

Global Perspectives workshop – Energy Systems, fall 2004 week 7 (Mon.8.Nov.) EJZ

Name: _____ Nation or Region:(A, B, or C) _____
Teammates:

Last weekend you read Ch.5 of Introduction to Energy (Cassedy and Grossman), Global Perspectives, which discusses energy needs, resources, and costs for lesser-developed-countries (LDCs) and the rest of the world. This workshop structures activities that are designed to deepen your engagement with and understanding of this material. **Learning goals** in our workshop include:

- Analyzing energy needs, resources, and costs for LDCs, qualitatively and quantitatively
- Articulating your analysis strategies, assumptions, and limitations
- Discussing specific needs, options, and consequences
- Synthesizing your learning in a brief team report

Use your notebook, as this short handout does not have enough room for all your work.

Overview of activities: For most of this activity, we will have two teams analyzing each of three nations or regions in Table 5.5 p.110 (for a total of six teams): **A:** India (and Indonesia), **B:** China, and **C:** Latin America. Which countries in Table 5.1 p.100 fit for each region? Since not all Latin American countries are listed in Tab.5.1, can you approximate C by doubling Bolivia + Brazil + Mexico? Is there enough comparable data available in the relevant tables to analyze Africa (**D**)?

0. Choose your team and your nation (or region). Discuss roles of team members. Recorder?
1. Compare each nation's wealth to their energy consumption. Calculate the growth of both wealth and consumption. Discuss results.
2. Discuss a series of questions about the needs, resources, and costs for each nation.
3. Compare your results with those of the other team analyzing your nation (tomorrow?).
4. Present a brief team report synthesizing your analyses, discussions, and results. Let's choose: a 10-minute oral presentation Tuesday, or a 1-page written report due Wednesday on WebX.

Activity 1: Analyze **Table 5.1** p.100 (approximately 1 hour)

(a) **Scan** the table. Do you see any patterns **relating the wealth** of a nation (in terms of its GNP per capita) **to the energy use** (per capita) of nations?

Do you see any **patterns relating the growth rate** of wealth with the growth rate of energy use?

(b) Next focus on your nation or region (A, B, or C). First, compare the wealth to the energy consumption. Make a reasonable assumption for the price of oil, and calculate **what percent of the country's wealth was spent on energy in 1982**. (Hint: 1 kg of water = 1 liter ~ 1/4 gallon).

(c) By considering growth rates, we can **estimate this cost for 2004**. First discuss how you can calculate the GNP per capita in 2004 (G_{2004}) if you know the GNP in 1992 (G_0) and the growth rate from 1980-1992 ($\Delta G/G$). Hint: Assume a constant growth rate, as a first approximation. How many years does the given growth rate span? ____ How many years have passed since then? ____ Write down an equation to find G_{2004} , if you know G_0 and ($\Delta G/G$). (Hint – it is very simple.)

$G_{2004} =$

(d) Use your equation and the data in Table 5.1 to **estimate the wealth of your nation in 2004**.

(e) Next, **find the energy consumption per capita (E_{2004})** if you know E_0 and $\Delta E/E$.

Hint: Your equation will have the same form as the one you developed for G.

(f) We have neglected population growth in this analysis. Is that legitimate? Why or why not?

What other assumptions have you made in your analysis? How reasonable are they?

(g) **Compare your results** with the other team analyzing your nation. Then discuss results with the whole class; take a break; and spent the next hour on the rest of this workshop.

Activity 2: Spend 10-15 minutes discussing each question below, and articulating a response with your team. *These questions are purposely open-ended.* It is up to your group to decide how they can **best** be addressed with limited data in limited time. While you have considerable data in our texts, you will often find the information insufficient to directly answer your questions. Discuss your strategies for making analyses with incomplete data, and your options for finding more complete data. Then do your best with the data at hand. Be as **specific** as possible, and support arguments with **evidence** from your texts (including page numbers).

A. What do LDCs require for a reasonable quality of life? Education for all citizens or only urban citizens? Guaranteed health care, or only for the poorest children, or only for those who can pay? Adequate protein and shelter? Transportation? Other?

B. Considering the requirements you agreed on in A, estimate the energy needs for your nation, based on your diverse reading so far this quarter. What strategies can you use to ESTIMATE needs? What assumptions do you make?

C. Based on your readings this quarter and the resources in our Energy text, what forms of energy are available to meet the needs you estimated in B? Is there enough? Of what types of energy? Under what circumstances?

D. How can your nation acquire the energy resources and technologies needed for growth (of population, and/or of quality of life)? How do they exploit what resources they do have? What policies should and can they adopt to achieve economic development? (Energy, 99).

E. What are the consequences of failure? (What forms could failure take?)

F. What is the role of rich nations in helping poor nations? In what ways do practical concerns mesh or conflict with peace and justice concerns? Compare lifeboat ethics to spaceship ethics (p.126-128)

G. Can there be improvements in all of the world's living standards without increasing pollution, population pressure, and resource depletion? (p.129)

H. If not (G), then would resource and technology transfers from rich to poor nations raise world living standards at the expense of the world itself, and pay off for no on in the long term? (p.130)