



CIRCULAR ECONOMY WARDROBE

Exploring Circular Economy
Textile Models in Japan

Lynn Wilson B. Des (Hons) M.A. Textiles, FRSA



*“Like all major transitions in human history,
the shift from a linear to a circular economy will be a
tumultuous one. It will feature pioneers and naysayers,
victories and setbacks...”*

Frans Van Houten, CEO Phillips

*“The purpose - where I start - is the idea of use.
It is not recycling, it's reuse.”*

Issey Miyake

*“No idea is so outlandish that it should not be considered with
a searching but at the same time a steady eye.”*

Winston Churchill

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JETRO Japan

JETRO UK

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Bunka College of Fashion

JEPLAN

MUJI

OKUJUN

Onward Kashiya

Shima Seiki

Teijin Limited

Tokyo Fashion Institute

Finally, a special thank you to my fiancé, Martin, who made a personal sacrifice of postponing our wedding trip in favour of my Fellowship and who came out to Japan and tried his best to nurse me through the worst flu I have ever had – Arigato!



Mrs Sakuma, Senior Instructor, Tokyo Fashion Institute

Lynn Wilson

B. Des (Hons) M.A., FRSA

Personal Statement

I always say at least once in any presentation: I am the consumer I am trying to change. The fashion and textile industry has not embraced sustainability as quickly as it needs to, indeed I have not always understood the negative impact of my own passion for fashion consumption although I make, buy well and love a designer charity find. Therefore, however many solutions there are at government and policy level, this Fellowship has been as much about me as an individual and the changes we can all make. Circular Economy Wardrobe is my vision for the future of fashion where we have less stuff in our wardrobes but more experiences with clothing. We can still enjoy the creative expression of fashion without the rest of the world paying the price. The move to a circular economy is about doing things better and differently whether that is design, manufacturing or as consumers. It is about economy and growth and how we do that whilst reducing the impact on rapidly depleting global resources. It is complex and at the same time simple – there is no alternative, we only have one planet for life.

Biography

Lynn Wilson has a Bachelor of Design (Honours), Constructed Textiles (1992) from Duncan of Jordanstone College of Art, Dundee University, specialising in knitted textile design and a Master of Art, Fashion and Textiles (1994) from Nottingham Trent University. She has been a practicing knitted textile designer and tutor for twenty years and has taught widely in textile vocational training colleges and organisations in Scotland, including Coatbridge College and H.M. Prison Shotts, Motherwell College. From 1996 – 2000, Lynn managed a textile training unit in Botswana which included a period of consultancy work and personal research developing micro textile business programmes with Naro San women in settlement camps in the Kalahari Desert, Botswana. Other strategic roles have included working with North Glasgow Community Planning Partnership, Artlink Central, Stirling and Planning Aid for Scotland.

Lynn is currently the Sector Manager -Textiles, Circular Economy Team at Zero Waste Scotland. Her role is to support innovation in design, manufacturing and production in the Scottish Textiles sector and support the development of business models that support a circular economy. Lynn is a Fellow of the RSA (Royal Society for the Arts and Engineering) and an Associate Member of the Textile Institute.



Lynn Wilson in Kimono Costume, Kyoto Costume Museum



The purpose of the Fellowship was to understand what textile processing systems, design and heritage solutions the Japanese textile industry and related industries are developing to support a move towards a circular economy in terms of textile apparel design and production and reprocessing.

Executive Summary

This report covers a one month stay in Japan during October 2015. The content and the recommendations from the report are written from a Scotland specific perspective but have wider implications for UK design, retail and heritage sectors. The timing of the publishing of this report coincides with the Scottish Government's announcement of a £70 million investment package for Scotland from the European Regional Development Fund to embed circular economy models and practice across key industry sectors and develop new business models which will contribute towards Scotland achieving a low carbon economy.

Scottish textiles, particularly Harris Tweed woven cloth and cashmere knitwear, are key exports to Japan whilst Scotland has been importing Japanese textile technology from companies such as Shima Seiki for the last 40 years. The purpose of the Fellowship was to understand what textile processing systems, design and heritage solutions the Japanese textile industry and related industries are developing to support a move towards a circular economy in terms of textile apparel design and production and reprocessing. Japan is twice the size of the UK and four times bigger than Scotland in terms of landmass. It has 125 times more people than Scotland and double the population of the UK.

