

Session 4 LCS and Technology Innovation

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Two presenters prompted delegates to think of addressing GHG emissions in two ways, one focused on land use management associated with strong action on carbon capture and storage (CCS), energy efficiency (EE) and renewable energy (RE) and the other showing that necessary R&D on energy and GHG technologies to fulfil the need for a new energy and GHG focussed array of technologies can be fairly simply addressed by introducing credible carbon pricing policies.

Jae Edmonds explained that only in the context of a strong “terrestrial policy” (a policy that addresses land use management and land use leakage) could we hope to attain a target that kept atmospheric concentrations of GHGs below 450 ppm CO₂e (2.6 W/m₂) With such a policy in place, this target could be achieved by 2100 through a combination of actions such as appropriate biomass use, CCS and advanced EE and RE implementation, even if some regions on earth delayed their participation for a time. Because we are near the thresholds for some of targets (i.e., we are currently near or at 450 ppm CO₂e), overshoot is to be expected with the peak concentrations of around 550 ppm CO₂e reached around mid century. This would require a negative CO₂ emissions strategy.

Emanuele Massetti saw a need for considerable technological innovation, development and deployment that required significant levels of R&D in technologies to address GHG emissions and energy use issues. Using the WITCH model, he concluded that credible carbon pricing policies would be sufficient to stimulate such R&D and would not affect R&D in other areas not related to climate change issues. He noted that, through such aggressive R&D, one could envision the development of breakthrough technologies necessary to keep the costs of attaining an emissions stabilization target down.

Major Findings - In order to attain a low carbon scenario, one needs

- a strong TERRESTRIAL POLICY that deals with land use management and addresses land use leakage, especially in a context where biomass becomes a major action to thwart GHG emissions and allay CC issues.
- a credible carbon pricing regime *that includes terrestrial carbon* is required to promote much needed R&D into GHG and energy focused technologies and to accelerate the advancement of EE, RE, CCS and biomass / land use technologies.
- the use of biomass with CCS to generate negative emissions required to attain the target if one allows for overshoot (highly likely, given the current state of the atmosphere) and have them return to 450 ppm CO₂e (2.6 W/m) by 2100.
- enhanced and directed R&D that increases the probability of devising breakthrough technologies capable of easing cost burdens in addressing GHG emissions and CC.

Main Issues Discussed

- Bioenergy plays a crucial role, especially in the context of an imperfect world. This involves addressing the likely shift in land use practises to other areas, called “land use leakage” – what gets grown where – which can be just as large or larger than industrial leakage in terms of importance.
- Land use and biomass use require the development of new technologies and practises that reflect changes in energy flow and land use management. These activities must be global.
- Sustainable development tools can be used to enhance and advance GHG emissions reduction and address climate change. The point of using such an approach would be to ease acceptance by participating governments especially in developing nations.

- Regional delays in addressing climate issues can be endured but such delay tactics are limited in terms of how long and which regions postpone their actions.
- Significant support, driven by the cost associated with the establishment of a carbon price, and perhaps funded in part by the revenue from carbon pricing, can lead to the development of breakthrough technologies which will help reduce the costs of attaining GHG targets and CC stabilization.
- R&D, while crucial, cannot resolve the GHG / CC issue and cannot be enhanced unless under a credible and durable carbon pricing regime.
- Technology development and deployment are crucial and policies need to address progress in both R&D and the deployment of the outcomes of such R&D
- Dissemination and deployment of R&D and the technologies developed is complex and requires some attention, especially in the social context (e.g., employment).

Further activities to be undertaken by LCS-RNet

- With the need for a global terrestrial policy on land use and biomass, significant research opportunities exist to explore the structure and formulation of such a policy such that it take into account regional issues in a social and environmental context.
- While not the only research group involved with biomass-focussed activities, much work needs to be done on the development of agricultural technologies, biomass-as-a-fuel technologies and the social ramifications of using biomass as a fuel (e.g., food availability, land use concerns, deforestation, afforestation, etc.).
- With the potential for overshoot likely, what are the behavioural consequences of passing a target with the hope of reducing emissions to that target at some future point?
- What are the logical and useful paths for dissemination and deployment of technologies? What pathways can be followed that addresses social and intellectual issues of employment and proprietary rights?
- What is the linkage between domestic R&D policy / programs and programs on a more global scale that may involve a consortium of R&D-capable countries in the context of Global R&D funding mechanisms? How can such development be made to fit GHG emission reduction and climate objectives?