PLATE
Product Lifetimes And The Environment

Qualifying and Quantifying the Reuse sector in Ireland

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Abstract: Reuse involves taking a product that someone is finished with and reusing it for the same purpose it was used for before. The Q2Reuse research project (2019-2021) investigates methodologies to assess and measure the Irish reuse sector – a future requirement for EU Member States. A systematic review of the reuse landscape in Ireland was undertaken, providing insights into how the sector can be quantified, developed and compared to other EU Member States. Available literature on eight other regions was first analysed and combined with personal communication to determine an overview of good practices in other countries, drawing lessons for Ireland, and identifying gaps in the information that was needed to be gathered. Together with reuse practitioners in Ireland, the research team then developed methodologies for the qualitative as well as quantitative assessment of the sector. Through small-scale piloting, the methodologies have been refined and barriers to data gathering identified. This paper details the products that are included, the criteria for inclusion and the specificity of the Irish context. The project has tested the capability of the Irish reuse sector to supply necessary data and inform Irish policy makers on required supports to the sector. By developing a national quantification methodology for the assessment of the sector, this research will provide policy makers, stakeholders and practitioners with a crucial overview of the non-waste reuse sector in Ireland; vital information as Ireland and the EU move to implement reuse targets supporting reuse to its place as an essential climate action in the circular economy.

Introduction

Reuse is one of the main elements of a circular economy, ensuring that materials and products are kept in use and extending their lifetime. In the waste hierarchy, reuse sits within the prevention tier at the top of the hierarchy, as it prevents raw materials entering the production/consumption cycle. This is followed by preparation for reuse, which represents the most desirable option for resources that have entered the waste system and is a more environmentally friendly option than lower tiers, such as recycling, incineration and landfill. An Irish EPA report (Johnson *et al*, 2018) states that mandatory targets for reuse can help overcome barriers to reuse by prioritising (in the case of their paper) preparation for reuse and avoiding a situation where primary focus is on measures at lower tiers of the waste hierarchy. The circular economy aims to counter the dominant 'take, make and dispose' economic model, whose negative effects threaten the

stability of economies and the integrity of the natural global ecosystems that are essential for humanity's survival.

Circular economy policy in the European Union is guided by the Commission's 2015 European Circular Economy (CE) Package, and more recently the Circular Economy Action Plan released in March 2020. Reuse is defined in the EU Waste Framework Directive (WFD) (*(EC) European Commission, 2018*) as 'any operation by which products or components that are not waste are used again for the same purpose for which they were conceived'. As a means of promoting reuse in the EU, the revised Waste Framework Directive intends that Member States (MS) take 'appropriate measures to prevent waste generation and monitor and assess progress in the implementation of such measures'. Reuse is difficult to measure. As a non-waste activity and therefore non-regulated, reuse involves a great diversity of material flows

and business models, from online exchanges to refurbishment workshops and second hand retail. To ensure such measurement takes place, and to ensure that it is achieved uniformly across all MS, the Directive proposes that 'common indicators and targets should be established'. This is further developed in Article 9(4) of the Directive which requires that MS measure reuse, applying the common methodology to be established by the implementing Act. The Commission Implementing Decision laying down the methodology and a format for reporting on re-use was published in January 2021 in Eurlex requiring:

- Member States measure reuse by "carrying out a qualitative and a quantitative monitoring of measures on reuse"

- Quantitative monitoring will include measuring - at least **once every three years – of reuse undertaken by reuse operators or households.**

- Appropriate measures should be taken to ensure the **reliability and accuracy of the data** on reuse.

In order to support Ireland in meeting the requirements of the WFD, the Environmental Protection Agency, in its Research Call for 2018 for Sustainability, included a project: 'Qualifying and quantifying the Reuse Sector in Ireland' (Q2Reuse). In March, 2019, a consortium led by The Clean Technology Centre (CTC) at MTU Cork, with the Community Resource Network Ireland (CRNI) and The Rediscovery Centre began work on the research project. This paper summarises the work carried out thus far on the project.

