



Sandra's scenario: Finding small but achievable changes, even when searching for something else.

Sandra has just finished the lengthy process of putting her daughter Niambh to bed. Niambh is excited about the topic her new teacher has started, which seems to be about waste and the environment. The teacher has asked each of them to write about a different topic, and Niambh has chosen fly tipping. This evening, Niambh was talking about all the litter she'd seen on her way back from school, and how it hurts animals.

It's 8pm and Sandra still has at least an hour of work to do. She has recently been allocated a client who wants to know about the benefits and costs of using reclaimed and recycled materials in constructing their new premises, and to have an estimate of the carbon footprint of the project as a whole. She smiles ironically: she recently made the decision to work for a smaller company in hope of achieving a better work/life balance. She never had to deal with such requests at *ConcreteJungleCorp* but *BuildLocal* seems to attract more environmentally conscious clients, and she knows the company is too small to be able to afford access to commercial databases containing relevant information on carbon footprints. Instead, one of her new colleagues suggested looking at a site called Waste Commons Scotland to see if she can find any relevant information there.

Sandra sits at the breakfast bar and fires up her laptop. She Googles the site and follows the link. She needs to understand more about carbon footprints and building materials and would ideally like to find some data where the carbon footprints of different materials and their disposal routes are costed – she hopes the site will have the right data, and that she'll be able to tell if it's reliable. The site looks official enough. Sandra goes straight to the search icon and types in "carbon footprint". She is directed to a page that gives a concise but informative description of what a carbon footprint is and why it is important to consider it when thinking about the impacts of waste on the environment. There is an infographic showing that the environmental impact of Scotland's waste was the equivalent of 2.3 million flights around the world. The caption states that the data come from SEPA and Zero Waste Scotland. Sandra finds the statistic interesting but realises she really wants to know more about the carbon footprint of particular activities and materials. She continues scrolling down the page in the hope of finding out more. She sees some text which tells her that, "Most people don't realise that the environmental damage caused by throwing your food waste in your household waste bin far outweighs the damage caused by our over-use of plastics." This does surprise Sandra: she vaguely remembered seeing a compost caddy when she first moved into her house but doesn't recall the leaflet from the council saying that food waste was collected. She makes a note to herself to check. Perhaps this is something she could do better and get Niambh involved in, too? However, she knows she mustn't get side-tracked; she needs to focus on the demands of her work for now.

She sees a few more links to reports on Scotland's carbon impact. She quickly clicks through these and skims the content but cannot see a link to data tables where individual materials by sector are displayed. She gets quite frustrated as it is clear the data obviously exist for the reports to have been produced, so why can't she find it anywhere? SEPA and Zero Waste Scotland, from whom most of the reports seemed to come, were public sector organisations, weren't they? Wasn't all of their data supposed to be openly available?

Then she notices some text saying that the Waste Commons Scotland team are currently working with Zero Waste Scotland to make carbon metric data available for public use. There's a way to contact the team to find out more. Sandra is disappointed but at least feels like she is on the way to an answer. She clicks on the contact link and fires off a message asking where she can find out about the carbon footprint of construction projects using new versus reclaimed materials. Then she decides to stop work for the evening. She is about to log off when she thinks perhaps she should have a look and see what is on the site about fly tipping, so that she can help Niambh with her homework. She types "fly tipping" into the search box and is shown a long list of results, starting with links to data sets (mostly tagged as coming from SEPA) but also including links to what appear to be blog posts or media stories. She bookmarks the page, confident that if they look at it together tomorrow, she and Niambh will find some useful information.

Finally shutting down the laptop, Sandra reflects on just how many different ways there are that she might be able to contribute towards improving the environment, both through her work and her actions at home. One thing is for certain – her career move hasn't improved her working hours, but it has improved her sense of her own values align with her employers'.



Iain's scenario: flagging up concerns about data reliability to the platform and to his Mum

Iain carries his coffee back to his desk. He wants to check out the now publicly-launched Waste Commons Scotland platform. The launch was featured in SEPA's internal news bulletin and, since he was involved in helping the team behind it early on in the project, he is interested to see how it has turned out.

