



Global human well-being possible at low levels of energy and carbon

High levels of energy consumption and carbon emissions are not necessary for high standards of living, according to a new study. In recent decades, the same human needs have been met with ever decreasing energy and carbon levels, achieving a steady decoupling of human development from energy use and carbon emissions.

Economic growth, based on increased production and consumption, has traditionally been seen as the driver for human development. An alternative view suggests social progress is better measured directly by improvements in human well-being. Given the impacts of carbon emissions on climate change due to fossil fuels being used for energy, the challenge is to determine whether human well-being can be sustained at the same level under reduced energy and carbon levels. In this study, the changing relationship between energy consumption, carbon emissions and living standards was examined over the period 1975-2005 for countries that account for 81-91 per cent of the global population.

Human well-being was measured by life expectancy, literacy and income (the three indicators that make up the United Nations' Human Development Index) and the Human Development Index itself. The research produced results on the minimum carbon and energy thresholds necessary to achieve a certain standard of average global human development for each time period in the study.

The study found that high levels of energy and carbon emissions are not required for high human development. Extra energy and carbon above the minimum thresholds do not inevitably lead to higher living standards. In fact, human well-being is steadily becoming decoupled from energy and carbon emissions, and being achieved at ever lower energy and carbon levels.

Individual development trajectories varied largely between countries. Most countries experienced simultaneous growth in human well-being, energy and carbon. For example, Spain, Japan and the United States all achieved increases in their already high levels of human well-being, but at vastly different levels of energy and carbon, with Japan below half and Spain below a third the values of the United States. However, over the time period studied, Spain and Japan significantly increased their energy and carbon emissions, while the United States remained relatively stable.

For developing countries, large human well-being increases occurred in India and China with corresponding growth in carbon and energy levels, while Costa Rica raised its living standards to attain a high level of human well-being at an impressively low level of energy and carbon. This implies there is a diversity of development and growth pathways: by learning from examples like Costa Rica's, countries can achieve living standards at little energy and carbon costs.

The study suggests that, although carbon and energy thresholds necessary for development are falling, developed countries need to substantially reduce high energy and carbon costs associated with the pursuit of a growth-driven economy. The researchers suggest this is possible without sacrificing human well-being.

It is estimated that the current amount of energy consumed globally is more than enough to achieve high human well-being for everyone, provided resources are evenly shared. Under this scenario, developing countries could catch up and achieve higher living standards with only small increases in energy and carbon costs. In addition, projections of the observed trends to 2030 suggest that global energy and carbon levels corresponding to universal high human development continue to decline even though population is increasing, implying that the energy and carbon efficiency increases in human well-being are growing at a faster rate than population growth.

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