A key objective and benefit to visiting Japan was the opportunity to explore the difference in scale from the UK in terms of textile processing and production. Small quantities of waste arising from the textile and consumer sectors in Scotland has meant less obvious opportunities to set up new reprocessing and recycling plants. The goal is for Scotland to be a destination for new businesses setting up circular processing systems that can service the whole of the UK and new manufacturing hubs using traditional industry skills producing products with provenance, heritage, durability and sustainability for the global market. From the consumer perspective, it is about finding solutions to the evidence that the average UK household owns £4000 of clothing and 30% is never worn.¹

The research focused on four key questions:

- 1 What technologies has Japan developed to support post-consumer and post-industrial textile processing and enable 'closed loop' systems?

Meetings and exchanges with JEPLAN, Onward Kashiyama, Shima Seiki and Teijin explored what technologies are available or being developed that create circular solutions for manufacturing and reprocessing.

- 2 What retail trends are happening in Japan that contribute towards a circular economy?

Through engagement with retailers and academia, evidence of fashion leasing systems, vintage stores and eco-fashion villages were identified. A few Scottish fashion brands were evident but production labelling identified that they were made in Italy or China.

- 3 80% of a product's environmental impact can be determined at the design stage². What can we learn from Japanese traditional design methods?

The key focus from a heritage perspective was observing vocational training classes in Japanese kimono design and construction which is considered a zero waste pattern design.

- 4 How can we help consumers make sustainable, circular textile/fashion choices?

Visiting a historic textile production company and discussing the importance of traceability and provenance in the supply chain.

This research was completed by attendance and participation at the Sustainable Apparel Coalition global meeting and was an opportunity to engage with industry experts and share knowledge and understanding about circular economy principles.

¹ WRAP, 2014, Valuing Our Clothes Report

² Ellen MacArthur Foundation,

<https://www.ellenmacarthurfoundation.org>

Findings

- Technology is available that could be applied in the UK but needs a critical mass of feedstock to work
- Post-consumer clothing can be reprocessed and made into textiles but it is not 'closed loop'
- Zero waste garment knitting technology is available and can aid circular economy if utilised to produce products supported by a return system
- Retail trends - fashion leasing, eco villages, vintage/retro fashion boutiques
- Kimono is truly zero waste design
- There are several environmental impact assessment tools available and used by the global apparel industry

Recommendations

- Teijin Eco-Circle® could work well for public procurement (e.g. NHS disposable gowns). More research is needed in public procurement to explore 'closed loop' systems where textiles are currently disposed and incinerated.
- The benefits of zero waste manufacturing technology need to be presented to the Scottish/ UK Textile sector and will work best in new emerging manufacturing hubs where young companies are more likely to be open to new manufacturing models.
- Scottish/UK Governments needs to offer incentives to retailers to trial consumer collection schemes in the UK and process them in the UK on a commercial scale with technologies that can process a minimum of 50,000 tonnes of post-consumer clothing.
- Fashion pop-up shop pilots that offer alternative retail models such as rental and leasing need to be explored further in the UK.
- Cluster of retail shops under the brand of sustainable fashion/circular economy. Fashion merchandising training is needed for nonprofit organisations/ businesses in Scotland/UK selling used clothing.
- Environmental Impact assessment tools to be introduced and used widely across micro, small and large textile businesses in the UK to ensure traceability in the supply chain.
- Scottish/UK Textile industry needs to identify an environmental impact tool to strengthen the 'Made in Scotland/UK' narrative of provenance, quality and sustainability.

Introduction

Mottainai is the Japanese term meaning ‘a sense of regret concerning waste when the intrinsic value of an object or resource is not properly utilised’.

My research Fellowship was inspired by my current job as Sector Manager - Textiles, Zero Waste Scotland and spokesperson for the UK consumer campaign Love Your Clothes³ in Scotland. My job is a strategic and administrative role and has required research, leadership and close cooperation with Scotland’s Textile sector including design, heritage and recycling. My Fellowship aims to help the Scottish and UK Textiles sector consider new models of textile design and production that will contribute towards a low carbon, circular industry that understands the true value of natural resources in textile and apparel manufacturing and consumption.

