



Technical Report

Best Practice Policies for Low Carbon & Energy Buildings, Based on Scenario Analysis

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The question seems simple enough: with best-practice policies, what is the global potential for energy-related GHG emission mitigation in buildings by 2020, 2030 and 2050? The answer is far from simple. But this report offers new analysis that provides a strong foundation for policymaking to build upon. Rather than a forecast, it delivers insights on how savings potential can be best captured.

The analysis focuses on China, the EU, India and the USA – regions that were responsible for 60% of buildings energy use in 2005 and where much of the future global growth will occur. Using a purpose-built model, three scenarios have been developed:

- The deep efficiency scenario incorporating today's state-of-the-art know-how and technologies (i.e. best practice);
- The frozen efficiency scenario which is the reference scenario based on no new policy or market developments; and
- The moderate efficiency scenario that illustrates the development of energy use under recent policy trends.

The report presents a detailed discussion of the model and the input data that makes a solid foundation for future analysis. The results vary considerably because all four regions are at different stages of policy development in the sector and socio-economic factors are significantly different.

Some of the key results are:

- Depending on the scenario, final energy use can increase 111% or can decrease by one-third in 2050, even with an increase in floor area of 127%;
- This confirms that a low energy pathway is feasible for thermal building energy uses;
- The less ambitious moderate scenario would see energy use increase by 46% in the four regions. This can lead to lock-in of benefits (i.e. missed opportunities) for considerable period;
- There are significantly larger opportunities for reducing energy use for heating/cooling than for other end-uses;
- Policies based on holistic/systemic approaches in buildings are likely to have more impact;
- Research demonstrates crucial importance of immediate action and the high cost of delay; and
- Single-family houses offer the greatest opportunities for emission reduction

There are some important regional messages:

- Increased energy efficiency offers large opportunities to reduce absolute thermal energy use in the EU and USA, with reduction potentials in the range of 60%;
- After an initial period of growth, it is feasible to slightly reduce energy use in China (-1%) through an ambitious approach; and

- For India, keeping thermal energy use growth under 200% from 2005 levels by 2050 will be significant achievement. The commercial and public sectors are rapidly expanding and there is to be a fivefold growth in total floor area by 2050.

The scenario analysis shows clearly what a long-term ambitious energy performance in buildings policy can achieve in all regions. There are many obstacles and constraints, but the analysis shows it is feasible. It is this type of analysis, together with the analytical tools presented here that will improve the policymaking process.