BLUE CIRCULAR ECONOMY

Northern Periphery and Arctic Programme 2014-2020

EUROPEAN UNION
Investing in your future
European Regional Development Fund

CREATING BUSINESS OPPORTUNITIES FROM THE **REUSE AND RECYCLING** OF FISHING NETS 2018-2021

Siv Marina Flø Grimstad, Project coordinator

DTU Technical University of Denmark

The Centre for Sustainable Design®

NTNU Norwegian University of Science and Technology

WDC Western Development Commission

eri environmental research institute

Project outline: Goal

Blue Circular Economy (BCE) aims **to help SMEs offering products and services within fishing gear recycling solutions in the NPA-region**

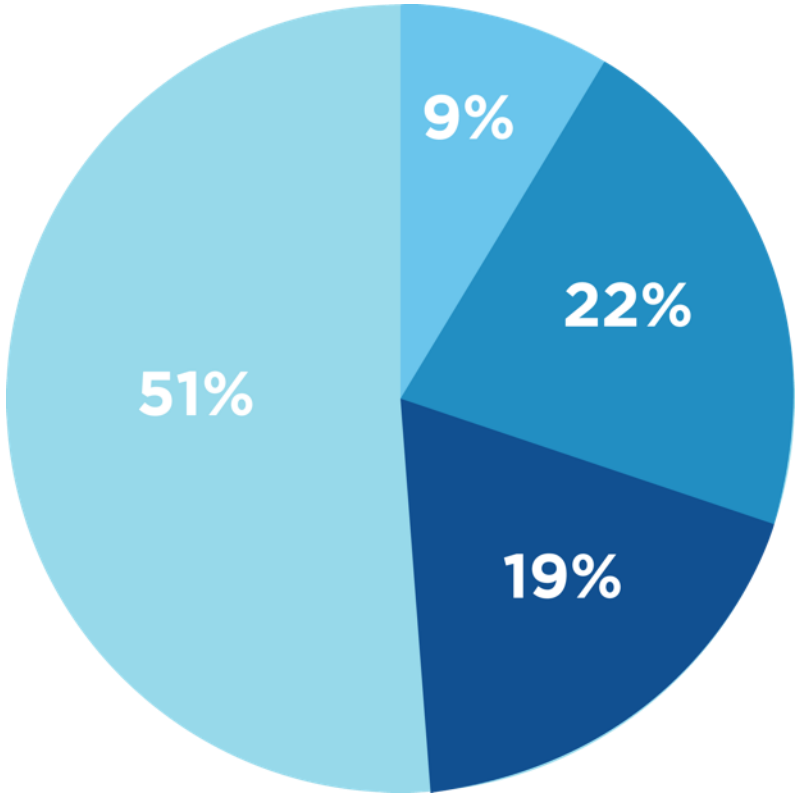
to attain greater market reach.

Building on the network developed under Circular Ocean (2015-2018),

the project will set up a **multi-level cluster** to connect and catalyse SMEs in the region.

The Northern Periphery and Arctic Region

Fate of plastic waste from FGs generated by Norwegian fishing fleet



- **ALDFG** (Abandoned, Lost and Discarded FGs)
- **Landfill**
- **Incineration**
- **Collected and segregated for Recyling**

Source: Deshpande et al (2019)

Project outline: Scope

The project will **focus on SMEs aiming to create value using circular economy concepts related to products and services within fishing gear recycling.**

National clusters in **Norway and Ireland** will form a core in the wider international cluster. These will serve as a basis for interactions between established companies and startups within the targeted industry.

BCE Main project output and indicators

T1 Clustering – WDC – Ian Brannigan

OT1.1.1 Create three clusters of recycled fishing gear in the NPA region (30)

OT1.3.1 Create sustainable value chains in the fishing gear industry (3)

Programme output indicator: Number of enterprises receiving support (CO01): 33

T2 Marketing strategy – NTNU – Richard Glavee-Geo

OT2.2.1 Stimulate the market demand for products made of recycled fishing gear (20)

OT2.3.1 Create environmentally and economically viable circular business models for SMEs in the fishing gear industry (30)

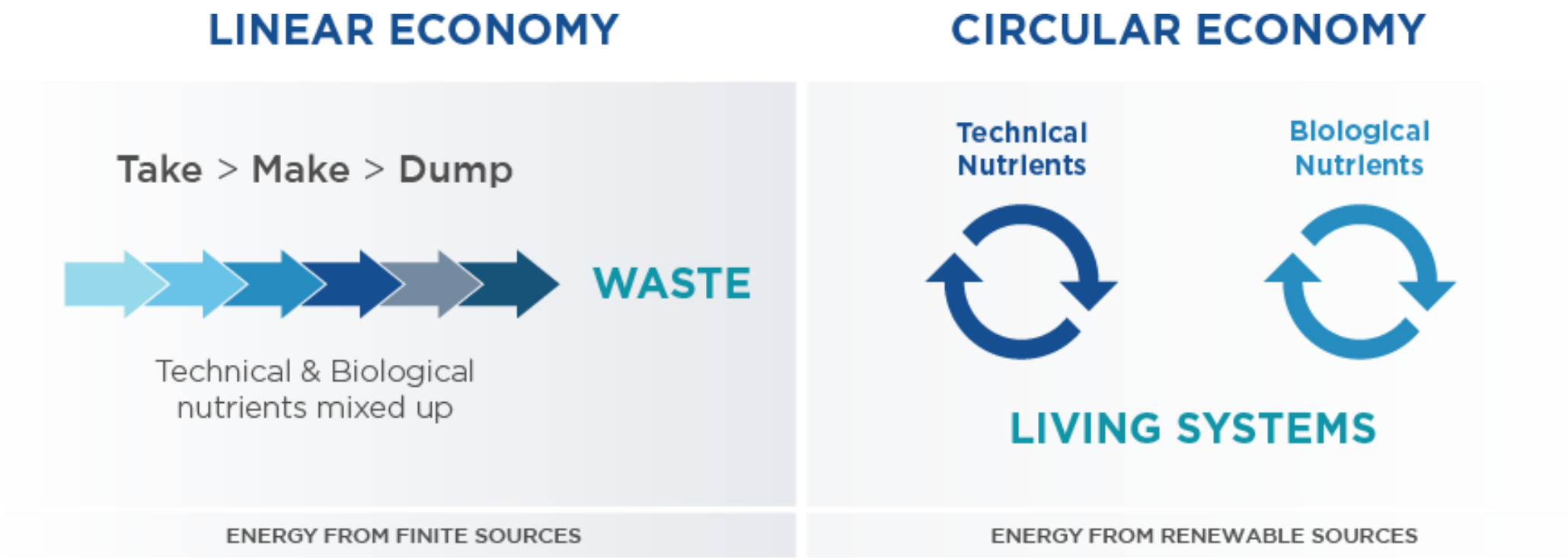
Programme output indicator: Number of enterprises supported to introduce new to the market products (CO28): 50

T3 Sustainability product standards – NHC/ERI – Neil James

T3.1.1 Blue Circular Economy Eco-label with indicator.

Programme output indicator: Number of business support solutions (services) utilising place-based opportunities (specific) : 1

Linear vs Circular Economy



Noprec – Norwegian Fishing Gear Recycling

Blue Circular Economy

Noprec, the Norwegian Plastic Recycling Company supplies recycled fishing gear to companies across Norway and Europe.

- **Established**: 2017
- **Location**: Ottersøy, North Trondelag, Norway
- **Employees**: 4 (plus 26 shared with Containerservice Ottersøy, the local waste management company).
- **Company Structure**: Private company led by two local entrepreneurs, strongly linked to Containerservice Ottersøy, which provides pre-processing services, such as cleaning, separating and cutting.
- Connections needed: Waste suppliers, plastic product manufacturers (HDPE and PP).

NOPREC

Norwegian Plastic Recycling

Noprec - Norwegian Fishing Gear Recycling

Noprec recycle plastic from the aquaculture and fishing industry to produce HDPE, PP and PE/PP mix granulates made from recycled fishing gear for companies across a range of industries in Europe, including:

- **Nordic Comfort Products** (Furniture)
- **Kiwi** (Supermarkets)
- **Plasto** (Plastic Product Design),
- **Partner Plast** (Aquaculture and Offshore industries)
- **Ørskog Plastindustri** (Construction)

NOPREC
Norwegian Plastic Recycling

Summing up

Consequenses of abandoned, lost and discarded fishing gear (ALDFGs):

- Ghost fishing
- Marine pollution
- Economic loss
- Long-term damage to fish habitat

The BCE project will work to create:

- More circular model of fishing gear production, collection and recycling
- More jobs through the creation of new products

How can we contribute to a more sustainable society?

