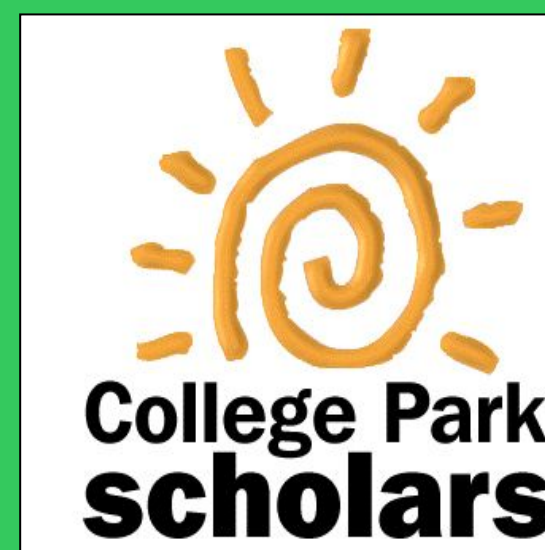




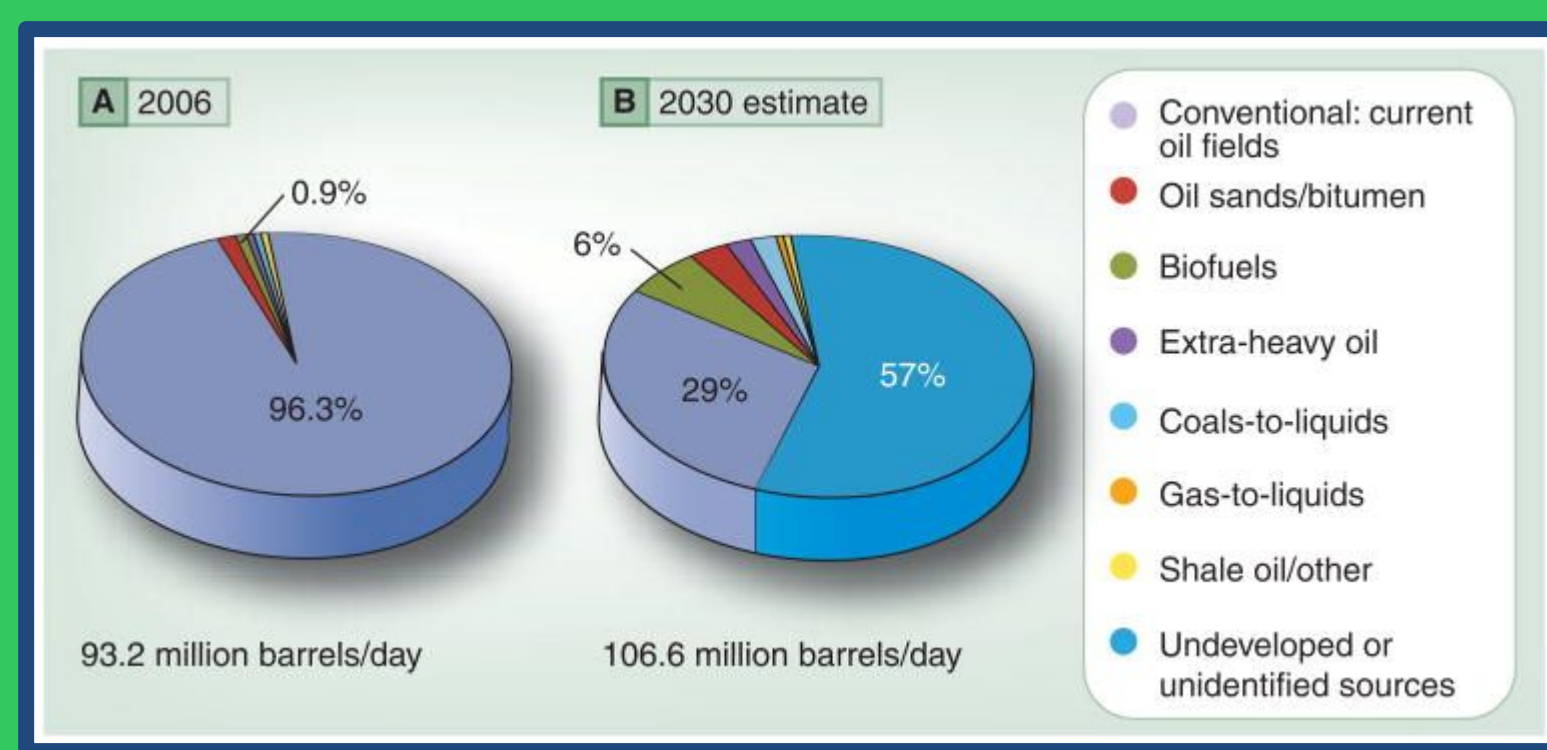
Search For Solutions: Algal Biofuels

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Introduction

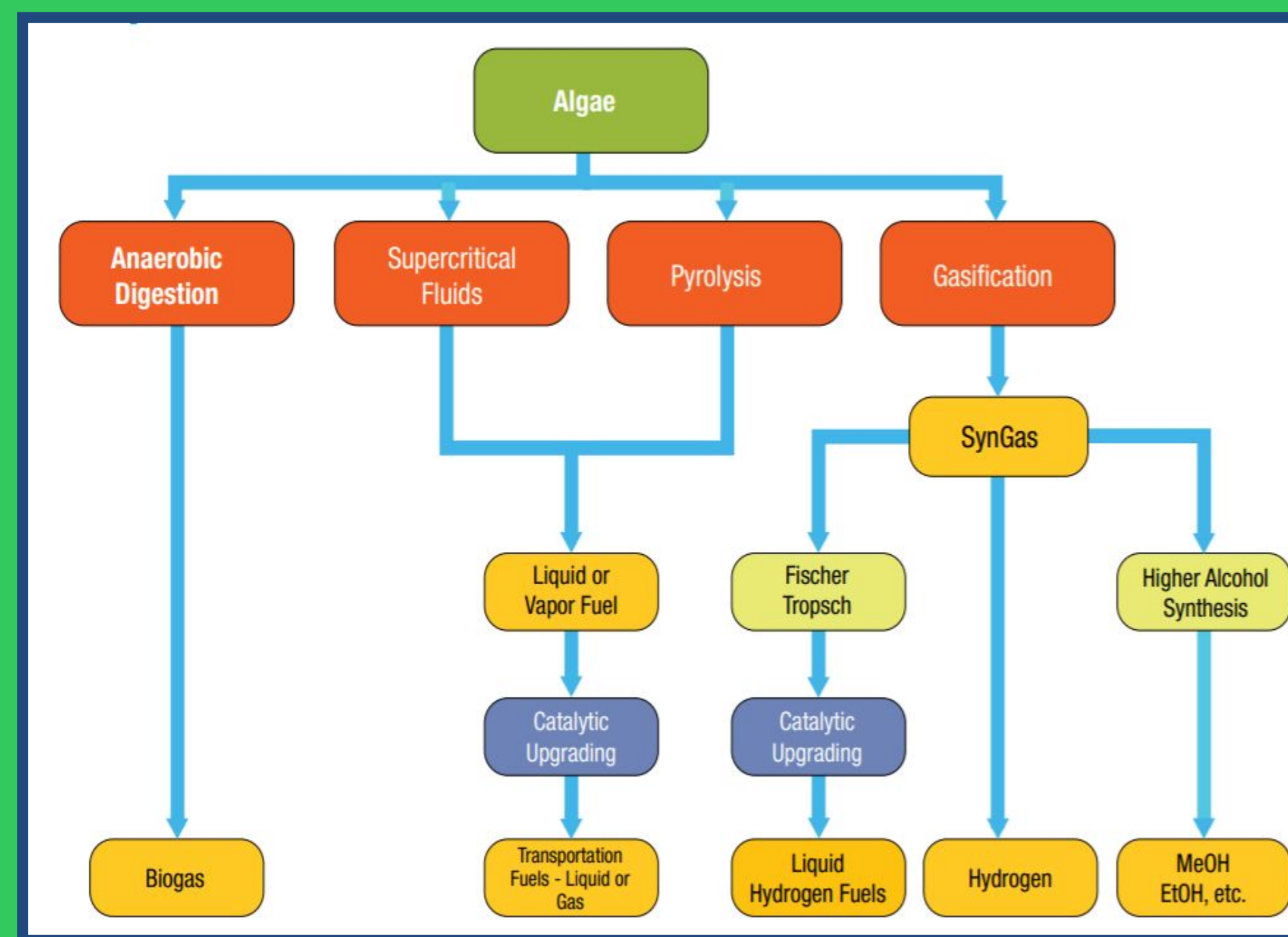
There are over 100,000 diverse strains of algae whose ability to convert sunlight to energy by photosynthesis can be harnessed to produce algal biofuels¹. Certain microalgae accumulate large amounts of lipids which are a high density energy source². The fat/lipid of the algae is then extracted and can be harvested to power cars, truck, planes, and trains. Algae are a renewable resource and carbon neutral.



Graph showing estimated algae production now versus in 2030⁴.

