



Community Workshops

Potential places and spaces to create and develop products from used fishing nets, ropes and components (FNRCs)

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In pursuit of innovative and sustainable solutions for marine plastic waste, the Circular Ocean project seeks to inspire enterprises and entrepreneurs to realise the hidden opportunities of discarded fishing nets and ropes in the Northern Periphery & Arctic (NPA) region.

As increasing levels of marine litter is particularly pertinent to the NPA region, the Circular Ocean project will act as a catalyst to motivate and empower remote communities to develop sustainable and green business opportunities that will enhance income generation and retention within local regions.

Through transnational collaboration and eco-innovation, Circular Ocean will develop share and test new sustainable solutions to incentivise the collection and reprocessing of discarded fishing nets and assist the movement towards a more circular economy.

Circular Ocean is led by the Environmental Research Institute, www.eri.ac.uk (Scotland), and is funded under the European Regional Development Fund (ERDF) Interreg VB Northern Periphery and Arctic (NPA) Programme <http://www.interreg-npa.eu>. It has partners in Ireland (Macroom E www.macroom-e.com), England (The Centre for Sustainable Design www.cfsd.org.uk), Greenland (Arctic Technology Centre www.artek.byg.dtu.dk), and Norway (Norwegian University of Science and Technology www.ntnu.edu).



Disclaimer: All reasonable measures have been taken to ensure the quality, reliability, and accuracy of the information in this report. This report is intended to provide information and general guidance only. If you are seeking advice on any matters relating to information on this report, you should contact the ERI with your specific query or seek advice from a qualified professional expert.

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1. Introduction

This report has been prepared as part of the Circular Ocean project. It suggested that this report is read in conjunction with the Circular Ocean Eco-Innovation Guide and the Circular Ocean Innovation Lab (COINLab) report (see Reports on <http://cfsd.org.uk/projects/circular-ocean/>).

2. Community workshops

The growth of the grassroots *Maker, Modifier and Fixer* movement has been hailed as a new industrial revolution with the potential to herald a new post-consumer, more sustainable approach to production and consumption through local peer production and the development of innovative products and services that are fit for purpose and longer-lasting.

Makerspaces, FabLabs, Hackerspaces and *Repair Cafés*¹ are examples of ‘community workshops’ focusing on making, modifying and fixing that have emerged as part of this new wave of grassroots innovation where diverse groups of people come together voluntarily in ‘places and spaces’ to experiment, modify, make and fix products and develop new solutions.

There has been rapid growth in the number of community workshops around the world in the last ten years. The table below shows numbers of different types of Community Workshops around the world as at 10th September 2018 compared to 20th April 2016. Differences between *Hackerspaces* and *Makerspaces* are ambiguous and many members describe their workshops as being both. Consequently, there is some replication in the listings of these organisations in the sources used to derive global counts in the Table 1 below.

Table 1. Global counts of Community Workshops

Type of Community Workshop	Global count (2018 compared to [2016])	Sources (accessed September 2018)
Hackerspaces	1,419 [1,242]	https://wiki.hackerspaces.org/List_of_Hacker_Spaces
Makerspaces	508 [516]	https://spaces.makerspace.com/directory/
FabLabs	1205 [565]	https://en.wikipedia.org/wiki/Fab_lab
Repair Cafés	1,615 [1,031]	https://repaircafe.org/en/visit/

¹ See global surveys of repair cafes and repair cafes/hackerspaces at www.cfsd.org.uk/research for more details on the subject.

Makerspaces and Hackerspaces are physical places and spaces where typically people with an interest in making, products and technology can meet and work in their own time on the projects of their choice. Every place and space is different and the projects undertaken are entirely dependent upon on member interests, although typically projects include software and hardware development and frequently include the more traditional ‘maker’ arts and crafts. Their growth has been facilitated by new ‘open source’ technologies, the advent of cheap computing, microcontrollers and the Internet of Things and digital fabrication technology, such as 3D printers. *Makerspace* and *Hackerspace* members often pay a monthly membership fee to cover the costs of operating the place and space.

What is a Makerspace?

