

# Environmental Impact Assessment of a Phosphate Mining off the Namibian Coast – A Pilot Project

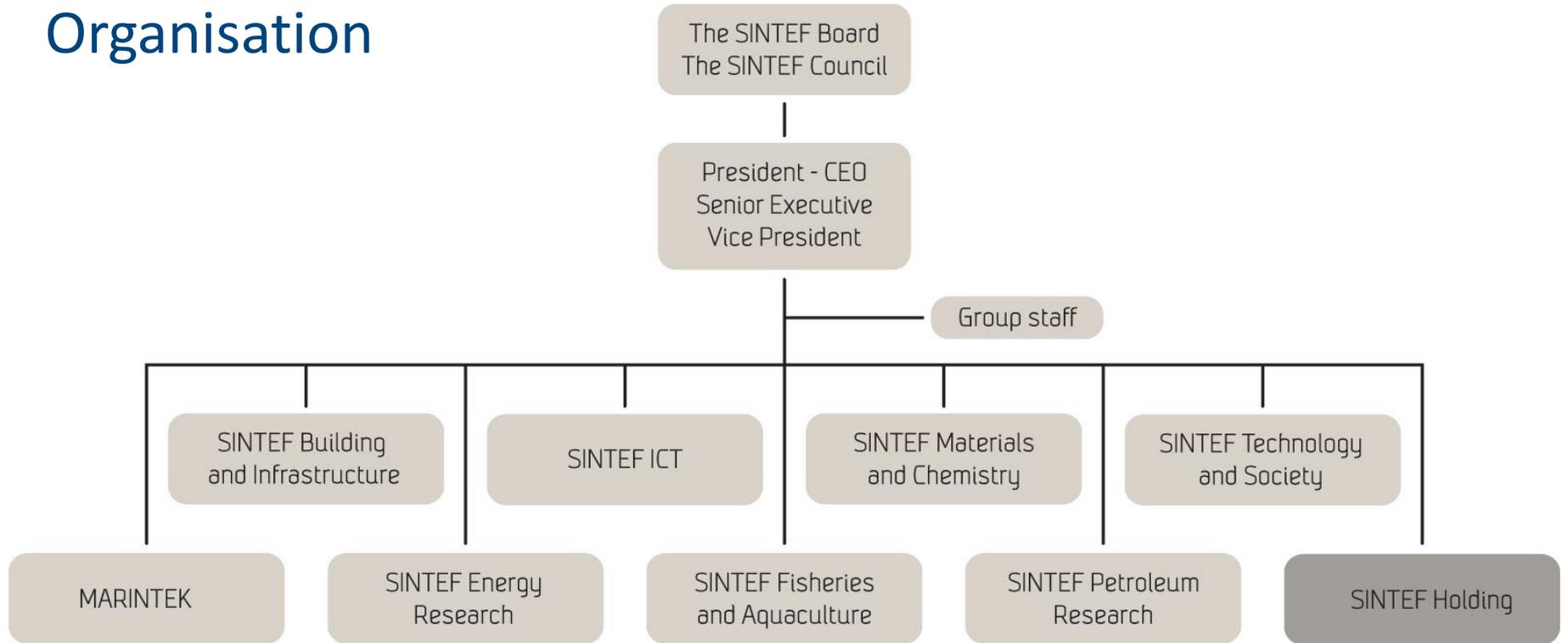
Roar Solbakken, Project Manager

**Norwegian forum for development cooperation in fisheries, aquaculture and aquatic environment  
Oslo August 26<sup>th</sup> 2014**

# Agenda:

- About SINTEF – brief version
- Background for the Pilot Project
- Objectives of The Pilot Project
- State of "the art"

