



Comparative analysis of the policies and practices associated with high household recycling rates

May 2019

Phil Williams, Research Analyst

Phil.Williams@zerowastescotland.org.uk

Acknowledgements: The project was delivered by Phil Williams at Zero Waste Scotland and Peter Jones and Gareth Morton at Eunomia, who were commissioned for the evidence gathering stage. Zero Waste Scotland then analysed the evidence gathered on each case and produced this summary report.

Zero Waste Scotland exists to lead Scotland to use products and resources responsibly, focusing on where we can have the greatest impact on climate change. Using evidence and insight, our goal is to inform policy, and motivate individuals and businesses to embrace the environmental, economic, and social benefits of a circular economy.

We are a not-for-profit environmental organisation, funded by the Scottish Government and European Regional Development Fund.

More information on all Zero Waste Scotland's programmes can be found at: zerowastescotland.org.uk.

[Twitter](#) | [Facebook](#) | [LinkedIn](#)



European Union



gov.scot

EUROPE & SCOTLAND
European Regional Development Fund
Investing in a Smart, Sustainable and Inclusive Future

Contents

Comparative analysis of the policies and practices associated with high household recycling rates	1
Project summary.....	3
Introduction	3
Selection of qualitative comparative analysis (QCA)	3
Case study selection.....	4
Calculating a household recycling rate	4
Policies and practice likely to influence recycling rates.....	5
Evidence gathering and analysis	5
Policies and practice associated with high recycling performance	6
Conclusions	10
Appendix A Policies and practice used in QCA and their binary coding	11
References and notes.....	12

Project summary

Qualitative comparative analysis (QCA) was used to examine the combinations of policies and practice that lead to household recycling rates of 60% and above. Ten causal policies and practices were developed that were likely to influence household recycling rates. From a long-listing process, ten case studies were examined in detail and information on each case was systematically captured through desk research and interviews.

No single policy or practice was sufficient on its own to produce household recycling rates of 65% and above. At a 65% household recycling threshold, a stretching local target, comprehensive collections, direct charging for residual waste collections and other incentives to recycle were present in all four cases. Extended producer responsibility schemes and comprehensive communication were in place for three of the four cases over the 65% threshold.

From the ten cases included in this study, the findings suggest that high household recycling performance occurs when a range of complimentary measures are in place. These measures typically require significant commitment from both local and national government and householders, which highlights the scale of the challenge in achieving household recycling rates of 65% and above.

Introduction

Scottish household recycling rates grew by an average of 9% per year between 2005 and 2010ⁱ. In more recent year's progress has slowed. For example, between 2016 and 2017 the recycling rate increased by 0.3%, from 45.2% to 45.5%. Between 2017 and 2018 the recycling rate fell by 0.9% (44.7%), which was the first year-on-year decrease using the current reporting methodologyⁱⁱ. The Scottish Government have previously set a 60% Household recycling target by 2020, and an all waste recycling target of 70% by 2025ⁱⁱⁱ.

Against this background, in February 2019 Zero Waste Scotland set out to systematically analyse high performing recycling services around the world. The project was delivered by Zero Waste Scotland, working closely with Eunomia who were commissioned for the evidence gathering stage. Zero Waste Scotland then analysed the evidence gathered on each case and produced this summary report.

Selection of qualitative comparative analysis (QCA)

Qualitative comparative analysis (QCA) was selected for this project as it enables comparative analysis between cases, improving the robustness of case-study research by using a systematic approach^{iv}. Key principles underpinning QCA include *complex causation* (i.e more than one attribute in combination may be what causes the outcome), and *equifinality* (there may be more than one causal set which can generate the same outcome).

QCA is particularly useful when there is a small to medium number of cases of interventions (10-50) which are of a similar kind but applied in different contexts^v e.g locales. It avoids overly simplistic reductionism to individual policies or practices, while recognizing that decision-makers need to clearly identify combinations of best

practice. QCA was therefore considered a useful method to compare the combinations of policies and practice that lead to high recycling performance across different cities and region cases in Europe and North America.

