

Reforestation creates economic value through the carbon-storing capabilities of trees

Reclaimed forests naturally capture and store a great deal of carbon, which in its gaseous form (carbon dioxide or CO₂) acts as a “greenhouse gas” that can contribute to climate change. Some local government agencies are evaluating proposals that would require companies under their jurisdictions to reduce their carbon emissions. Additional emissions reduction requirements may be implemented over the long-term, although substantial near- and medium-term uncertainty remains.

In anticipation of future potential CO₂ emissions requirements, many industrial companies are planning to buy “credits” for the carbon captured and stored (i.e., “sequestered”) by reclaimed forests. These credits could help carbon-emitting firms more cost-effectively comply with future requirements. For landowners and mine operators, the sale of carbon sequestration credits is a promising new economic opportunity associated with reforestation. For landowners, the leasing or sale of reforested mine land to companies seeking environmental credits can also bring new economic opportunity.



Extensive vegetation growth is storing significant amounts of carbon on this 200-acre Eastern Kentucky reclaimed coal mine. Photo: Chuck Meyers, Office of Surface Mining.

What is carbon sequestration, and how does it work?

Carbon sequestration refers to the transformation of atmospheric carbon dioxide into solid carbonaceous components, such as those comprising trees, shrubs, other vegetation, and soil organic matter. Once the carbon dioxide has been transferred into these materials, it is effectively stored (i.e., sequestered) until decomposition occurs. Even after trees are harvested, some of the carbon remains trapped in solid form if the trees are converted into wood products such as lumber, plywood, and other building materials.

What are carbon credits?

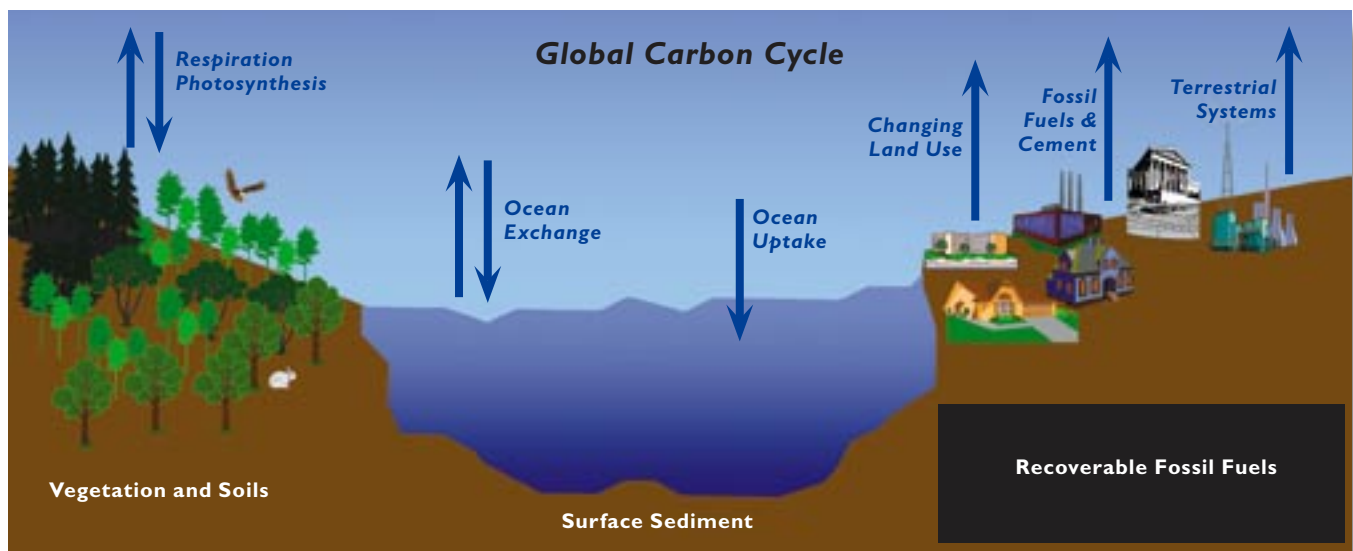
Carbon credits provide ownership or “rental” rights to a certain amount of gaseous carbon that has been sequestered in a forest, which a company may then buy, sell, or apply toward a reduction. (Ownership rights pertain to the carbon sequestered in a forest—not the trees themselves.) Carbon credits are measured in terms of tons of

carbon sequestered per acre of forest; generally a third party verifies the sequestration activity in the forest.

Currently, organizations and individuals buy and sell carbon credits in private markets, which are in their early stages. However, there are signs that companies are becoming more interested in carbon credit trading. For example, a new organization called the Chicago Climate Exchange has enlisted dozens of domestic and international corporations to buy and sell carbon credits on a voluntary basis.

What does all this mean for landowners and mine operators?

Although there is some regulatory uncertainty, the long-term (i.e., 20-50 years) future of carbon credit markets looks very promising. This long-term promise is yet another benefit associated with reforestation—and a good short-term reason for mine operators and landowners to consider reforestation.



Carbon stored in forests is part of the global carbon cycle, depicted above. Arrows represent carbon fluxes between the atmosphere and global carbon pools. A significant amount of carbon is stored in these pools, including vegetation and soils, ocean water and sediments, and unharvested fossil fuels. Reforesting mined land can increase carbon storage in soils and vegetation.