



## Q&A External Report Launch Webinar EPRA|CRREM

09/25/2023

Q1: What about the Facilities Management / running of the building and third-party emissions?

A1: In our analysis, we considered stages A1 to A3 (cradle-to-gate) of the WLCA.

Q2: How are you managing the fall in energetic emissions factors over the coming 20 years?

A2: The decarbonization of the grid was taken into account by using the CRREM methodology.

Q3: How do the embodied carbon to operational savings ratios and payback periods take in the continued grid decarbonisation?

Q3: See A 2

Q 4: Can you detail the carbon counted in the "energetic retrofit embodied carbon" because 20-140 may be in fact very low depending on what you count or not?

A 4: The case studies we analyzed include typical energetic measures, such as insulation of the building, replacement of the windows, etc. For a more detailed overview of the measures, please look at the report **Table 6**

Q 5: What was the scope of your embodied carbon calculation? Which Modules (e.g. A1-A3) did you included?

A 5: Yes, the focus of our analysis was on the **A1 to A3** (cradle-to-gate) stages of the WLCA.

Q 6: How can fire hazards be avoided with wood-based insulations and other applications?

A 6: This was not part of our research. We want to encourage the use of low-carbon materials by market participants, as their use can minimize the embodied carbon of measures.

Q 7: In the case studies, what did you require for the operational energy and carbon emission of the assets after the retrofit: net zero in operation, net zero ready, etc.?

A 7: In terms of asset performance standards, we did not impose any requirements (net zero ready, etc.) We have a broad mix of assets with different levels of consumption before and after the measure. The average savings achieved are shown in **Table 7** of the report.

Q 8: Is there a standardized process for normalizing (weather, occupancy, etc.) pre/post retrofit operational energy use/emissions?

A 8: The factor weather was not included in the analysis because the carbon payback period in all case studies was less than 10 years, and the impact is very small. Occupancy, which would of course make a significant difference in consumption, was considered as part of the data collection.

Q 9: Does 'energetic' retrofit mean a retrofit solely focussed on reducing carbon emissions, in comparison to a normal retrofit which would be focussed on improved earnings?

A 9: From our perspective, the case studies we evaluated focused on reducing emissions. Whether and to what extent higher earnings were generated after the measure is beyond the scope of the study.

Q 10: The superiority of using consumption data to evaluate operational carbon impact of renovation projects ex post is clear, but does the report give guidance on best practice methodologies companies can use to estimate operational carbon of various designs of renovation measures to then estimate carbon payback? Or is this deferred to existing methodologies/software? This is critical for the decision making processes of companies and would be very helpful.

A 10: In the report, we provided an overview of the data that needs to be tracked around an energetic measure in order to calculate the amount of embodied carbon and the carbon payback in years (see **Figure 7** and **Appendix p. 59**).

Q 11: Which accounting methodology and standard did you use to quantify the carbon sequestration of biobased materials?

A 11: The case studies in our research were all carried out with conventional materials. We recommend to use low-carbon materials for future measures.

Q 12: What about the decarbonisation of construction materials along with industry processes being progressively less carbon-intensive?

A 12: This is a process we are aware of and support. By decarbonizing the materials with the same potential for savings, the carbon payback time would be significantly shorter.

Q 13: Seeing the results, I would recommend to implement the effects of optimising the technical equipment (f. e. on BMS), Our experience is, that the costs are lower and the payback is much higher than on the retrofits shown in your presentation. This approach would perfectly fit for the building age between 10-25 years. Do you consider adding this into your paper?

A 13: This is a very good and important advice! We have listed this measure as a smart solution/low hanging fruit and recommend it to every market participant (see **Table 6** → Tips for optimization).

Q 14: How /when will embodied carbon be included in SBTi calculations?

A 14: Will be included asap as far as we know. Since SBTi is working with Ramboll on this for some time. See current consultation. Targets for retrofits however are not planned (yet). Just new construction.

Q 15: Do you take into account in the dynamic target curve when, after 40 years of use, the biobased materials are deconstructed and the stored emissions are released? Thank you very much for the interesting presentation. Do you have any recommendations for a data basis to be used so that the results are consistent and meet the requirements for the target paths according to CRREM? E.g. how to proceed with the different data bases in the Ökobaudat according to DIN 15804 +A1 or DIN 15804 +A2.