# Organisation

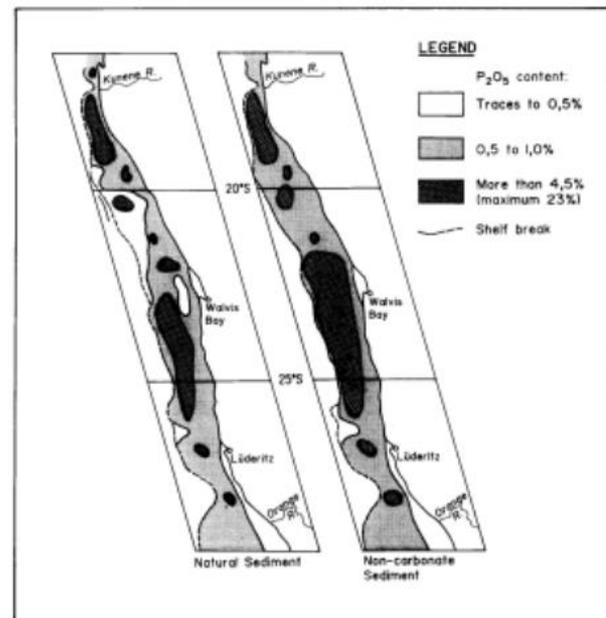
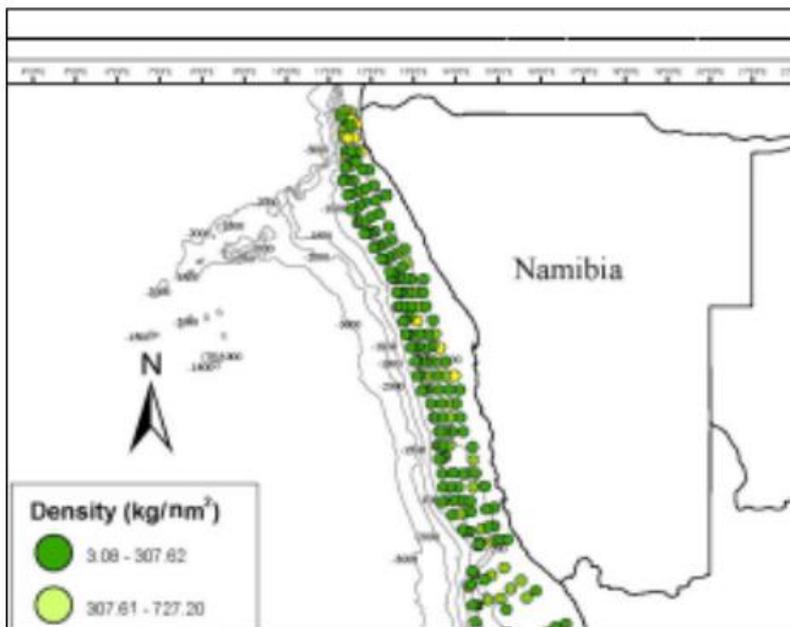


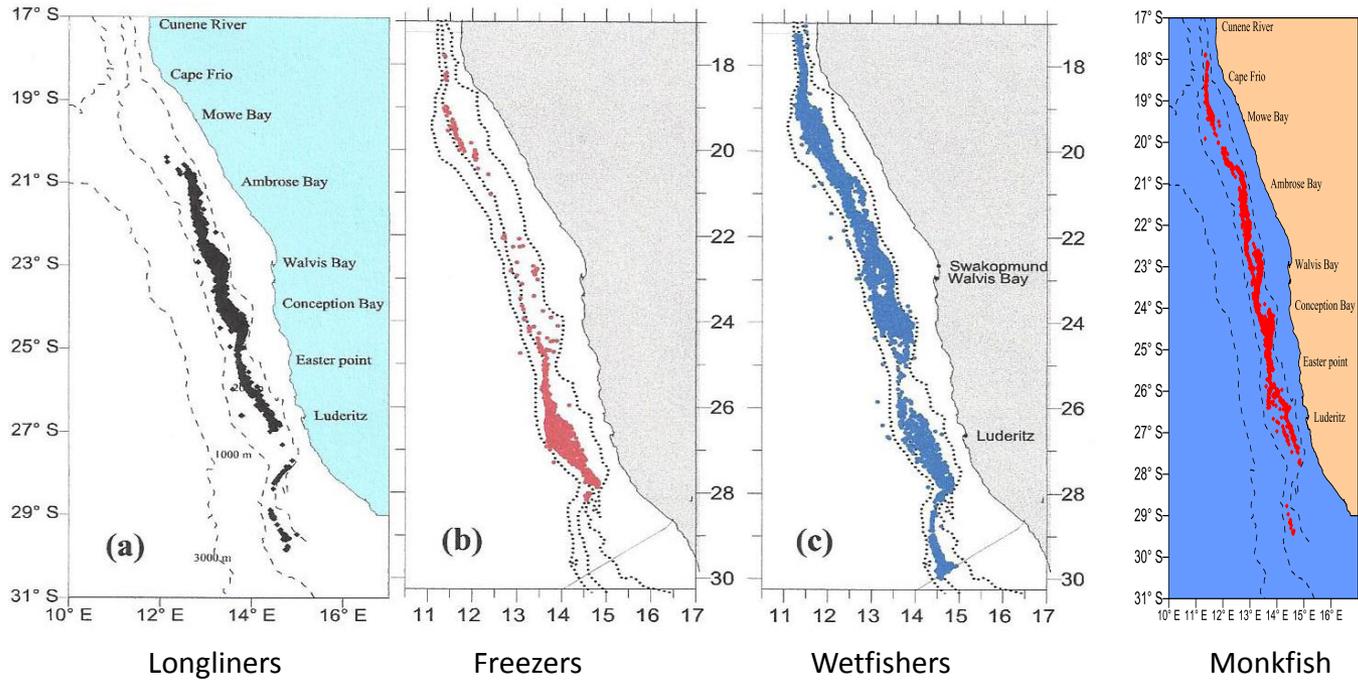
## Background for The Pilot Project:

- Namibian coastal waters are one of the most biologically productive upwelling areas in the world: these waters support living resources which live and breed at the coastal waters off Namibia.
- These areas are rich in mineral resources at the seabed, including deposits of phosphates which are potential mining commodity for fertilizer.

Both living and mineral resources are of commercial interest

There is overlap in the distribution of the living resources and that of phosphates





Project proponent:

Ministry of Fisheries and Marine Resources in Namibia

The Ministry is the guardian for the marine environment with the mandate (from The Cabinet) :

**"in a sustainable way manage the living aquatic resources and conserve the ecosystem as well as to promote the aquaculture sector"**



Google maps

## Objectives of The Pilot Project:

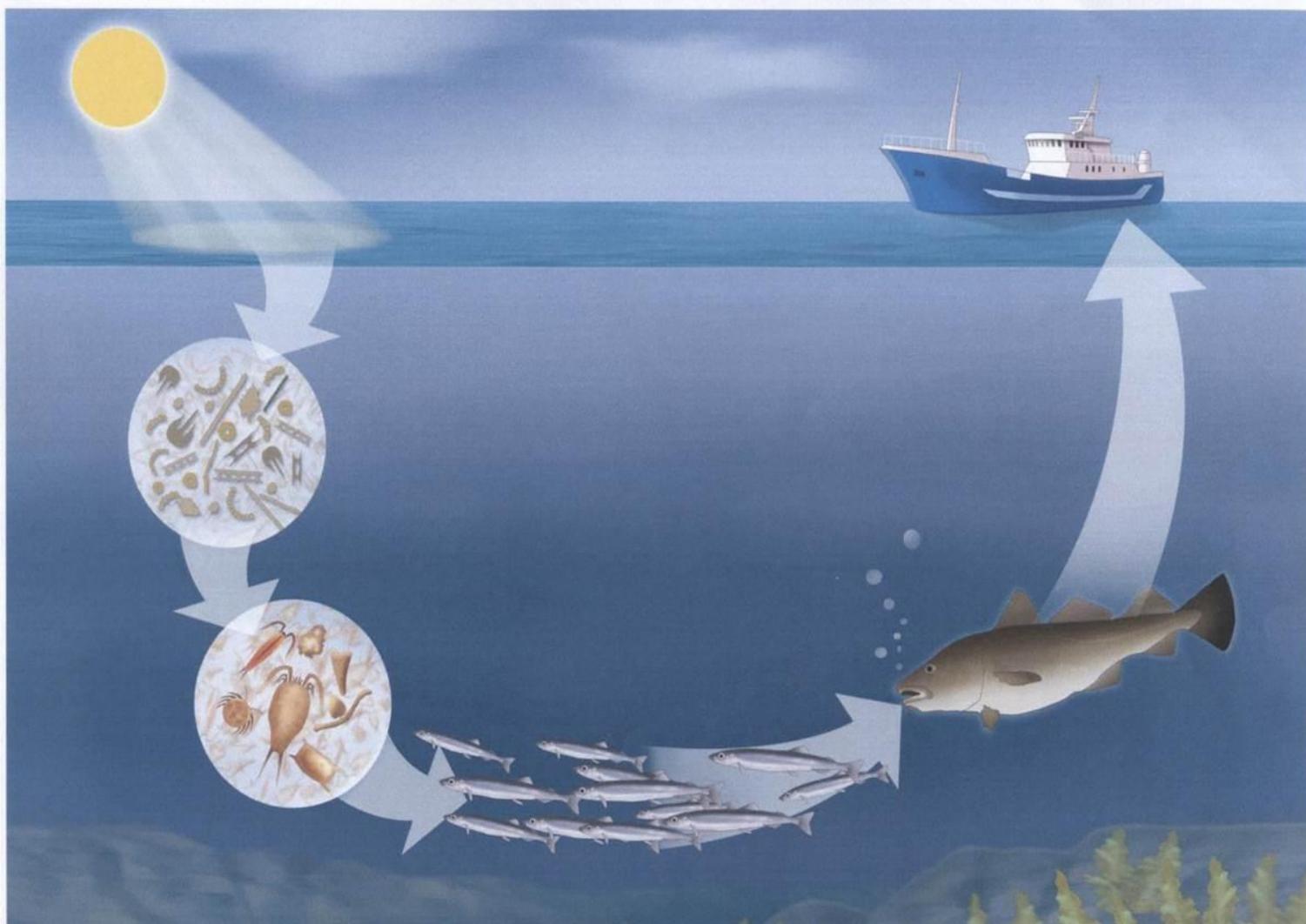
In cooperation with Institute of Marine Research (IMR):

