Assessment group presentation #3: instructions

In this group presentation, you are the design consultants on a construction project. You will present to the project client, and describe your proposals for how sustainability strategies at the cement/concrete/structure scale can be applied to the construction project.

Crucially, this goes beyond the previous two assessments as you are expected to make semi-quantitative estimates, to give numbers to support your proposals. You are expected to search in the literature to present information that goes beyond what is included in the lectures.

The concrete product, construction application and location assigned to each group are:

- **Group #1** – Concrete blocks in a house (Accra, Ghana)
- **Group #2** – Precast concrete in a tunnel lining (Istanbul, Turkey)
- **Group #3** – UHPFRC concrete in a bridge deck (Montreux, Switzerland)
- **Group #4** – In-situ reinforced concrete in a multi-story building (Bangkok, Thailand)

Objectives

- **Describe** the three sustainability strategies (one each for the cement/concrete/structure scale) that you have chosen for your project.
- **Explain** the scientific rationale for why you think each of the three sustainability strategies could effectively reduce the embodied carbon of the structure.
- **Assess** (semi-quantitatively) the effect of the three strategies **individually**, describing: any change in material quantities used to build the structure; the effect on the embodied carbon of the whole structure; the effect on the cost of the whole structure.
- **Assess** (semi-quantitatively) the effect of all three strategies if used **in combination**, comparing: any change in material quantities used to build the structure; the effect on the embodied carbon of the whole structure; the effect on the cost of the whole structure.

Competencies to be assessed

- Understanding of the principles of key sustainability strategies for cementitious materials.
- Application of the principles of key sustainability strategies to a specific construction project.
- Identification of required LCA/LCC input data from a range of sources.
- Estimation of quantities, embodied carbon and cost for situations with a high degree of uncertainty.
- Evaluation of strategies across environmental and cost metrics.

Presentation outline

- The general **outline/format** for your presentation should be follow the order below, and answer the listed questions/points:

1. **What are the technical requirements for your structure? (BRIEF recap of presentation 1)**

2. **What are your three chosen sustainability strategies, and how do they work?**

3. **What are the effects of each individual (cement/concrete/structure scale) strategy, in terms of…**

- Material quantities?
- Embodied carbon?
- Cost?

4. **What are the effects of combining the three strategies, in terms of…**

- Material quantities?
- Embodied carbon?
- Cost?

5. **What is your recommendation to the client for which strategy/strategies to use?**

Instructions and guidelines

- **Time limit** = 15 minutes (+questions)
- The presentation time should be shared approximately equally between the group members. (This should not include the general introduction and thank you for listening slides, and these don't have any scientific content)
- We expect some **basic 'good habits'** in your presentation – these are:
    - Include slide numbers
    - Ensure that any text on your slides is visible from the back of the lecture theatre (a general rule is minimum font size of 12)
    - We encourage you to use figures and diagrams to help explain your points. These can be from articles in the literature, or you can make your own diagrams too.
    - Include appropriate references for any content included in the presentation that is not your own. This includes, figures, images and quotes.
    - Only cite research articles, or textbooks (unless there is a special reason).
    - Do not cite the lecture slides – find your own sources of information to cite.
- You are encouraged to make up a company name and logo for your presentation – not essential, but it can be fun!

- There are no 'right answers' for this presentation – we are assessing your skill in applying key sustainability principles, finding information, estimating quantities, and evaluating your findings.
- Without going into too much detail in your slides, describe your estimation approach clearly. E.g….
    - What assumptions have you made, and why?
    - How have you accounted for uncertainties?
    - Where did you source your input data from, and why?