A: 15 The case studies we analyzed were performed with conventional materials only. For this reason, we did not take into account the release of embodied carbon caused by deconstruction. As a data basis, we can suggest those listed in **Table 3**.

Q 16: Well in the NLs these kind of calculations are already embedded in the building regulations for many years. Database is also in place for many years. Please refer to <https://milieudatabase.nl/nl/>. Unfortunately the effect of these calculations can be questioned.

A 16: We have listed this database in **Table 3**.

Q 17: The embodied carbon values you show for new buildings are tricky since in France the regulation obliges us to take into account all the elements which is not the case for other European countries. You could please explain where you get the average of 600-700 kg CO<sub>2</sub>eq/m<sup>2</sup>? Thank you

A 17: The value of 600 - 700 kg CO<sub>2</sub>e/m<sup>2</sup> refers to the value estimated by Ramboll who focus on new construction. It is an average value that does not explicitly refer to a country.

Q 18: To meet the green taxonomy, 30% energy saving is needed. Do you consider the embodied carbon portion should be accounted for or maybe used to make up the total carbon reduction if 30% energy saving can't be met?

A 18: That is a good suggestions – definitely worth exploring to not just focus on purely operational gains but also factor in the embodied carbon part. But for now out of the scope of the commission as far as we know.

Q 19: Thank you for the presentation. Did you look at all into the embodied carbon of adding a rooftop solar system?

A: 19: Yes, we have also analyzed this in the case studies of assets where such measures have been implemented. An example value from the German database “Ökobaudat” is shown in **Table 4**. Furthermore, databases such as EC3 show a embodied value per m<sup>2</sup> for the installation of a solar system (<https://buildingtransparency.org/ec3/epds/ec3k79yf>) .

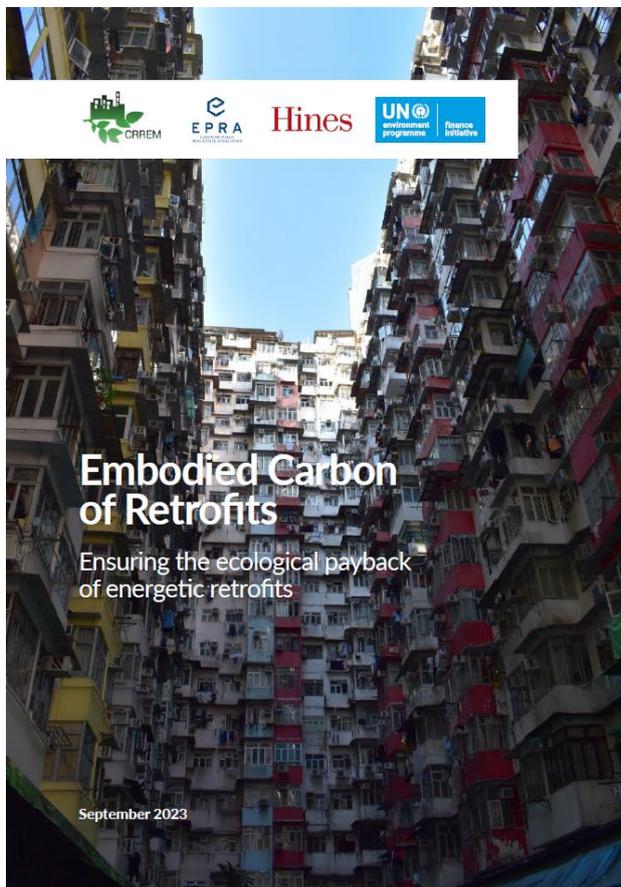
Q 20: When using wood for the retrofits: Aren't the Forestry industry already show those negative figures on their CO<sub>2</sub> balance sheets. When showing it on retrofits again, it would be counted double?

A 20: Since it is Scope 3 it would not be double. Indeed if credits from the forestry industry are to be sold elsewhere one needs to make sure we do not end up supporting greenwashing.

Q 21: In terms of metrics, rather than primarily talk in terms of payback, would it be preferable to use a metric that makes a comparisons over a standard timeframe, e.g. carbon cost/saving over 10 year/20 years/to 2050 timeframe, to decide whether it is preferable to progress works or consider different options. This would encourage retrofits that make larger savings as well as considering the payback (especially when the payback is similar as per the presented examples)

A 21: In our point of view, the KPI Carbon Payback Period in years is a very good indicator to determine if the measure pays off under environmental considerations.

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