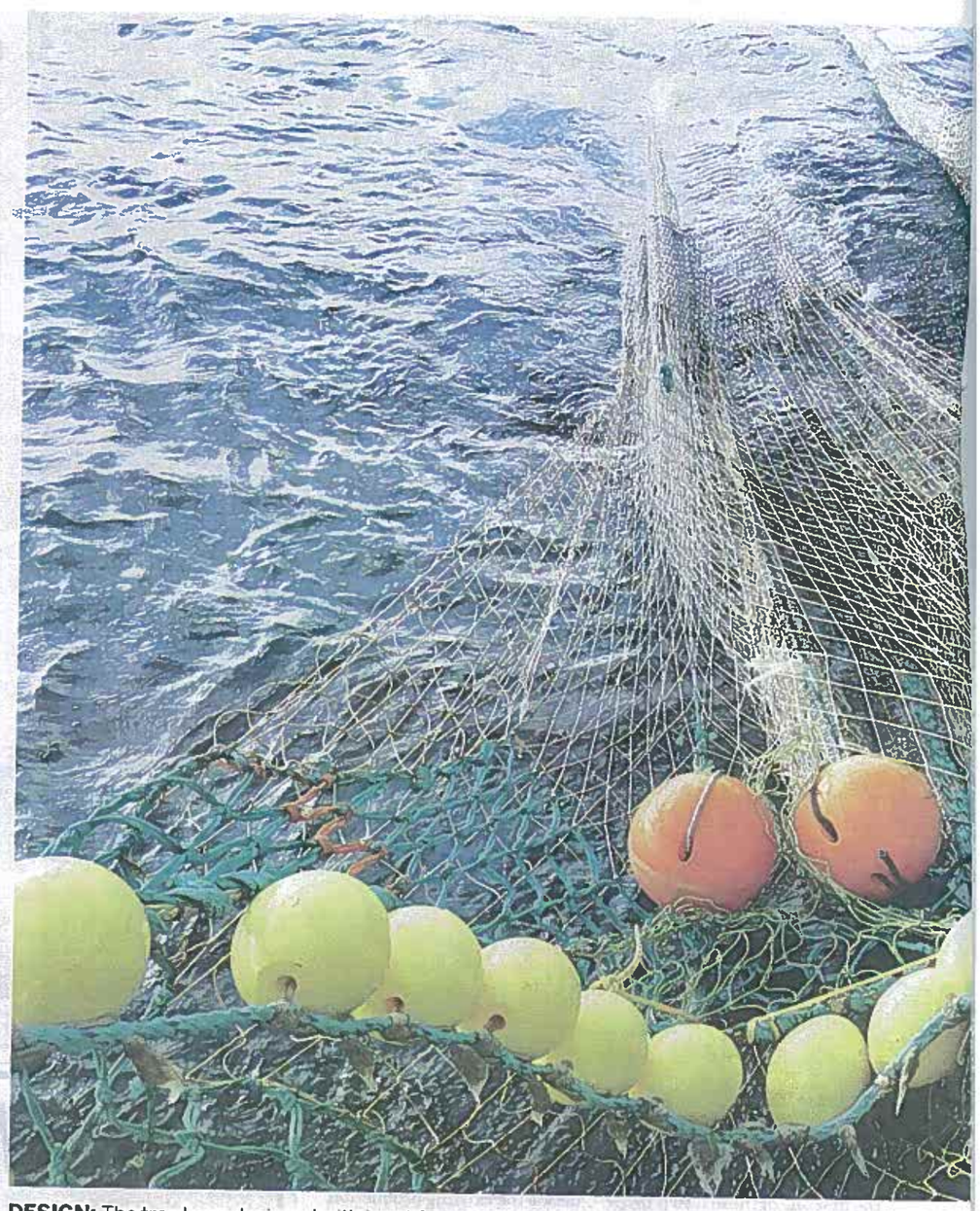
Amazing results in Baltic gear trials



DESIGN: The trawl was designed with input from Ulrik Jes Hansen of CATch-Fish and Niels Jørgen Nielse

A project on the Danish island of Bornholm that brought together expertise from several directions and proceeded without any of the usual restrictions, proved to be a great success

Quentin Bates

With preliminary results after almost a year with experimental trawl gear showing that fuel consumption per kilo of fish landed can be reduced by between 35 and 40%, the gear trials are rightly being hailed as a success.

Behind this figure are an increase in catches per towing hour of 20%, while demonstrating a reduction in energy consumption of at least 15 to 20%.

Financed by the European Fisheries Fund and the Danish Ministry of Food, Agriculture and Fisheries, the project was carried out for the Bornholm and Christiansø Fishermen's Association by Gemba Seafood Consulting.

Local processor A Espersen AS, DTU Aqua, the Danish Technological Institute, fishing gear supplier Nexø Vodbinderi, Ulrik Jes Hansen of CATch-Fish and trawl door manufacturer Thyborøn Skibssmedie all took part, along with skipper Niels Jørgen Nielsen of the 400hp test trawler *Katrine Kim* R-254.

