

## OVERVIEW OF MEETING

**Vito Comar, Charles Hall and José Tomaz V. Pereira**

*The research group “Advances in Energy Studies” during the meeting in Campinas exchanged results of studies on Energy-Ecology-Society and took notice of the South’s point of view about the destructive impacts of “globalization”. It became aware of the need to change the current model of development. This important issue underlay many of the presentations made. The following general observations reflect our synthesis of the perceptions of the participants*

### General Observations

I - There were four different groups with different basic perspectives or interests:

- 1) **The Growth Limits Group:** “*we are about to go over the cliff and civilization better get knowledge of that*”, this was so for many of the speakers the message to be given. This group identifies with the Pulse Paradigm and considers that public policy should consider the beginning of a decline stage after the use of huge stocks of accumulated biomass and biodiversity and atmosphere quality destruction.
- 2) **The Technical Group:** which included people discussing methodologies of energy accounting and also people interested in how one would evaluate productivities in agricultural and agro-ecological systems.
- 3) **The Social Concerns Group:** this is a welcome addition, being better represented than at previous Workshops, both within the presentations and with many people from the audience, including especially younger people. Their proposal is *to include the excluded* and to incorporate the political issues in the energy debate.
- 4) **The Unlimited Growth Group:** researchers with radical perspectives, who believed that for the foreseeable future there is an almost unlimited quantity available of fossil fuels of exploitable quality, although with large environmental impacts. This position was not present at this meeting.

II. The discussion to understand the end of cheap oil has to be increased. There is an over emphasis on supply issues and it is missing the critical issues of managing demand. An important component of this debate is the quality of petroleum relative to the quality of alternatives – petroleum has, at least in the old days, an extremely high energy return for small energy invested, a relatively low local environmental impact, very high transportability, allowing dispersed economic activity and high utility stocks. The energy return on investment for many of the alternative fuels suggested at this and other workshops seemed to be very low (e.g. around an **order of magnitude less**, compared to the 50/1 from petroleum). Can we run anything like our contemporary civilization with the present number of people and affluence on such low energy returns?

III. Have we sufficiently quantified the degree to which we are living or could live on stocks versus flows. Probably, the present population cannot be supported on flow energies, thus how fast should we use up stocks? It has to be considered that this energy demand varies a lot between the different development models of social organizations.

IV. Systems efficiency has two points of view: the closed system approach and the complex systems perspective. The engineers have improved the closed system efficiency over time, so that e.g. photovoltaic cells are likely to be substantial net energy gainers by now. The other side of the coin is that efficiency by itself does not necessarily save energy at a broad

scope, due to operation of Jevon's Paradox. This fact has to be discussed more carefully in future workshops.

V. Globalization is a much bigger issue in this meeting than in previous ones, which has to do with both the spread of globalization and its direct impact in Latin America. A number of presentations lead one to the conclusion that globalization means a loss of local control, leading to a greater instability in planning economies, agriculture, energy futures, environment, etc. Also, we didn't particularly address what might be a main conclusion that, although it is not quite clear whether free markets produce a net economic gain or loss for a country, it does seem clear that the losers were the poor and the winners were the rich. This is something that perhaps we should address in more depth.

VI. We are able to generate a clear and consistent message to the rest of the world. This could be done comparing available methodologies at different scale usages (ecological footprint, energy, exergy and emergy analyses), numerous examples of the application of Ecological Engineering to a numerous range of issues and novel and creative mathematical clarity and elegance tend to diminish this information gap. We greatly welcome those people from various media, who were interested in capturing the thoughts of participants and spreading the concepts. We disagree with environmental education that focuses on natural systems or animal care rather than humans.

VII. We have to maintain methodological pluralism as the best way to evaluate projects. Most assessments should include economic, energy, exergy, emergy, social and perhaps other approaches. If the results agree then the conclusions will be robust. When they do not, the way they disagree can improve the understanding of methodologies boundaries.

VIII. There is a need to move our studies from that of specific entities, such as a crop or fuel source, to a regional economy. This would incorporate energy, emergy, exergy, economic and social analyses into a spatial analysis using GIS and geographical modeling. We also feel that this would, with proper visualization, contribute to our ability to communicate to people who can relate to their own region.

IX. Perhaps the most important general observation is that many people at this conference commented on the inadequacy of traditional economic tools by themselves, for generating good decisions for either humans or nature. The steamrolling of neo-liberal procedures onto the governments of Latin America, by powerful global financial institutions had led to a misallocation of resources and much unnecessary misery. For example, in Brazil, even there are millions of jobless people suffering of hunger, yet economic decisions dictate that millions of hectares of prime agricultural land should be dedicated to produce soy beans, with little labor use, for the affluent in the northern hemisphere. Globalization promotes free trade as an unequivocal virtue, while ignoring the necessary biophysical assessment and the extremely large subsidies of northern countries to protect their agricultural producers. There is an extreme need for the use of the scientific method and biophysical analyses of various sorts to be applied to issues of routine trade and policy. Governments should use these tools to support their decision making process.