“A makerspace is a collaborative work space inside a school, library or separate public/private facility for making, learning, exploring and sharing that uses high tech to no tech tools. These spaces are open to kids, adults, and entrepreneurs and have a variety of maker equipment including 3D printers, laser cutters, cnc machines, soldering irons and even sewing machines.”

Source: <https://www.makerspaces.com>

What is a Hackerspace?

“A hackerspace refers to a place or facility where individuals with similar interests gather together to work on projects, share knowledge and collaborate on ideas. It is a community-oriented place that brings in or connects individuals looking to learn or collaborate on something.”

Source: <https://www.techopedia.com>

Fab Labs were the brainchild of Professor Neil Gershenfeld from MIT's Center for Bits and Atoms and focused on public-access spaces for use of shared equipment and knowledge transfer. Activities in *Fab Labs* range from technological empowerment to peer-to-peer project-based technical training to local problem-solving to small-scale high-tech business incubation to grassroots research. Projects being developed and produced in *Fab Labs* may include solar powered products, thin-client computers and wireless data networks, analytical instrumentation, custom housing, and rapid-prototyping of rapid-prototyping machines. *Fab Labs* share core capabilities, so that people and projects can be shared across them.

Most *Fab Labs* are accessible to the public and charges are typically levied for the use of machines and the hiring of laboratory space. Many *Fab Labs* are at least part funded by large

corporations or institutions including Universities although this does not affect the essential public-access character of *Fab Labs*.

What is a *Fab Lab*?

“A Fab Lab is a technical prototyping platform for innovation and invention, providing stimulus for local entrepreneurship. A Fab Lab is also a platform for learning and innovation: a place to play, to create, to learn, to mentor, to invent. To be a Fab Lab means connecting to a global community of learners, educators, technologists, researchers, makers and innovators- -a knowledge sharing network that spans 30 countries and 24 time zones. Because all Fab Labs share common tools and processes, the program is building a global network, a distributed laboratory for research and invention.”

Source: <http://www.fabfoundation.org/index.php/what-is-a-fab-lab/index.html>

Repair Cafés offer a free meeting place for people to bring products in need of repair and to work together with volunteer fixers, to repair broken products. *Repair Cafés* present a means whereby skilled individuals motivated to support their communities and help others to live more sustainably are working together on a local level to extend the useful life of a wide range of products, to teach repair skills and also to communicate the value of product repair to the wider community. The Repair Café International Foundation, founded in the Netherlands in 2010, indicates that over 1615 active *Repair Cafés* around the world as at 24th September 2018.

What is a Repair Café?

“Repair Cafés are free ‘community-centred workshops’ for people to bring in consumer products in need of repair, where they can work together with volunteer fixers to repair and maintain their broken or faulty products. In addition to repair, many Repair Cafés provide assistance with product modification, particularly to clothing to improve fit and appearance.”

Source: Charter & Keiller, 2016 http://cfsd.org.uk/events/farnham_repair_cafe/

3. Relevance of Community Workshops within the NPA Region

Community Workshops could present an opportunity for people living in proximity to fishing ports, harbour or coastal communities to become involved in finding local solutions to the challenges posed by used Fishing Nets, Ropes and Components (FNRCs). For example, local *Makerspaces*, *Hackerspaces* and *Fablabs* might be able to develop product prototypes from *used* locally accessible FNRCs (see Circular Ocean Eco-Innovation Guide and Circular Ocean Innovation Lab (COINLAB) report at <http://cfsd.org.uk/projects/circular-ocean/>). Networks of Community Workshops, eg *Makerspaces*, *Hackerspaces* and *Fab Labs* might choose to collaborate on finding solutions to the challenge, perhaps using digital fabrication technologies, like 3D printing or the manufacture of plastic moulds.

Community Workshops aim to bring communities together and are a repository of local skills, knowledge and experience that might be leveraged in new ways to directly support the development of products from FNRCs and/or act as catalysts for others to become involved. Community Workshops sit within informal or informal local innovation networks within fishing ports, harbour or coastal communities. Connecting up with other components of the local innovation system may create synergies in relation to the development and production of products from FNRCs e.g. plastics moulders, plastic producers, shredders and those that own 3D printers.