Iain follows the link from the news bulletin. He is struck by the way the splash page is organised. As well as a menu linking to the usual stuff such as an About page, the page is divided into different areas which appear to be links to high-level categories including domestic and commercial waste data, but there are also categories for "Understanding waste data," "Re-use ideas" and "Waste Commons Scotland community." He knows the platform has been designed to make open data on Scotland's waste accessible to a range of people including the general public, but he feels that maybe this page has been designed very much for the lay-person. He suspects it is going to take him a lot of clicks before he finds anything he doesn't already know. Still, it looks nice enough, and he supposes there is really no need for a duplicate of the SEPA data portal, which he knows isn't particularly user-friendly for non-experts.

Iain scans the page more closely and notices a link marked "Data sources." This takes him to a page with a text overview of the different sources that the data brought together by the platform have been published by. He's not surprised to see SEPA get top billing, but there also seem to be datasets provided by Local Authorities, Zero Waste Scotland, and others. He reads that some of the data have been uploaded by registered members of the Waste Commons Scotland community. He decides to have a look and see what they've got that he hasn't seen before. Entering the Commercial Waste Data section of the site, he finds a page with a broad overview of the data available, and options to filter by industry, waste product or destination – or simply to search using a text-entry search tool. Iain selects the industry filter and a menu appears, listing areas such as Agriculture, Construction, Fashion and Healthcare.

As Iain is currently working on SEPA's rather limited textiles data, he wonders what there is under Fashion. He applies the filter and is presented with a list of links. Some of these are to datasets, some are to documents such as Zero Waste Scotland's sector-based re-use mapping report and others are to what appear to be forums or blog posts within the Waste Commons Scotland site. Iain scans the datasets and sees that each is tagged with the publisher and the date of publication. One, described as a "Map of Scotland's Fast Fashion Waste," appears to have been uploaded by a user of the site. Iain selects this and a colour-coded map of Scotland appears on his screen. The accompanying metadata claims that the map shows the amount of clothing sent to incineration from retail fashion outlets in Scotland, measured by weight.

Iain is very surprised to see this – he isn't aware that such data are reported, and if they are, he knows they are likely to be incomplete as smaller outlets and charity shops are exempt. He's starting to get worried by the site's verification and reliability processes when he notices an icon indicating that this dataset has not been verified. Now that he sees it, he recalls seeing similar icons next to the publisher and date tags in the search results list. He skips back and sees that the ZWS data that appears in the list is tagged as coming from a publisher with high verification standards. He skips forward again to the map he was looking at. He wants to raise his concerns about the data with Waste Commons Scotland and looks for a way to do so: he sees a button labelled "Flag possible issues." He presses the button and a text-entry box appears with an invitation to enter any concerns about the data or publisher. Iain quickly types in a message and wonders what will happen next. He then clicks on the name of the publisher, and is taken to a user profile. This suggests the publisher is an open data enthusiast, rather than an environmental campaign group or commercial company, but Iain is still doubtful about the reliability of what he has seen.

He looks at the clock and realises he'll have to leave this for now; he might come back to it the next day. Right now, though, he needs to get on his bike. He has promised to call in at his Mum's on the way home, as she wants some help with something she's trying to do on the internet. When he gets there, he finds she's struggling to use SEPA's household waste data tools on the tablet he recently gave her! She explains that she wants to get some data on local recycling to share with her Women's Institute WhatsApp group. Iain knows that it will take her a long time and a lot of effort to extract what she wants from the SEPA tools, and from what he saw of the Waste Commons Scotland site he thinks she'll find it more intuitive. He shows her how to get to it and together they look at the Domestic Waste Data area of the site. Watching her select and view various bar charts, Iain is glad he is there, as he can explain to her about the reliability and verification icons and hopefully stop misinformation being spread among her online friends.



