

To whom it concerns:

I have an email that was sent to me below by Jack Ruderman. I want to voice my opinion on solar hot water rebates since I feel there are so many more efficient and energy saving things out there than solar hot water that you should consider putting rebates toward. Solar hot water systems make almost all of its hot water in the summer and that is not when you really need it. I think more emphasis should be put on solar PV since it has such a better payback and also a better impact on the environment by providing electricity and if you are tied to the grid it does not matter that you are making most of this in the summer... it can be stored as a credit and used in the winter.

I am very disappointed that when I installed my 4.3kw pole mounted system last fall I was told I did not make the cutoff on the \$6,000 rebate. I had intentions of putting it in for a year and my paperwork was filed with my solar installer well before the credit was gone (my paperwork was with them in May of 2010). Now others are holding it for themselves and they do not even have it installed yet where mine has been running for 9 months and has created 3000kw/hrs and also saved 47,000 pounds of CO₂. Rebates should be given to those that actually did spend the \$30,000 (like me) to install it and the ones that are actually reducing the impact on the environment and the money should not be saved for whoever signed up first but have no intention of putting it in right now for whatever the reason is that they have not installed it yet.

As for the solar hot water the money that is being given to that should be used to fund solar PV and geothermal in the state since all of those have a better payback and make more sense. Geothermal can provide you with as much hot water as solar and it is free with a geothermal installation. This is through the desuperheater and this is actually endorsed by the EPA as the most efficient heating, cooling and hot water system made. The whole geothermal system has only a 5 year payback and then saves 80% off annual fuel costs. That is way better than even solar PV, that has a payback of 15-20 years, even with the 30% tax credit.

And solar hot water has a crazy payback that makes no sense to why it is being funded so much; like 40-60 year payback! We have many customers that call our office, Ultra Geothermal, to talk about how upset they are with their solar hot water system not creating what they thought it would. The average solar hot water system is \$8,000 - \$10,000 and it only saves you about \$200 a year. That is a 50 year payback and then there is the state and federal credits that bring it down to about \$4,000 out of pocket but that is a 20 year payback still. The system is only expected to last for 25 years so why is the state putting in money to fund something that does not even have a net zero payback?? Why is everyone funding the item with the least payback and the least environmental concerns?? How about creating a geothermal rebate? That would help tremendously and would actually make an impact on what we need to be doing. Below is a layout of my house located in Strafford and it shows my paybacks and cost savings. Hopefully this can show you that there is a much better payback in other choices and funding should be going toward these items. Especially geothermal in retrofit applications because it is a large expense and hard for people to come up with the money. They do though and we do about 150 systems a year but it would help if the people that need to be able to switch out really old heating systems could have some assistance, even in a 1% interest loan or something. It is hard to get funding now and anything would help.

You can take a look at my calculations and see that geothermal has the best payback and it makes as much hot water for me as the solar hot water system. I have it paired with a Stiebel-Eltron air sourced hot water heater to make my COP of 6.8 on hot water, which is 3 times more efficient than a solar hot water system and it is a fraction of the cost. The total cost for my hot

water system was \$4,000 and it makes all of my hot water for free in my house! If you are interested in me giving a slide presentation to the state or anyone interested in learning about this so they may want to put funds in a better direction I would be more than happy to do so. I am an accredited geothermal designer, installer and loop designer. I also teach classes in this that are accredited to architects and contractors and I am the advisor to the UNH energy committee sharing all of these ideas with faculty and students. Please contact me if I can help explain further, thanks 603-380-6126. Melissa Aho

Here is my payback layout on my house at 36 Bernard Rd, Strafford NH:

My solar has a 25 year payback after the 30% tax credit that I received and my geothermal has a 3 year payback and this was with drilling 4 wells for the system. But it was new construction and needed a heating system already. At my new house my electric bill for the whole year so far (since January) has been a total of \$98.00. On average my bill is \$11-\$15 a month. My savings I figured at \$6,000 a year for a 5800sqft home will be \$180,000 savings over the next 30 years. Here is how I figured my solar payback at 25 years and this means that it only breaks even since it has a 25 year life expectancy. However, I think that electric rates will go up in the next 25 years also so the payback should be sooner. The way I look at it is even if it breaks even it sure beats getting power from a coal plant. Mine is from nature:

Cost of solar PV ground mounted system \$29,000 (see attached picture)

30% tax credit \$8700 = \$20,300

It is making about 5100kw per year. PSNH is 15.5 cents for each kw/hr and so this is \$790.50 savings per year.

$\$20,300 / \$790 = 25.7$ years for a payback.

My geothermal system cost \$65,000 and that is for all the interior work and also the 4 wells on the outside of the home. This is a vertical closed loop system. I received the 30% tax credit on this and so the out of pocket expense was \$45,500. For a high end propane furnace to handle the whole 5800sqft and also central A/C I would have spent \$30,000 to have that so the difference is about \$15,000. I would have spent about \$6,000 in propane a year and instead my geothermal is costing about \$1,600 a year for both heating and cooling. Our house is insulated to R-27 in the walls and R-60 in roof and it has a total thermal break around the whole house so it is very tightly insulated, in addition 3000sqft is completely below grade in a full basement that has radiant heat in the slab. If I saved \$5000 a year in fuel costs then my payback is 3 years. I have figured this on so many of my customers homes that I see it all the time and the geothermal payback is extremely fast. Solar has about a 20-25 year payback with the tax credit, when that is not there the payback is about 40 years. In most cases geothermal has a payback of 3-7 years with the tax credit and about 6-10 years without the credit. It is a much better payback on geothermal any day but I do also understand there is a big upfront cost which needs to be funded before the payback starts to come.

Please consider what I am saying since my voice is one of hundreds that contact my office every month asking if there are any geothermal rebates. This is the technology that needs funding! And it has a great recognizable payback and should be everyone's main focus.

Thank you,
Melissa Aho
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