

## THE GREEN RIG – INFO FOR TYRE-KICKERS!



Horizons' Green RIG mobile environmental education vehicle comprises the following:

**A custom-built semi-trailer:** 14 tonnes gross weight, 13.9m long by 4.0m high. Running on a dual wheel, tandem axle chassis, the trailer has remote-controlled auto-stabilising hydraulics, electric landing legs and air suspension. The low-rider chassis was built by Jacksons Enterprises in Pahiatua and trailer construction and fit out by Custom Coaches, Palmerston North.

**Towed by a:** Mitsubishi Fuso Shogun, six tonne, 2 x 2 tractor unit. The 370 hp, 6 cylinder diesel intercooled turbo engine is compliant with Euro 3 emission standards. With a 10 speed synchromesh gearbox and rear air suspension, the 3-seater sleeper cab has a range of driver safety features (e.g. side intrusion bars). Custom additions include a propeller plate deck, stainless steel mudguards, LED lights, a rear storage locker and loading hoist.

**The Green RIG is powered by:** three alternate sources (mains power, solar and generator) depending on source availability and location. A series of roof-mounted solar panels independently deliver power to the battery system when the sun shines (and the truck is outside). All three sources of power deliver energy to the battery system when supplied.

Selection between mains power from a local outlet and generator is a manual task, however the

supply of energy to and from the batteries, as well as the starting and stopping of the generator, is fully automated. The on-board charger/inverter has the task of converting mains/generator power to the batteries, as well as supplying all mains power made from the batteries for use in the truck, or making a direct connection from the mains/generator supply when charging the batteries. Power consumption, battery status and solar gain are recorded by on-board displays to allow for active energy management to ensure energy efficiency. Component details are:

**Mains Power Connection:** 16amp plug socket connection via a 25m cable.

**Roof-Mounted Photovoltaic Panels:** 8 roof-mounted Sharp 123 watt tempered glass panels. Maximum generation capacity approximately 1kW. It is hoped this PV source will provide 25-50% of the Green RIG's power needs.

**Energy storage:** A bank of twelve 2-volt Lead Acid Gel Cell Batteries. Total energy storage 20kWh

**Generator:** A fuel-efficient (eco-throttle), quiet running, low-emission Honda 6.5kVA Petrol Generator with micro-chip controlled sine-wave inverter.



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**Internal trailer features include:** A portable water supply (250L tank) as wastewater dump tank. Gas heating and faucet hot water. Forced-air (and natural i.e. window and hatch) ventilation.

**External trailer features include:** A 'push-out' 3.4m wide main entrance (that extends 1m) with detachable folding alloy steps. A pull-out 3-burner gas BBQ and servery area is covered by an electric winch-operated 3m adjustable shade umbrella. Chassis storage via a series of lockable and security alarmed lockers equipped with gas struts. Slide-out educational stream table at trailer rear (complete with self-contained (non-potable) recycling pumped water system). Exterior scene lighting along the full length of the vehicle.

Energy efficient LED display and working lighting. Secure office space with extensive storage, audio/IT rack and control system, power switchboard, 12 volt fridge, and emergency exit window.

**Security/Alarm system:** The tractor and trailer units are fully alarmed and equipped with smoke detectors (internal display space and roof cavity). An auto-dialling system reports any on-board faults/alarms to a duty staff member.

**Trailer construction:** Fibreglass shell over steel frame. Aluminium roof and plywood floor. Walls are lined with Autex polyester Green Stuf thermal insulation and ceiling with Quiet Stuf acoustic insulation. Internal walls are clad with Alucobond panels and the ceiling with Autex Vertiface.

**Technology:** In the Office, a server and 3 rack-mounted PCs drive 3 multimedia touch screens and 40" LCD screen in the main display area. A DVD/Video/Audio system is also routed to the 40" LCD wall mounted screen and 3 roof-mounted speakers. In the ESI Lab area at the rear, there are two iMAC all-in-one computers that provide public internet kiosk access and a video macro-scope for invertebrate and natural history studies. The view from the macroscope can also be routed onto the 40" LCD for a super close look! A portable digital projector, screen and PA system are carried for outdoor use (in the Genesis energy dome).

**Communications:** For mobile internet, the Green RIG is equipped with an IPSTAR broadband satellite system with the satellite dish mounted on the front of trailer using a telescopic gas mount. The backup system is a Vodafone 3G/GPRS unit. The tractor unit has an RT operating on Horizons' Teamtalk network, a Smarttrack GPS tracking unit and dash-mounted webcam. The trailer is equipped with a series of Civil Defence communications aerials operating at different frequencies (Police, Marine VHF, ES Band) with a radio patch panel in the office. This will allow the Green RIG to operate as a back-up mobile communications centre during a civil defence emergency.

**Outdoor venue:** The Green RIG carries an inflatable 10m diameter, 5m high PVC dome shelter and groundsheet structure that can either be assembled stand-alone or connected to the push-out entrance of the vehicle via a special gusset. The dome is kept inflated by an energy efficient electric blower unit and has removable walls with windows. The Green RIG carries a small amount of catering equipment, 6 folding tables and 30 folding chairs for use at events.