Desk based research has identified a number of Community Workshops in the vicinity (within a 50 km radius) and wider vicinity (a radius of over 50 km but less than 200 km) of named fishing ports in the NPA region (Sisimiut, Nuuk, Narsaq, Uummannaq and Ilulissat in Greenland; Killybegs, Castletownbere, Dingle, Cobh and Rgos A Mhil in Ireland; Shetland, Scrabster, Lochinver, Ullapool and Kinlochbervie in Scotland; Alesynd, Tromso, Egersund and Maloy in Norway). Community Workshops were identified through online search and their distances from each port assessed using a simple radius approach on Google Maps. The research was originally undertaken in April 2016 and has been updated in September 2018. The most recent results are shown in Tables 2 and 3. The research identified no Community Workshops in Greenland.

Makerspaces and Hackerspaces are more common in the vicinity and wider vicinity of ports, but Repair Cafes are not apparent in the fishing ports, harbour or coastal communities in the NPA region e.g. only 1 exists in Ireland close to a fishing port. In total, within the region between 50 - 200 km radius of fishing ports, there are 2 Repair Cafes in Ireland, 2 in Norway, 3 in Scotland none in Greenland. The development of new Repair Cafes in fishing ports, harbour or coastal communities might help to attract repair skills from the community that

might be further utilised to repair FNRCs alongside the development from products utilising *used* FNRCs. There might also be opportunities to start to incorporate FNRC upcycling work stations in new Repair Cafés to try develop new ideas for both products and art/craft, also even specific FNRC Upcycling Cafes might be developed to specifically develop new ideas for products and art/craft made from used FNRCs.

Table 2. Community workshops **within 50 km** of named Fishing Ports in Ireland and Norway. No workshops were found within 50 km of ports in Greenland or Scotland.

Port	Name	Location	Distance from port	Type	Website	Notes
IRELAND						
Cobh	Benchspace	Cork	20 km	Makerspace	https://benchspacecork.ie/	Benchspace is a space in Cork City established to provide equipment and work space to individual makers, designers and small businesses.
Rhos A Mhil	091Labs	Galway	32 km	Hackspace	http://091labs.com/	Creative projects, art, woodwork, software, photography, electronics and other
Killybegs	FabLab Manorhamilton	Manorhamilton	40 km	FabLab	http://www.fablabmh.org/	Digital fabrication facility at Manorhamilton near Sligo
Dingle	Kerry Repair Café	Tralee	42 km	Repair Café	http://www.transitionkerry.org	Not listed on Repair Café Foundation website. Irregular pop-up Café - Contact Transition Kerry.
NORWAY						
Tromsø	MIT FabLab Norway	Lyngseidet	48 km	Fablab	http://www.fablab.no/	No online records since 2010

Tromso	Tromso Hackspace	Tromso	5 km	Hackspace	https://wiki.hackerspaces.org/HackNets-Troms%C3%B8	Small Hackspace, primarily focussed on Arduino microcontroller applications
Alesund	NTNU FabLab	Alesund	5 km	Fablab	https://www.ntnu.edu/fablab	An NTNU Fablab
Egersund	Stavanger Hackspace	Stavanger	50 km	Hackspace	http://www.meetup.com/Stavanger-Hackerspace/	Becoming more established. Projects range from electronics, to laser cutting and 3D printing, wood working, knitting and geeky conversations

Community Workshops *further than 50km but less than 200 km* from fishing ports, harbour or coastal communities were identified in Scotland, Ireland and Norway. No Community workshops were identified in Greenland. These are shown in Table 3. These are listed because they may also be approached to provide support, perhaps as part of network of Community workshops.

Table 3. Community workshops **further than 50 km but less than 200 km** from fishing ports in Ireland, Scotland and Norway.