Think global/local challenges

Think life cycle and circular

Think multi-disciplinary

Thank You

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bluecirculareconomy.eu

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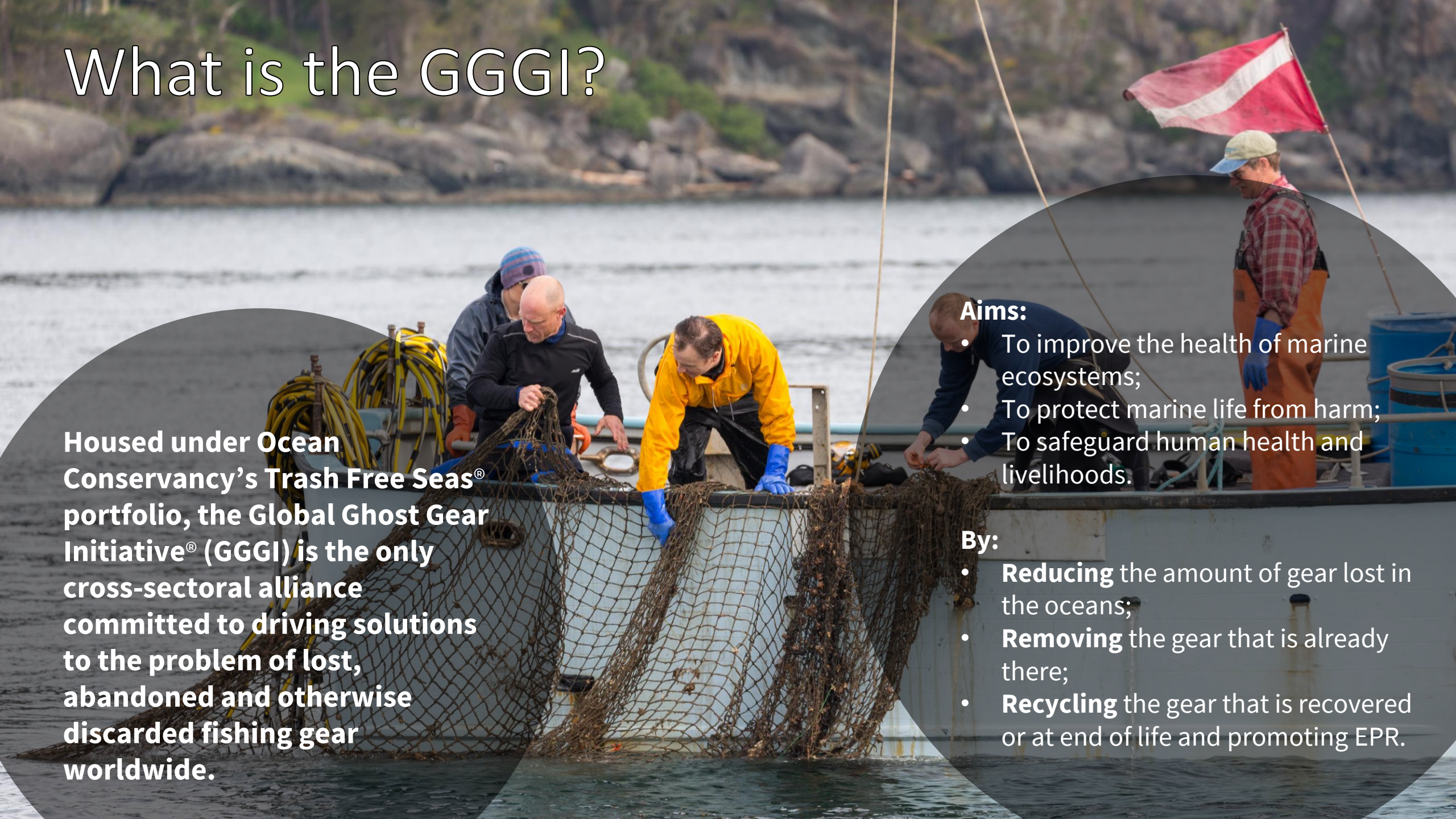
instagram.com/bluecirculareconomy

linkedin.com/bluecircular

BLUE CIRCULAR ECONOMY


GLOBAL
GHOST GEAR
INITIATIVE®
Driving Solutions to the Problem of Lost
and Abandoned Fishing Gear Worldwide
www.ghostgear.org

What is the GGGI?



Housed under Ocean Conservancy's Trash Free Seas® portfolio, the Global Ghost Gear Initiative® (GGGI) is the only cross-sectoral alliance committed to driving solutions to the problem of lost, abandoned and otherwise discarded fishing gear worldwide.

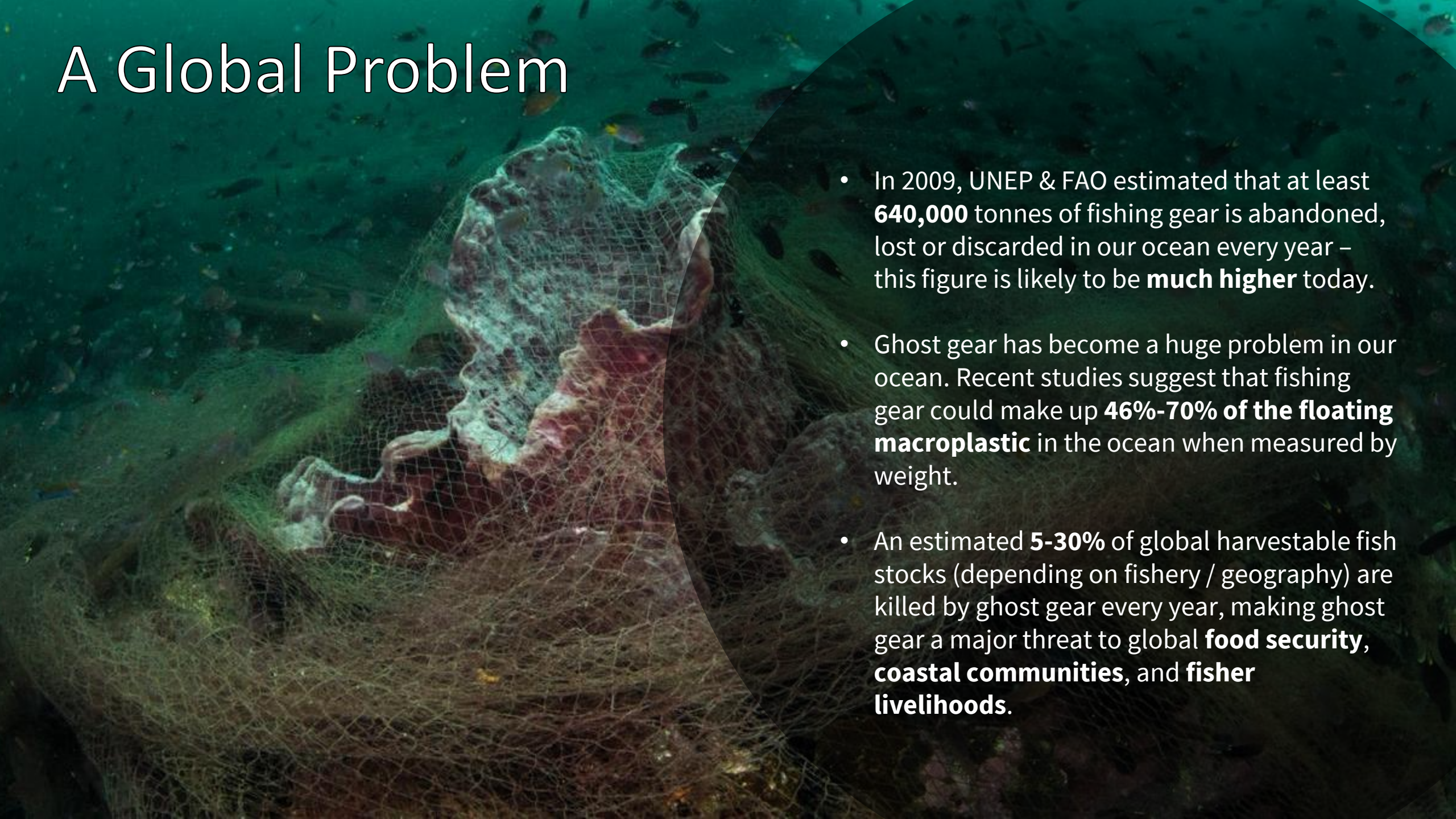
Aims:

- To improve the health of marine ecosystems;
- To protect marine life from harm;
- To safeguard human health and livelihoods.

By:

- **Reducing** the amount of gear lost in the oceans;
- **Removing** the gear that is already there;
- **Recycling** the gear that is recovered or at end of life and promoting EPR.

A Global Problem



- In 2009, UNEP & FAO estimated that at least **640,000** tonnes of fishing gear is abandoned, lost or discarded in our ocean every year – this figure is likely to be **much higher** today.
- Ghost gear has become a huge problem in our ocean. Recent studies suggest that fishing gear could make up **46%-70% of the floating macroplastic** in the ocean when measured by weight.
- An estimated **5-30%** of global harvestable fish stocks (depending on fishery / geography) are killed by ghost gear every year, making ghost gear a major threat to global **food security**, **coastal communities**, and **fisher livelihoods**.

A Global Reach

112 member organizations
16 supporting governments
5 high level global affiliates

1-3 participants

4-8 participants

9+ participants

GGGI Projects

GGGI / FAO Workshops

Food and Agriculture Organization of the United Nations

UN environment
United Nations Environment Programme

OSPAR COMMISSION
Protecting and conserving the North-East Atlantic and its resources

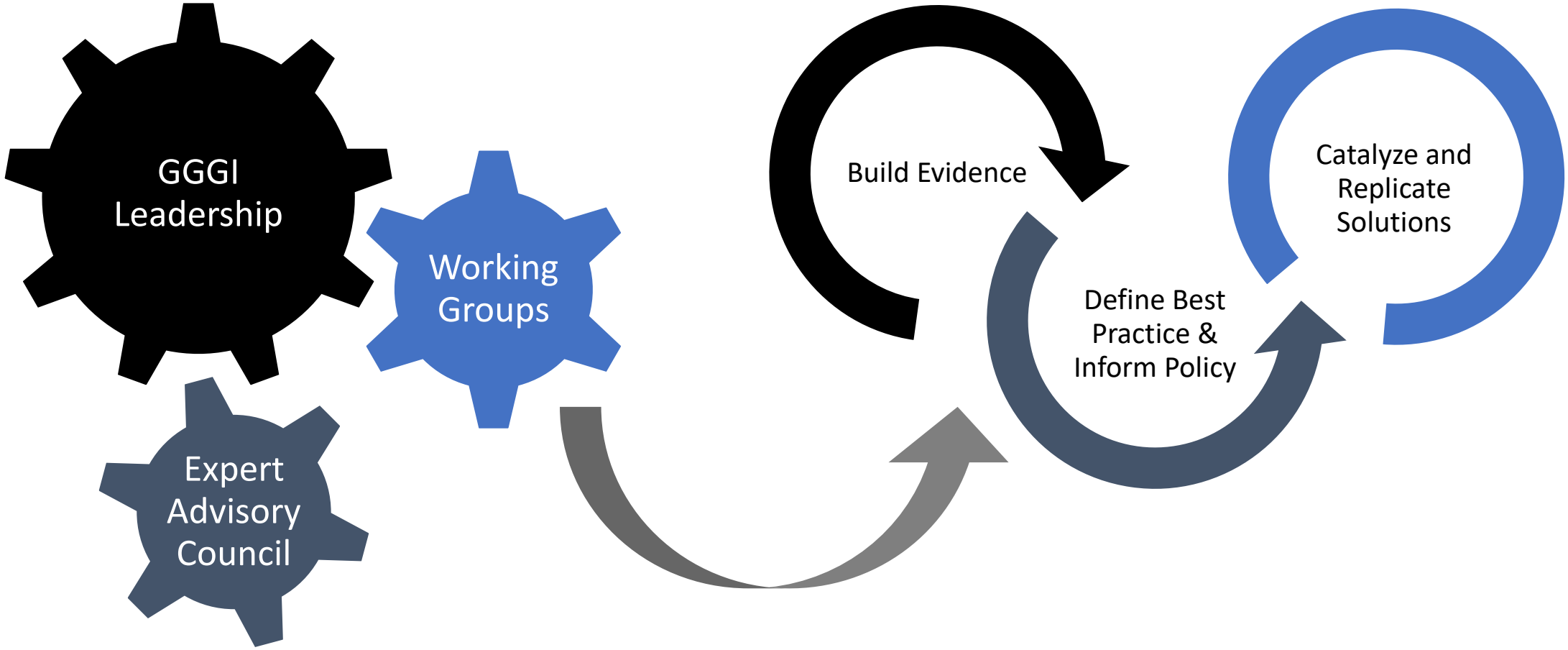
MARITIME AFFAIRS AND FISHERIES

CSIRO

Our Members

We have over 100 member organisations from the fisheries sector, industry, retail corporations, academia, NGOs and government.

