A partnership that has had a leading hand in changing many aspects of New Zealand's seafood industry for the better is entering a new era.

The industry and the Government have invested $48 million on research and innovation since the inception of Seafood Innovations Limited (SIL) in 2005. Now the two-stage government funding programme has reached its closing phase.

Initially, the funding was via the Foundation for Research, Science and Technology (FRST) and subsequently the Ministry of Business, Innovation and Employment (MBIE).

SIL is a partnership owned by Seafood New Zealand and Plant and Food Research. However, the MBIE project ends in June next year.

SIL general manager Anna Yallop said research that added value to the seafood sector came in many guises.

"It can be research that leads to the creation of new products for the sector, saves costs for the industry or enhances products that are already in the market."

SIL, through MBIE, funds 50 percent of research and companies the other half.

Yallop said the money that SIL receives goes to pay the research providers.

"All of the funding goes to research organisations like NIWA, Cawthron or universities or companies that can provide specific engineering, science or software development for specific projects. The kind of work that a company can't necessarily do in-house – they might not have the equipment to do it and they might not have the expertise because it's not business as usual."

And, surprisingly, it is less about making use of any waste created by the sector.

"The seafood sector is one of those industries that does something with pretty much everything. They turn by-products into fishmeal, fertiliser or fish oil, so they don't have a huge volume of waste that gets dumped. The driver is often about saving costs or getting more value from the raw product rather than minimising waste."

But SIL's research projects are not just about by-products.

"It could be finding ways to improve processes on board vessels, minimising by-catch, finding ways to find why a species is not thriving in an area – it has to have some type of novelty and requires some scientific stretch.

"It could be a new way of doing something – a new way of developing a product that is already in market. It could be a cheaper way or a more efficient way or a method for processing that retains some bioactivity that a different process might not."

Yallop said companies across many sectors were increasingly approaching research organisations and universities to do more innovation and there were a number of reasons.

"They are realising that even though you are good at making primary sector products there is further leverage to be had. New Zealand is known for having safe food products, that clean green element, so it makes sense for companies to develop new products or enhance products they already have by telling more of a New Zealand story around it."

However, the big driver is certainly value.

"They need to look at a whole-of-resource approach. By minimising the parts of product that you get no value out of you get more value out of what you have.

"So, if they can eke a bit more value out by handling products differently that can save costs. If you have a product that is being roughly handled and it gets downgraded changing and improving your processing techniques may mean you can sell it at a higher price.

"If you think about the regulatory costs for processing products, the cost of landfill, the cost of waste water, the cost of people. You've already invested all that money into processing you may as well get the most money out of it as possible."

There are also companies that are driving innovation in a more sustainable way because it is important to both their company and their customers.

"It's a combination of saving costs and social license, as being environmentally responsible has a spin off for the bottom line as well," Yallop said. "For example, companies are really looking hard at plastics at the moment and there are a range of solutions that are being worked on by industry whether it is minimising, re-purposing or looking for alternatives to plastic. It is certainly a hot topic."

Companies are getting into new areas as well as they increasingly realise that they can de-risk their current operation by adding products and markets.

SIL general manager Anna Yallop.

"Partnering with people who want to make use of the seafood sector's raw material is a real trend. If you are in the business of processing fish and you want to stick with that, that is fine, but companies are now getting together with new companies to develop products in a totally new space, or branching out on their own into new areas.

"Going it alone with a new venture is all very good if you have the wherewithal to put in new infrastructure or a plant to develop different products for your company but for others it is often better to partner with someone else. Similarly, companies often can't justify having their own in-house experts in niche areas and there is value in being able to tap into universities and research institutions as and when you need them for specific expertise."

She said once you found your way into one research organisation, that organisation has a network of other places that you could tap into for subsequent ventures. SIL could help by pointing people in the right direction, locating specific companies they needed and linking them with scientists, engineers, funders and investors.

The benefit of doing a SIL-type project was that the researchers managed the project, Yallop said.

Maximising mussels

North Island Mussels Ltd (NIML) is a good example of companies using external research providers for a range of R&D projects with commercial value. With co-funding from the Bioresource Processing Alliance, NIML worked with engineers and scientists from Callaghan Innovation to develop uses for their marine waste stream.

The researchers determined the composition of each by-product and developed prototype products for the company to develop into full-scale production. NIML has that work in progress and expects to have commercial offerings in place within the next 12 months.

In addition to this project, NIML has co-funded further research projects with SIL that investigated methods for improving its mussel harvesting and processing methods using various engineering techniques. Once again, engineers and scientists at Callaghan Innovation undertook the work alongside the company with each project having the potential to provide hundreds of thousands of dollars in increased returns.

"I am a great believer in not distracting businesses from their core business because a lot of these ideas can be quite high-risk. The idea might have been bubbling away for years but the companies have not had the energy, expertise, time or resources to do it. So utilising SIL, which offers 50 percent funding and manages the project while you get on with your business, is valuable. There is also value in having independent research organisations involved in product development as it often helps with regards to substantiating future claims on your product."