Name	Location	Type	Website	Notes
IRELAND				
MilkLabs	Limerick	Hackspace/ Makerspace	https://www.facebook.com/milklabs/	Art, woodwork, software, photography, electronics and other.
South East Makerspace	Waterford	Makerspace	https://www.southeastmakerspace.org/	A Makerspace for Irelands South East

FabLab Limerick	Limerick	FabLab	http://fablab.saul.ie/	Well established digital fabrication facility – links with University of Limerick
WeCreate	Cloughjordan	Fablab	http://wecreate.ie/	Creative and technological workspace located in the Cloughjordan Ecovillage and offers access to a Fab Lab, work space units and co-working spaces.
TOG	Dublin	Makerspace	https://www.tog.ie/	Shared space where members have a place to be creative and work on their projects in an environment that is both inspiring and supportive of both new and old technologies. Mostly coding and technology
Bray Repair Café	Bray	Repair Café	https://www.facebook.com/Bray-Recycling-Centre-260854003959339/?fref=nf	Not listed on Repair Café Foundation website. Located at Bray Recycling Centre
Repair Café Dublin - Sandymount	Dublin	Repair Café	https://www.facebook.com/sandymount.repaircafe/info/	Listed on Repair Café Foundation Website
SCOTLAND				
T-Exchange – Moray Firth Makerspace	Findhorn/Forres	Hackspace	http://www.t-exchange.net	Creative, established Hackspace on the Moray Firth, but with membership over a wide area including Durness, <i>relatively near to the Ports of Scrabster, Kinlochbervie, Lochinver and Ullapool</i>

57-North	Aberdeen	Hackspace	https://57north.org.uk/	Well established. Projects include materials hacking with mouldable plastics
Becycle	Aberdeen	Hackspace	http://becycle.worldpress.com/	Bicycle collective. Repair and innovation.
Dundee Makerspace	Dundee	Makerspace	https://dundeemakerspace.co.uk/	Social workspace for people interested in making. With everything from electronics and coding to art, design and small-scale fabrication.
Perth Makerspace	Perth	Makerspace	http://perthshirecreates.co.uk/maker_space/	At AK Bell Library, to support creatives, start-ups in the area. 3D printing, green screen.
Edinburgh Hacklab	Edinburgh	Hackspace	https://edinburghhacklab.com/	Wide range of projects, electronics, coding, craft, art, music.
Hatton Repair Café	Hatton nr Aberdeen	Repair Café	https://repaircafe.org/en/location/hatton-repair-cafe/	Listed on Repair Café Foundation website
Glasgow Repair Café	Glasgow	Repair Café	https://repaircafe.org/en/location/repair-cafe-glasgow/	Listed on Repair Café Foundation website
Stirling Repair Café	Stirling	Repair Café	https://www.transitionstirling.org.uk/	Listed on Repair Café Foundation website. Well established and supported by Transition Stirling
NORWAY				
Hackheim	Trondheim	Hackspace	http://hackheim.no/	Based at NTNU
Omega Verksted	Trondheim	Hackspace	http://www.omegav.no/	Primarily coding and electronics
HackBergen	Bergen	Hackspace	http://hackbergen.org/	Electronics, server operation, gnu+linux

				"education", programming, sewing, glass cutting & upcycling.
Fellesverkstedet	Oslo	Fablab	http://www.fellesverkstedet.no/	Well established digital fabrication workshop
Repair Café Sorum	Sorum, nr Oslo	Repair Café	https://www.facebook.com/sorumoko	Listed on Repair Café Foundation website

4. Establishment of new Community workshops

There are little relatively few Community Workshops in the vicinity of fishing ports, harbour or coastal communities in the NPA region. Identifying local individuals who might consider acting as founders and locating accessible places and spaces are key factors in establishing Community Workshops. The number of initiatives in any given area is likely to reflect the extent of local innovation systems and/or innovation culture. Existing or newly established Community Workshops might act as an important anchor for the development of COINLabs within local innovation systems (see Circular Ocean Innovation Report that is downloadable from Reports on <http://cfsd.org.uk/projects/circular-ocean/>)

5. Local 3D printing services

In addition to Community Workshops, businesses that provide prototyping services in the vicinity of fishing ports, harbours or coastal communities, such as 3D printing, could also potentially contribute to finding local solutions to *used* FNRCs. Inspiration can be found with Fishy Filaments www.fishyfilaments.com where filaments from *used* fishing nets are utilised for 3D printing (see also Circular Ocean report “3D Printing Applications for Creating Products Made From Reclaimed Fishing Nets” www.circularocean.eu/research).