Our Approach to Ghost Gear

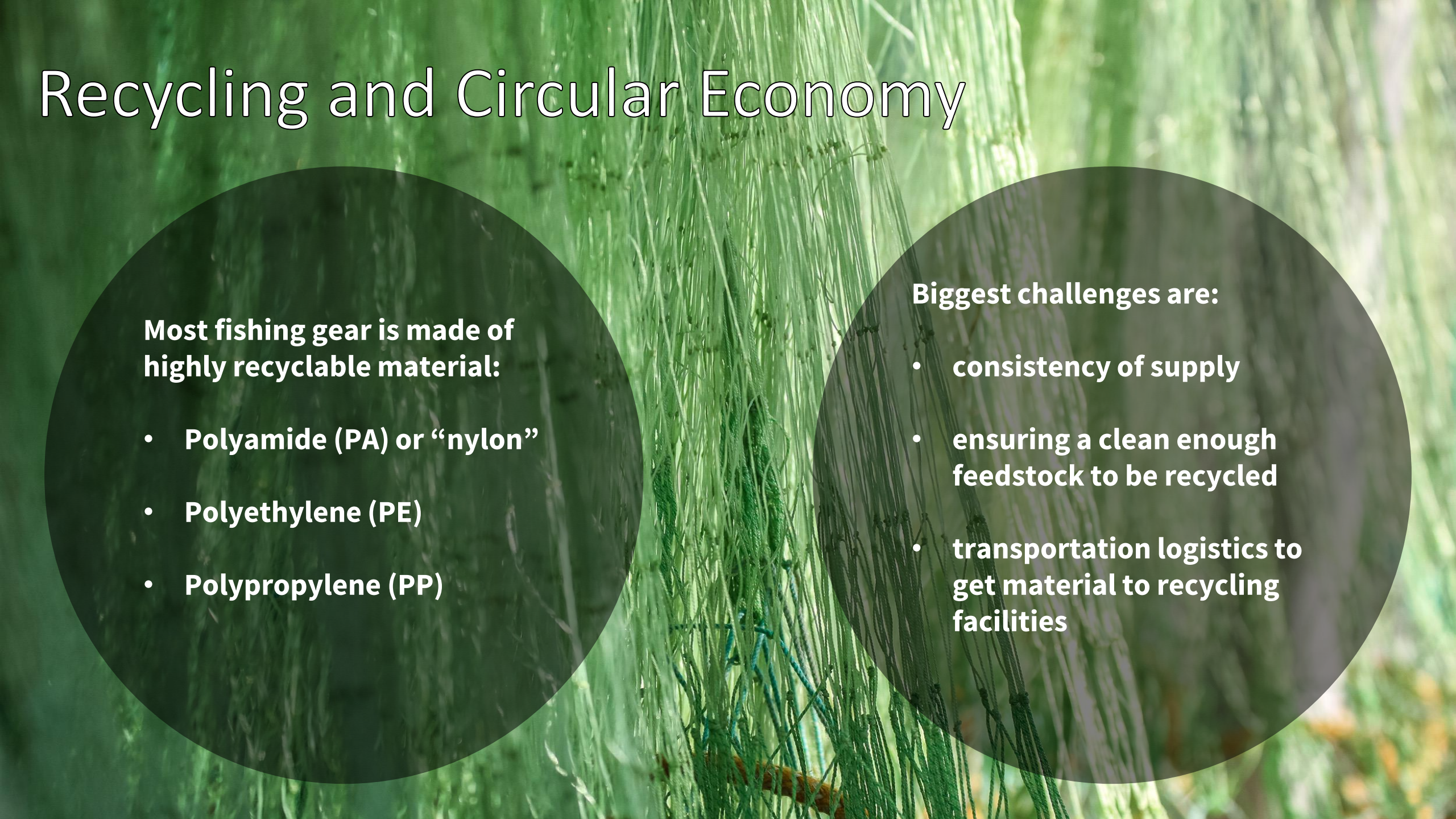


Industry Engagement

- Raise awareness about the issue and learn from the industry about causes of gear loss.
- Develop innovative solutions with industry to minimize gear loss and reduce its impact if lost.
- Work with industry to appropriate disposal options for end of life gear.
- Ensure solutions are viable, lasting and make sense for the industry.

Scaling up solutions around the world

Recycling and Circular Economy



Most fishing gear is made of highly recyclable material:

- **Polyamide (PA) or “nylon”**
- **Polyethylene (PE)**
- **Polypropylene (PP)**

Biggest challenges are:

- **consistency of supply**
- **ensuring a clean enough feedstock to be recycled**
- **transportation logistics to get material to recycling facilities**

GGGI Member Case Study – Steveston Harbour Authority

https://stevestonharbour.com/

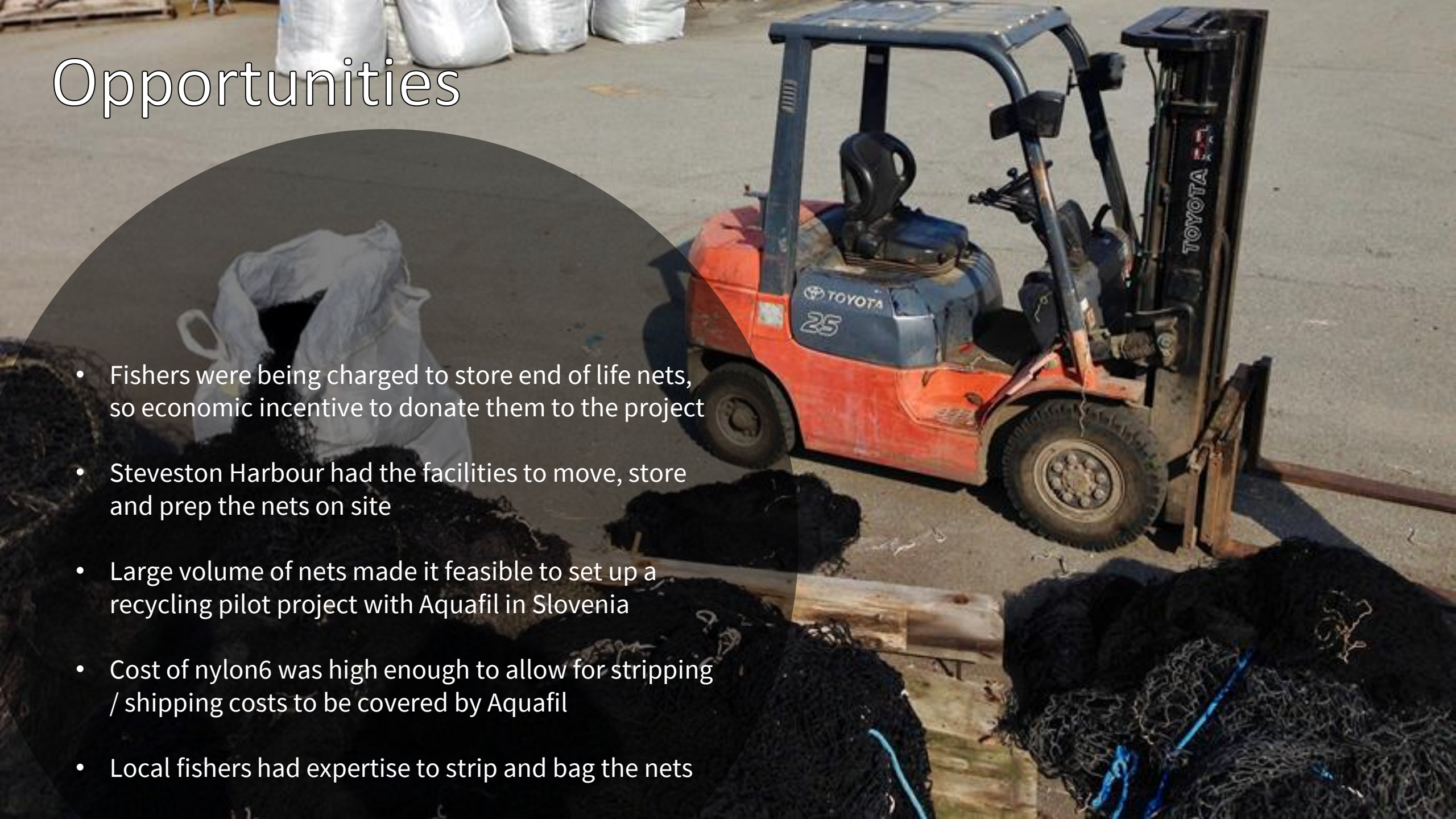
Steveston - Canada

- After the move to a quota system of fish harvesting, many nets were left unattended, sitting in storage for years.
- Disposal was typically either landfill or incineration, both of which cost fishers money and neither of which is a good solution from an environmental perspective.
- A new solution was needed.