Laetitia's scenario: Learning new ways to connect data and getting new ideas for creative learning

It's Friday evening and Laetitia is still at school. She has some work to do to get ready for next week and she doesn't want to go home until she's confident that she's on the right track. She has started a new project with her P6s. She wants them to learn about food packaging and where it ends up, in the hope of encouraging better habits than she has been seeing up until now. Since moving back to Glasgow, she has been horrified at how much waste goes into the bins each lunchtime. She has also been disappointed to notice that not many of the children separate out the recyclable and food waste (and she's not sure some of the other teachers are very good at that either). To be honest, she hadn't even noticed separate bins at school when she was growing up, but her time in the islands community has made her much more aware of how important it is to deal with waste properly (or even better, to avoid it in the first place).

She sits at her desk, props up an outdated, school-issue tablet and navigates to a site she has been using quite a bit since she got the idea for the project. Her plan is to get the whole class to keep a "food waste diary" for a week, recording the food they leave uneaten, the packaging it comes in, and what they see in the bins in the cafeteria. She knows some of the kids will think looking in the bins is gross so she wants to make sure she's got some killer facts to motivate them. She's pretty sure she'll be able to find what she needs on Waste Commons Scotland.

She's pleased to see the school's firewall lets her access the site. She taps on "Domestic waste data," quickly swipes past the explanatory text that she read the other day and tries to find the way to filter by location. She sighs – if she were doing this for herself, she would be telling her phone to go straight to what she is after, not tapping and swiping at a slightly sticky touch screen – but she's doing this at school, using school equipment, so that she can see exactly what the site will look like to the kids. Part of what she's trying to decide is whether the site is easy enough to understand for 9-10 year olds to use it themselves. She finds the link she's after and selects her own local authority's waste data, with the additional filter "2019." She selects the option to view weekly volume data for landfilled waste in the form of a bar chart. Just as she suspected, the amounts get bigger during the long summer and shorter winter school holidays. She switches the filter options to look at weekly volumes of food and garden waste – it's harder to tell whether there's a "school holiday" effect here because of the seasonal variation, but she thinks there might be. She flips backwards and forwards between the two data sets a couple of times and then sees a message on her screen: "Did you know you can view two data sets at the same time? Select *Compare* and then choose from *Stack*, *Overlay* or *Correlation*." When she taps the message it disappears, but now she knows to look for it, she notices a "compare" option among the various other filters. She plays around for a while until she has convinced herself that the kids are putting little or nothing in their food waste when they're at home.

Laetitia smiles happily – manipulating the data like this might be a bit advanced for most of her class, but she can now say with reasonable certainty that when they're not at school, more waste goes to landfill than when they are, but no more food waste gets composted. So ... where does the extra food waste they produce at home end up? She hopes this will get them thinking and starting to own their waste.

Although Laetitia is pleased with what she's learned, she still feels she's not quite ready enough to go home. She taps through to "Waste Commons Scotland community." When she was exploring what the platform offered before, she had found a link to an "Education for Sustainability" interest group and she wonders whether she might get some inspiration there. Laetitia knows one of the members of this group is a teacher she already follows on Twitter – in fact, it was a PedagooFriday tweet a couple of weeks ago that took Laetitia to Waste Commons Scotland in the first place. Laetitia sees a new blog entry from the teacher and clicks on it. It turns out that her students have been writing poems or short stories about the impact of waste on the outdoors: Laetitia reads the example poem on fly-tipping that the teacher has shared and is really impressed. That's what she needs – to get her own class to produce something creative, not just to find out facts and record numbers. She starts to think – maybe they can take photos of the bins and make a big collage showing everything that happens during the week. If it goes well, she might even post her own tweet on PedagooFriday – and on the Waste Commons Scotland interest group! She guesses she'll have to register to do that, but she's been using the site often enough now that she doesn't think that would be a problem. She'll wait and see how the project goes. Now, though, she can go home feeling more confident about the week ahead. She is looking forward to telling her boyfriend about her plans when they skype later.