- Develop The Main Project
- Give The Main Project a scientific content, identify and fill in knowledge gaps
- Build up an organization for The Main Project
- Estimate the costs of The Main Project
- Focus on co-financing of The Main Project

## WPs of The Main Project:

- WP 1: Identify present knowledge on the marine ecosystem off the coast of Namibia
- WP 2: Initial survey of Namibian industries – baseline information
- WP 3: Pre-mining environmental studies
- WP 4: Experimental and toxicological studies
- WP 5: Food Safety
- WP 6: Ocean Modelling
- WP 7: Assessment of results from WP 1 – 6
- WP 8: Suggestions for regulations and management of the Namibian coastal systems
- WP 9: Capacity building and knowledge transfer
- WP 10: Monitoring development

The Main Project will include field work and analysis, and cover all seasons.



Fishing is important in a global food supply perspective:

FAO:

- By 2050:
  - Double the food production
  - Half the climate footprint

# Biological production and food supply

Total  
bioproduction

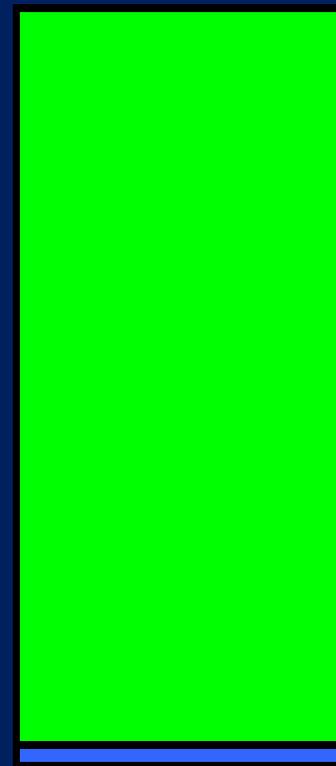
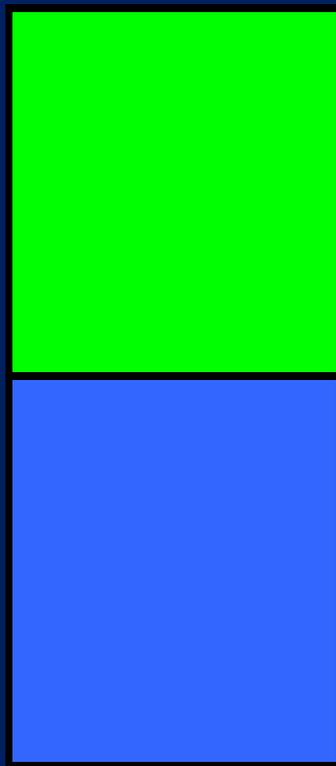
Contribution to  
food supply