State of the art
The project team first looked at regions that have carried out, or are carrying out, the measurement of reuse. Ten international programmes, measurement systems and sets of activities were analysed by the project team. The findings from Scotland, Spain, UK, New South Wales, Netherlands, Flanders, Finland, Greece, New Zealand and New York City were condensed into a synthesis report (Q2Reuse, 2020).

Some regions, such as Scotland, New South Wales, and the UK have carried out once-off quality or quantity related assessments of reuse. Each of these studies used different data gathering methods with varying assumptions and parameters. Other regions, such as Flanders, The Netherlands, Spain and Greece, have set up systematic, online, multi-annual data gathering systems to measure reuse (though the systems in Spain and Greece are only Electrical and Electronic Equipment (EEE) related). While this project was underway, a comprehensive review of possible measurement methodologies in Europe was published by Oko-Institut (Gsell, M. *et al*, 2019). This has been reviewed and has informed this work.

Qualitative Methodology
Next, a qualitative mapping of reuse in Ireland was conducted. This iterative process informed the development of a flow diagram outlining the definition of reuse, how reuse happens at different levels in Ireland and the different classifications of practitioners involved (see Figure 1). The main steps in the qualitative assessment of reuse in Ireland were:

a. Determining a definition for reuse
b. Creating a reuse decision tree and flowchart diagram
c. Building a database to catalogue reuse practitioners in Ireland

The flowchart was initially used to establish whether a material is classified as 'reuse' or 'waste'. A key criterion for this is whether there is an intention to discard the material or whether it is intended to reuse/exchange this material for its original purpose (even if some checking, cleaning or repair is required). The next main consideration within the scope of the Q2Reuse research project was whether that activity would be impacted by setting a target. Informal reuse between individuals is unlikely to be influenced by targets and as such, it was not included in the research. Subsequent to these decisions, the flowchart was used to map the different routes by which materials are reused within society. From this mapping it was apparent that the most appropriate point of measurement for reuse is at the final point of sale or exchange, as this is the ultimate point of transfer from one user to the next. This decision was informed by the Oko-Institut's work on

providing a methodology to report national reuse data to the European Union and previous work by RREUSE on how to measure preparation for reuse. The rationale for collecting data at the final point of sale / exchange rather than at interim points or at the initial point of collection is that collected items, particularly textiles, can be exported for reuse. However, as this work is concerned with measuring reuse in Ireland, targeting the final point of sale/exchange ensures that exported items are not included. Additionally, double accounting is avoided through setting the measurement point at the final point of sale / exchange rather than at interim transfer points (e.g. donation to a charity). The mapping exercise made it clear that, no matter how much granularity was explored, there would always be exceptions. Therefore, it was decided that the flowchart should represent 'business as usual' and any important exceptions or explanations would be noted accordingly.

Based on the mapping of reuse outlined in the flowchart and the different reuse practitioners identified, the team created a database to catalogue those involved in reuse across Ireland. Inclusion in this database followed the rationale behind the flowchart so, for example, it was agreed that sharing schemes and rental (e.g. libraries, library of things, clothing rental, reuse of cups for events/festivals, etc.) would be excluded from the database because, although these initiatives are important, they do not fit the definition of reuse as a change of ownership does not take place. This database organised reuse practitioners according to eight broad categories (including organisational information, contact details, materials handled, sources of materials, interim activities such as repair, the primary point of sale/exchange, information regarding measurement and metrics, and other comments).

A systematic search approach was employed (involving direct internet searches as well as searches across a number of social media channels), to populate the database. Additionally, inputs from the Community Resources Network Ireland membership, Irish Charity Shops Association and the Rediscovery Centre Circular Economy Academy were utilised. Google searches and Facebook searches yielded the largest amount of results, with Etsy and Twitter providing a small number

of additional entries. The research team also found a large amount of reuse and private sales through online platforms such as Depop and Instagram, as well as through online marketplaces such as Adverts and DoneDeal. Future revisions of the methodology might place a greater focus on online sales and swaps to capture those exchanges. Throughout the process, the team reviewed exemptions and decided on whether to include practitioners which did not fit the reuse definition with full certainty.

