

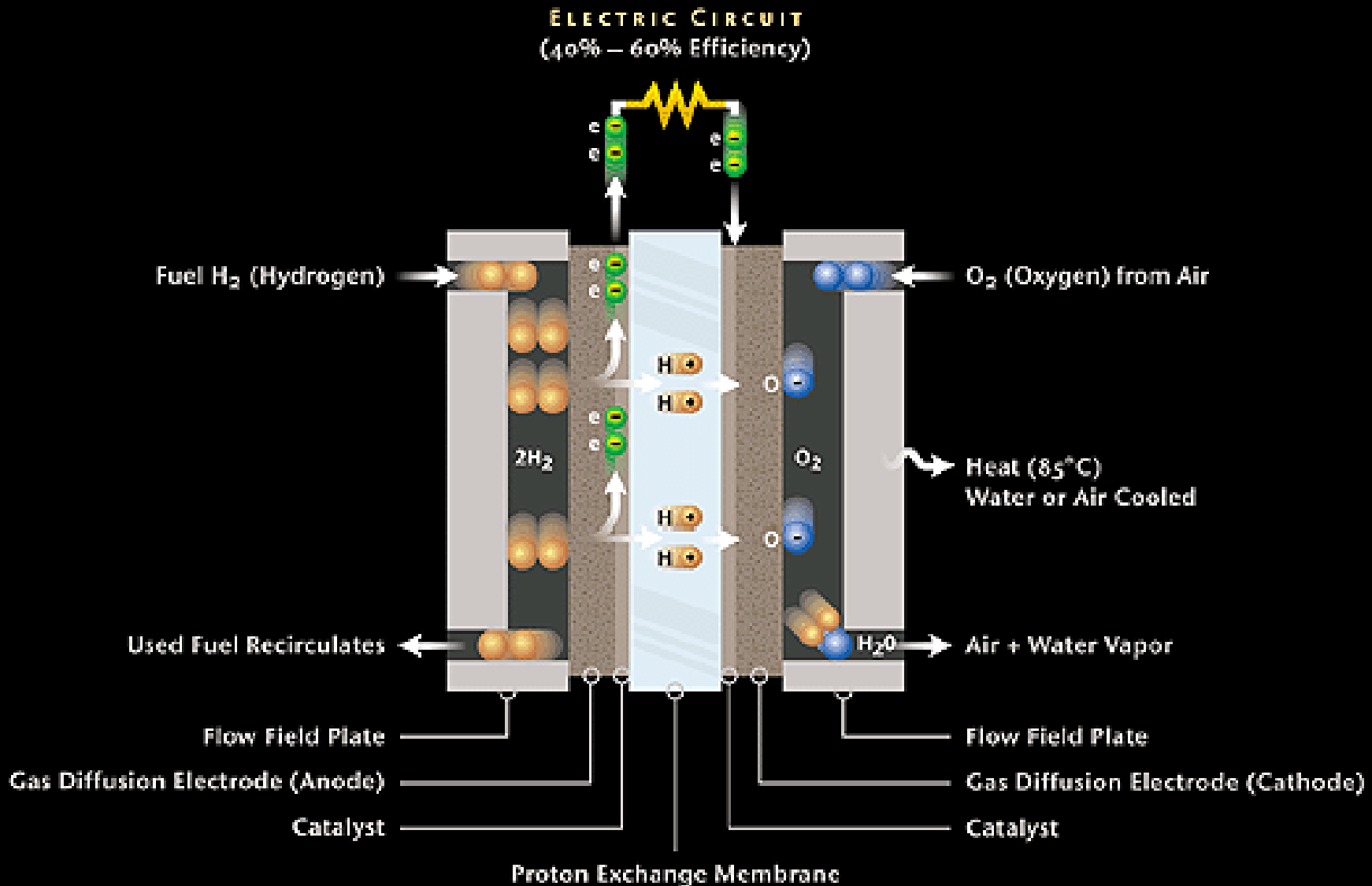
sefca
sustainable energy fuel cells australia



SEFCA Pty Ltd

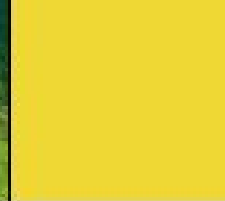
- First hydrogen fuel cell integration company in Australia
- Offices in Melbourne and Sydney
- Strategic Partnership with BOC (a member of the Linde Group)
- Established September 2006
- Solution provider for all mobile power applications and Back Up Power requirements

Hydrogen Fuel power



Why hydrogen?

Hydrogen is the only energy source that can be produced, stored and used to create power. All with zero emission.



Hydrogen And The Environment

- Hydrogen is the most abundant element, comprising about three quarters of the mass in the universe. Hydrogen is found in the water that covers 70% of the earth's surface and in all organic matter.
- Hydrogen is the simplest element in the universe. It is made up of one proton and one electron.
- Hydrogen is the lightest of all elements and gases, and is 14 times lighter than air. A gaseous hydrogen "spill" diffuses immediately into the air, and does not pollute the ground or groundwater.
- Hydrogen is colorless, odorless and nontoxic. It does not produce acid rain, deplete the ozone or produce harmful emissions.
- Hydrogen has the highest combustion energy per pound relative to any other fuel, meaning it is more efficient on a weight basis than fuels used currently.
- Hydrogen offers 2-3 times more energy than most other common fuels. It combines readily with oxygen, releasing considerable energy as heat.
- Hydrogen is the cleanest fuel because unlike carbon-based fuels, hydrogen produces no harmful by-products upon combustion. Only energy and clean water are produced when hydrogen is combined with oxygen in a fuel cell.