Steve's scenario: Getting new ideas for communicating reliability and making connections between data

Steve pushes back his office chair and sighs with exasperation. The email in front of him is another FoI request asking about the Council's recycling rates. He's fed up with answering the same questions over and over. He's also irritated by the implied criticism and the obsession with recycling, when the best outcome would be to eliminate waste before it happens, rather than create lots of unnecessary and environmentally costly recycling. He's had enough for the day.

When he gets home, Steve calls his girlfriend, Laetitia, a primary school teacher currently working at a school on the mainland. When he complains about the Council's apparent inability to communicate effectively about waste, she tells him about a website she's recently come across, Waste Commons Scotland. She's been using it to access data for a class project on food waste, and she has been impressed by the way the information she looked for was presented in an easily accessible fashion. She sends him a link and he clicks through to a splash page that claims the site is intended to help people learn how to access and make sense of waste-related data in Scotland. He's very pleased to see the site doesn't use cookies. Steve bookmarks the page and returns to it after he and Laetitia finish their chat. The page has some links to general categories of information – "Domestic waste data," "Commercial waste data," "Understanding waste data," "Re-use ideas" and something labelled "Waste Commons Scotland community". Some of these are broken down further, for example "Domestic waste data" has sub-categories for food and garden waste, dry recyclables, ideas for re-use, waste reduction. It also has a search box and a menu with items including "About Waste Commons Scotland", "Data sources" and "Sign in."

Steve wants to see what the site can do, so he types "landfill" into the search bar. The search returns a list of results, each of which has one or more tags. The first few items on the list appear to be links to data sets, with tags indicating the source of the data (in this case, all of them SEPA) and the date of publication. The next items on the list appear to be links to regulatory or policy information, again with tags indicating the source and date of publication. Finally, there are links to news stories and campaigns. Some of these are tagged as coming from sources which seem to be Waste Commons Scotland subscribers.

Steve clicks on a result with the title "Waste Landfilled in Scotland," tagged *SEPA* and 2019. This takes him to a page with a short paragraph explaining what the data are – Steve is familiar enough with the SEPA website to guess this has been scraped from the pdf summary documents that usually accompany SEPA's excel format spreadsheets. Below this is a list of data options: landfilled waste by category, landfilled hazardous waste, historical trends, map landfill sites, and so on. Next to the first three of these is a dropdown menu allowing him to choose the format in which he wants to access the data: download .xls files, view bar chart, view pie chart, view data series. He selects "view pie chart" for the hazardous waste category and the system displays a clearly labelled chart. Next to the chart, a traffic light image shows green. Steve moves his mouse over the image and some text appears, telling him that according to the data publisher, these data are more than 80% accurate. He tries out some of the other options. Then he notices some text telling him that "Other people who looked at these data also looked at:" followed by what appear to be hyperlinks to "Scotland's household data" and "Incinerated waste in Scotland," both tagged *SEPA* but with different publication dates. While he finds the similarity to "Customers who bought this also bought ..." a bit irritating, Steve thinks suggesting other data sources to look at is a great idea. He wonders whether the Council could make use of ideas such as the traffic light and recommender systems.

Steve decides to explore it a bit more. Clicking back to the homepage, he wonders what "Waste Commons Scotland community" is all about. The link takes him to a page with a brief statement explaining that Waste Commons Scotland wants to help people connect with each other and share their own findings and experiences. There are links to discussion forums and an invitation to "Join the community and contribute your own waste data and waste stories." He skims through the most recent posts in a forum dedicated to recycling questions and is not surprised to see confusion about what can and can't be recycled. He's pleased to see that there has been some discussion about the carbon costs of recycling, though, and follows a link to a blog entry on the site which turns out to be written by someone who works at a MRF. The blog describes how frustrating it is that so much of what should be recyclable waste in Scotland is contaminated with food and so on, and so has to go to landfill. Reading it, Steve is struck by how much more powerful this emotional but lucid piece of prose is than the statistics and charts he was looking at earlier. Perhaps these kinds of stories are a way the Council could improve their own communications? He opens a word document and starts to write his own piece ...



Nils's Scenario: A search for old pallets turns into an education in reuse – and recycling!

