

“Carbon Capture and Storage: A Way Forward for Cleaner Fossil Fuels” Workshop with the World Federation of Scientists

**Closing Remarks
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Managing uncertainties and opportunities of carbon sequestration and storage

It is my duty and pleasure to present to you some thoughts that have occurred to me while attending the sessions on “Basics” and “Visions”. Overall, they were positive and encouraging as to the future important role of carbon sequestration and storage. I thank the various contributors for having brought out this message.

Generally, the issue did not seem to be the “Basics” and “Visions” as such. We master those surprisingly well. Rather, the issue is to proceed from the “Basics” to the “Visions”, to go from here to there, from the present state of the art of carbon sequestration and storage to systems which are affordable and sustainable in terms of environment and development. In other words: the issue is to manage opportunities under conditions of uncertainty.

What are these uncertainties and opportunities, and how did we approach them? I distinguish those, which we could not clarify, from others, which we have only timidly broached, and again others, which we dealt with more successfully.

First, let me start with those uncertainties, which we have NOT clarified sufficiently today. These are the basic uncertainties associated with climate change and energy

use. Sure, we have been “politically correct” in espousing the mainstream thinking asserting that there may be a direct and strong cause-to-effect relationship between fossil energy use, CO2 emissions and climate change. This may indeed be so. But there remains a basic uncertainty as to the urgency, nature and calendar of CO2 mitigation policies and their implications on carbon sequestration and storage. This being acknowledged, may I suggest that we need clean fossil fuel use and carbon sequestration and storage in any case.

Secondly, looking beyond the narrow fences of our specialization, we have only timidly broached the issues of carbon sequestration and storage in combination with transportation and access to clean water. However, human development depends critically on our capability of supplying affordable clean energy for these basic needs. Hence my proposal to devote our next workshop to “Clean fossil fuels for human development”.

Third, not surprisingly, we were more successful in discussing some of the risks of carbon sequestration and storage.

We were also successful in identifying approaches to unfold the opportunities offered by a diversified and ever evolving portfolio of carbon sequestration and storage. Tapping these opportunities requires:

- **governments to keep all energy options open, including the fossil fuel and nuclear options**
- **governments to create favourable framework conditions for investments in carbon sequestration and storage**
- **public/private partnerships, including international alliances, to step-up RD&D in carbon sequestration and storage**
- **market forces to determine the choice and sequencing of technologies**

- **manufacturers of equipment for carbon sequestration and storage to bring down the cost**
- **developing countries to avail themselves of carbon sequestration and storage technologies adapted to their development stage and to participate in related networks, RD&D, licensing and manufacture of components**
- **International Financial Institutions to assist the deployment of carbon sequestration and storage in developing countries.**

These are all welcome and necessary recommendations to reduce risk and implement opportunities. Though, if I were to establish a priority among them, I would, quite clearly, put the dissemination of *information* on top of the list -- to accelerate progress and as a precondition of international technology transfer.

Last, I note that already decades ago, in its “Declaration on Social Progress and Development,” the UN proclaimed:

“Social progress and development shall finally aim at the attainment of...

- **equitable sharing of scientific and technological advances by developed and developing countries, and a steady increase in the use of science and technology for the benefit of the social development of society; and**
- **protection and improvement of the human environment.”**

This addresses scientific development and international collaboration. I could not agree with this more, and I think we realized this mandate today -- and more. I can say that the Cleaner Fossil Fuels Systems Committee has broadened

its horizon by joining with the World Federation of Scientists in this dialogue and have benefited greatly.

For our planet, we must solve this problem. Please look at me and say we can do this, yes, we can meet the challenge.

You have given of your time and expertise today, and we are grateful to each of you.

I thank all of those who have made this interdisciplinary exchange possible, Robert Donovan with the USEA Professor Zakiki, Chairman of the World Federation of Scientists, Professor Wilson, Chairman of the Energy Planetary Monitoring Panel and our common friend, Dr. Hisham Khatib.

I wish you happy returns or well-deserved holidays in beautiful Sicily.