"There is a huge difference. These results show around 40% savings on his overall fuel costs," Poul Tørring of Gemba Seafood Consulting said, commenting on the results a few weeks before the one-year project ended.

"We have had some spectacular results, showing substantially improved profitability for the vessel," he said, explaining that as *Katrine Kim* has a 300t quota for cod, at an DKK8 per kilo average price, this represents a catch value of DKK2.40 million."

"With the capacity to catch 20% more for the same time at sea and fishing effort, this means he could lease an additional 60t of cod at DKK2.25 per kilo, which sells for DKK8 per kilo. For a boat with a revenue in the order of DKK4 million per year and fuel costs of DKK400,000, this means that he can add DKK370,000 to the boat's earnings – which covers his fuel costs for the year."

A further consideration is that CO^2 emissions from a vessel like Katrine Kim come to approximately 160t/year with an annual fuel consumption of 60,000l.

"This can be reduced by 40% to only 96t. So it follows that with a Baltic cod quota of 60,000t, the potential is there to remove 13,000t of CO^2 emissions if all the cod in the Baltic were caught using this type of gear."

Lifting the rules

Katrine Kim's entire fishing gear was re-thought from the ground up, with investment in a Simrad trawl sonar, a new trawl, pelagic doors and Dyneema warps, all engineered to minimise the drag of the gear. Payback time for the new fishing equipment, including the sonar, doors, warps and trawls, is approximately one year.

EYE: *Katrine Kim* is one of the trawlers taking part in the Danish catch quota scheme, with cameras that monitor activity on deck as part of full catch documentation

"Fishermen in the Baltic have to work with very detailed descriptions of the gear that they are allowed to use, which includes the Bacoma escape windows and strict codend specifications," he said, commenting that a crucial part of the project was the dispensation that allowed all of the usual technical measures to be suspended for the duration.

He commented that discards, which are low under normal circumstances, were even lower with the trial trawl gear.

The largest single contributor to *Katrine Kim*'s fuel savings was the switch from conventional demersal trawl doors to a pair of 2m2 Thyborøn Type 15 pelagic doors, accounting for a massive 15% saving in fuel consumption as they do not touch the ground and also spread the gear with around 15% more spread than the bottom doors did.

"There are even better results that indicate an additional 5% improvement now that the doors have been replaced by a 1.50m² pair," Poul Tørring told *FNI*.

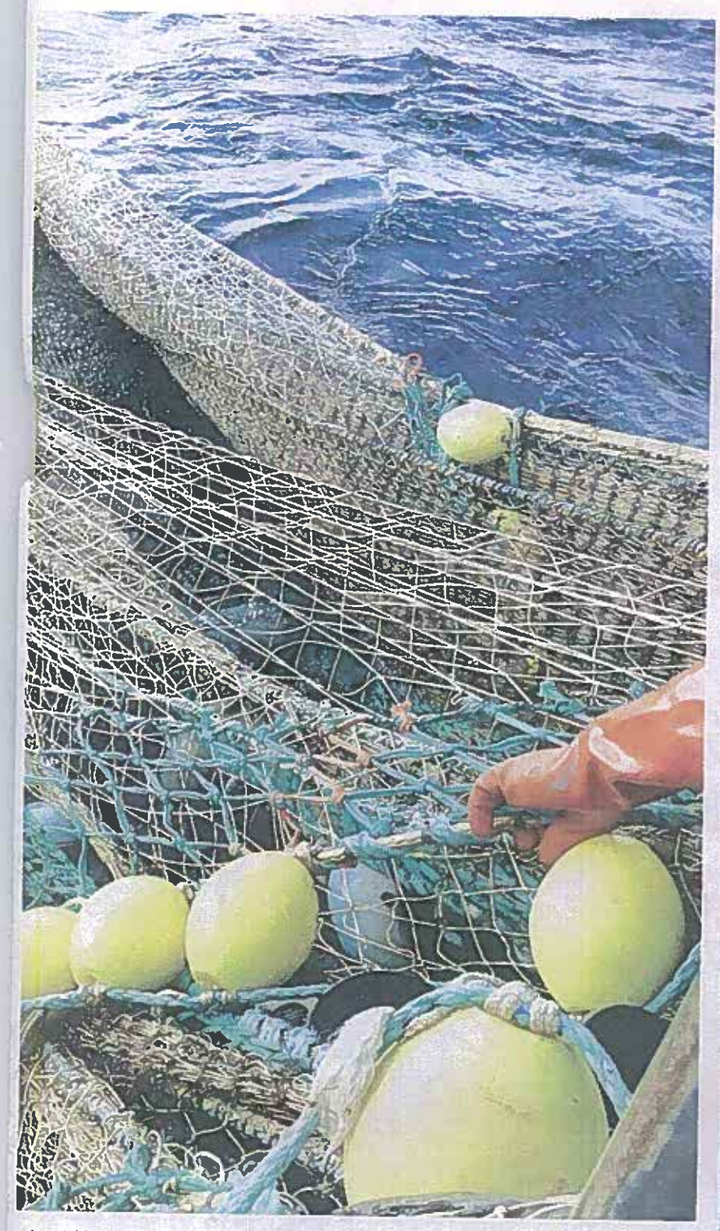
As well as new doors, *Katrine Kim* was fitted with a set of 10mm Dyneema ropes to replace the usual trawl warps. To protect the rope from wear, the steel rollers in all of Katrine Kim's block were replaced with a nylon version, although stainless steel would also have been an option.

