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### **Carbon Cycling with Nuclear Power**

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Liquid hydrocarbon fuels like gasoline, diesel or jet fuel are the most efficient ways of delivering energy to the transportation sector, in particular cars, ships and airplanes. Unfortunately, their use nearly unavoidably leads to the emission of carbon dioxide into the atmosphere. Unless an equivalent amount is removed from the air, the carbon dioxide will accumulate and significantly contribute to the man-made greenhouse effect. If fuels are made from biomass, the capture of carbon dioxide is a natural part of the cycle. Here, we discuss technical options for capturing carbon dioxide at much faster rates. We outline the basic concepts, discuss how such capture technologies could be made affordable and show how they could be integrated into a larger system approach. In the short term, the likely source of the hydrocarbon fuels is oil or gas; in the longer term, technologies that can provide energy to remove oxygen from carbon dioxide and water molecules and combine the remaining components into liquid fuels make it possible to recycle carbon between fuels and carbon dioxide in an entirely abiotic process. Here we focus on renewable and nuclear energy options for producing liquid fuels and show how air capture combined with fuel synthesis could be more economic than a transition to electric cars or hydrogen-fueled cars.