Challenges

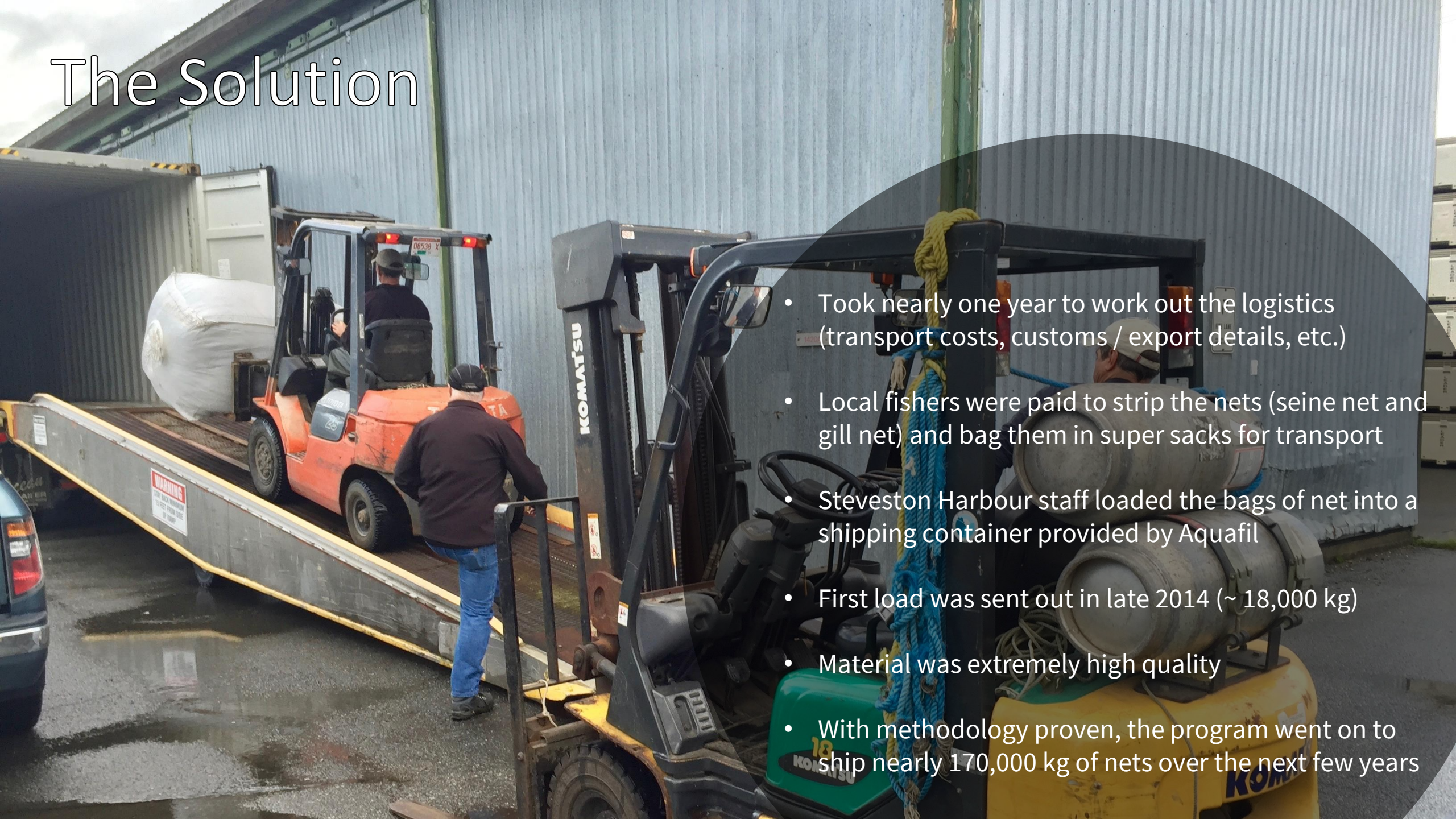
- Full 875 seine nets could be $100,000 + new, so fishers still saw value in end of life nets
- Full seine nets can weigh as much as 20,000 pounds, so not easy to move them around
- No local recycling option, so would need to send the nets overseas to Europe
- Any recycling opportunity would need sufficient volume to make it economically viable
- Nets would need to be stripped of other material as only the plastic (nylon6) could be recycled

Opportunities



- Fishers were being charged to store end of life nets, so economic incentive to donate them to the project
- Steveston Harbour had the facilities to move, store and prep the nets on site
- Large volume of nets made it feasible to set up a recycling pilot project with Aquafil in Slovenia
- Cost of nylon6 was high enough to allow for stripping / shipping costs to be covered by Aquafil
- Local fishers had expertise to strip and bag the nets

The Solution



- Took nearly one year to work out the logistics (transport costs, customs / export details, etc.)
- Local fishers were paid to strip the nets (seine net and gill net) and bag them in super sacks for transport
- Steveston Harbour staff loaded the bags of net into a shipping container provided by Aquafil
- First load was sent out in late 2014 (~ 18,000 kg)
- Material was extremely high quality
- With methodology proven, the program went on to ship nearly 170,000 kg of nets over the next few years

The Future

- There is now a recycling facility in British Columbia that can process the nets locally
- Fishers are still involved in the process of stripping/bagging/loading the nets, providing additional income in the off-season
- With the methodology proven, the potential exists to expand this project across British Columbia and the surround region

GGGI Member Case Study – Ocean Legacy Foundation

https://oceanlegacy.ca/

OLF - Canada

- Working with processors, fabricators and engineers to put together a line specifically focused on recycling marine debris, including end-of-life fishing gear.
- Working with businesses in the marine sector to identify sources of leakage along the coast.
- Providing a high-tech recycling plant in British Columbia, Canada to be able to process fishing gear and other marine debris.

GGGI Member Case Study – Axiom Cycling Gear

https://www.axiomgear.com/solutions/oceanweave/

OCEANWEAVE - Canada

- Axiom's entire range of cycling bags are the world's first and only cycling bags made out of recycled fishing nets sourced from the Yellow Sea.
- OCEANWEAVE retains the same durability and performance as new material, so riders don't have to choose between eco-friendly and high quality.
- Production of OCEANWEAVE reclaimed fishnet retains all of the characteristics of virgin material, yet uses 75% less crude oil, and removes all measurable traces of heavy metals, toxic dyes, harmful chemicals and VOCs.

GGGI Member Case Study – Bureo

www.bureo.co

Net Positiva - Chile

- Engaging with local fishers to provide an end-of-life solution for fishing nets
- Local fishers prepare the nets for recycling (cleaning, debris removal)
- Development of Netplus material (fully traceable, 100% recycled, end-of-life fishing nets)
- Innovative product design: sunglasses, skateboards, frisbees, Jenga Ocean, etc.
- Expansion into fishing communities in Argentina and Peru 2019/2020

GGGI Member Case Study – Fourth Element

Ocean Positive - UK

www.fourthelement.com

fourth element

- OceanPositive products: Swimwear, Hydro Leggings, Rashguards and a non-neoprene wetsuit system, Thermocline, all made with Econyl® fibre from recycled nylon, including ghost gear.

- Mission 2020: Mission 2020 is an initiative to encourage all organizations within the diving community to make a pledge to change their business practices and reduce single-use plastic, in order to help protect and preserve our oceans for the future.

- Packaging: Fourth Element has pledged to eliminate all single-use plastics from their packaging by World Ocean's Day 2020.

GGGI Member Case Study – Healthy Seas

North Sea, Adriatic Sea, Mediterranean Sea

www.healthyseas.org

HEALTHY SEAS®
a journey from waste to wear

- Partnership between Aquafil, Star Sock and Ghost Fishing Foundation
- Collaborations with many other businesses (manufacturers), stakeholders, including fishers and local communities
- Nets recovered by Ghost Fishing's dive teams are sent to Aquafil in Slovenia for recycling into new nylon yarn
- Yarn processed by Aquafil is used to make new products such as socks, jeans, carpets, swimwear, etc.

Some Gear Can Be Recycled…

But Opportunities Remain

- Crab/lobster traps/pots
- PP rope
- Multi-filament rope/line
- Steel rings
- Cable
- Cork line
- Lead line

Contact Info

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Website: www.ghostgear.org
Twitter: @gggInitiative

Waste Fishing gear in the EU policy context

Maris Stulgis, *DG for Maritime Affairs and Fisheries, MARE A1*

European Green Deal

How EU curbs marine litter

Prevention and mitigation

Four main axis

Directive on the reduction of the impact of certain plastic products on the environment (2/07/2019)

Revised Port Receptions Facilities directive (27/06/2019)

European Commission

The new Directive on Port Reception Facilities for the delivery of waste from ships

SUP Directive - Fishing Gear

(1) **EPR schemes** for producers of fishing gear containing plastic will cover:

Separate collection of waste FG delivered to adequate PRF - **Transport – Treatment - Awareness raising** measures > to be established by 31 December 2024

(2) MS to **report** to the COM on the amounts of fishing gear placed on the market and collected in ports > 1st reporting period: 2022 (MS to submit data within 18 months)

(3) EU to request the EU Standardisation organization to develop a **standard for a circular design of fishing gear**

(4) MS to set up **national collection targets** (in view of establishing EU binding targets later – after the evaluation)

Waste Framework Directive

- Articles 8 and 8a of the Waste Framework Directive set the **minimum compliance requirements for Member States** when **establishing EPR schemes at national level**, and for all producers and actors involved in implementing EPR schemes for products
- Therefore, all the requirements in Article 8a WFD apply to the EPR schemes envisaged in the SUP Directive (for fishing gear and for single-use plastic products identified in Annex E).

EPR in the WFD

Examples of **minimum requirements:**

- *MS – to create incentives for waste holders for separate waste delivery, notably, through economic incentives or regulations.*
- *MS - to ensure that the financial contributions paid by the producer of the product to comply with its EPR obligations cover the following costs for the products that the producer puts on the market:*
  - *costs of separate collection of waste and its subsequent transport and treatment*
  - *costs of data gathering and reporting*
  - *do not exceed the costs that are necessary to provide waste management services in a cost-efficient way. Such costs shall be established in a transparent way between the actors concerned.*

EPR in the WFD

- MS shall identify **relevant enforcement body** to ensure that producers and other actors fulfil their obligations:
  - MS shall ensure that producers of products and organisations implementing EPR obligations on their behalf implement their EPR obligations, that the financial means are properly used and that all actors involved in the implementation of the EPR schemes report reliable data.

- Where **multiple organisations** implement EPR schemes in a MS on behalf of producers of products, MS concerned shall appoint at least one body independent of private interests or entrust a public authority to oversee the implementation of EPR obligations.