Case study selection

An initial long list of thirty-one cases was developed by Eunomia and reviewed by Zero Waste Scotland. These were cities/municipalities or geographical regions that reported distinct recycling rates. A rapid review of these cases was conducted to identify the occurrence of policies and practice likely to influence the recycling rate. Two criteria were used to aid short-listing:

- Does the case have a *reported recycling rate* of 60% or more?
- Is there reliable information available to allow for adjustment of the reported recycling rate to a household recycling rate?

Additional short-listing considerations were balancing cases from Europe and North America, and those with a mix of urban and rural housing. Ten final case studies were examined in detail and information was systematically captured through desk research and interviews.

- Ghent/Flanders, Belgium
- Argenton, Catalonia, Spain
- Ljubljana, Slovenia
- Vancouver, Canada
- Capannori, Italy
- Oslo, Norway
- Parma, Italy
- Milan, Italy
- San Francisco, USA
- Powys, Wales

Oslo was by exception included in our final selection despite not passing a 60% reported recycling rate threshold, as it was judged to provide a particularly interesting combination of waste policy and practice.

Calculating a household recycling rate

The outcome we defined for QCA analysis was *household recycling rate*, since this was the ultimate measure of interest. We anticipated that many of the *reported recycling rates* would require adjustment, in order to remove the contribution of waste from other sources (e.g commercial waste), or where there was known over-reporting (e.g contamination in household dry recycling). When combined with the other detailed evidence gathering requirements for this project, this meant that we set Eunomia a target of completing ten detailed cases.

The most significant adjustments to reported recycling rates were the removal of construction and demolition wastes and commercial and industrial wastes from two north American cases, and to a lesser extent three European cases. For Parma and Milan its likely a significant quantity of commercial waste remains in the recycling figure, but due to the fully integrated nature of the collection service limited data was

available to make further adjustments. Reported dry recycling tonnages were also typically adjusted downwards by 2-5% to allow for under-reporting of contamination.

Policies and practice likely to influence recycling rates

Ten individual policies or practices were judged to play an important role in recycling performance. Appendix A describes each policies and practice and the basis for the binary coding used in comparative analysis. A key methodological consideration was whether detailed information on each policies and practice could be captured across all cases.

The final list of policies and practice was developed from reviews of existing literature and expertise from within Eunomia and Zero Waste Scotland. The policies and practice went through several iterations as the project developed until final analysis was completed. For example, Eunomia captured detailed information on how recycling and waste services were paid for. In final analysis, “funding” was eventually split into whether there was a contribution from EPR, local & national taxation, and direct charging for residual waste.

Evidence gathering and analysis

Evidence gathering on short-listed cases consisted of searches of academic literature, technical and policy publications, national statistics and interviews with representatives from nine of the ten cases. On completion, Eunomia compiled a large dataset describing the detailed characteristics of each case and policies and practice combination. Eunomia carried out a first round of coding of the data that is required for subsequent use in QCA software and supplied an excel file containing workings for the adjusted (household) recycling rate.

Coding is heavily reliant on an analyst’s judgement, so a Zero Waste Scotland analyst carried out a complete second round of coding using the dataset and supporting case information supplied by Eunomia. This was useful as a moderation exercise, but also proved invaluable for understanding the cases in greater detail. Examples of revisions during the second round of coding included where DRS was coded as present but there was also clear evidence that the system was not functioning as intended.

A Zero Waste Scotland colleague also peer reviewed the second round of coding to check that a similar judgement could be formed from available evidence. Draft findings were also reviewed with Zero Waste Scotland resource management colleagues.

QCA can adopt either a binary approach (presence or absence of a policy and practice), or so-called fuzzy set, where each policy and practice and case combination might be coded as either full membership, part membership or no membership. The choice over methodology is normally driven by the relative availability of quantitative and qualitative data. Eunomia attempted to capture information that could enable fuzzy-set analysis, while retaining the flexibility to use a binary approach. In practice, the nature of the available information and policies and practice meant that binary QCA was used in final analysis. Analysis was completed using open access QCA software and supporting guidance^{vi}.

Policies and practice associated with high recycling performance

Table 1 below summarises the combinations of policies and practice that are associated with cases above or below a 65% household recycling rate threshold.