Terrestrial

98 %

Marine

2 %



# Food safety:

- Food Safety Surveillance:
- Monitor :
  - Trace metals (cadmium, nickel, mercury, arsenic, copper, chromium) on the industry site and on a reference site pre-industrial activity.
  - Time series, focus on species for human consumption, edible parts of fish and crustaceans. Samples to be taken at all seasons.
  - Monitoring should include deep-sea crab, shellfish and oysters, lobster, pilchard, orange roughy, hake, monk fish and South African horse mackerel.
- If trace metals are accumulated in species important for the fishing industry:
  - Toxicokinetic studies (uptake, distribution and elimination)
    - To study if problems are of long time concerns.

- Monitor:
  - Radioactive compounds and mining production chemicals (flocculants, flotation chemicals and others)
  - Time series, focus on species for human consumption, edible parts of fish and crustaceans. Samples to be taken at all seasons
  - Monitoring should include deep-sea crab, shellfish and oysters, lobster, pilchard, hake, monk fish and South African horse mackerel.
- If the monitored compounds are accumulated in species important for the fishing industry:
  - Toxicokinetic studies (uptake, distribution and elimination)
    - To study if problems are of long time concerns.

## Activities:

Visits to Namibia (Dec 2013 and June 2014):

- Stakeholder meetings
- Meeting with Ministry of Fisheries and Marine Resources and Ministry of Mines and Energy
- Meetings with the Local Steering Committee
- Meetings with the University of Namibia and the University of Cape Town

Processing the inputs from Namibia

Writing The Draft Report

Presentation of the Final Report from the Pilot Project for the Namibian Cabinet fall 2014.

Dorcas Mhunu

The Foundation for Scientific and Industrial Research at the Norwegian Institute of Technology (SINTEF), a Norwegian research organisation has been consulted by Namibia's Ministry of Fisheries and Marine Resources to construct the main Environmental Impact Assessment of the consequences in the marine environment of the marine shelf mining regarding Phosphate Mining along the Namibian coastline.

Road Sibabale, project director at Sintef Fisheries and Aquaculture said the EIA main project on Phosphate mining will be the first one to be carried out in Namibia and will be conducted over a minimum two year period. Areas to be covered will include measurements of baseline (pre-mining) environmental parameters, identification of knowledge gaps, modelling of coast water currents, toxicology, sediment profiles of the water column, release of gasses (methane and hydrogen sulphide) from the sediments, oxygen levels in the sediments, biology and biodiversity in the sediments and of the whole ecosystem chains, impact of spawning/hatching and changes of the seabed recruitment levels and fishery. Other topics will also be covered. The EIA will include field monitoring and data collection. The project is also expected to contribute to competence transmission.

It is a type of mining that has been used for 18 months. The Norwegian-based Foundation for Scientific and Industrial Research (SINTEF), and Institute of Marine Research (IMR), has been asked by the Namibian government to study the impact of marine phosphate mining on the ocean environment – specifically in the context of Namibia's fishing grounds within the Region's Current Large Marine Ecosystem. SINTEF is the largest independent research organisation in Scandinavia and supports research and development of about 2,000 Norwegian research projects. It is also a research and development activity. The findings will be crucial to the ongoing debate between the proponents of the fisheries and mining sectors, and hopes to neutralise skepticism that the "fish" in the water is being over-exploited. Marine phosphate mining is a considerably new field when it comes to ocean mining operations and has faced strong opposition around the world because of possible irreversible damage such operations could cause on fragile ocean systems.

It was feared that Namibia was going to become a guinea-pig for this type of mining but the government has decided to pause the mining until the EIA is completed. The project is also expected to contribute to competence transmission.

