to implement. Ensuring clear title to the tags has staff wondering about not owning any tags for residential systems.

The net present value of solar tags is about \$1.00/watt at today's range of green tag prices. It would be administratively easier to lower the incentive by this amount and remove the Energy trust from any ownership position, ever. Staff seeks comments on the following alternatives for residential systems<sup>1</sup>:

### Option 1

Lower the current incentive by \$1/watt and allow the system owner to keep all the tags for the life of the project.

#### Pros:

- Cleaner, clearer to customer and installer
- Supports the emerging private market in tag purchases
- Less administration, tracking and reporting
- Funding for solar can be spread further

#### Cons:

- Requires board amendment of the green tag policy
- Emerging private market is thin and could be unreliable

### Option 2

Let the customer own the tags for the first four years of a project's life. Require registration of green tag purchasers. Lower the incentive gradually as increasing numbers of customers take advantage of selling tags.

#### Pros:

- No change in current policy
- Supports the emerging private market in tag purchases
- Retains a relatively higher near-term incentive
- Allows for gradual lowering of ETO subsidies

#### Cons:

- Additional administrative steps for Energy Trust
- High burden for a small number of tags
- Administrative hassles for system owner
- Continued larger ETO market involvement.

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<sup>1</sup> Applicable to all residential systems installed after the Energy Trust lowered the incentives to \$3/watt for PacifiCorp and \$3.25/watt for PGE.

## **Summary**

Analyses indicate that the Energy Trust's ownership of green tags should change for both residential and small commercial systems. For residential systems, customers should own the tags for the first four years of a project. Sales of green tags could only be to entities that had been listed on the Energy Trust's web site.

Alternatively, Energy Trust could exit from any green tag ownership in exchange for a lower incentive.

For commercial systems 7 KW and less, funded under the current incentive structure, the Energy Trust should change its ownership from the first ten years to the first 20 years of a project. Ownership of tags from other systems will be done on a case by case basis.

## **Committee/Public Review**

Staff seeks comments on this draft prior to presentation to the Renewable Advisory Council on October 13, 2004. If no policy or other significant issues arise, staff would revise and finalize the policy by October 15, 2004. If significant disagreement arises, we will bring a new proposal back to the RAC in November.

## Technical Appendix, Analysis

The analysis compares Energy Trust funding as a share of net, above market costs. For net metered systems covered under the Energy Trust's Solar Electric Program, the above market costs are the residual after energy values and tax benefits have been subtracted.

Net, above-market costs for residential and commercial systems vary significantly. The main reason is the multiple tax benefits commercial projects can receive from the state and federal governments. The analyses for green tag ownership looked at residential, small commercial (3 KW) and medium commercial (7 KW).

Manufacturers warrant systems to perform within 80% standards over 20 years. While this is the warranted level, anecdotal evidence appears to suggest that actual degradation is much less. The larger factors in underperformance include: failure to re-set systems after outages, weather damage, leaves, replacing inverters, dust, increased shading and change in ownership. It is possible that these issues are more prevalent in residential settings.

Quantifying all the risks of under performance is difficult. Some data from California suggests that actual output has been 65% of expected for residential systems. We do not know of data for commercial systems. Given all the quality control in Oregon, we should not expect such low levels. Staff suggests initial values for be set at 25% for residential and 15% for commercial.

The tables below calculate the above market costs for typical systems we have seen. We propose using these typical systems to re-set the standard for the Solar Electric Program.

### Residential

The table below list the costs and Energy Trust's share of costs for a typical residential system in the Solar Electric Program.<sup>2</sup> All costs are at the average for the program for 2003 and the first half of 2004. The analysis assumes the customer finances the bulk of their expenses.

<b>Component</b>	<b>Cost/Value</b>
Installed 3 KW System	\$19,829
NPV Energy (retail)	- 3,601 <sup>3</sup>
RETTC	- 1,275 <sup>4</sup>
Above-Market Cost	14,953
ETO Funding (average)	- 9,375
Above Market share	
Unadjusted	63%
Risk-adjusted	79%

<sup>2</sup> Installed costs averaged \$6.35/DC watt. Installation costs also assume the system will be financed over five years at 6% rates. The analysis assumed a discount rate of 8.1%, the average, long-term return for stock market investments (after taxes).

<sup>3</sup> The energy value was calculated for the average conditions in Oregon using the average residential retail rates for PGE and PacifiCorp (7.2 cents/kWh) in 2003. The analysis assumes this grows an inflation rate of 3%.

<sup>4</sup> The maximum state tax credit (RETTC) is \$1,500. However, the analysis below assumes the net value of RETTC will be less since the lower state income taxes reduce deductions on federal returns and increases federal taxes.

If the risk-share of above-market costs is 79% for the Energy Trust's funds, the customer should be able to own the green tags for the first four years of a 20-year system.

#### Small Commercial

The table below list the costs and Energy Trust's share of costs for a small commercial system in the Solar Electric Program.<sup>5</sup> Costs are the same as those for the average residential system, except for tax rates and energy costs. The analysis assumes the customer can take advantage of 90% of all the available tax credits.<sup>6</sup>

<b>Component</b>	<b>Cost/Value</b>
Installed 3 KW System	\$19,847
NPV Energy (retail)	- 2,609 <sup>7</sup>
RETC	<u>- 10,540<sup>8</sup></u>
Above-Market Cost	6,698
ETO Funding (average)	- 6,750
Above Market share	
Unadjusted	101%

The above indicates that the Energy Trust is paying all of the above market costs, without factoring in risks. Consequently, there should be no sharing of green tags for this type of small commercial projects.

Staff repeated the above analysis for a 7KW system. In this case, the Energy Trust incentive for commercial projects is capped at \$15,000 in most cases and the BETC must be spread over five years. As the table below shows, in this case the Energy Trust share is 92% of the above market costs, without factoring in the risk of under performance.

<b>Component</b>	<b>Cost/Value</b>
Installed 7 KW System	\$45,252
NPV Energy (retail)	- 6,088
RETC	<u>- 22,932</u>
Above-Market Cost	16,232
ETO Funding (average)	- 15,000
Above Market share	
Unadjusted	92%

<sup>5</sup> The analysis assumed a discount rate of 10%, the low end of standard rates of return for business.

<sup>6</sup> Business customers can take advantage of a 10% federal tax credit, a 35% Oregon Business Energy Tax Credit and accelerated depreciation at the state and federal level. For projects below \$20,000 all of the BETC can be taken in the first year. The total is net of take-back effects at the federal tax level. Because of the alternative minimum tax, not all of the credits can be realized.

<sup>7</sup> The energy value was calculated for the average conditions in Oregon using the average residential retail rates for PGE and PacifiCorp (6.3 cents/kWh) in 2003. The analysis assumes this grows an inflation rate of 3%.

<sup>8</sup>

These analyses for small commercial projects indicate that the Energy Trust does not need to share tag ownership for projects 7 KW and below. For projects above this size, our funding is not likely to be as large of a share and individual calculations should be made.

Staff will be proposing changes in the Solar Electric Program to provide a standard offer for projects up to 25 KW. When this change is implemented, we would re-do the above analyses for this class of customer installing larger systems at that time