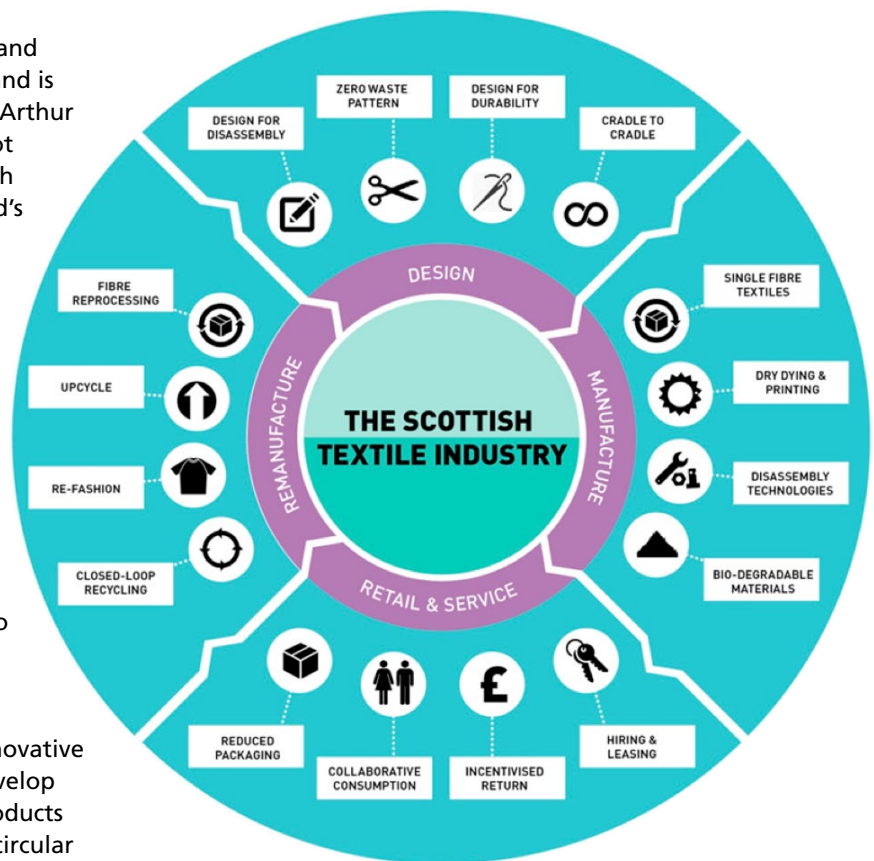
The Scottish Government is committed to Scotland becoming a global leader in circular economy and is the first government to sign up to the Ellen McArthur Foundation, CE100. Zero Waste Scotland is a not for profit company 100% funded by the Scottish Government to support the delivery of Scotland’s Zero Waste Plan and Safeguarding Scotland’s resources

The UK currently disposes of 350,000 tonnes of clothing at a value of £140 million every year⁴. One of the largest textile recyclers in the UK is based in Scotland, but UK retailers are exploring ways to reprocess clothing beyond collections for charity resale (M&S’s Shwopping project). Scotland has the potential to set up a textile processing plant that can recycle post-consumer/post industrial waste back to fibre or oil to be reprocessed into a new material or yarn creating a ‘closed loop’ system of textile and apparel manufacturing.

Zero Waste Scotland has been investigating innovative ways to protect and conserve resources and develop ‘closed loop’ manufacturing and high value products and services which contribute to a sustainable circular economy for Scotland. This work is part of Zero Waste Scotland’s support of the Scottish Government’s Zero Waste Plan which has set ambitious targets to achieve 70% recycling and maximum 5% to landfill by 2025 for all Scotland’s waste. ‘Safeguarding Scotland’s Resources’, launched on 9 June 2013, is the Scottish Government’s programme to reduce waste and create a more productive and circular economy with one clear benefit: “there is a potential saving of £2.9 billion through straightforward resource efficiency that this programme will help tap”. The Scottish Government has sealed its commitment by being the first

government to join the Ellen McArthur Foundation, CE100.

