

Foundations for empirical energy rebound estimates

I think this is the longest paper I've ever reviewed for The Energy Journal (and I've done a lot of reviewing). It's 72 pages, including the title/abstract page and some bits of unused blank space, but leaving out the 45 pages of appendices. The journal asks for papers to be 25-35 pages, or under 9,500 words – a word conversion of your main pdf says 19,000 excluding the references. Even after a bit of count-exaggeration on the equations, it's still very long, and I think longer than the topic deserves.

Underneath the length, there is a good paper – it sets out a comprehensive framework for calculating the rebound effect from energy efficiency improvements and applies it to two contrasting cases. I think this is useful, though I don't know how different the authors' numbers are from existing estimates – a table that gave other estimates of rebound effects for their chosen products would be very useful (and there's another exercise, which tries to work out what's actually driving differences – elasticity inputs / calculation methods / excluded effects etc., though that's likely something for another paper (or the book that this one is attempting to expand into)).

I suggest that the authors start by combining the paper and the appendices into an IAAE working paper, for which length limits are less of an issue. I'm fairly sure that if things were properly integrated, they wouldn't need 117 pages, since some of the material in the appendices is set-up that's already in the paper. Relevant chunks of the appendices might be moved into boxes within the main text, for example, and so that the "results-oriented" reader would just read that "the formula for this effect is $X+Y$ " and there's then a box which shows how to get to that formula for the "checker". (Or have the box first if that's more logical.) They could then produce a much shorter paper that is focused on applying the framework to their examples and contrasting their results with those of others, so that readers can decide "yes, this matters and we need to do it this way". The framework would be described and key formulae given, but readers would be referred to the working paper for many of the details. You'd also save space if there was a lot less scene-setting in terms of laying down frameworks and writing about the problems with others' frameworks (I have NOT written on the rebound effect myself, so am not an aggrieved person you mention!). Sensitivity tests are useful (particularly as I suspect the range of existing estimates from a common methodology is high), but think about which ones to display and how much to write about them.

Page 5 EEU is used for the first time without definition (the term has been mentioned in passing without the abbreviation)

2.1 – is this sub-section needed?

Page 6 – you say that it's important that rebound analysis covers everything – later on you should calculate how much it would matter in practice if something was left out of the examples, and you could pre-mention that result here – some things may be less important!

I'm sure 2.6 could be shorter

Page 14 – for a "theory of everything", assuming exogenous energy prices is a weakness, though I think an inevitable one (but then tone down the earlier claims?). I think footnote 8 ought to say that rebound due to energy price changes ought to be included in the macro effect – because here, it isn't. Even then, you'd actually have some mix of macro and micro changes – if the price per kWh falls, you then get another set of substitution and income effects from this, and where they

“ought” to be included is another debate?

Your notation isn’t particularly easy to follow – do you really need all the dots, for example? Capitals and lower case might be an alternative way if you really want to have different notation for stocks and flows. Later on, you assume that your readers will be as familiar as you have become with your tildes, bars and hats – I always find that a reader-unfriendly assumption. The sort of abbreviations you use in subscripts are much easier to keep track of.

Page 16 – I think I’d have dropped “final” from energy rather earlier...

Fig 2 (etc) I wonder whether your coloured lines from the star-point onwards should be diagonals between the coloured blobs, although I’d then have thin black lines that allowed readers to see the two components?

Given the length of the paper, why have this conceptual section, rather than saving space by introducing and explaining the diagrams once you have the results for your first case study?

When thinking about embodied energy rebound, do you have any discounting?

Figures 12-16 – it might be easier to tell apart some of these lines if you used different shaped blobs – I fear that the red, orange and purple and blue might be hard for some readers – and since memory says that the EJ print edition is in black and white, think about this for all your diagrams!

I really wonder whether all of section 4.3.5 is needed to tell us that an effect which is linear in an author-chosen (but literature-informed, of course) parameter is linear!

I wonder whether claim ii of 5.1 is a bit strong, given that arc elasticities might be used to calculate non-marginal impacts? I wrote that comment before reading the appendix (the journal didn’t help by not including it in the original email to referees), and I see that you point out that this could leave a difference of 5% – is that 5% of original consumption, 5% of the rebound (2% of consumption) or 5% of the substitution / income effect (1% of consumption)? How important are those differences, when energy prices can easily change 10% (or more) in a year?

On page 64, would you expect the other studies of rebound to have given the same 54% overall effect for both cars and lamps, which is what choosing different value of k to get there seems to imply? Was there no more information that would have differentiated between them?