Workshops

18th February 2020 workshop on waste fishing gear and passively fished waste

https://webgate.ec.europa.eu/maritimeforum/en/node/4478

Workshop/webinar to be organized 1st half 2021

Development of Guidance on Extended Producer Responsibility (EPR)

Final Report

European Commission – DG Environment

2014

https://ec.europa.eu/environment/waste/pdf/target_review/Guidance%20on%20EPR%20-%20Final%20Report.pdf

European Commission

Building an engaged R&I community

EMFF Blue economy call (projects: 1.1.2019 – 31.12.2020)

Behaviour change & awareness raising

- EU4Ocean coalition – a platform for ocean preservation and OL
- EU beach clean up initiatives
- Data (Emodnet, Atlas of the seas)

Smurfing our blue planet: European Union and Smurfs team up to protect the ocean

17/04/2019

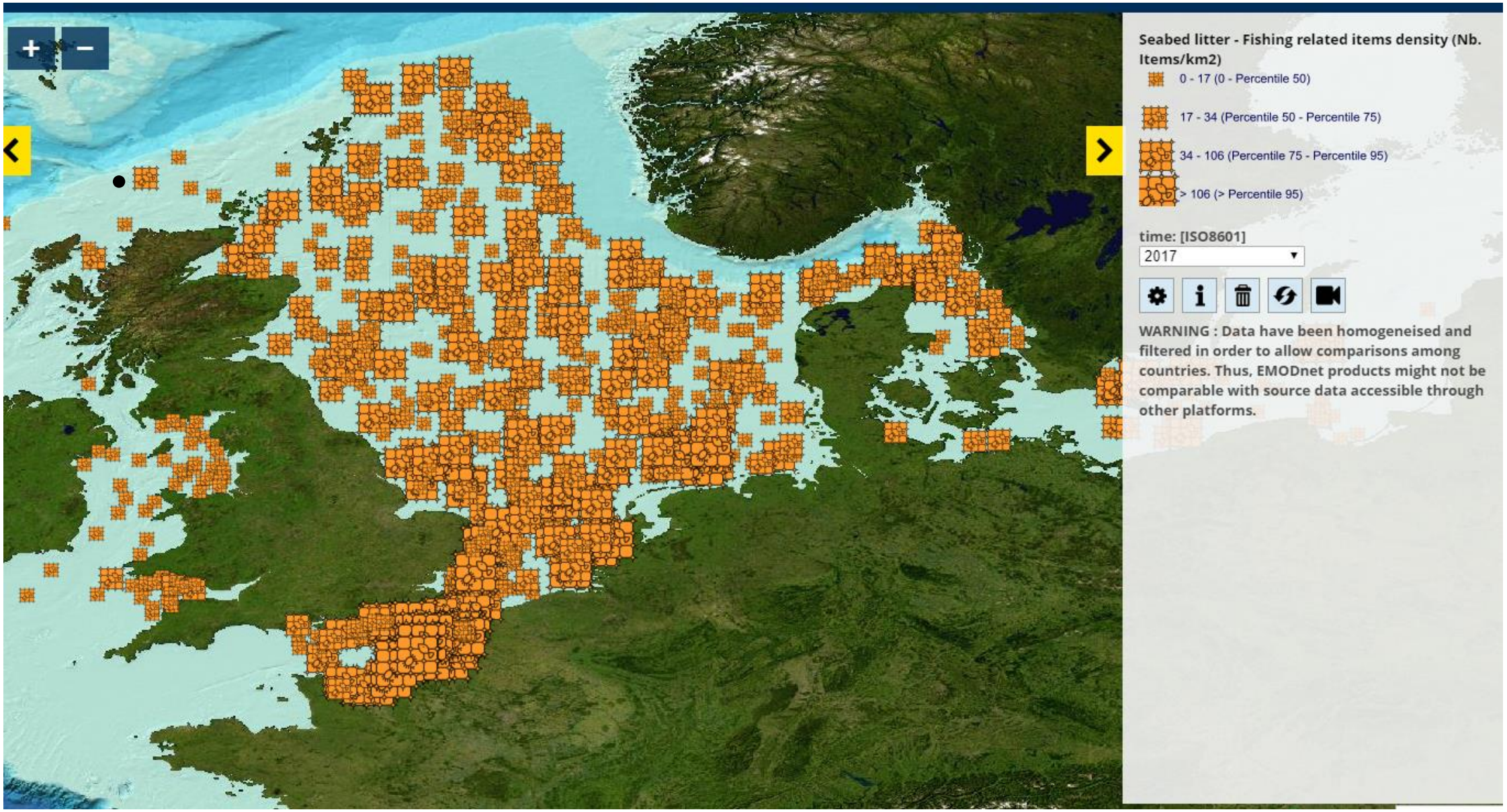
What do the European Union and the Smurfs have in common? Both are blue, and both care deeply about the health of our – blue – planet. And now they will partner to clean up beaches across the world, and encourage people to take care of our ocean.

MARINE LITTER IN EMODnet

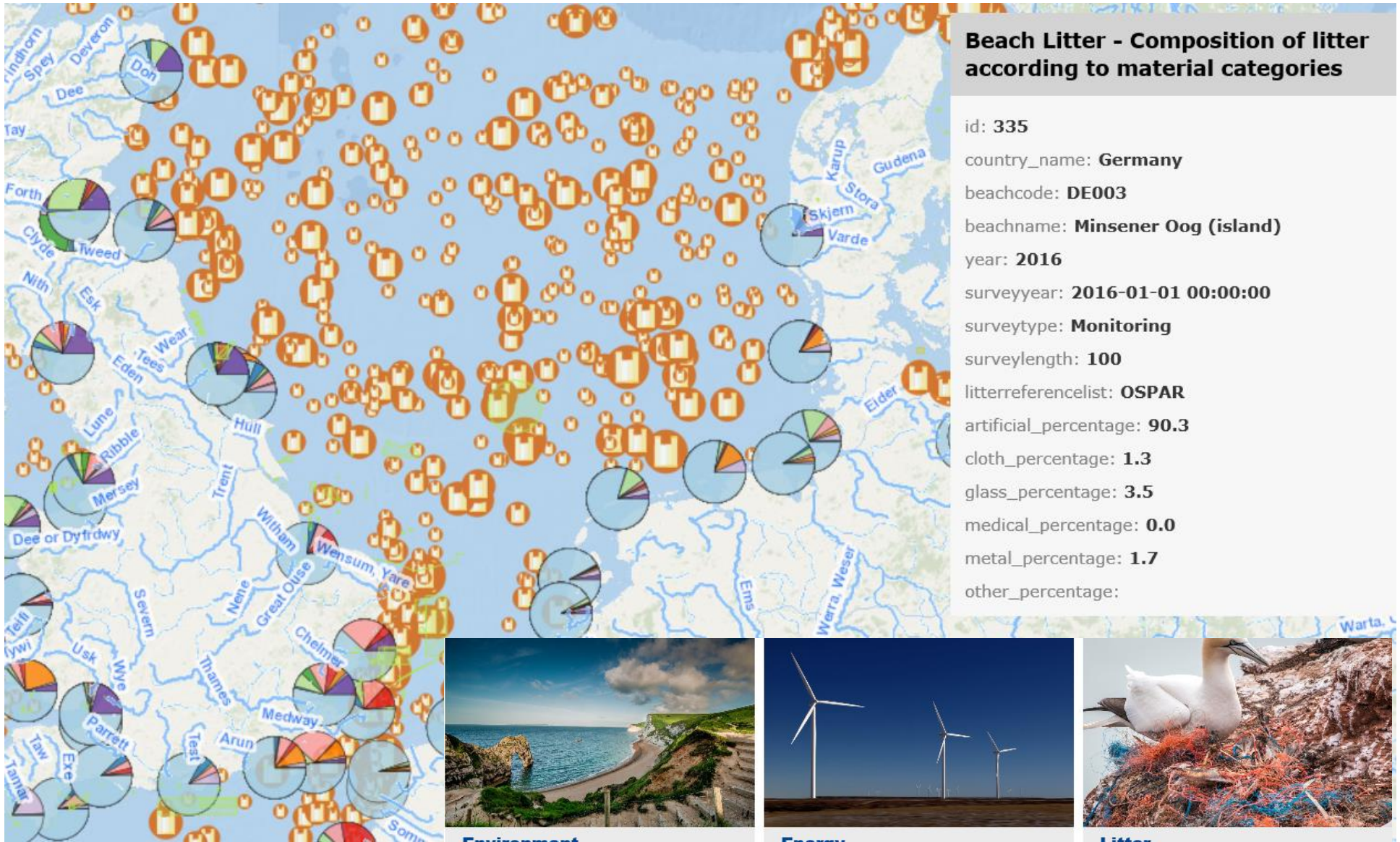
- EMODnet collects, aggregates, standardizes, quality checks data and develops new services to share information and products incl. display services/maps
- Expanded to marine litter in March 2017 EMODnet:
  - Beach litter (nets, bottles etc.)
  - Seabed litter (i.e. litter collected by fish trawl surveys)
  - Micro litter (microplastics

EMODnet
European Marine Observation and Data Network

Seabed litter - Fishing related items density (Nb. Items/km2)



European Atlas of the Seas



Beach Litter - Composition of litter according to material categories

id: **335**

country_name: **Germany**

beachcode: **DE003**

beachname: **Minsener Oog (island)**

year: **2016**

surveyyear: **2016-01-01 00:00:00**

surveytype: **Monitoring**

surveylength: **100**

litterreferencelist: **OSPAR**

artificial_percentage: **90.3**

cloth_percentage: **1.3**

glass_percentage: **3.5**

medical_percentage: **0.0**

metal_percentage: **1.7**

other_percentage:

Plastic waste: an opportunity?

Thank you

GREENLAND EXPERIENCE: RETRIEVING AND RECYCLING NETS

BLUE CIRCULAR ECONOMY

TRANSFORMING WASTE FHING GEAR INTO BUSINESS OPPORTUNITIES

OCTOBER 5 2020

METTE FROST, WWF VERDENSNATURFONDEN.

GHOST FISHING IS A CONCERN

How many nets are lost, and why?

What’s the impacts of ghost fishing on marine living resources?

Can nets be retrieved and recycled?

PART 1: RETRIEVAL

Pilot project

Two days on a boat in the Nuuk fjord with local fishermen 2018 .

Location

Retrieval informed by user knowledge.

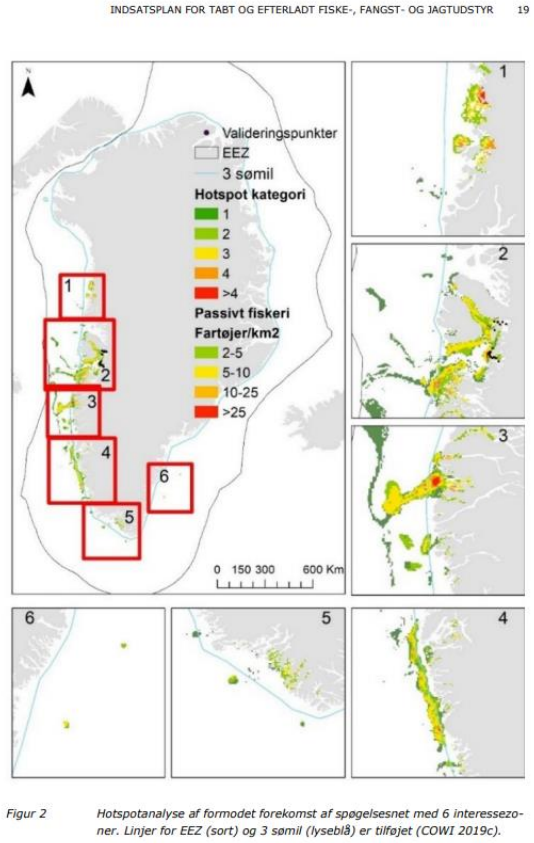
Results

Not effective approach, need for better equipment and experience.