Zero Waste Scotland believes the textiles sector has a significant part to play since it is the seventh most important contributor to the Scottish economy, with an annual turnover of £956 million. Exports of Scottish textile products are valued at £375 million. There are over 570 companies directly employing around 9,000 people across Scotland with 55% of Scottish textile companies having fewer than 10 employees. In areas such as the Scottish Borders, 50% of employment is within the textile industry. Recent investments from international global brands, such as Chanel, demonstrate the high value and lucrative position of the Scottish textiles sector.⁵



ZWS Infographic

³ <http://loveyourclothes.org.uk>

⁴ <http://www.wrap.org.uk/content/valuing-our-clothes>

⁵ <https://textclothsustain.springeropen.com/articles/10.1186/s40689-015-0005-y>

OUTLINE OF A CIRCULAR ECONOMY

PRINCIPLE

1

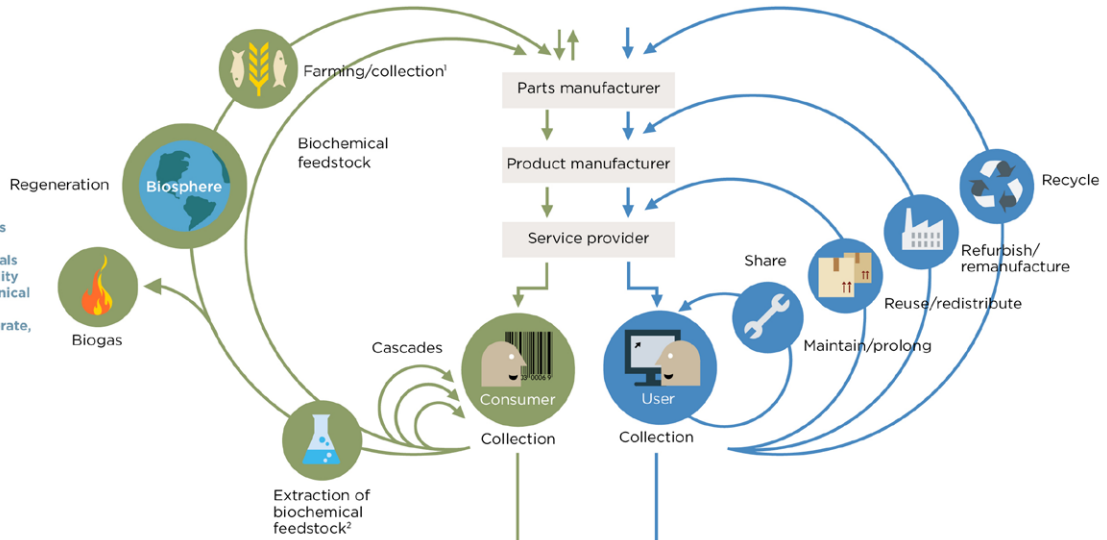
Preserve and enhance natural capital by controlling finite stocks and balancing renewable resource flows
ReSOLVE levers: regenerate, virtualise, exchange



PRINCIPLE

2

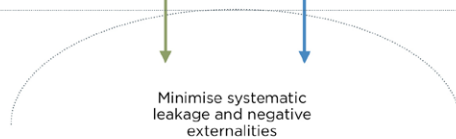
Optimise resource yields by circulating products, components and materials in use at the highest utility at all times in both technical and biological cycles
ReSOLVE levers: regenerate, share, optimise, loop



PRINCIPLE

3

Foster system effectiveness by revealing and designing out negative externalities
All ReSOLVE levers



1. Hunting and fishing
2. Can take both post-harvest and post-consumer waste as an input
Source: Ellen MacArthur Foundation, SUN, and McKinsey Center for Business and Environment; Drawing from Braungart & McDonough, Cradle to Cradle (C2C).

Global economic trends have had a positive impact on the luxury export side of the Scottish textiles sector and Japan is the second largest luxury goods market with strong import links to Scotland. In October 2013, the sector reported a level of growth 12% above the 2020 target and as a result has revised its targets to achieve between £1.2 and £1.5 billion in turnover growth by 2020. These revised figures recognise the significant gains to be made in international trade and a 50% increase in exports is predicted by 2017. 64% of textile production in Scotland is for luxury export goods.

