Homes of the Future: How Global Housing Shapes Tomorrow's Material Demand

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Project description

Homes around the world differ widely: from timber houses in Northern Europe to concrete apartments in Asian megacities, from compact city flats to large suburban dwellings. These differences strongly influence material needs and therefore their environmental impacts.
However, our dynamic material flow model **IMAGE-Materials**, has a major limitation: we assume the same share of housing and construction types for every region (26 world regions). This limits our ability to capture real-world diversity and explore how **different housing futures**, such as shifts toward wood construction, or shift to more apartment buildings, **affect material demand**.

This project works to improve the buildings module in IMAGE-Materials by collecting data to have a more realistic global representation of housing characteristics.

You will gather and structure data on buildings for all regions represented in IMAGE:

- Building types: for example share of high-rise or detached houses
- Construction types: for example share of concrete or timber structure
- Implement the data into the python IMAGE-Materials model and analyze the effects

As part of this project, you will gain insight into one of the world's leading integrated assessment models, IMAGE, developed by PBL (Netherlands Environmental Assessment Agency) and UU. You will join an active interdisciplinary team, collaborate with researchers working on global sustainability pathways, and contribute to improving an international research tool. There is also potential for this work to contribute to a scientific publication.
We are an active and close-knit team that values collaborative approaches, new ideas and teamwork. Reach out to us if you have any questions! We look forward to your application.

Job requirements

We are looking for a motivated student with an interest in global housing systems and sustainability. It is helpful if you have:

- Experience with Python
- Motivation to explore diverse data sources and think independently
- Willingness to learn and work with the IMAGE materials model (Python-based)
- Good to have, but not required: experience with material flow analysis