The phosphate mining operation will use. On the pilot project we are going to deliver a report to the Ministry of Fisheries and Marine Resources with suggestions to the content of the main Environmental Impact Assessment (EIA) report. We are neutral, we are just bringing out information that we know that this is one of the most important areas for marine production in the world.

Namibia has one of the largest phosphate deposits in the world that opens the doors for prosperity, jobs and food security for Namibia – and that is why the government is already looking to mine through Namibia's phosphate operations. The fisheries sector, which boasts the third largest catch in the world, is a major source of income and employment for about 14,000 people. Four hundred of these people are employed in the sector – and for Namibia as a whole – if such mining is carried out. The phosphate mining operation will be a state-owned enterprise, and will be managed by the Ministry of Fisheries and Marine Resources. The project is also expected to contribute to competence transmission.

The press of the fishing experts, who are leading the marine phosphate mining, has already been a cause for concern. The project is also expected to contribute to competence transmission.

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The minister's concern is derived from lack of documented experience in bulk removal of the sea bottom in phosphate mining globally and noted that unlike the land environment, the marine environment is a three dimensional character of being fluid, mobile and being a living system.

NAMIB TIMES 13 Dec 2013

The Ministry of Mines and Energy has earmarked a large piece of land in the protected Drob National Park to the south of Walvis Bay Salt Works for the land-based operations of Namibian Marine Phosphate (NMP), who operates the Sandpiper prospect".

# New Interest in Seafloor Mining Revives Calls for Conservation - Published in National Geographic's latest edition of "Ocean View"



## Esau issues a caveat for phosphate mining – NEW ERA, 12 Dec. 2013

SWAKOPMUND – The Minister of Fisheries and Marine Resources, Bernard Esau, says he is not willing to put at risk the country's renewable resources at the cost of the temporary exploitation of phosphate. Esau's stand was backed by the entire fishing industry during a one-day consultative meeting between the fishing and mining industries that took place at Swakopmund yesterday

NEW ERA 17 Dec. 2013:  
The first President and Founding Father of Namibia, Dr. Sam Nujoma, added his opposition to phosphate mining along the Namibia coast in an interview with New Era which published an article in its edition of 17 December 2013. The text follows below.  
He also voiced his opinion on the fact that the marine phosphate projects [Namibia Marine Phosphate in Walvis Bay (Sandpiper project) and LL Namibia Phosphate in Luderitz and also Chatham Rock Phosphate] are foreign owned and controlled.  
Earlier the Hon. Theo-Ben Gurirab, Speaker of the National Assembly remarked in the Assembly on 19 April 2013:  
"I am against the idea that phosphate is mined from the seabed." He reminded members of the recent SWAPO Party Congress and the strategy it adopted: "Fish is a renewable resource – phosphate is not".

## Acknowledgement to The Project Team:

- Bjørn Serigstad, Institute of Marine Research
- Johanne Arff, SINTEF Fisheries and Aquaculture
- Karl Tangen, SINTEF Fisheries and Aquaculture
- Bronwen Currie, National Marine Information and Research Centre (NATMIRC), Namibia
- Graca D'Almeida, Local Steering Committee