Japan, unlike the UK, does not have a culture of charitable retail enterprise and so 1.7 million tonnes of post-consumer textiles is disposed of every year in Japan, compared to the UK which disposes of 350,000 tonnes, 10% of which is from Scotland. They do excel in other recycling systems with an envious record of 98% steel recycling.

Illustrations of the traditional linear economy model (top) and a circular economy model separated into biological and technical cycles. Source: Ellen MacArthur Foundation

Aims, Objectives and Purpose of the Project

Aim

The aim of the project was to travel to Japan and meet key companies developing circular business models and 'closed loop' solutions. The focus was within the three key business areas relating to the Scottish Textiles sector: technology, design and heritage.

Objective

Japan has always been an inspiration to Western designers but has also led the field in technical solutions for the last 40 years, most recently in technologies for 'closed loop' systems. The objective was to gather contacts, knowledge and perspective on developments in the Japanese textile industry that could be applied in Scotland but have an impact on the wider UK. By travelling to Japan for the period of a month to undertake meetings, workshops, presentations and foot research in the area of circular economy fashion and textiles, I hoped to meet with companies developing recycling and 'closed loop' technologies, design and retail solutions.

Purpose of the Project

Japan is considered the global leader in 'closed loop' technologies that can support a circular economy. An example of this is the chemical company, Teijin Limited, who have created the world's first recycled plastics (PET) yarn recycling system called Eco-Circle®. Japan's social and textile heritage also supports the ethos of a circular economy as the Japanese kimono is considered a zero waste garment because of its construction using only lengths of fabric. Japanese fashion designer, Issey Miyake, has been at the forefront of using technology to ensure his collections consider the environment since 1971 and was the initial inspiration for the Fellowship proposal. The purpose of the project was to gain a perspective on techniques and trends in the Japanese textile and fashion industry that could be applied in Scotland and shared with the wider UK Textile Design and Manufacturing sector that will support a move to a more environmentally sustainable, circular industry.

Note: Other neighbouring countries, such as China, Korea and Taiwan, are also developing technologies and industries around 'sustainable' textile technologies but the origins of the technology and techniques come from Japan.

Approach and Methods

The approach taken was to engage with key stakeholders and businesses within the key themes identified. The methods used were:

Participatory research through meetings and discussions with key staff from relevant companies and organisations

- JEPLAN
- MUJI organised by Scottish Development International
- Okujun Co. Ltd., organised by JETRO UK and Japan
- Onward Kashiwama, organised by Scottish Development International
- Scottish Development International Japan Office
- Shima Seiki
- Teijin

Presenting lectures and observing practice in academia and vocational colleges

- Bunka College of Fashion, Tokyo
- Tokyo Fashion Institute, Tokyo

Retail and consumer trend research looking for evidence of:

- Scottish luxury products in department stores
- Trends in sustainable fashion in Japan
- New business models relating to circular economy/ sustainability

Participation in the Sustainable Apparel Coalition – Solutions Forum

- Engaged with key global businesses

Attended presentations by international companies with circular and sustainable solutions

Facilitated a workshop during the Solutions Forum which included representatives from Adidas, Nike and Patagonia

Report Overview

This report presents key findings within the four questions that the Fellowship aimed to address through being located for one continuous month in Japan.

Research Question 1

What technologies has Japan developed to support post-consumer and post-industrial textile processing and enabled 'closed loop' systems?

Scotland/UK Context

It is estimated that 350,000 tonnes of textiles goes to landfill in the UK every year at a staggering value of £140 million. The main destination for used textiles collected in the UK for re-use and recycling is overseas markets. Demand for UK used textiles has started to decrease in export markets and prices have been falling since 2013. The UK is exploring recycling systems that enables textiles to be captured and reprocessed back to raw materials or oil. Textile merchants sell the lowest value textiles to overseas markets. Therefore we need to find new technologies and business models that will enable materials from end of life textiles to be used for longer and the value retained in the UK.