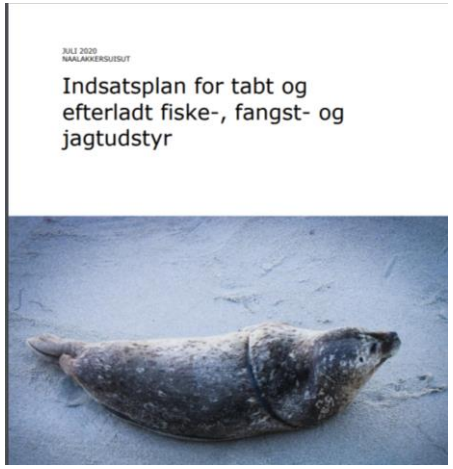
©Kaare Winther Hansen, WWF-DK

FOCUS CAPACITY AND KNOWLEDGE

RETRIEVAL OPERATIONS BY GINR, NEW GOVERMENT PLAN INFORMED BY HOTSPOT ANALYSIS



Figur 2 *Hotspotanalyse af formodet forekomst af spøgelsesnet med 6 interessezoner. Linjer for EEZ (sort) og 3 sømil (lyseblå) er tilføjet (COWI 2019c).*



- ©Greenland institute for natural resources, Government of Greenland

PART 2: RECYCLING

Pilot project

- Shipping nets from the Nuuk landfill to PLASTIX in Lemvig, Denmark.

Results

- 26 tons shipped
- all but 500 kilos could be recycled.

Perspectives

- Transport costs high
- CO_2 emissions?
- Community benefits?

Let’s not create this species

Keep our oceans clean

Jan 2020

Transforming Waste Fishing Gear into Business Opportunities

Cuno Jensen

QALUT VÓNIN®

The main Issue

More

Our approach

- Talk to the industry
- Talk to the fishermen
- And pressure from the custumers
- Approx 800 tons of net per year in Greenland
- Used to end up on land dug down into the ground – some in the ocean
- Now all ends up with us, and we make sure it gets shipped for Recycling
- Big success, about 90 % get recycled now.

Headlines in newspaper

Old Gillnets must be picked up from the ocean to end ghost fishing.

We decided to do something

- Gillnets can be returned to Qalut Vónin
- You get a discount on the next gillnets you buy
- We ship for Recycling
- So far not a succes.
- We need a chance in the mindset of the fisherman in the small boats.
- We will continue the campaign
- Ghost gear fishing links to MSC and sustainability.

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Northern Periphery and Arctic Programme 2014-2020

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SpeedNET ©

Professor Martin Charter, UCA

DTU Technical University of Denmark

The Centre for Sustainable Design®

NTNU Norwegian University of Science and Technology

WDC Western Development Commission

eri environmental research institute

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BCE Online Conference
5th October 2020

Professor Martin Charter
Director
The Centre for Sustainable Design®
Business School for the Creative Industries
(7th highest ranked Business School (Guardian Rankings)
University for the Creative Arts
UK

SpeedNET ©

- Welcome: All (Muted)
- Host: Background
- Objective: Introductions & connections
- Breakout rooms: 2 rounds x 10 minutes
- Connections: LinkedIn, Twitter, Facebook, Instagram
- Chat: Breakout rooms
- Broadcasts: Host messages
- Lessons learnt: 5 minutes

SpeedNET ©

Process (10 minutes)

- Introduction - each participant (1 minute x 5)
- Someone needs to lead e.g. go first!
- Identifying synergies & connections (5 minutes)

Introductions (1 minute)

- Your name
- What are your interests outside work
- How does your work related fishing gear?
- What issue are you looking to solve related to waste fishing gear?
- If you were animal, what animal would you be & why?
- One item you might create from waste fishing nets

Synergies & Connections (5 minutes)

- Articulate any 1:1 inter-connections
- Write-down names, interest & follow-up
- Discussion

Contact

Professor Martin Charter

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Transforming Waste Fishing Gear into Business Opportunities

Oct 5th 2020

Ian Brannigan WDC

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DTU Technical University of Denmark

The Centre for Sustainable Design®

NTNU Norwegian University of Science and Technology

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eri environmental research institute

The Northern Periphery and Arctic Region

Clusters update

OT1.1.1 Create three clusters of recycled fishing gear in the NPA region (30)OT1.3.1 Create sustainable value chains in the fishing gear industry (3)Programme output indicator: of enterprises receiving support (CO01): 33

- Initial methodology –
- Create three clusters of recycled fishing gear in the NPA region

  - Create an overarching innovation infrastructure, from where the national clusters, partnership, associated partners, policy markers, can connect to drive business opportunities, grow transnational relationships, foster circular collaboration
  - CURRENT STATUS : Norway will develop a best practice template from ONA methodologies applied in local value chains (2021). In tandem Ireland will identify and create target potential stakeholder groups (Q3/4) and when Norway Model available will engage local group to define best path to functioning value chain (2021).

Clusters update

OT1.1.1 Create three clusters of recycled fishing gear in the NPA region (30)OT1.3.1 Create sustainable value chains in the fishing gear industry (3)Programme output indicator: of enterprises receiving support (CO01): 33

- Initial methodology –
- Create sustainable value chains in the fishing gear industry
  - Policy proposals, guidelines & Regional Development Action programmes which differs substantially from more general and aggregated cluster evaluations. Policies and guidelines for learning and knowledge transfer, and innovation generation within the cluster.
  - CURRENT STATUS : Best practice model being developed in Norway . In Ireland and rest of regions relevant policy outlines /models will be developed upon a comparative process against Norwegian findings.

Clusters update

Communications

- Website and Newsletters

  First of our project newsletters issued in September; next will issue towards the end of the year. Newsletters are distillation of the website whose aim is to be the one-stop-shop for info on the project, the sector, and an avenue to connections between new and existing stakeholders.

- Social Media

  Social media has now expanded beyond the original Twitter and Linkedin. Future updates will be much more consolidated with cross-posting and wider engagement with both immediate stakeholders and the interested public, resulting in greater lead generation, increased information flow, etc.

- Stakeholder Engagement

  Much already occurred, including this conference, but even more will be needed as the project continues. Exact nature will dictated partially by pandemic, but more importantly by stakeholder needs as those become clearer.

- REGIOSTARS Video

  Great exposure for BCE, offering a chance build awareness and momentum during the next phase.

Thank You

twitter.com/BlueCircular

bluecirculareconomy.eu

facebook.com/bluecirculareconomy

instagram.com/bluecirculareconomy

linkedin.com/bluecircular

BLUE CIRCULAR ECONOMY

BLUE CIRCULAR ECONOMY

Marketing strategy overview & Lessons learned

Richard Glavee-Geo, NTNU
rigl@ntnu.no

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BCE project goals, objectives and beyond:

- More circular model of fishing gear production, collection and recycling
- More jobs through the creation and marketing of new products
- Clustering

Marketing strategy

Partners – Key Researchers

The Department of International Business, NTNU Ålesund: Richard Glavee-Geo, Mark Pasquine, Arron Wilde Tippett

University for Creative Arts & the Centre for Sustainable Design: Martin Charter

Contributing Partners: NTNU, NHC, WDC, ARTEK, UCA

Blue Circular Economy

Goals and Objectives

Blue Circular Economy Goals

- Blue Circular Economy (BCE) aims to help SMEs offering products and services within fishing gear recycling solutions in the Northern Periphery Area (NPA) region to attain greater market reach.
- Focus on SMEs aiming to create value using circular economy concepts related to products and services within fishing gear recycling.

Marketing strategy: objectives

- Stimulate the market demand for products made of recycled fishing gear
- Create environmentally and economically viable circular business models for SMEs in the fishing gear industry

Activities:

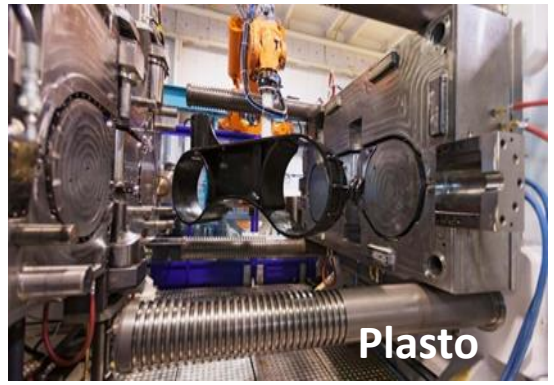
T2.1 Business models and strategies

T2.2 Supply networks & Logistics

T2.3 Marketing models

T2.4 Innovation systems

Activities:

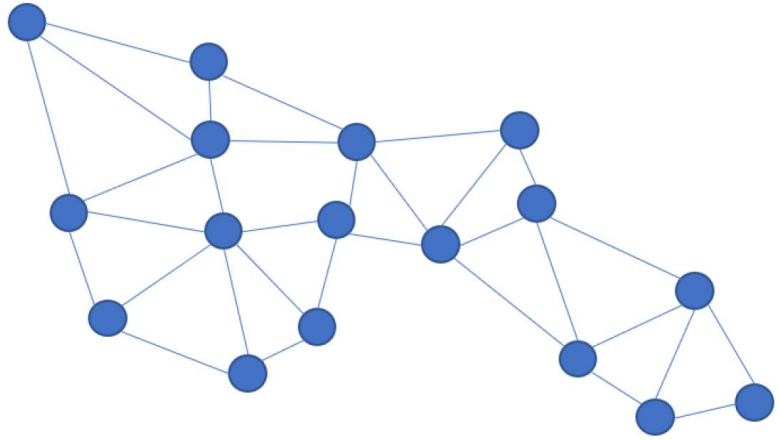


T2.1 Business models and strategies

- Overview of new business models
- Mentoring of SMEs to new business models

Activities:

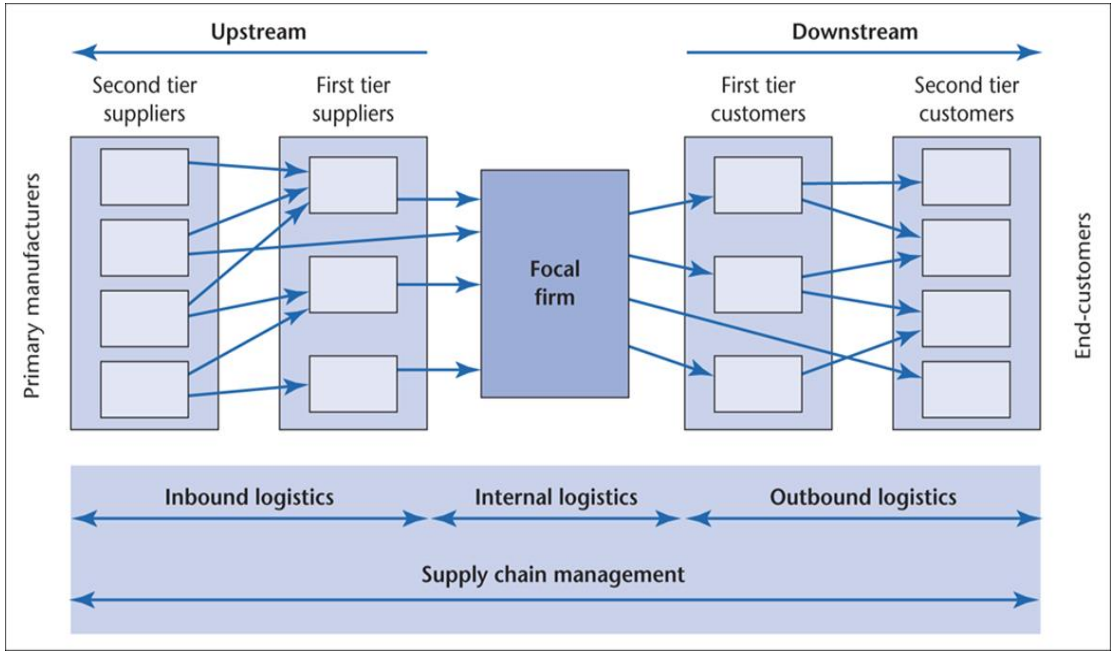
T2.2 Supply networks & Logistics



Sourcing and mapping of material flow

Appreciation of the supply network structure from the focus of a focal company

Institutionalization of the roles of non-profit organisations



Activities:

T2.3 Marketing models

1. Identification of marketing strategies
2. Understand messaging and images used in ads, websites etc.
3. New product/market opportunities for products from used fishing nets
4. Marketing obstacles for products from fishing nets, ropes and components

NOPREC
Norwegian Plastic Recycling

B2B vs B2C

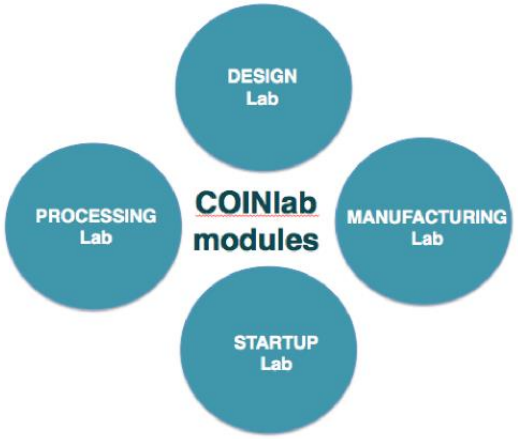
PLASTO®
(Plastic Product Design)

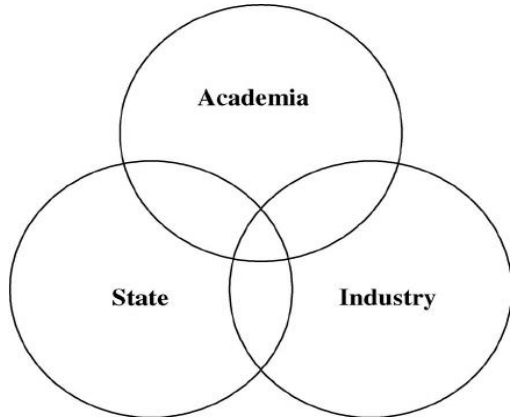
(Construction)

Activities:

T2.4 Innovation systems

- Local innovation system workshops (2 main workshops)
- Fishing Gear Manufacturers, Recyclers, Plastic Product Manufacturers, Local and National Government, Research Institutions, Environmental NGOs and SMEs in the NPA region.
- Best practice guide





Lessons learned - Summary

- Irish cluster: fragmented; Norwegian cluster though nascent, robust and growing
- Hugh opportunities for start ups, new product development, new business models and markets
- Need for innovative marketing strategies
- Contamination: big issues associated with contamination of fishing gear; need to develop a typology of levels of degradation/contamination e.g. from unusable to potentially usable.
- New innovations (e.g. Net cleaning robots)
- Producer responsibility legislation to be a game changer

Thank You

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Northern Periphery and Arctic Programme 2014–2020

EUROPEAN UNION
Investing in your future
European Regional Development Fund

SUSTAINABILITY PRODUCT STANDARDS

5th October 2020

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DTU Technical University of Denmark

The Centre for Sustainable Design®

NTNU Norwegian University of Science and Technology

WDC Western Development Commission

eri environmental research institute

Birds & plastics in the Northern Periphery

Birds & plastics in the environment

- ~80% ocean litter comes from landbased sources
- Top ten rivers transport 88-95% of global plastics load into the sea
- 19 to 23 millions tonnes plastic waste generated in 2016 entered aquatic environment
- Even with ambitious governmental commitments 53 millions tonnes per year by 2030
- Assuming 20 million tonnes plastic waste enters waters = ~30kg per bird per year