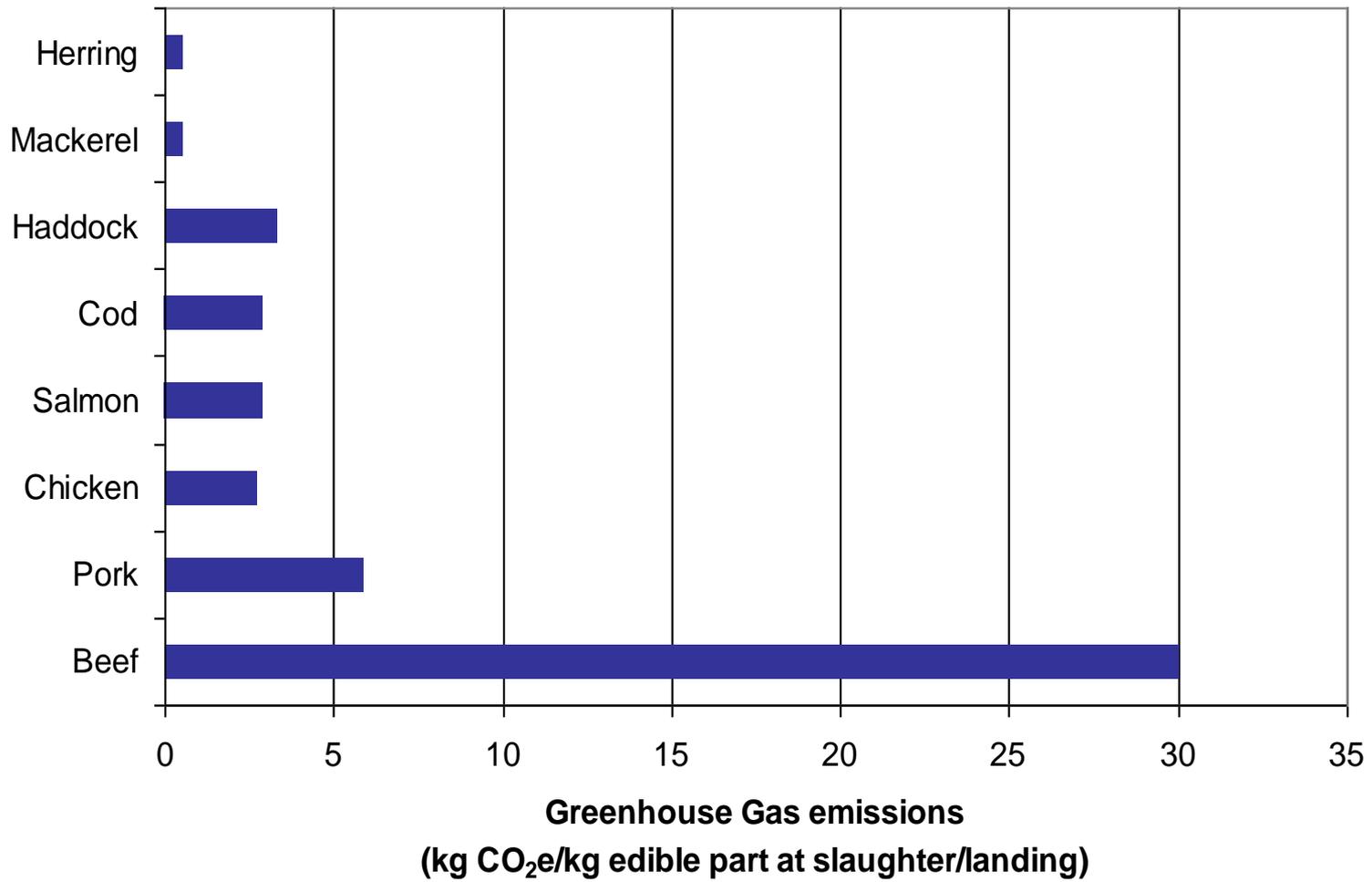
Thank you for your attention !

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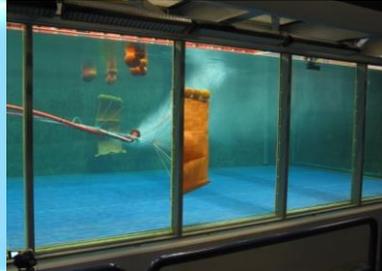
# Seafood in perspective



# "The European Fisheries and Aquaculture Engineering Laboratories" at SINTEF

## *Fishing gear engineering*

Flume tank  
Hirtshals , Denmark



## *Marine Juvenile Process Engineering*

Trondheim



## *Aquaculture engineering*

Large scale test site  
Offshore constructions  
Coastal location



## *Simulation, Surveillance and Operations Laboratories (SSO)*

Trondheim



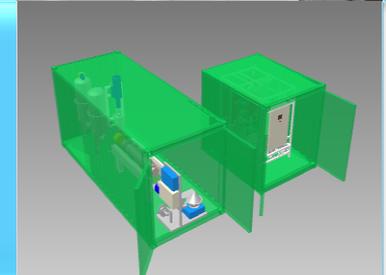
## *Fish Process Engineering*

Process Hotel  
Trondheim



## *Mobile Pilot Plant for Marine Ingredient*

Trondheim



## *Norwegian Center for Seaweed Technology*

Trondheim

