



CALCULATING THE IMPACT OF FEDERAL, STATE, AND UTILITY SOLAR WATER HEATING INCENTIVES USING THE RETSCREEN SOFTWARE: A Guide for Massachusetts Solar Water Heating Installers

**Prepared by
The Solar Boston Initiative
City of Boston**

**Prepared for
The National Grid RETScreen Solar Water Heating Software Training Program**

There are currently several different federal, state, and private sector incentives available to solar water heating projects. But what exactly are they? How do they interact? And how can you plug them into the RETScreen model? This memo provides answers to these questions and is intended as a supplement to RETScreen texts available at www.retscreen.net.

When entering different incentives into the RETScreen model, it is recommended that you keep track of them in the “Custom” spreadsheets on the RETScreen Tools tab. It is also recommended that all of these incentives be added together and entered into the “Incentives and Grants” cell in the RETScreen model. It is important to note, however, that the Incentives and Grants cell calculates the incentives as occurring in year zero. For incentives that occur after year zero, it is recommended that the Excel NPV function be used to calculate the value of the incentive in year zero. This will be explained in greater detail below.

National Grid Solar Water Heating Rebate

National Grid provides incentives for both non-residential and residential solar water heating systems to its gas customers.

Non-Residential Systems (e.g. Commercial and Industrial)

The National Grid solar water heating rebate is set at \$3.00 per therm, based on the system’s projected first year output. A therm is equal to 100,000 British thermal units, and there are 10 therms in an MMBTU (million British thermal units). Please contact National Grid at 1-800-843-3636 to apply for the solar water heating rebate. Rebates are available on a first-come, first-serve basis.

It is also possible for programs to pursue funding from National Grid under the Economic Redevelopment Program, under which projects are eligible for an incentive of \$8/therm,

based on the system's first year output. Unlike the standard rebate, projects must apply for the Economic Redevelopment Program. For more information about the Program, please contact National Grid at 1-800-843-3636

Residential Systems

Residential customers may be eligible for a rebate of 15% of the solar thermal project cost, with a maximum rebate of \$1,500. The installer must include a minimum 2 year installation warranty, along with additional manufacture requirements. For more information about the Program, please contact Brian Kearney 781-907-1599

How to Enter it into the RETScreen Custom Sheet

For the commercial systems, multiply the rebate amount by the RETScreen cell that includes the annual output figure to get the rebate value, and put that value in the "Incentives and Grants" cell.

Federal Tax Credits

In addition to the National Grid rebates, there are federal tax credits available for both residential and commercial & industrial (C&I) installations.

Commercial and Industrial

Under the current business energy tax credit, C&I facilities that install solar energy systems before December 31, 2008 will receive a tax credit equal to 30% of the installed cost of the solar water heating system. This tax credit can be carried forward for 20 years if the value of the credit exceeds the entity's tax liability. After December 31st, 2008, the tax credit reverts back to 10%, but discussions to extend the 30% credit are ongoing. There is no cap on the size of the tax credit that a for-profit entity can claim.

Residential

The residential solar energy tax credit is a 30% investment credit that can be claimed between January 1st, 2006 and December 31st, 2007, after which it will expire. The residential tax credit is capped at \$2,000 and can be carried forward to the succeeding year. For cooperatives or condominium buildings that invest in PV, the tax credit is divided proportionately among the shareholders or association members.

How to Enter it in RETScreen Custom Sheet

For the purposes of the training, the National Grid rebates are considered *non-taxable*¹. As a result, you must subtract the value of the rebate from the system's total cost before calculating the tax credit. In other words, if the system costs \$10,000, and the rebate is

¹ i.e. it is not taxed as income. It is important to determine if the rebate is taxable or non-taxable because this has implications for how tax incentives are calculated. According to the Lawrence Berkeley National Laboratory, rebates are non-taxable if it is considered a "utility energy conservation subsidy¹." For the purposes of the RETScreen training, we consider the rebates to therefore be non-taxable. That said, there is no clear guidance from the Internal Revenue Service as to whether PV and solar water heating rebates are taxable or non-taxable, and the authors of this report are not tax professionals. Please consult a tax professional to determine how to treat the rebate. A more detailed discussion of this issue can be found here:

<http://repositories.cdlib.org/cgi/viewcontent.cgi?article=4795&context=lbnl>

\$1,500, then the “tax credit basis,” or the amount that you can claim the tax credit for is \$8,500. If the rebate were *taxable*, then the tax credit basis would be the full system cost (but the rebate would be taxed by the federal government as income).