The different searches resulted in 1,273 identified reuse practitioners in Ireland. Throughout this qualitative investigation, the categories within this database were continually refined and updated based on barriers encountered during its application and feedback from stakeholders. It is important to note that the 1,273 practitioners identified excludes EEE/WEEE and food.

Quantitative Methodology

In order to quantify the reuse sector, a quantitative methodology was drafted with a sampling plan (referred to as Survey A) designed to support it. The sampling plan, based on 1,200 entries in the database, provides a 95% confidence level and a 10% margin of error, with a minimum of 90 samples being required. In order to identify those to be further investigated, a combination of probability and non-probability sampling was applied. This first involved identifying the number of practitioners within the main categories of reuse, followed by the project team identifying a proportionate number of individual businesses within each (e.g. social enterprise retail, charity shop retail, private retail, marketplaces, depots/redistributors, online (national/local) and online (international)).

In total, 104 practitioners were contacted, six of whom didn't want to participate. 57 Survey A questionnaires were completed and compiled using SurveyMonkey software. The output from these surveys was quantitative and qualitative, primarily showing overall approach by the sector to data collection as well as some qualitative data on incentives. Over 50% of the practitioners listed in the database were found to be non-profit organisations. This provides an

important profile of the landscape of reuse practitioners in Ireland.

Subsequently, a further 20 practitioners were approached via semi-structured interview (referred to as Survey B) to explore in more detail the actual flow of materials through the various practitioner locations and, where possible, identify and measure throughput at the appropriate points within this process flow. This subset was determined by non-probability convenience sampling. First, during a workshop held remotely, the research was explained and participant input was used to refine the interview methodology. A broad range of practitioner types were involved in Survey B, ensuring that these included online as well as physical retail spaces, shops which are part of a larger group with formal systems in place, as well as independent shops without formal management systems. This work was originally intended to take place during on-site visits but, with Covid-19 restrictions in place, this engagement was carried out remotely instead. In order to ensure a consistent examination of the different practitioners, and to facilitate collation of data, a flow template, with associated questions was developed using Miro software. The results of this process were combined to identify the main areas where data is currently gathered, to better understand how reuse materials should be classified and help the project team consider how data can be scaled up to provide national reporting figures.

Based on these results, further investigation of relevant quantification systems in Flanders, The Netherlands, Scotland, Australia and Finland was deemed necessary. The project team conducted a number of structured follow-up interviews with organisations based in these regions in order to aid the development of a national quantitative methodology for Ireland. As a consequence of these, and the results from both surveys, the main steps proposed have been identified as follows:

a) Scoping of the sector
b) Defining what will be measured
c) Data compilation – gathering, collating, assessing
d) Data extrapolation, scaling and accuracy

Scoping of the sector

The European study on a Methodology for the reporting of re-use of products underpinning the Commission's Implementing Decision (Gsell, M. *et al*, 2019) proposed a narrow scope of product categories as appropriate for measurement: EEE, textiles, furniture and construction materials. Many current measurements focus on measuring reuse by social enterprises working with donated goods, though there are diverging opinions on whether the wider sector should also be included, particularly online platforms. Based on findings from Q2Reuse research the proposed nine main material categories for reporting reuse in Ireland developed under this methodology include: clothing, other textiles and accessories, footwear, bric-a-brac, books and media, furniture, bikes, jewellery and other with a minimum of 28 sub-categories (and potentially 33 sub-categories) identified. Both non-profit enterprises and commercial enterprises (e.g. the whole sector) are included in the scope.

While in an ideal situation there would be a 100% response rate for any data collection exercise, in the absence of any Government funding directed to reuse operators, many of whom are charities with other driving forces, it may be difficult to gather sufficient data to provide for accurate reporting.