Nils has spent another sunny morning in his allotment and has brought back some sweet peas for his wife, Sarah. He picks a small jar out of his glass recycling, half fills it with water, and puts the flowers in their makeshift vase in the middle of his small kitchen table. Nils smiles as he thinks, "One less jar to carry down three flights of stairs come recycling day!" He wonders if his neighbour, Mr McAllister, will put out any recycling this week or if he will fill the rubbish bin with glass, as usual.

Nils and Sarah have made a pact that they will try not to buy anything new for the next year as they are trying to save to buy their first home: hopefully somewhere bigger with some outside space. But he wants to make a new raised bed in his allotment so that he can try growing asparagus. He wonders if there is anywhere locally he could source some free wooden pallets and thinks about turning on his 10-year-old computer to search the internet. He doesn't want to spoil his good mood -- the last time he turned on his computer to try and find out if the council were still giving away free compost he quickly gave up and felt grumpy for the remainder of the day. But he really does want to make that new bed, and he realises that if he is not going to buy anything new for a whole year, he is going to have to find new ways to source things.

Nils types "waste wood Scotland" into Google: one of the first links is to "Waste Commons Scotland." He clicks on it and is pleasantly surprised by what appears. The page seems uncluttered and no distracting ads flash up. Nils reads that the site is intended to help people learn how to access and make sense of waste-related data in Scotland. The word "data" makes him a little nervous – he isn't after data, he's after pallets, and anyway he "doesn't do data" – but the idea that the site might help him learn and make sense of things makes him feel as though perhaps he doesn't need to be an expert to continue. He is debating whether to leave the site or not when he spots the word "re-use." He smiles as he notices another link to "waste reduction" but tells himself not to get distracted and clicks on the "re-use" link.

Nils is taken to a page where he seems to have more choices of what to look at. The first option is "Re-use data," indicated by a small pie chart. No way does he want to go there. The next option is "Re-use stories." Nils's attention is caught by the accompanying photo of a car tyre being used as a garden planter. He clicks on the picture. The page before him displays dozens of links to pictures and text about re-use ideas people have had. Before he knows it, Nils has spent half an hour browsing, coming across several ideas that he thinks will help him and Sarah achieve their goal of not buying anything new. As he reads he notices that several of the stories about gardening are by the same author. He realises that the author's name is an active link: he clicks on this and it takes him to a profile with a link to a blog. Nils bookmarks the blog. He shuts down the computer and goes back to his allotment, his mind buzzing with new ideas.

That evening, Nils tells Sarah about some of his new gardening plans and where they have come from. They turn the computer back on and Nils finds his way back to the Waste Commons Scotland site. Nils says he likes the stories but he's not sure why the site has so much about data on it. Sarah suggests that if they're ever going to convince Mr. McAllister to stop filling the shared rubbish bin with recyclable stuff, perhaps they need a bit of data – maybe if he knew how much the Council were losing by not getting the revenue from recycling, he'd realise they might be able to lower the council tax rates if people like him behaved more like Nils and Sarah. At Sarah's insistence, Nils reluctantly clicks on the "dry recyclables" link and then on to "dry recyclables data." He's faced with a daunting list of different kinds of data and almost closes the browser, but Sarah notices an option to filter the results by Local Authority area. Once they do this there are far fewer links. Nils notices that each link is accompanied by some other options that seem to be to do with what the data will look like. He chooses data on their local council's glass recycling and selects "bar chart" format. He is presented with a graph showing years along the bottom and something – he isn't sure what – for each year. Whatever it is, it seems to have increased for a while and then levelled off. He sighs, wondering how anyone can learn anything useful from this – but then Sarah points out that another option has come up asking if he wants to compare his council's glass recycling rates to those of other Scottish LAs. He selects a neighbouring but more rural council area and additional columns pop up in the chart. They're way lower than his urban council data. Nils is surprised and pleased – maybe people aren't generally as bad at recycling as he thinks. Then he notices a message suggesting he might be interested in comparing volume per person. He does this and the relative heights reverse themselves – now his area's data is much lower than the other's. He sighs, not knowing what to think of this. Sarah says maybe they need to look at the section about "Understanding waste data" that they saw on the main page. Nils says maybe another time – he doesn't fancy getting a headache just now.



