Details of the Technical and Achievable Potential

MALE SPEAKER: Hi, and welcome to the fourth and final video in our series on the Energy Efficiency Opportunity Assessment tool. In this video we'll be going over the details for the technical and achievable potential calculations that are part of the energy efficiency potential path in the tool.

So, before we dive in, we'll just define each of those in real-world terms. So, the technical potential is the maximum theoretical potential if the entire market adopted the energy efficiency measures that you're looking at. Whereas the achievable potential is the potential that could actually be realized if you implemented, say, a utility demand-side management program to, you know, encourage the market to take up those measures.

So, let's dive into the calculations. So the technical potential starts with this E-factor, or the energy consumption for the relevant end use. And so, this is entered in the tool. We have your advanced inputs country input tab, where, for instance, for lighting, E would be the 508 for your total consumption multiplied by 34 percent for your end-use breakdown percentage. Then the end use is multiplied by this R-factor,

which is the relevant percentage of the end use. So, for instance, if we are doing a measure that just wanted to look at plug-in lighting, our advanced inputs program tab can specify the relevant percentage of our end use. And so, for instance, maybe we'd put, you know, 30 percent or 40 percent, whatever the percentage of lighting consumption that's from plug-in fixtures rather than permanent fixtures.

Then we need to apply a D-factor here, which is our distribution by model or efficiency levels. So, for instance, here, we're considering two water heating measures. And so, we need to distribute our baseline opportunity, since these are both looking at the same baseline. Otherwise you could simply add more and more measures and get a higher potential out of the same baseline opportunity, which would not be realistic.

We then can further reduce our relevant end use by this penetration by high efficiency measures factor, or H. And so, this accounts for, say, for instance with my lighting measure, if my baseline is incandescent, and my upgrade case is LED, well, I only want to consider the percentage of lighting that's from incandescents. And so, for instance, maybe 20 percent is from CFLs and LEDs and other already high efficiency measures.

We then can specify that so that we don't, you know, double-count any savings.

And then lastly, we multiply by our measure percentage savings, which is input on our advanced inputs EE measure database tab for each measure. And you can see, based on the measure name and the baseline, what your percentage savings are for each measure.

All right, so now onto the achievable potential, which is a little bit more of a daunting formula. But basically what it is, is two parts. We take our technical potential for that year and we multiply it by this payback-corrected participation S-curve. And so, although it looks like a big formula, we'll break it down into the simple parts. First, there's M, which is our maximum participation, which is equal to our maximum market penetration, which is entered for each program here on the advanced inputs program tab, multiplied by our payback acceptance, which is calculated for each measure based on the information entered for the payback acceptance rates under the advanced inputs country tab.

Then, F is our first-year participation, which is our payback acceptance times max market penetration, divided by our ramp up rate. So, you can see the only difference between these two is dividing by our ramp up rate, which is input here in our advanced inputs program tab.

And so, with our F and our M covered, the final remaining factor is this U, which is our ramp up shape. And so, U is part of the exponential which helps to determine how quickly we transition from our first-year participation to our maximum participation. And so, you can see that when your current year that you're looking at is equal to your start year, this is going to reduce, so that we get an M on the bottom here, and then we get the M's canceling out, and our first-year participation. However, when we then have a program year, say, like 20 years after we start, then this is going to reduce, so that we end up with an F on the bottom. And the F's cancel out and we get our maximum participation.

So, that is the achievable and technical potential formulas. Thank you for joining us for this video series. And I hope that these have been helpful in your usage of the tool.

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