

Hydrogen + Solar =

ZERO^{CO₂}

Patent Pending



No carbon emissions. The future of site welfare.



www.gap-group.co.uk

EasyCabin Site welfare is easy.



A replacement for traditional diesel power systems, combining solar & hydrogen power to eliminate local carbon emissions.

As a result of winning multiple Green Apple awards, AJC EasyCabin have been asked by many of their customers to develop site welfare solutions that produce zero emissions at point of use. As a result we have been busy designing, building and testing a new concept, ready for the demands of future CO² reduction targets.

Ecosmart ZERO is the first viable welfare alternative for companies that are working to reduce their carbon footprint and, more importantly, improve the environment for communities in the vicinity of operation.

With increased focus on the reduction of carbon footprint and the prioritisation of corporate social responsibility issues, there is a real demand for industries to adopt cleaner fuels whilst maintaining reliability and cost effectiveness.

Diesel generators produce CO² and are heavy on maintenance and it is clear a smarter alternative is needed.

The Ecosmart ZERO fuel cell + solar system provides an opportunity to both reduce operating costs and increase environmental performance relative to the use of traditional diesel generator welfare. ZERO is near silent, and emits only pure water vapour.

Ecosmart ZERO has been designed to have the same user friendly operation as standard Ecosmart welfare unit. Power to run the heating, sockets, kettle and microwave comes instantly from the battery bank. The batteries are constantly fed by the built-in hydrogen fuel cell and solar panels.

Working in partnership



Intelligent Energy



EasyCabin

Intelligent Energy is a world-leading fuel cell engineering company focused on the development, manufacture and commercialisation of its Proton Exchange Membrane (PEM) fuel cell products, for customers in the automotive, stationary power and Unmanned Aerial Vehicle (UAV) sectors. Fuel cells are used in multiple applications, where clean, lightweight, high efficiency and cost-effective power is required.

Intelligent Energy's 800 Series Fuel Cell Modules are used in the Ecosmart ZERO and they are suitable for a wide variety of off-grid applications.

All the benefits of an Ecosmart welfare unit with ZERO emissions.



Zero carbon emissions

Only water vapour.



On-demand power & heat

On any appliance in the cabin.



Zero fuel with solar panels

On summer days up to 100% of the power demands can be met from the solar panels.



Low maintenance

Only air filters need replacing.



Near silent operation

Very quiet with no vibrations.



Safe & easy to re-fuel

Hydrogen gas bottles. Available from most gas suppliers. Easy to replace.



Hydrogen fuel cell module. Zero carbon emissions, ultra low maintenance.



Full array of solar PV mounted on roof.

Hydrogen gas, safe and easy to use. Available from any major gas supplier.





Clean air & ultra-low-emissions zones. Ensure your site welfare is compliant.

Hydrogen and fuel cell technology have the potential to provide solutions to the UK's most critical energy challenges – enabling growth while improving quality of life and minimising environmental impacts.

Most of the focus at the moment is on transport to reduce emissions in cities. London has the ULEZ (Ultra Low Emissions Zone) coming into place soon. London already has a growing fleet of hydrogen powered buses and taxis.

Major construction and infrastructure projects in London and other large cities have a huge carbon footprint. There is also a large drive to reduce all carbon emissions on building operations and off-grid power supplies.

Hydrogen fuel cells are the ideal solution for powering small site welfare facilities in very built up areas. Zero emissions at site means that you can run your welfare cabin inside a building, or in a shopping centre.

UK low emissions projects and initiatives.

Hydrogen London

Working towards a hydrogen economy for London and the UK
www.hydrogenlondon.org

Crossrail

Minimising the impact of construction on the environment
www.crossrail.co.uk/sustainability

HS2 - Air Quality

Outlines how the potential air quality impacts of the Proposed Scheme will be managed.
<https://www.hs2.org.uk/documents/phase-2b-factsheet-air-quality/>

Clean Air London

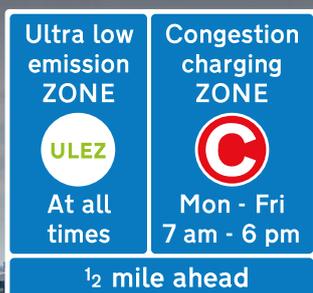
Campaigning to achieve urgently and sustainably full compliance with World Health Organisation guidelines for air quality throughout London and elsewhere.
www.cleanair.london

Non Road Mobile Machinery Register

London's 'low emission zone' for non-road mobile machinery.
www.nrmm.london

Birmingham Clear Air Zone

Proposed clean air zone for traffic and construction in the city centre.
www.birmingham.gov.uk/caz



Questions. Answered.

Are hydrogen systems safe?

Hydrogen systems are as safe, if not safer, than conventional fuel systems, including gasoline and natural gas. Hydrogen has been used as an industrial gas for decades, which means methods to safely and efficiently produce, distribute, store and use hydrogen are mature. Fuel cell vehicles meet the strictest safety and quality standards set by the United Nations Global Technical Regulations (GTR).

Who else currently uses hydrogen?

In London, hydrogen is being safely used as a fuel for public transport, TFL hydrogen buses have covered over 1 million Km. Worldwide, hydrogen has been used for decades to power forklifts and other non-road machinery.

Who supplies the hydrogen?