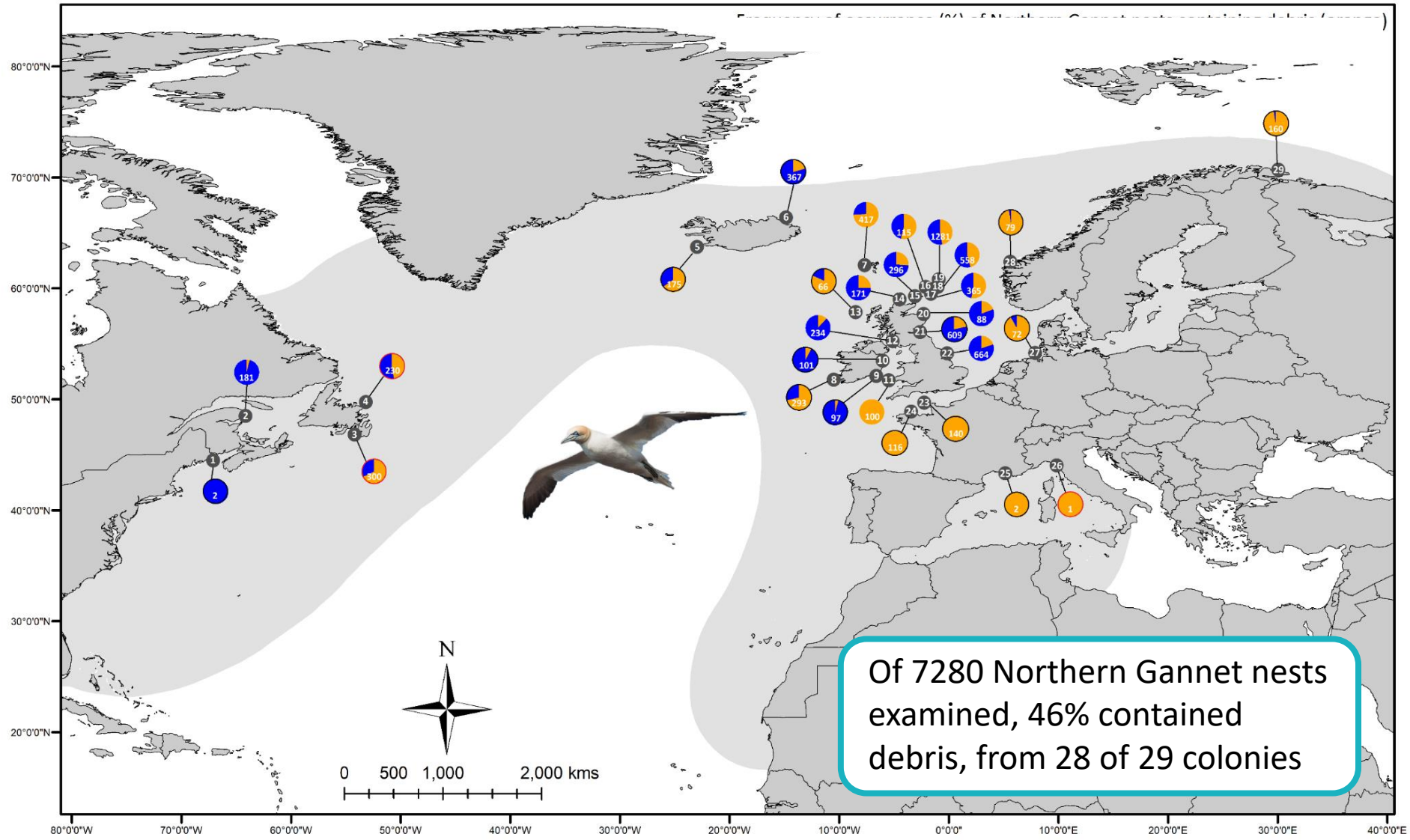
Borrelle *et al*. 2020

Over 56% of seabird species worldwide have been affected by plastic pollution


Hermaness
Noss
Troup Head
Fair Isle

Plastics in Northern Gannet nests across their range

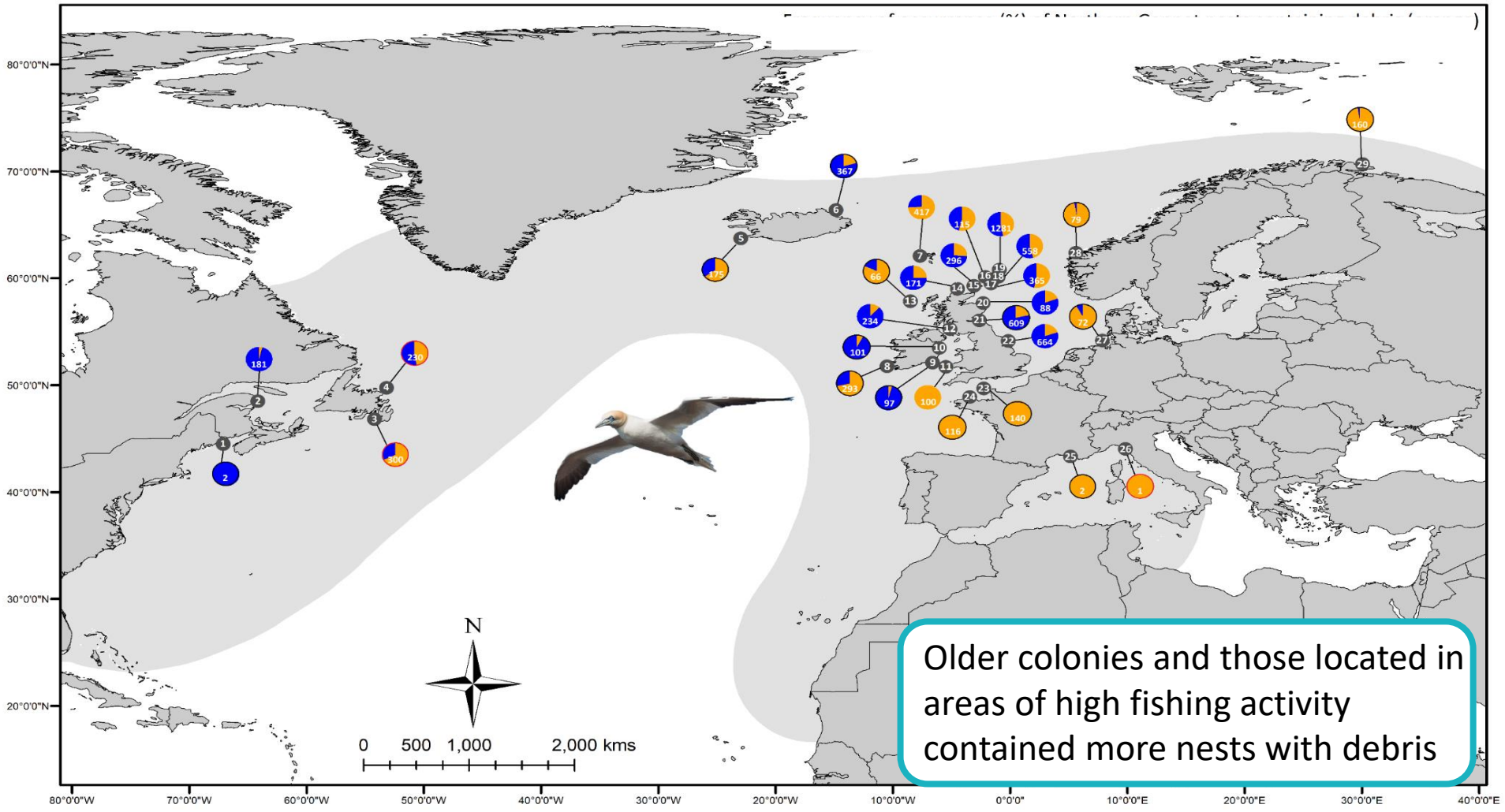
Orange = nests containing debris. **Blue** = clean nests



O'Hanlon et al. 2019

Plastics in Northern Gannet nests across their range

Orange = nests containing debris. Blue = clean nests



O'Hanlon et al. 2019

Plastics in Northern Gannet nests across their range

- Nest incorporation of debris by Northern Gannets occurred in 28 of 29 colonies.
- Of 7280 Northern Gannet nests examined, 46% contained debris.
- Debris was largely threadlike plastics thought to originate from fishing activities.
- Gannets are a useful indicator species for monitoring fishery related debris.
- Threadlike plastics, most likely from fishing activities, was most frequently recorded in nests, being present in 45% of 5842 nests, in colonies where debris type was identified

Birds & Debris

www.BirdsandDebris.com

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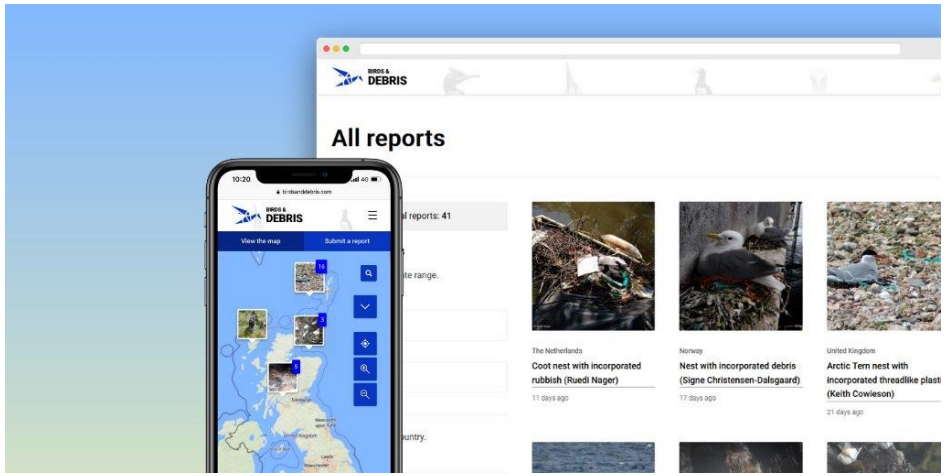
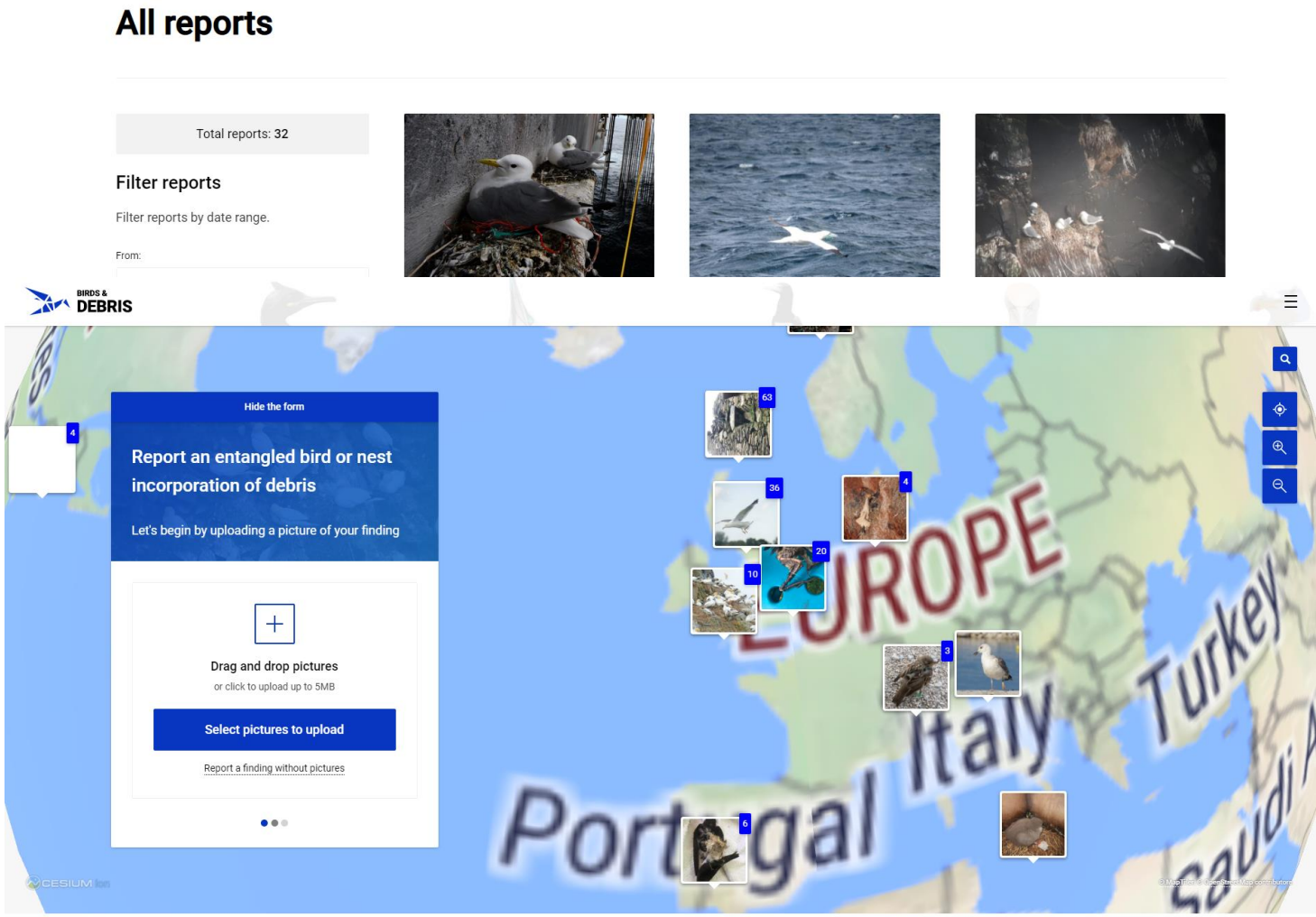
DEBRIS





Establish an overview of fishnet material & recycling potential

Key stakeholders mapped to understand material flow & potential supply chain for Aalesund region

Keystone individuals/companies providing excellent insight into developments in the region

- End-of-life fishing gear managed in different ways in Aalesund region
- Landfilled at Bingsa
- Incinerated at Tafjord for electricity and district heating
- Sent to Denmark for mechanical/chemical recycling via Nofir

Review Existing Product Communication Tools or Ecolabels!

Existing ecolabels reviewed of their applicability for recyclate made from fishing gear & products made from this recyclate

Key findings:

- Environmental Product Declarations are most applicable type of ecolabel currently available
- Well known ecolabels (e.g. EU Ecolabel or Nordic Swan) take up to 2 years to produce necessary product category rules
- Life Cycle Methodology knowledge is integral – commonly utilised for Ecolabel criteria assessment

Methodology development & testing for TEP product communication

Literature review of articles carrying out Life Cycle Assessment on waste management of plastics

- Mechanical recycling (grinding, melting, pelletising) of plastic waste is most environmentally friendly form of management
- Chemical recycling (breaking down of plastic into monomers using heat, then forming virgin quality plastic granulate) has high energy demand but is required for recycling of Nylon (used extensively in fishing gear)
- No peer-reviewed Life Cycle Assessment on fishing gear recycling conducted

Methodology development & testing for TEP product communication

Literature review findings continued

- The waste management methodology poorly communicated within peer-reviewed literature
  - fairly common in LCA literature as companies reluctant to share key aspects of business model
- Full LCA methodologies for plastic recycling are available from the Product Category Rules documentation (developed to guide users on how to create Environmental Product Declarations)

Methodology development & testing for TEP product communication

Literature review findings continued

- We have successfully completed a Life Cycle Assessment (LCA) of fishing gear recylate for a company based in Norway
- LCA reports are currently being produced for the company involved
- The LCA process is being used to develop draft Product Category Rules which will then be shared with Environmental Product Declaration (EPD, a type of ecolabel) programme operators for further advancement and publication

Thank you for listening.

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