

# Electricity generation by Plant Microbial Fuel Cells in tropical wetlands

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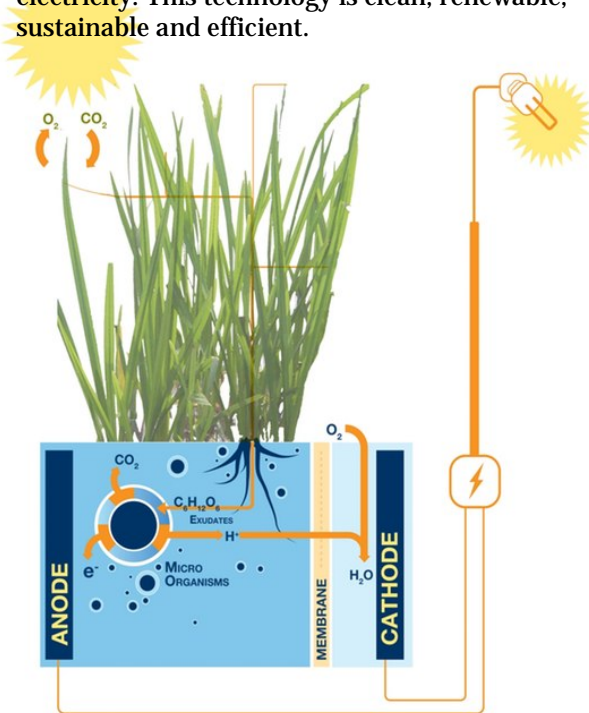
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## Motivation

Environment devastation, global warming issues, energy security, and rising energy cost are among present energy challenges which stimulate renewable energy development. New sources for sustainable bioenergy production must be found. The Plant Microbial Fuel Cell (PMFC) generates electricity without harvesting the biomass. The PMFC can be applied in wetlands and generated up to 0.24W/m<sup>2</sup> for-over two weeks. Recent research has shown that PMFC can be integrated in wetlands, potentially at large scale, producing electricity and protect the environment from devastation.

**Principles of the Plant Microbial Fuel Cells**  
PMFC is a system that produces bioenergy *in situ* in which plants and bacteria convert solar energy into electricity. This technology is clean, renewable, sustainable and efficient.



## Technological challenge

To be able to apply this technology into tropical wetland application, several technological challenges must be overcome:

(i) PMFC make use of expensive electrode materials. Therefore cheaper (bio-based) electrode materials must be developed. To utilise these materials, research on the diversity of electron transfer mechanisms is needed.

(ii) It is important to find out what plant/wetland type is most attractive for PMFC installation. Tropical wetland consists of wide range of plant species and can have high productivity. Therefore, recently developed tubular PMFCs can be used in tropical wetlands and must be investigated on performance.

When these challenges are tackled, a beautiful resort in a remote wetland can be powered by a PMFC system.



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