

Session 17: Social Development and Sustainability Aspects

Hoffert et al. (1998): Energy Implications of Future Stabilization of Atmosphere CO₂ Content

- Can you estimate the future trend of carbon emission using the Kaya identity of energy production below, in conjunction with projections of future growth in population, GDP per capita, energy intensity, and carbon intensity?

$$\dot{M}_c \equiv N(\text{GDP}/N)(\dot{E}/\text{GDP})(C/E)$$

(Carbon emission = population*per capita GDP*energy intensity*carbon intensity)

- According to the equation above, why do the authors advocate for improving energy supply in addition to reducing demand?

Pachauri and Spreng (2003) Energy Use and Energy Access in Relation to Poverty

- Use an example to explain and distinguish the following concepts: “*primary energy*”, “*end-use energy*”, “*useful energy*”, and “*energy service*”.

Content removed due to copyright restrictions. To view the table please go to page 4 of: "[Energy Use and Energy Access in Relation to Poverty](#)" by Shonali Pachauri and Daniel Spreng.

- Look at the table above. Pick a few energy services of interest to you and discuss how different household needs create demand for different amounts of energy and how energy efficiency of different sources varies.
- Why do the authors suggest subsidizing energy infrastructure expansion to poor areas rather than the energy use itself?

Sagar (2005): Alleviating Energy Poverty for the World's Poor

- The author tries to make a connection between environment conservation and poverty alleviation. What is the connection? Why does the author think the international community has ignored this connection?
- What is the “energy-poverty alleviation” fund proposed by the author? What impact does an energy levy have on both consumers and the suppliers? What about the impact on the other parts of the international economy? Do you agree with Sagar’s approach?

In general

- With all the readings on energy we have covered so far, do they give you some ideas of how to design an integrated energy policy that balances (1) the need of the poor versus the wealthy, (2) the supply side versus the demand side of energy, and (3) the environment concerns and the development concerns?

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