Since the tax credit occurs at the end of year one, you will need to discount it back to year zero using the net present value (NPV) function. In the Custom sheet type =NPV(discount rate, rebate cell), linking the formula to the “discount rate” cell in the RETScreen model. Add the resulting value to the Incentives and Grants cell.

Depreciation, aka the Modified Accelerated Cost-Recovery System (MACRS)
 C&I solar hot water heating systems also qualify for the Modified Accelerated Cost-Recovery System (MACRS), which outlines the schedule by which businesses can recover investments in solar equipment through depreciation deductions. Under MACRS, solar water heating systems are eligible for the depreciation schedule shown in the table below.

The business energy tax credit reduces the value that can be depreciated (i.e. the depreciable basis) by 50% of the tax credit amount. In other words, if the 30% tax credit is claimed, then only 85% of the PV system cost can be depreciated. Similarly, if the tax credit reverts back to 10%, the depreciable basis will be 95%. Since the rebate is non-taxable for the purposes of this training, you must first deduct the rebate amount to get the tax credit basis, then calculate the depreciable basis, and then calculate the value of the incentive.

How to Enter it in the RETScreen Custom Sheet

Set up depreciation table below in the custom sheet.

- Step 1: In the cell to the right of each MACRS percentage amount, multiply the percentage by the depreciable basis.
- Step 2: In the next cell to the right multiply the result of Step 1 by the income tax rate (e.g. 34%)
- Step 3, take the net present value of the depreciation schedule (=NPV(discount rate, Year 1, Year 2, Year 3, Year 4, Year 5, Year 6) and add the resulting value in the Incentives and Grants cell.

MACRS SCHEDULE AND CALCULATION GUIDE

Year	Percentage	Step 1	Step 2
1	20.00%	=20% * depreciable basis	=income tax rate * Step 1 result
2	32.00%	=32% * depreciable basis	=income tax rate * Step 1 result
3	19.20%	=19.2% * depreciable basis	=income tax rate * Step 1 result
4	11.52%	=11.52% * depreciable basis	=income tax rate * Step 1 result
5	11.52%	=11.52% * depreciable basis	=income tax rate * Step 1 result
6	5.76%	=5.76% * depreciable basis	=income tax rate * Step 1 result

State Tax Incentives

In addition to the federal state tax credits, there are tax incentives available to residential and C&I systems from the Commonwealth of Massachusetts.

Commercial

C&I customers can deduct the value of solar water heating system investments from their taxable income. The state corporate excise tax rate is 9.5%. Practically speaking, the excise tax deduction can be seen as a 9.5% investment tax credit. In other words, the value to the taxpayer is 9.5% of the solar water heating system's value. It should also be noted that the benefit provided by the state tax deduction is considered taxable income by the federal government and is subject to federal income tax.

Residential

Residential customers can claim a 15% credit -- up to \$1,000 -- against the state income tax for the installed cost of a solar water heating system installed on their primary residence. If the credit amount is greater than a resident's income tax liability, the excess credit amount may be carried forward for three years.

How to Enter it in RETScreen Custom Sheet

For the C&I incentive, multiply the total system cost by 9.5% and enter that value in the Incentives and Grants cell. For the residential incentive, multiply the system cost by 15%. It is currently unclear whether you must first subtract the National Grid incentive or not. Like the federal tax credits, the state tax credits occur in year 1, so you should calculate the NPV of the incentive before adding it to the Incentives and Grants cell.