There were four cases in our sample that were over a 65% household recycling rate threshold. Ljubljana in Slovenia is noteworthy for being just under the threshold (64.3%) and interviews suggest they are likely to significantly exceed the threshold when new data is published.

No single policy or practice was sufficient on its own to produce household recycling rates of 65% and above. Of the four cases above a 65% household recycling rate threshold:

- Stretching local recycling targets, comprehensive collections and communications, direct charging for household residual waste and other incentives to recycle were all present in all cases.
- Argentona and Capannori have an identical combination of policies and practice (i.e they form a single set). In both cases a legal requirement to recycle was present and wider community facilities to recycle were absent.
- Parma and Ghent form a similar but not identical combination of policies and practice, only varying by the presence or absence of extended producer responsibility schemes for packaging waste. In both cases a legal requirement to recycle was absent and wider community facilities to recycle were present.

A stretching local recycling target of 60% or above was present in all cases above threshold and seven of the ten cases overall. In the case of Ghent, a recycling target of 75% was supported by a residual waste production target of 150 kg/capita^{vii}. The Emilia-Romagna region where Parma is situated also use a performance-based grant system, which is tied to a residual waste production target. The three cases without a stretching local recycling target (Vancouver, San Francisco and Oslo) also have the three lowest household recycling rates (51.2%, 46.2% and 38.4% respectively).

All the cases above the 65% threshold and nine out of the ten cases overall provided comprehensive kerbside services that target paper, card, metals, plastics, glass, food/biowaste. Oslo is the exception, where residents must recycle glass and some metal packaging at collection points.

Regularly communicating with households also clearly underpins any other policy or practice. In the case of San Francisco, we found evidence of good website information, but lacking in any additional activity (e.g printed media, PR and community engagement).

All the cases above threshold and eight out of the ten cases overall used direct charging for household residual waste based solely on a form of volume-based charging (i.e no weight-based element). San Francisco and Vancouver were notable in operating the purchase of a fixed annual bin volume. This may not provide the same level of incentive to recycle when compared to true “pay as you throw” volume-based bin and bag systems. The North American cases are therefore likely to be qualitatively different but have been treated the same when binary coding for QCA. Powys operates a restricted residual volume provided free at the point of use, with the purchase of additional 60 litre residual waste bags at £51.88 per 26-bag roll. We did not consider this service to be comparable to direct charging. At the time of our analysis, Milan was considering introducing direct charging for household residual waste.

Providing other incentives to recycle was found in nine out of the ten cases. Appendix A provides a description of the range of interventions we classified under this heading. In practice this category felt less analytically useful owing to the broad range of measures under this heading.

Only three of the ten cases (Ljubljana, Powys and Milan) were supported by local and national taxation, and none were above the 65% threshold. Ljubljana is noteworthy for using a wide range of policies and practices to support waste and recycling services. As noted above, Milan is also considering introducing residual charging, which may reduce or remove their reliance on funds raised through a local property tax.

Deposit return schemes (DRS) were present in three cases (Vancouver, Oslo and Ljubljana) and none were above the 65% threshold. San Francisco technically has a DRS in place, but interviews suggest the coverage of return points is very limited making it difficult to redeem deposits. The degree of impact of a DRS on household recycling rates will be dependent on the existing capture rates prior to introduction. Deposit return schemes are also introduced to deliver littering benefits, which our current analysis takes no account of.

As noted above, Vancouver, Oslo and San Francisco were notable as the three lowest performing cases, and the only cases not adopting stretching local recycling targets. Oslo is notable for the adoption of direct charging for household residual waste and extended producer responsibility for packaging waste, which might be expected to

produce a household recycling rate higher than 39.4%. The relatively poor performance of Oslo probably reflects a reliance on energy from waste for both waste management and local heating. We considered Oslo a particularly useful case in highlighting the interaction between measures typically associated with high household recycling rates and the effects of other areas of policy e.g local energy infrastructure.

Conclusions

Qualitative comparative analysis proved a useful methodology to systematically examine the combinations of policies and practice that are associated with high household recycling rates. Practical considerations around evidence gathering limited the number of cases included in analysis, but the findings do suggest some consistent themes.

