

## In Praise of Petroleum?

**A**mong other difficulties,\* the 2002 World Summit on Sustainable Development (Rio+10) struggled with defining “sustainability.” Typical of efforts to make concrete this slippery concept was a preparatory paper addressing one of the most pressing issues in human development: how to bring modern energy services to the one-third of humanity whose development and survival requirements suffer from the lack of them.† These 2 billion people have little access to electricity and depend for cooking and heating on local biomass in the form of wood, crop residues, and dung. In common with other such analyses, the premise of this paper was that, for the poor as for everyone else, only renewable energy sources qualify as sustainable. After all, fossil fuels are in principle limited, and the fossil carbon they contain is a threat when released. Nevertheless, there are questionable assumptions behind the premise that fossil fuels are unsustainable for the rural poor:

1) That the major alternative—local use of biomass fuel—is, by comparison, sustainable. In many cases, however, it contributes to local depletion of biomass resources, including forests; produces serious health impacts in the local population because of its high emissions of pollutants; and even when renewably harvested, is not greenhouse-neutral because the poor combustion in simple stoves releases non-CO<sub>2</sub> greenhouse pollutants such as methane and dark particles.

2) That provision of household fuel to the world’s poor would appreciably add to the environmental burden of fossil fuels. Even if all 2 billion people shifted to liquefied petroleum gas (LPG) for household fuel, it would add less than 2% to global greenhouse gas (GHG) emissions from fossil fuels. In terms of human health, a shift to LPG would actually result in a net reduction of human exposures to air pollution that would be substantially larger than today’s total exposure from all fossil fuel emissions.

3) That, being nonrenewable, petroleum cannot be relied on to serve household needs in the future. Petroleum resources, however, are more than sufficient to supply all conceivable household needs far into the future. It is demand from other sectors that depletes supplies, stresses the balance of payments, and threatens international security.

4) That available means to supply high-quality renewable energy services for cooking and heating will be affordable, reliable, and suitable for the rural poor. True sustainability needs to consider these factors as well. Unfortunately, few of the available renewable technologies to replace household fuels with high-quality substitutes meet these requirements today.

Does it make sense to ask the poor to take on novel devices and fuels that have never been tried elsewhere, because otherwise we may add a bit to GHG emissions or shorten the petroleum era by a few weeks? Shouldn’t it be those that produce the most GHG and have the resources and technology to do something about it who shoulder the burden of testing and using new low-GHG high-efficiency technologies? To illustrate, efficiency increases in the world automobile fleet of just 0.5% per year (5.1% over 10 years, which is not much more than 1 mile per gallon) would free up annually sufficient fuel energy for the cooking needs of all 2 billion people well before the year of the next Earth Summit (Rio+20). If continued, by Rio+30, a 10-year household fuel reserve could also be put aside for these people. Put another way, no matter how the rural poor do their cooking, the GHG production and petroleum demand battles that count will be fought in Detroit, Yokohama, and Stuttgart (as well as Shanghai, São Paulo, and Mumbai).

What possible better use for high-efficiency clean-burning fossil fuels such as LPG than providing high-quality energy services for poor households? There remain serious cost constraints and implications for local employment, of course, but there are no realistic resource or greenhouse constraints to keep us from targeting the needs of the poorest with LPG in places where renewable technologies are not yet appropriate or sustainable. In addition, there are clear health benefits of doing so. The World Health Organization (WHO), for example, has recently estimated that some 1.6 million premature deaths each year come from the use of solid fuels (biomass and coal) in poor households.‡ Rather than excluding petroleum, some of this one-time gift from nature ought actually to be reserved to help fulfill our obligation to bring the health and welfare of all people to a reasonable level: an essential goal of sustainable development, no matter how defined.

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\* *Science* **297**, 1785 (2002). † Greenpeace/The Body Shop, *Power to Tackle Poverty: Getting Renewable Energy to the World’s Poor* (IT Power, London, 2001). ‡ WHO, *World Health Report: Reducing Risks, Promoting Healthy Life* (WHO, Geneva, Switzerland, 2002).