WiGs, WiSES, AGECs, ram-wing vehicles, hoverplanes, wingships or ekrano-plans, whatever you call them, the ground-effect vessel has been around since the 1960s, but it's never really taken off due to a lack of commercial credibility and close to "dying of apathy". Graham Taylor of Hypercraft Associates argues that the concept has suffered from being unfairly shunned by the conservative marine sector as a typical response to disruptive innovation. However, WiG may finally get off the ground following renewed interest in the concept.

Taylor believes growing markets for this technology will be from China and East Asia, areas that are moving to fulfill First World economic aspirations. "There are huge demographic and economic changes taking place which demand improved transport systems to support the population and to support trade," he said, suggesting that the scale of the demand will be vast and immediate, while the capability of traditional transport systems are likely to be confined by geography and environmental factors.

"This means transport systems that require high infrastructure investment (e.g. roads, rail, and airports) cannot provide a complete solution. Current marine transport cannot fill the gap either."

Taylor pointed out that vessel speeds below 40kts will just not be fast enough for the First World economy in which transit speeds of up to 100mph are typical of all other surface traffic. "This is why we believe there is a demand for a 100kt economic transport solution which avoids high infrastructure investment by making use of waterways."

As such, Hypercraft Associates has been working with the German research company Fischer Flugmechanik to commercialize a 100kt+ wing-in-ground effect craft called Hover Wing, a high speed marine vessel that is said to be unlike any of the ekrano-plan-type vessels that have previously tried but ultimately failed to cut a niche in the mainstream marine market.

**Caspian Sea Monster**

Taylor referred to significant Russian research on ekrano-plan vessels between 1960 and 1980, although the HoverWing concept is claimed to be a step forward from the 'stick with wings'-type craft such as the so called "Caspian Sea Monster" which made headlines in 1963. In layman's terms the technology is not dissimilar to that of a hovercraft but rather than riding on a static air cushion trapped within the skirt, the craft rides on a dynamic air cushion of downwash created between itself and the surface by virtue of its own passage.

The HoverWing incorporates a patent protected lift-off aid in the form of an SES-type air cushion under the hull. For take-off, seven per cent of the propeller stream is diverted and guided between catamaran hulls to produce a static air cushion which reduces displacement of the craft by 80% to lessen drag. Static pressure is maintained until take-off whereupon the craft makes a seamless transition to ground effect cruise mode. By combining the lift-off aid system and sponsons with a blended lifting body centre hull shape a more aesthetically pleasing, futuristic looking craft is possible.

This configuration allows it to fly at sufficient height to perform banked turns of less than 300m radius while cruising at 90kts; this, without subjecting passengers and crew to uncomfortable G forces. For such speeds, a gas turbine configuration is the obvious contender but the efficiency of ground-effect cruise means that fuel costs are said to be "reduced to the point where they cease to be the main cost-driver."

**Commercially viable**

From a technological perspective a commercially-viable ekrano-plan is now possible, but there remains the task of translating concept and prototype work into an actual marketable product at a vehicle size that is commercially acceptable. Hypercraft Associates and Fischer Flugmechanik acknowledge, however, that commercial credibility hinges on the ability "to take this technology through the iterative process of the 'design spiral' to produce an optimal vehicle design which will balance all the technical elements together with the financial, commercial and risk dimensions, both in terms of the manufacturer and the operator. Put simply,