Projects underway* or envisaged

- Develop safe, healthy and environmentally responsible operation practices for vessels featuring alternative propulsion.*
- Evaluate battery technology suited to marine propulsion.*
- Obtain, design and trial generators to recharge the battery banks. These range from standard solar panels to ‘water windmills’, solar-Stirling.*
- Optimise the water jet module in the vessel to meet the design considerations.*
- Design and build a drag reducing, transport friendly reconfigurable hullform.*
- Extend water jet discharge to match reconfigurable hullform. Nozzle vectoring control to be moved aft.*
- Automate vessel control, including CAN-bus drive by wire.*
- Develop a variable drag device to allow ‘dial in’ hull performance to allow the GreenLiner to mimic any vessel for propulsion testing.
- Develop predictive software to model performance of a propulsion system employing proprietary components.
- Instrument the propulsion system to allow actual performance evaluation of alternative systems.
- Obtain and install various electric motors suited to marine propulsion, along with their motor controllers to evaluate best practice.

Goals for 2009

To operate the Greenliner in solar recharge, zero emission mode on a water body such as Dove Lake where internal combustion engines are unacceptable. The already low 2008 noise emissions will be halved, as will the vessel wash. Simultaneously the endurance will be increased 50%

For more information

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Origin of the Hull
Designed by Australian Naval Architect Greg Cox, the Greenliner hull was built as a 1/8th scale model for undertaking wave wake studies (riverbank and bed erosion) for an intercity ferry between Sydney Harbour and Gosford. The AMC Towing Tank group conducted many experiments on a 1:30 scale model to confirm performance predictions. Propulsion for the planned full scale vessels were twin Rolls Royce Alison gas turbines burning CNG, though the 1/8th scale Greenliner featured a B & S Vanguard engine to provide equivalent scale power. The design brief for a draught of only 164 mm fully laden (for the 1/8th scale Greenliner) and to have high sea state (blue water) seaworthiness, saw international interest in the hull design.

In 2006 the Greenliner hull was adopted as a platform for developing propulsion technologies in student research and design projects. In 2008 the vessel successfully traversed the entire Tamar River length from Beauty Point to Home Point. The vessel is used to prove systems under marine conditions after the theoretical design bugs have been ironed out in the lab.

International Interest
The Greenliner project has attracted national and international interest. In 2009 an undergraduate research student from ENSIETA France plans to visit Tasmania to work on the project.

The second key area involves harnessing alternative power sources for vessel propulsion. This will result in creative application and design of solar, wind, water and possibly biomass systems in ways that are not already common place (such as sail).

Principal Particulars
- **Cruise Speed:** 17 knots (original spec)
- **L.O.A.:** 7.75m
- **L.W.L.:** 6.15m
- **B.O.A.:** 1.06m
- **Draught:** 164mm (original spec)
- **Displacement:** 348kg (original spec)
- **Built:** 1999, Greg Cox, Newcastle, NSW
- **Construction:** Ply (Australian Plantation Hoop Pine)
- **Current Motor:** 4hp HiTorque Industrial Technik DC electric
- **Propulsor:** DOEN DJ60 Axial flow water-jet

Vision for the Greenliner Technology Demonstrator
To develop a practical alternative propulsion and related systems to operate reliably on the Tamar River, from Home Point to Beauty Point. Such a vessel could operate in most Australian estuarine boating regions because the Tamar valley has unreliable/low wind energy, solar energy, and tidal/flow energy.

To reliably undertake such a journey with no single reliable energy source other than fuel will require clever design, giving it diverse operational capability.

Important Design Considerations
- Efficiency and effectiveness; health & safety; reliability & applicability; technology suitability; solid, liquid & atmospheric emissions including end of life/sinking; noise emission; energy (exergy) consumption (lifetime energy use); propulsion damage (shallow draft operation); cost effectiveness and ethics.

Goal for 2009
To operate the Greenliner in solar recharge, zero emission, mode on a water body such as Dove Lake where internal combustion engines are unacceptable. The already low 2008 noise emissions will be halved, as will the vessel wash. Simultaneously the endurance will be increased 50%.

Sponsorship and Links with Industry
The Greenliner has been developed on the basis of Industrial Sponsorship as acknowledged by signage on the vessel, including Industrial Technik, Greg Cox (Naval Architect) and DOEN WaterJets. Other sponsors are being sought for the energy recharging and systems needed to realize all the current projects and sponsor’s own projects.