**The Carbon Cycle and Energy Security research**

What is the biogeochemical carbon cycle?

What are carbon stores and how do they differ?

How does geology and biology affect the earth’s carbon?

How do geological processes release carbon into the atmosphere?

How do biological processes sequester carbon on land and in the oceans?

How can biological carbon be stored or returned to the atmosphere?

How does the concentration of atmospheric carbon influence the natural greenhouse effect?

How do ocean and terrestrial photosynthesis regulate the composition of the atmosphere?

What is fossil fuel combustion? How has it altered the balance of carbon pathways and stores?

What are the implications for climate, ecosystem and the hydrological cycle?

What is energy security? What is the global energy consumption and energy mix?

What affects the access to and consumption of energy resources?

Who are the energy players? What roles do they play?

What is the mismatch between the supply and demand of conventional fossil fuel supply?

What are energy pathways? Why are they key to energy security? Why are they prone to disruption?

What are the social and environmental costs and benefits of the development of unconventional fossil fuel resources?

What is renewable and recyclable energy? How could it be help decouple fossil fuels from economic growth?

What are the costs and benefits of renewable and recyclable energy (economic, social and environmental)? How can they contribute toward energy security?

What are biofuels? What are the implications on food supply? What are the concerns about biofuels (carbon neutral?)?

What are radical technologies? How can they help reduce carbon emissions? What uncertainties are there about them?

What are the contrasting regional trends of land use cover globally? How does this affect carbon stores, the water cycle and soil health?

What is ocean acidification? What is a carbon sink? How is fossil fuel combustion increasing ocean acidification and what are the impacts of this?

What is the enhanced greenhouse effect and how might it be increasing the frequency of drought?

What are the implications of forest loss? What evidence is there that forest stores are being protected/expanded? What is the Kuznets’ curve model?

How do increased temperatures have atmospheric implications?

How is human wellbeing impacts by ocean health and why are developing regions so affected?

How might natural factors, human factors and feedback mechanisms impact future emissions, atmospheric concentration levels and climate warming?

What are adaptation strategies for climate change? What are the costs/risks?

How can the carbon cycle be re-balanced? What are the global and national actions needed to address this?