CONCLUSION AND FUTURE SCOPE

One last important renewable energy is hydrogen. It is the only transportation fuel after solar-generated electricity and biomass fuel that does not emit carbon dioxide and other "green house" gases into the atmosphere. Hydrogen is produced today from oil, coal, biomass and natural gas as part of various industrial processes. However, it would cost roughly as much to produce hydrogen as to produce methane. Hydrogen may also be obtained from water either by electrolysis (Casper, 1978) or by means of many physico-chemical processes (Macler et al., 1979, Ohta and Mitsui, 1981). Electrolysis processes are clean and well known but generally much more expensive than processes in which hydrogen is extracted from coal and hydrocarbons (Sullivan, 1981). Besides this hydrogen production ultimately depends on the cost of electricity. So, currently research has focussed on photolytic production of hydrogen. Photolytic production of hydrogen using organic or biological catalysts is the most elegant solution to the hydrogen production problem (Mathias, 1976). So, continuous trials have been under taken for biological hydrogen production through photosynthetic microbes. Heterocystous cyanobacteria have been proven (Reddy et al., 1996, Rao and Hall, 1996) as potential candidate for such activity. However, the production of \( \text{H}_2 \) is techno-economically not encourageable for its use directly as transportation fuel or for generation of electricity, indirectly (Pryde, 1983).

Our present findings on development of low cost hydro- oxy fuel cell with high efficiency of current output may be helpful in commercializing the technology on bioreactor based fuel cell, for electricity generation. The main advantage of \textit{Nostoc} sp. is its high adaptability habit with wide range of
temperature, 25-35°C. As the hydrogen production was noticed to be closely linked to heterocyst frequency, it would be possible to increase the potential of hydrogen production more efficiently by some other biotechnological means, in future.