SEFCA Product Overview

- 1 to 500watts (mobile power)
 - Military and emergency services power for remote power needs
 - Military: (BA5590) such as radios, surveillance etc
 - DSE : Remote radio towers
 - Replace or Supplement Batteries for longer life without requiring recharging
 - Corporate use
 - Mining
- 600watts to 65 000watts
 - Corporate
 - AC back up power
 - Forklift Market
 - Telco and Communication
 - DC Back up power
 - Replace Diesel Generators and Batteries

AC back up power

- Problems with Current Back Up Power Solutions
 - Issues when installing Diesel generators in existing high rise buildings
 - Noise issues
 - Need to be constantly tested due to issues with diesel and reliability
 - Not environmentally friendly
 - Can be difficult to refill
- Solution
 - Fuel cell needs no flue as only output is water
 - Can run as long as Hydrogen is available
 - Takes less floor space and modular in 10 kilowatt modules



Power Support

Grid Backup or Grid Replacement

Emergency Communications

Existing Solution: Generators

Inefficiency: Noisy, No Indoor Use,
High Maintenance



Cordless Power Support

Existing Solution: Batteries / Generators

Inefficiency: Un-predictable, No Fuel
Flexibility, Limited
Runtime



UPS Replacement

Existing Solution: Batteries

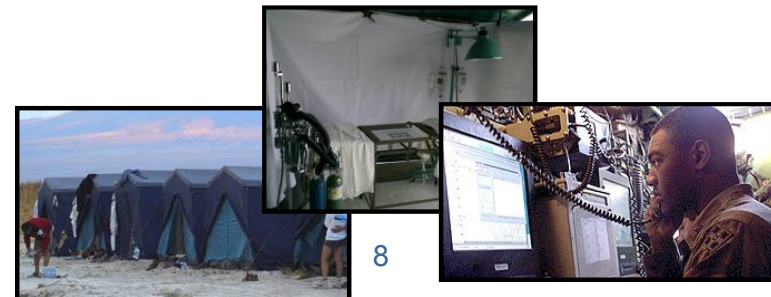
Inefficiency: Short Time Only,
Limited ROI



Generator Replacement

Existing Solution: Generators

Inefficiency: Noise, fumes, life



more power. more
possibilities.

DC Back up power for Telecommunications and Communications locations

- Problems

- Batteries are unreliable,
 - need to be changed every three years,
 - have limited back up time,
 - unreliable monitoring
- Diesel is noisy,
 - Needs to be constantly checked,
 - can be difficult to refill

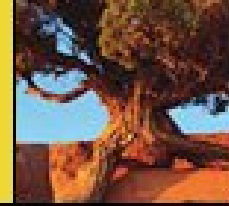
- Solution

- Hydrogen fuel cell will last approximately 20 years
- Provides unlimited uptime as long as Hydrogen supply is maintained
- Green power



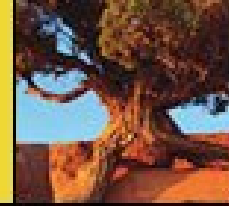
Forklift and Mobility





Forklift Fuel cell power

- Problems
 - Propane and LPG are noisy, smelly and environmentally problematic
 - Batteries only last 6-8 hours,
 - need 8 hours to recharge,
 - need 20 minutes to be swapped out,
 - slow down when they near end of power
 - do not have the power to work outside
 - Issues around lead and acid disposal.
- Solution
 - Hydrogen fuel cell run 12 to 24 hours on a single fill.
 - No change over time
 - 5 minutes to fill
 - No slowing down during shift
 - Can be used inside and outside
 - Environmentally green



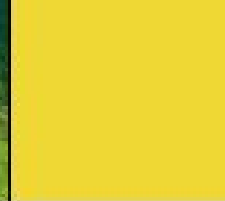
Military and emergency services power for remote power needs

- **Problems**

- Batteries are heavy, reached limit of watt hours, no indication of remaining charge
- Require power to recharge
- Solar is not portable and problems in smoke and low light areas, still need traditional battery back up
- Environmental problems around the disposal of batteries

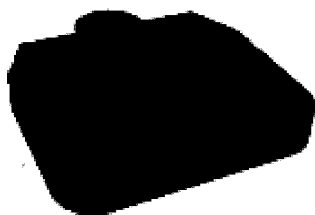
- **Solution**

- Hydrogen is $\frac{1}{4}$ the weight and lasts three times longer
- Able to be charged without access to power
- Lower TCO



Battery Replacement

Surveillance Robotics



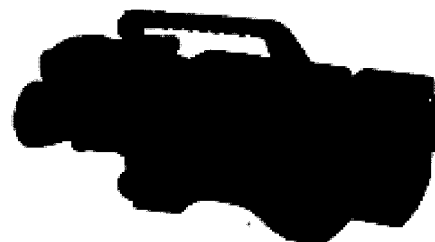
Un-manned Aerial Vehicle



Military Communications



Professional Broadcast



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