You can buy hydrogen gas from the internet or local gas supplier as easily as you can buy barbecue gas. We can introduce you to suppliers in our network. Supplied as a compressed gas (at 300 bar) in gas cylinders. The cylinders can be ordered online and are usually delivered within 24–48 hours. A click & collect service is available from some suppliers.

Is it easy to maintain?

The Ecosmart ZERO fuel cell only needs periodical replacement of air filters. No moving parts, no messy oils or diesel fuels. Almost zero vibration means systems can run unattended for long periods, with no degradation of parts.

Are there any contamination risks?

Unlike solutions that rely on liquid fuels, there is zero risk of contamination from fuel spillage.

What is hydrogen and where is it produced?

Hydrogen is a very common element. It does not occur naturally as a gas on Earth and is generally combined with other elements (e.g. carbon (as in hydrocarbons) or oxygen (to form water)). While it is not a primary source of energy, hydrogen is an energy carrier and can therefore be used as a fuel. Transporting hydrogen (e.g. via gas networks) in order to move energy to its point of use provides an alternative to using electricity networks. There are a number of low carbon routes to produce hydrogen, including electrolysis using renewable electricity and reformation of biogas. Currently most hydrogen is produced as a by-product of other industrial processes.

How does a fuel cell work?

A fuel cell is an electrochemical device that generates electricity (and water) from oxygen and hydrogen.

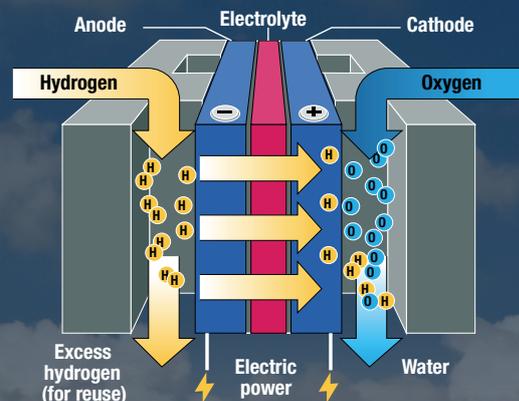


Diagram of a typical fuel cell

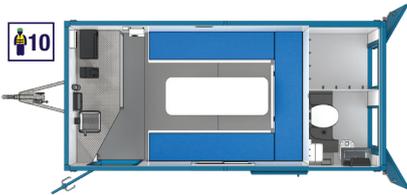
Being based on a chemical process instead of combustion, a fuel cell can operate at high efficiency and have zero harmful emissions such as NOx and particulates. A fuel cell produces DC power that provides constant power. It can be used with batteries to supply higher peak loads or with an inverter for AC power.

EcoSmart ZERO^{CO2} Mobile welfare units

EcoSmart 12



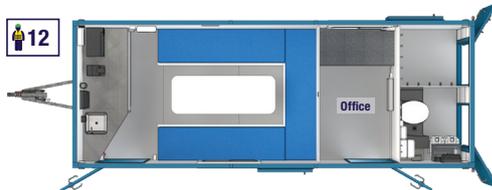
EcoSmart 16



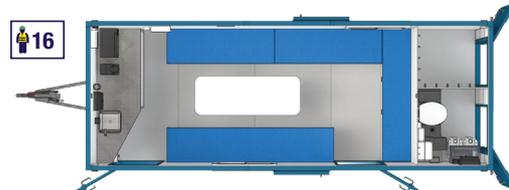
EcoSmart 16+



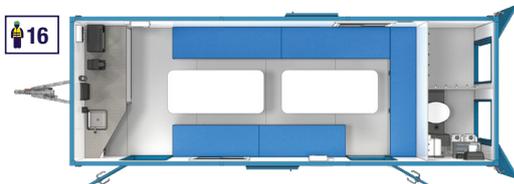
EcoSmart 20



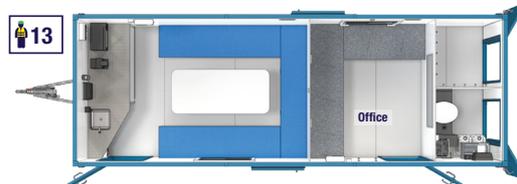
EcoSmart 20 Xtra



EcoSmart 22.9 Xtra



EcoSmart 22.9



Self sufficient, static welfare facilities with ZERO CO₂ emissions



Canteen facilities



Zero fuel with solar panels On summer days up to 100% of the power demands can be met from the solar panels

Roof mounted solar panels



Toilet facilities



Large PV array

Hydraulic axles



Hydraulic controls



Canteen heating



Bench seating



ZERO IE Fuel Cell

Ecosmart ZERO^{CO₂}



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GAP

GROUP

WELFARE SERVICES

www.gap-group.co.uk



Multi-award winning site welfare.

 DESIGNED & BUILT IN THE UK BY

 **EasyCabin**

www.easycabin.co.uk 01582 486663

FOOTNOTES

As part of our on-going commitment to improvement we reserve the right to alter specifications, designs or figures, without prior notice. All dimensions and weights are approximate.

Zero CO₂ emissions at point of use, where the Ecosmart ZERO is parked and in use. All figures quoted for guidance only & do not include use of hydraulics. A full energy presentation is available on request.

Solar panels achieve maximum output in direct sunlight, but they work in normal daylight and cloudy weather too.

The amount of power a 48v solar panel or charging kit generates in cloudy weather will be lower compared to direct sunlight.

Less solar power is generated in wintertime than summertime. The positioning of the cabin will affect the solar charging of the batteries i.e. under trees, etc.