Visits were organised to two Japanese chemical companies that are developing recycling systems through the development of new technologies or using existing technologies but developing new collection systems; two fashion and lifestyle companies operating consumer collection systems. I also visited a manufacturer of electronic knitting machines that manufacture zero waste technology, as below:

- Teijin Limited
- JEPLAN – FUKU-FUKU Project
- MUJI
- Onward Kashiyama
- Shima Seika

Teijin Limited

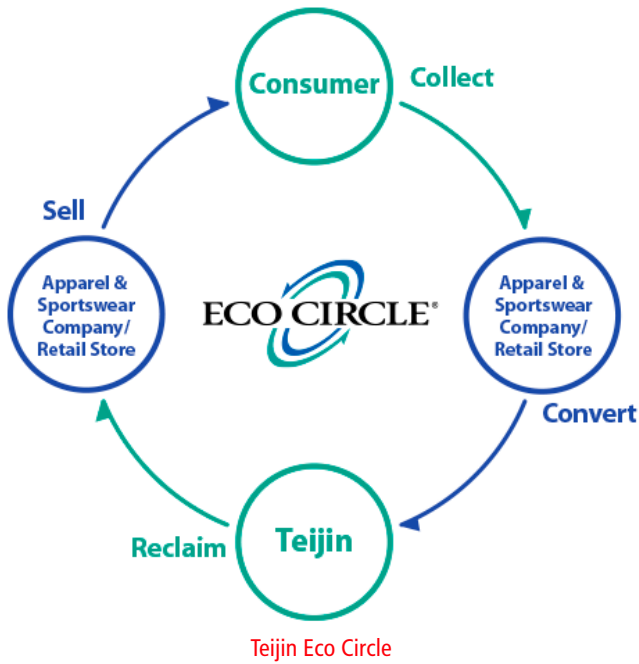
"In 2002, Teijin, along with apparel and sportswear manufacturers that shared our commitment, started a closed-loop recycling system named "ECO CIRCLE", based on our one-of-a-kind chemical recycling technology."⁶

Teijin Limited was founded in 1917 and is predominantly a chemical company specialist in high performance fibres, resin and plastic processing. Teijin Limited's main office is based in Osaka. I met with Mr Ricky Miyatake, General Manager of the Information Strategy Department and Ms Tomomi Okimoto, Chief, Information Strategy Department. I had hoped for a factory visit to see the process of Eco-Circle® but this was not possible as it was difficult for the company to organise a visit for one person. The meeting explored the various active trials that Teijin are currently involved in.

Teijin Limited has been working with schools in Japan since 2010 on return systems for polyester school uniforms that can be recycled and made into new products. Mr Okabe, a Teijin Environmental Manager, gave a presentation at an elementary school in Kyoto in 2008 about the company Patagonia⁷ and a recycled fleece jacket that is made from plastic bottles. The students said that they would like to wear something made from this process. Mr Okabe set up a project. 100 schools across Kyoto have now joined the Teijin Limited uniform trial return scheme. The durability of polyester has meant slow uniform returns and so there is limited evidence of the 'closed loop' system working. Teijin Eco-Circle® needs a critical mass of regular feedstock which relies on retail/ public sector partners to invest in the

⁶ <http://www.teijin.com/solutions/ecocircle/>

⁷ <http://www.patagonia.com/recycled-polyester.html>



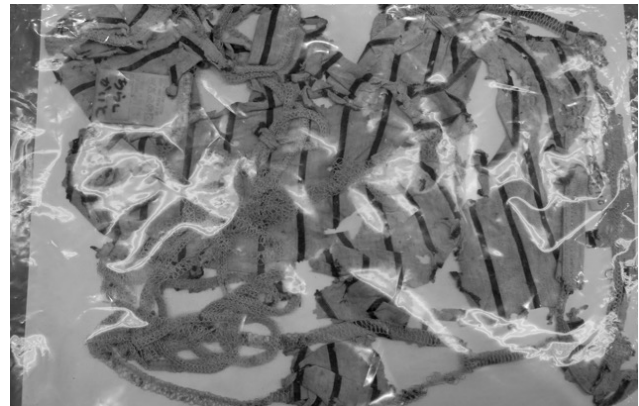
collection schemes to allow 'closed loop' reprocessing systems to work on a significant scale.

