POLICY DEBATE

Rejoinder: Creating the future we want

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We thank John Stutz for his review and comments on our article. He raises a number of salient points to which we would like to respond.

1. **Scientific uncertainties about the impacts of industrial emissions.** We agree that the analysis of “safe operating limits for humanity” by Rockström et al. (2009) is a useful summary of global stressors and that the uncertainties surrounding chemical pollution are daunting. Both regulators and the chemical industry are grappling with the challenge of characterizing the health and environmental effects of thousands of chemicals, with new molecules constantly being developed. As we mentioned, one promising development is the adoption of green chemistry principles to formulate more benign substances, for which the Environmental Protection Agency (EPA) and others are pursuing important developments in computational toxicology (CompTox). Traditional testing for chemical toxicity is expensive and time consuming and requires extensive animal experimentation. CompTox conducts innovative research that integrates advances in molecular biology, chemistry, and computer science to more effectively and efficiently rank chemicals based on risk. The outcome from this research is rapid chemical-screening data (ToxCast™) and decision-support tools to limit potential risks to humans and the environment.

2. **Scaling up of new technologies and practices.** Dr. Stutz correctly points out the potential difficulty in scaling up sustainable innovations, a process that has historically often been slow and disappointing. However, history need not repeat itself. We argue that global collaboration is necessary to create the market signals and framework conditions that will encourage rapid adoption of new technologies and practices. For example, reducing subsidies for traditional fuels and introducing financial incentives for capital investment and technology conversion would accelerate a shift toward renewable, low-carbon energy sources.

3. **Importance of encouraging sustainable consumption.** Dr. Stutz makes the important point that consumer behavior will be an essential driver of a green economy. Indeed, we believe that public understanding and support are needed to enable the profound changes that we envision, and that consumer awareness is essential for “greener” purchase decisions, especially when extra costs are incurred. We put a stronger emphasis on business and government collaboration to activate sustainable consumption on a large scale. Areas for collaboration include lifecycle-assessment tools to understand the full impacts of alternative designs and communication tools to inform consumer behavior. Such collaborative initiatives are already under way, including the Sustainability Consortium initiated by Walmart, the Keystone Center’s Green Products Roundtable, and the activities of the General Services Administration (GSA).1

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4. **Negative linkages between economic growth and sustainability.** As indicated in the beginning of our article, we are acutely aware that economic growth can contribute to environmental degradation if not addressed in a sustainable manner. Our main goal is to outline a strategy for breaking this pattern. As we stated, one of the grand challenges of our time is decoupling economic growth from negative environmental and social impacts. This is why we endorse the idea of going beyond the use of gross domestic product (GDP) as a measure of progress. However, as Dr. Stutz suggests, one should not ignore the potential for continued negative consequences; for example, in many nations economic growth has exacerbated income gaps. We argue for a comprehensive systems approach that fully accounts for both positive and negative feedback loops and avoids oversimplified policy initiatives.

5. **Role of the business community.** While Dr. Stutz recognizes the importance of collaboration between business and government, his analysis highlights the roles of nongovernmental organizations (NGOs), civil society, and consumers. While our article emphasizes business-government collaboration, we fully accept the roles of all stakeholder groups, which are especially vital in areas such as human health and social and environmental justice.

6. **Economic growth vs. limited growth.** Dr. Stutz suggests a “fundamental divide” between those who stress economic growth as a part of the transition to sustainability and those who focus on limiting growth. We maintain that economic growth with a reduced footprint on the environment is essential. Economic development will continue to be a central goal for human communities around the world. Decoupling is admittedly difficult, because of the “rebound effect,” i.e., the stimulation by increased efficiency of increased resource consumption. There will certainly be factors that limit economic growth, primarily resource scarcity. The overarching challenge is to achieve a resilient and sustainable pattern of growth that avoids painful economic shocks and disruptive conflicts over resources. That is the future that we want.

Our motivation for writing this paper was the convergence of government, business, and NGOs in Rio de Janeiro in June 2012. We surveyed the sustainability landscape from our diverse perspectives. In many arenas, we see disturbing trends that could impede economic prosperity, social well-being, and environmental protection. All of us feel strongly that global leadership, collaboration, and education are needed to address these threats and firmly believe that humanity has the capacity to overcome them by taking swift and decisive actions. Our optimism is tempered with realism, but we are encouraged by the apparent emergence of a global consensus on the urgency of the situation.

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**References**