The website, <https://www.3dhubs.com/> provides a growing but incomplete database that lists owners of 3D printers, 3D printing hubs, etc, generally operated by small businesses or individual hobbyists with 3D printers with spare capacity. Individuals and 3D printing hubs within 50km of fishing ports were identified from the 3D Hubs website and are shown in Table 4. These individual and/or 3D print hubs could potentially provide services in areas where there are no community workshops or complementary services available. Individuals and/or 3D printing hubs might be prepared to experiment with 3D printing using plastics from *used* FNRCs and could also provide additional information to people with relevant interests within the local community that might be invited to participate in local projects.

Table 4. 3D Print Hubs within 50km of fishing ports (Based on initial research in 2016)

Country	Port	No. 3D Hubs Within 50km of Port	3D Hub Usernames and Distance from Port
Ireland	Killybegs	2	Donegal3d (35.6km) Bertzerker (20.7km)
	Castletownbere	0	
	Dingle	0	
	Dunmore East	1	Print3d (12.0km)
Scotland	Rhos A Mhil	4	3d printing point (33.5km) Stephen (26.0km) Billy (32.6km) Conor (37.1km)
	Wick	0	
	Tromso	0	
	Alesund	0	
Norway	Egersund	1	Minecraft (18.2km)
	(All)	0	
Greenland	(All)	0	

The potential for 3D printing and *used* FNRC's seems potentially large, it should also be noted that more experimentation, research and development is needed in the field to develop proven and stable solutions.

6. Conclusion

This report explores the potential of Community Workshops as an opportunity for people living in proximity to fishing ports, harbour or coastal communities in NPA region to become involved in finding local solutions to the challenges posed by used Fishing Nets, Ropes and Components (FNRCs).

The last decade has shown a radical growth in the number of Community Workshops and an increase in civil society involvement in those places in what has become known as the Maker, Modifier and Fixer movement. Matching this growing trend and resource with the challenges of used FNRC's therefore seems like a promising match.

It is, however, also clear from the research conducted for this report that in the vicinity of fishing ports, harbour or coastal communities in the NPA region there is a very little presence

of community workshops, which makes the symbiosis harder to establish. One way forward could be to attempt establishing new Community Workshops in those areas based on the resources actually present in the harbour areas. Or to create linkages to Community Workshops further away.

Either way it seems essential to establish initiatives together with local business, people and grassroots innovators already present in the harbour and port communities.

7. Circular Ocean Reports

- Report (online): M.Charter, S Keiller & S. Femmer Jensen, Circular Ocean Innovation Laboratory (COINLab), CfSD:UCA, September 2018 www.cfsd.org.uk/research
- Report (online): M.Charter, Knowledge Base Report: Booklet on Knowledge Base related to Eco-innovation and Circular Economy of Used Fishing Nets, Ropes and Components, CfSD:UCA, June 2018 www.cfsd.org.uk/research
- Report (online): M. Charter, R. Carruthers & S. Femmer Jensen, Products from Waste Fishing Nets: Accessories, Clothing, Footwear, Homeware, Recreation, CfSD:UCA, April 2018 www.cfsd.org.uk/research
- Report (online): M. Charter & S. Femmer Jensen, Eco-innovation Guide for Start-ups, Entrepreneurs & Small and Medium-sized Enterprises (SMEs), CfSD:UCA, January 2018 www.cfsd.org.uk/research
- Report (online): M.Charter, Summary of the Findings of Port-related Feasibility Studies related to the Collection and Recycling of Waste Fishing Nets and Ropes in Greenland, Ireland, Norway and Scotland, CfSD:UCA, November 2017 www.cfsd.org.uk/research
- Report (online): R. Hunt & M. Charter, Potential Applications of 3D Printing (3DP) in the Recycling of Fishing Nets & Ropes (FNRs), CfSD:UCA, July 2016 www.cfsd.org.uk/research





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