

## **A review on third generation bioethanol feedstock: Journal of Renewable and Sustainable Energy Reviews**

### **Abstract**

The current issues of the depletion of fossil fuels reserve and environmental changes have increased the concern for the hunt of sustainable renewable energy for the future generations. Biofuels emerged as a promising viable alternative to replace the existing fossil fuels. Among these, bioethanol outstands due to its ability to substitute gasoline. However, the major challenge in bioethanol industry is the need to discover a suitable feedstock together with an environmentally friendly approach and an economically feasible process of production. The first generation and second generation bioethanol appeared unsustainable due to its impact on food security as well as inflated production process. These problems and concerns have directed the search for the third generation bioethanol (TGB) feedstock from marine algae. The integration of algae (microalgae and macroalgae) as a sustainable feedstock for bioethanol has gained worldwide attention in terms of food security and environmental impact. The research on algal utilization in bioethanol has increased in recent years and is expected to become the major drives in bioethanol industry. Therefore, the potential and prospects of the third generation bioethanol feedstock are being highlighted in this review. An insight into the current hydrolysis and fermentation technologies on algal conversion together with the economics and viability of the process are also accounted. This review can be crucial in providing ideas for the future studies that can be implemented in the commercialization of bioethanol from the third generation feedstock.