No single policy or practice was sufficient on its own to produce household recycling rates of 65% and above. At a 65% household recycling threshold, a stretching local target, comprehensive collections, direct charging for residual waste collections and other incentives to recycle were present in all four cases. Extended producer responsibility schemes and comprehensive communication were in place for three of the four cases over the 65% threshold.

From the ten cases included in this study, the findings suggest that high household recycling performance occurs when a range of complimentary measures are in place. These measures typically require significant commitment from both local and national government and householders, which highlights the scale of the challenge in achieving household recycling rates of 65% and above.

Appendix A Policies and practice used in QCA and their binary coding

Policies and practice	Summary of binary coding for QCA
Stretching local target in place	Present: Local target adopted at least two years ago which is greater than 60% for recycling/separate collection. Absent: no specific recycling target (zero waste by 2040 target, landfill diversion or recovery target), or if a recycling target was set within last two years.
Recycling collections are comprehensive	Present: where all of Paper, card, metals, plastics, glass, food/biowaste are targeted at the kerbside. Absent: where at least one of Paper, card, metals, plastics, glass, food/biowaste are not targeted at the kerbside.
Requirement to separate recyclables placed on household and/or collector	Present: Requirement to separate recyclables placed on household and/or collector. Absent: No requirement placed on household and/or collector.
Extended producer responsibility schemes in place	Present: Extended producer responsibility scheme in place for household packaging as a minimum. Absent: Extended producer responsibility scheme not in place.
Services supported by local & national taxation	Present: Services funded via forms of local or national taxation. Examples include property-based tax in Milan and Powys. Absent: No evidence for reliance on taxation. Services utilise a mixture of EPR and/or direct household charging for waste services.
Services supported by direct charging for residual waste	Present: household charged directly for collection of residual waste, with variable volume-based charging dominant (no weight-based systems included in final case list). Absent: no direct charging to households (e.g service funded through local and/or national taxation).
Comprehensive communication with householders	Present: provides a range of content, varying frequency according to changes in service. Use of website, social media/apps, printed, marketing, PR and Community engagement. Absent: Information limited to what and how to recycle, with digital channels being the prime mechanism and little or no direct communication with householders.
Deposit return scheme in place	Present: Deposit return scheme in place for some/all drinks. Absent: Deposit return scheme absent, or in one case where there is clear evidence that the scheme is not functioning as intended.
Wider community facilities provided for recycling and reuse	Present: Additional facilities provided where recycling of additional materials is made easier (coverage of kerbside services is assessed separately). May include recycle parks, eco-

	stations/wagons, recycling centres and repair cafes. Absent: no evidence of wider facilities.
Other incentives to recycle are provided	Present: Includes subsidised composting, discount on waste service charges if composting, restricted residual capacity (either where not charging, or changing default sizes of fixed volumes), fines for not recycling, community champions and workshops. Information on its own is considered under communications. Absent: No evidence available of other incentives.

References and notes

ⁱ SEPA Waste Data Digest 11: Key facts and trends, 2011

ⁱⁱ <https://www.sepa.org.uk/environment/waste/waste-data/waste-data-reporting/household-waste-data/>

ⁱⁱⁱ <https://www.gov.scot/publications/making-things-last-circular-economy-strategy-scotland/>

^{iv} Blackman, T., Wistow, J., & Byrne, D. (2013). Using Qualitative Comparative Analysis to understand complex policy problems. *Evaluation*, 19(2), 126–140. <https://doi.org/10.1177/1356389013484203>

^v Byrne, D. (2016) Qualitative Comparative Analysis: A pragmatic method for evaluating intervention, CECAN Evaluation and Policy Practice Note for policy analysts and evaluators, Note no.1, Autumn 2016

^{vi} Ragin, Charles C. and Sean Davey. 2016. Fuzzy-Set/Qualitative Comparative Analysis 3.0. Irvine, California: Department of Sociology, University of California. <http://www.socsci.uci.edu/~cragin/fsQCA/software.shtml>

^{vii} In 2017 Scottish households produced on average 194 kg/capita.