SIL has a healthy stream of projects in the pipeline. There is still funding available on a quarterly basis before the partnership ends next year, but Yallop advises not to leave applying until the last minute.

The first step is finding the right research organisations to do the work, and that's something SIL can help with.

"A lot of companies don't know who to talk to or where to start, so we can find the right combination of scientists, developers or engineers you need to get it to work," she said.

The proposal is written, jointly with the company and researcher, or, if the proposal is over $200,000 SIL can fully fund the proposal write-up.

"Often companies don't have the time or resource to write their own proposal. That's a service that SIL offer so companies can get on with doing their own business. The proposal will focus on a range of things

Plant and Food research scientist Maren Wellenreuther is researching ways to develop marine fish into farmable species.

including the technical stretch, which means how difficult it is to do and the ability to deliver the project on time and on budget.

"It also focuses on pathway to market, although not all projects have one. If it is a project looking at how to avoid marine mammals in nets that's not going to necessarily have an end product but is still worthy. However, if the end result is a product it will need to have a plan to actually get that into market.

"It also focuses on what benefits to Maori there might be and how much engagement with Maori has gone on. And the proposal must also demonstrate that the project shows a significant benefit to the sector and/or whether capability and expertise is being developed, or there are any environmental or sustainability benefits," Yallop said.

The proposal goes to a research advisory committee which scores it against those measurements.

"These are very experienced people from industry, people who have worked in government and academia and science. They rate the proposal and then make a recommendation to the Seafood Innovations Ltd board which makes the final decision over whether the proposal is accepted for funding. We prefer to do large projects, requiring funding of more than $100,000 but there is no minimum or maximum – it comes down to how much co-funding the companies can put into the project and the overall value the project will have."

Any intellectual property developed from the projects, as a rule, goes back to the companies co-funding the projects.

So, what happens when the partnership and funding expire in June 2020? Yallop said she was already

A Plant and Food food safety project on oysters.

exploring options.

"Part of my role is to work on how a business model could work after 2020. In my discussions with companies there is a real need for a SIL-type model, particularly at the applied end. Things like product development, providing independent assessment of a product will still be needed by the industry after this programme expires. By mid this year I hope to have a plan in place for how that could look because certainty for industry is important."

Speeding up seabed recovery

Finding innovative ways to speed up the recovery of the seabed under fish farms is being investigated as part of a project funded by Seafood Innovations Limited (SIL).

The seabed sometimes needs to be fallowed (rested) following a period of farming, resulting in production losses estimated to be $250,000 for every month a company's fish farm licence is out of production.

A first stage SIL project undertaken by the Cawthron Institute and co-funded by New Zealand King Salmon, Sanford, Ngai Tahu Seafoods and Akaroa Salmon has identified methods to remove the sediment to accelerate seabed recovery. It was found that managing the removal of the sediments, rather than allowing nature to take its course by leaving the seabed untouched, sped up the seabed recovery. If this is successfully implemented in a full-scale operation, farm fallow times could be substantially reduced.

As part of the initial project, Cawthron tested a range of potential methods including irrigation with oxygenated water and removing sediment. The next stage involves trialing sediment removal at a semi-commercial scale with vacuum dredging technology, all while following strict conditions to mitigate any potential environmental impacts.

The success of the programme will be determined by evidence of improved seabed recovery. Additionally, low-risk environmental effects, potential uses for the biodeposit sediments in land-based applications, and the ease of use and cost effectiveness of methods used during the project will be considered.

Saving seabirds

Wet tags manufactured by Zebratech.

Ensuring that baited hooks sink below the depths at which seabirds feed is a key mitigation strategy for surface and bottom longline fisheries. Current mitigation methods include deploying tori lines, setting at night or using weighted hooks which are designed to reduce the risk of seabirds accessing baited hooks during setting operations.

A collaboration between Fisheries Inshore NZ Ltd (FINZ), Seafood Innovations Limited (SIL) and The Department of Conservation (DOC) is deploying "wet tags" attached to the fishing gear to record the sink rate and ongoing depth of the gear in the water.

The work involves the deployment of the hardware and software on board participating vessels, analysis of the wet tag data and the development of an adaptive management tool.

The wet tag is a small, low-cost logger which records and transmits automatically.

Increased information on seabird captures in relation to the position of the line will enable seabird risk assessments to be updated to reflect the realities of the interactions of these fleets with seabirds. Information will be available for industry to demonstrate transparency regarding its ongoing commitment to mitigating seabird bycatch.

Information from the tags will be aligned with the ER data to provide information to fishers on catch rates associated with how the gear operated in the water.

The roll-out of electronic reporting on the New Zealand fleet means the fisher will be able to download the data from the tags once the gear is hauled aboard and, if a seabird has been captured, adjust fishing practices in order to avoid more captures.

The project is being conducted as a collaboration between Wellington-based company Trident, which will analyse the data, FishServe Innovations Ltd, the electronic reporting providers and Zebratech, which manufactures the tags.