Incentivising reporting (e.g. financial incentives, funder requirements, targets, access to data or marketing) has been shown to result in high levels of reporting. In the Irish context it is recommended that supports accompany reporting requirements.

Defining what will be measured

In Ireland, number of units (e.g. number of items sold) and financial metrics are the most commonly compiled primary measures on reuse. Very few reuse operators measure weights at the point of reuse and for those who report weight metrics, most use proxy weights or product weight protocols to convert unit data into tonnes sold.

Turnover data is widely available, though for some reuse operators it may be difficult to distinguish general earnings from the value associated with reuse activities. Providing the data to check this can also involve a high

reporting burden. In the Netherlands floor area (m²) is widely reported and used for extrapolation of other data. Social metrics are not generally used to correlate with reuse levels.

Data compilation

There is general agreement in the sector that point of sale is an appropriate point for measurement though other data (e.g. weight) could help validate this. There are many unit to weight conversion tables (product weight protocols) used in different regions, with between 300 and over 1,000 categories. Observations of product weights over time indicate that these should be regularly updated to remain accurate, particularly for textiles and electrical goods. However, voluntary updates are harder to implement effectively. In Flanders, the move towards regularly weighing general product categories (rather than having a very large number of individual categories) will aim to help improve accuracy, reduce reporting burden and remove potential for error at store level.

There is a growing trend toward unit-to-carbon saving conversion tables though these are mostly proprietary due to the large development cost involved. Electronic Point of Sale (EPOS) systems offer a clear advantage in terms of collecting point of sale data. The risk of double counting or error due to online sales or repair is considered to be minimal.

Data extrapolation, Scaling and Accuracy

As it is not always possible to gather data from all reuse activities taking place, to generate a baseline or full estimate of the amount of reuse taking place nationally, some form of extrapolation and scaling is required. Retail area and turnover are possible secondary metrics for scaling up available data to represent the entire sector. A number of methods are employed to ensure the accuracy of the data including checks at micro level (specific product categories such as "supermix" donations, sales data) or auditing (accountants), as well as checks at macro level (collective data compared with historic data). It is important to strike a balance between accuracy and the accessibility of data, bearing in mind the ultimate aim of driving reuse.

Conclusions

Based on the research carried out in Q2Reuse to date, the recommended methodology proposes:

Periodic material category characterisation surveys using a base metric of number of units

These surveys would assess the main materials category (of 9 categories) and examine them under their various sub-categories (between 28 and 33) to generate a profile for each. While doing this, weights of the different sub-categories would be recorded to develop a statistically robust weight-based dataset for the main material subcategories. It is proposed that this data would be used, in conjunction with national data (e.g. reported data, national turnover), to generate a national profile (based on weight and individual sub-categories) of reuse in Ireland.

Application of conversion factors

For this bottom-up approach to be applied, it will require either (or a combination of):
  a) the whole sector (or a representative proportion) to report into a formal national system, or
  b) a sub-set of the sector be assessed and then used to scale up against an appropriate national dataset (e.g. turnover).

Both of these options currently have major data gaps that would need to be addressed to be applicable.

Incentives to report for the reuse sector

Incentives will be necessary for sector buy-in. Subsidies/funding could include: local authority rate rebates, reduced VAT, gift aid, more labour activation, grants for EPOS/scales. A national communications campaign to promote the sector may be a useful support but not likely to be incentive enough on its own to promote reporting.

With a thorough and well-presented overview of reuse (both in quantitative and qualitative terms), policy makers can make assured and focused decisions on the most beneficial supports that are required to boost the sector and track the impact of policy decisions pertaining to the sector.

Stakeholders and practitioners of reuse can also use this information to get a balanced picture of the current status of the sector and how they can act to increase activities.

The proposed national measurement methodology developed through this research represents a significant step towards Ireland's progress in benchmarking its reuse sector against those of other Member States and regions. This provides Ireland with a valuable asset in meeting its future requirement to report on reuse levels to the European Union.

Acknowledgments

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Reuse flowchart diagram

Figure 1. Reuse flowchart diagram