"The economic lifetime of the rope is expected to be around five years. Although the price of the Dyneema rope is double that of wire, the long-term costs are still less than half, as the lifetime of steel wire rope is only around one year," he said.

"The rope is a lot easier to handle than wire and has the advantage of having no backlash if it parts, which make working with it safer. It's also much easier to handle the doors when they are towed on Dyneema rope than on steel wire."

Largely standard ground gear and sweeps were used, although their impact on the sea bed is reduced owing to the change in the trawl doors, but the trawl gear was thoroughly re-thought by Klaus Hjorth Hansen of Nexø Vodbinderi, Ulrik Jes Hansen of CATch-Fish and skipper Niels Jørgen Nielsen, who were allowed to use whatever methods they liked, as long as these were in line with the objectives of maintaining selectivity levels and minimising the drag of the gear.

Katrine Kim's trawl is made in Dyneema and nylon netting,



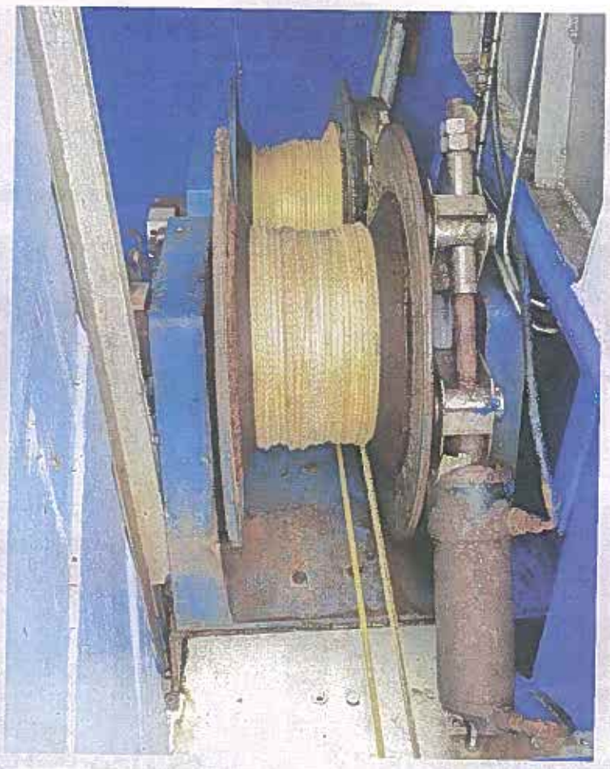
ade at Nexø Vodbinderi in nylon and Dyneema is larger, lighter and more

with PE netting used in the codend.

The trawl is larger than *Katrine Kim*'s original trawl, and considerably lighter to tow.

"Dyneema's tensile strength is around nine times greater than that of PE per unit of weight, which made it possible to reduce the twine diameters used in the gear to roughly a third of what they had been, which reduces the overall twine surface area considerably," Poul Tørring said.

"But as Dyneema has very little elasticity, a nylon section was put in the trawl in the fishing circle between the forward and rear sections to act as a shock absorber.



STRENGTH: The 10mm Dyneema rope used to replace *Katrine Kim*'s conventional steel wire rope warps

SWITCH: One of the 2m² Thyborøn Type 15 doors on the surface. These were replaced during the project with a 1.50m² pair

"Knotless netting was also used in the lifting bag of the codend to improve the quality of the catch."

The dispensation to dispense with technical measures also made it possible to build the codend without the normal mandatory selectivity devices, either a Bacoma square mesh window or the very narrow T90 codend. The codend used is full size and in T90, probably serving to increase the catch results.

Trawls without the normal square meshes, but netting in a T90 configuration was used instead.

Intelligent management

"This illustrates just what an intelligent fisheries policy can do," he told *FNI*, commenting that this approach indicates what is feasible if fishermen are free to choose the gear they use while documenting their catches; as is done on board *Katrine Kim* as one of the Danish vessels fitted with cameras to take part in the catch quota scheme.

He told *FNI* that the 2000+ detailed regulations that specify what can or cannot be used in fishing gears are both ineffectual and counter-productive, while a simpler regime of results-based management with full documentation is a far more effective approach.

Denmark made the move to transferable quotas several years ago, and Poul Tørring told *FNI* that within a matter of months the 30% overcapacity in the Danish fleet had gone.

"Those who wanted to stay in the industry had the opportunity to do better, while we also had a large number of older fishermen who were prepared to leave fishing, but didn't have a way out.

"So this provided a way for them to be compensated for leaving," he explained, adding that Danish fishermen were initially firmly against the move to a transferable quota regime, but today are in favour – although they are adamant that there is a real need for the raft of inappropriate technical measures to be discarded.