

ALGAL TURF SCRUBBERS: CLEANING WATER WHILE CAPTURING SOLAR ENERGY FOR BIOFUEL PRODUCTION

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Algal Turfs are biodiverse communities of unicellular to filamentous algae of all major algal phyla. Algal Turf Scrubbers (ATS) are bioengineered ecosystems dominated by algal turfs. They clean water to very high quality, and remove CO₂ from the atmosphere by capturing solar energy at rates 10 times that of agriculture and 50 times that of forestry. Since they are controlled ecosystems, using local algae, ATS does not suffer the major disadvantages of agricultural crops, which for maximum efficiency require fertilizers, herbicides and pesticides. ATS removes CO₂ from water and the atmosphere, and can be configured to remove CO₂ from power plant stack gases. As a normal part of operations, ATS removes heavy metals, break down toxic hydrocarbons, and oxygenates treated waters.

ATS systems are capable of removing nitrogen and phosphorous from surface waters in the mid latitude US at \$0.60/kg and \$10.60/kg respectively (10% of the cost certified by the Chesapeake Bay Commission), and independently producing an energy product at \$0.85/gallon. Given a nutrient credit system for rewarding nutrient removal from rivers and lakes, this price can be driven down to below \$.40/gallon. Conservatively ATS can produce the equivalent of US imported oil on less than 30M acres of land along major rivers.