Laura's scenario: Finding a resource to help communicate and empower people to act

Laura has been working on her latest blog for over an hour. She wants to challenge a recent newspaper article criticising Orkney Council's recycling rate and to try to improve how ordinary members of the public can critique such articles themselves. She believes the best place to start is with the most unprocessed data possible, but she knows this can be daunting for many people.

Indeed, despite her own confidence with data, she is struggling to understand the WasteDataFlow file that she downloaded from the SEPA website. Her friend Iain, who works in the Data Flows team at SEPA, admits that the data are not presented in a very intuitive format. He offers to help her understand it but she feels as though part of the journey of her blog will be to explain how you access the data, and that a member of the public won't have the help of a SEPA member of staff. The Household Waste Discoverer tool is easier to use but just shows the aggregated data. She is determined to try to get to the raw data and not settle for someone else's interpretation. When Laura types "Scotland raw waste data" into Google, one of the links displayed is to the *Waste Commons Scotland* page. Laura hasn't come across this site before – it must be new. She wonders what it is and who owns it. She clicks on the link to find out.

Laura is intrigued to see what appears to be a new central source for open data on waste in Scotland. The homepage seems to immediately highlight the importance of making data accessible, which she thinks is good; however, Laura is sceptical as to who manages the site and how their agenda might shape what data is available and how it is communicated. She is also wary about the idea of more waste data being made available to businesses and corporations who are all too good at finding ways to misuse and manipulate it. She clicks on "About". It seems that the site has been developed by a collaboration between Scottish universities, Local Authorities and various open data initiatives, and with the support of SEPA. She believes that academic research is generally of a high quality due to the peer review process, so she hopes the data will be reliable, but she isn't entirely convinced that there won't be an underlying political or commercial agenda – after all, Higher Education is very much a business these days.

Laura continues to read. The page explains that the site aims to be a central hub for open data on Scotland's waste. A key aim is to help make these data more available and accessible for all to use. Laura makes a mental note to assess how well they are achieving this as she continues to search for raw data on household waste. She goes back to the home page. She is not sure where to go next as the options under "Domestic waste data" seem to link to more specific topics than she wants, such as "dry recyclables" and as "food and garden waste," but there's no obvious option to raw datasets. She clicks on "Understanding waste data" in the hope that it will tell her something about how the site is laid out.

The page that appears starts by explaining that Waste Commons Scotland provides links to data sets created and maintained by a range of different sources. It gives Laura the opportunity to choose whether she wants to understand, "What data are available?" "Where does the data come from?," "Why were the data collected?," "How reliable are the data?" "What can the data tell me?" and "How do I learn more?" Each statement is accompanied by a photograph, infographic or graph and Laura is impressed by the lack of jargon and the options available. She selects "What data are available?" She is given the option to select if she wants to view the datasets by category, by provider, by reliability rating, by most viewed, or by most recently updated. She is intrigued by the "reliability rating" option but decides, for now, to view by category.

The page allows her to select a letter of the alphabet or to view all categories. She chooses "W" and picks "Waste, household" from the resulting list. She sees a link to WasteDataFlow and sighs – this will surely take her back to the SEPA webpage. She follows it anyway and is taken to another page on the Waste Commons Scotland page, where a summary is given about what WasteDataFlow is, what information is collected and from whom, who manages it, when it is updated and who can view the data. As well as these metadata, there are several options. The first is to explore a "WasteDataFlow made easy" dataset – something she assumes is a tutorial. The second is to access pre-filtered subsets of the WasteDataFlow data. There are also options to be redirected to the WasteDataFlow page and SEPA's Household Discoverer Tool. Laura selects the first and finds herself starting an interactive tutorial on how to read and understand the SEPA data set. "Fantastic!" she thinks – this is exactly what she was looking for.