Criticisms⁴

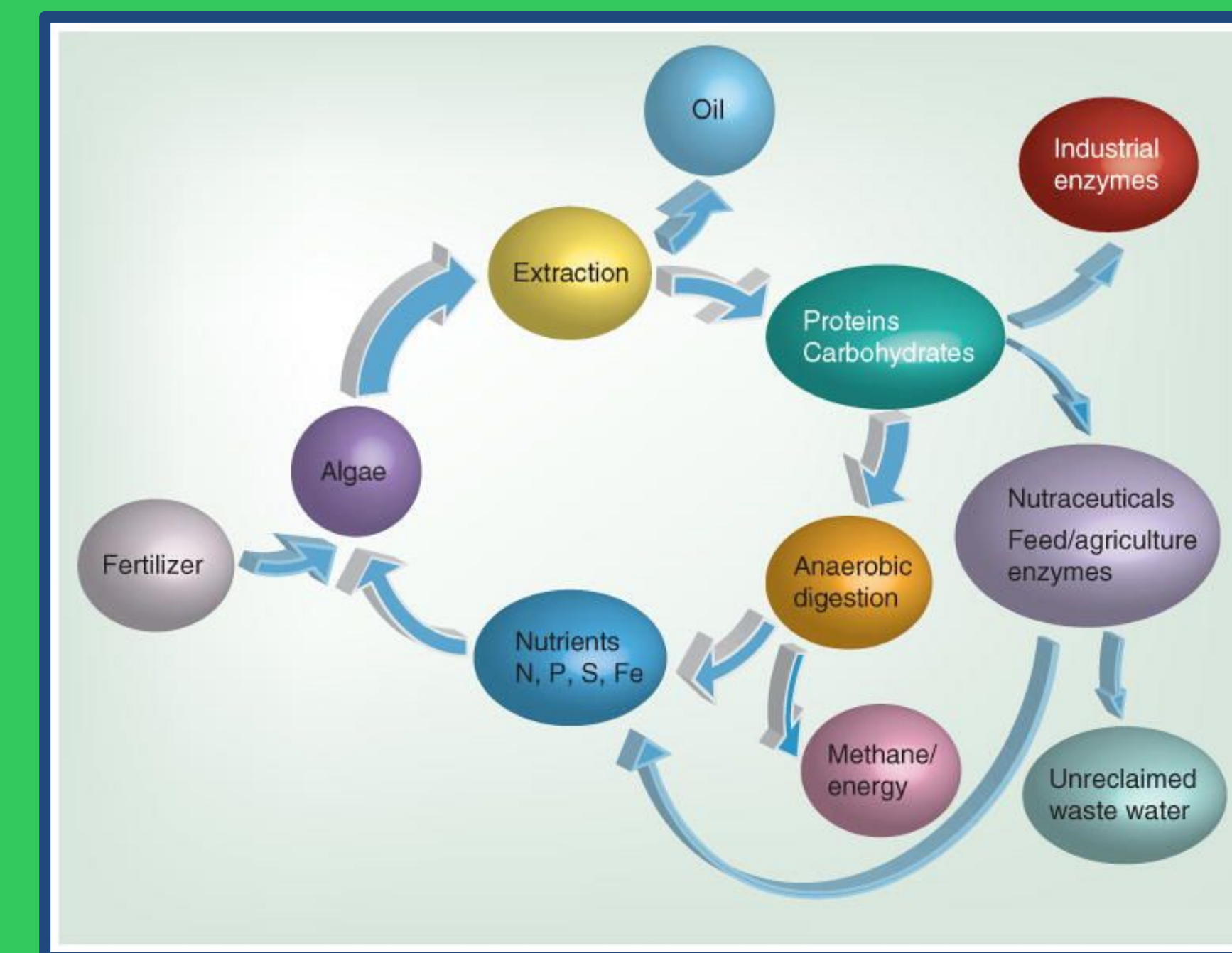
- Water use will increase especially for arid lands
- 30 million acres of land will be needed
- Fertilizer will be needed for algae nutrients- additional 50 million tons of phosphate will be needed
- US\$300–2600 per barrel compared to \$60-200 per barrel of gasoline



This diagram shows how algae can be converted from algae into various energy sources²

Benefits²

- High per-acre productivity
- Non-food based feedstock resources reduces competition with agriculture
- Use of otherwise non-productive, non-arable land
- Utilization of a wide variety of water sources: wastewater, salt water, ect.
- Production of biofuels and co-products
- Potential recycling of CO₂ from power plants and industrial sites
- Oil yields from certain algae are 60 times higher than soybeans



Ideally how the nutrients should be recycled to produce maximum algae production⁴.

Readability

- Can be used today but it is more expensive than fossil fuels³
- Improvements in strain identification and production⁴
- Was being farmed but was too expensive³



Bibliography:

- 1 Algal Biofuels. U.S. Department of Energy. <https://www.energy.gov/eere/bioenergy/algal-biofuels>
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- 4 Hannon M, Gimpel J, Tran M, et. al. Biofuels from algae: challenges and potential. 2010; 1(5). *Biofuels*. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3152439/>