Teijin Limited is also currently working with Fuji Xerox in China on uniform trials. The Teijin Limited programme is the first of this type: the articles of recycled PET⁸ can be decomposed at a molecular level and reprocessed as ultra-pure raw material ad infinitum. The material obtained from this processing does not lose anything by quality and does not deteriorate, even after repeated processing. When compared to the production of virgin PET, it is claimed that this process reduces energy consumption and CO2 emissions by around 80%.

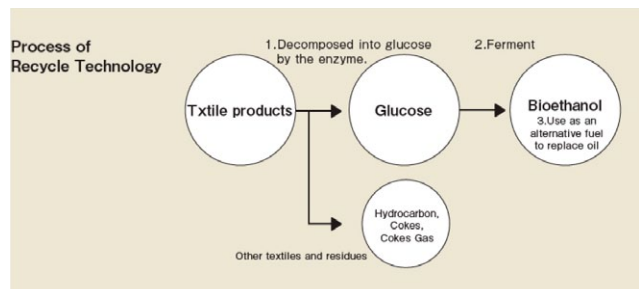
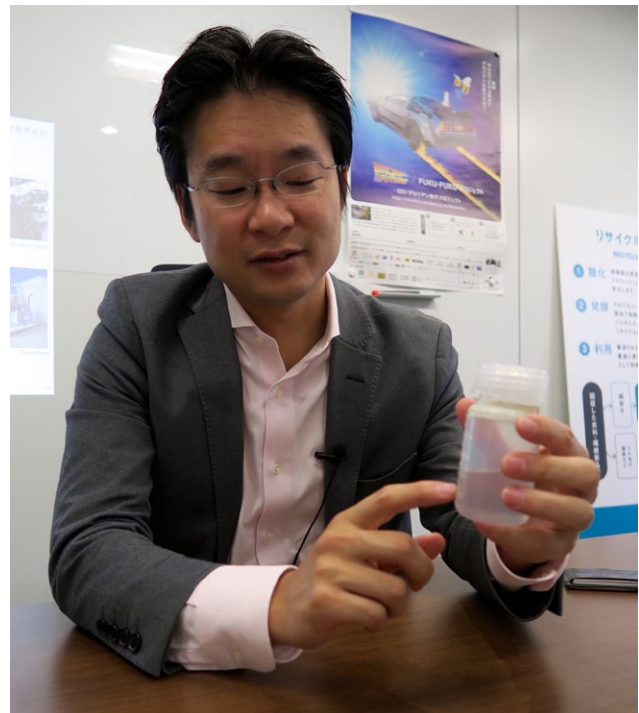
JEPLAN

JEPLAN is a ten year old Japanese company that currently employs 20 people and is expanding their operations into India with support from the Indian Government. It has also recently received 500 million Yen (£3,105,000) in funding from NEDO (New Energy and Industrial Technology Development), Japan Government. There is an international interest in the company and, when I visited JEPLAN Head Quarters in Tokyo, Mr Masaki Takao the Chief Operating Officer was being filmed for the television channel NHK (Japanese equivalent of the BBC). JEPLAN was also featured on the BBC technology show CLICK broadcast in the UK on Sunday 10th January 2016.

JEPLAN has developed a technology that can extract cotton from cotton/polyester garments and then process the cotton fibres into bioethanol fuel. This technology is already available and working with waste food being made into bioethanol but has not been made commercially available for textile processing. The technology relies on substantial cotton/polyester feedstock sourced from consumer collections in department stores where there are eye-catching clothing recycling bins provided by JEPLAN.



Above: Example of cotton polyester fabric with the cotton extracted. Below: Mr Masaki Takao the Chief Operating Officer with bottle of Bioethanol. Bottom: Producing Bioethanol from Cotton Textiles



⁸ *PET is a thermoplastic polymer of the polyester family. The term 'polyester' is generally used in the textile industry, whilst 'PET' is more commonly used in the packaging industry, particularly in food packaging. So we talk of a PET bottle or a polyester pullover.

Mixed fibre textiles, such as cotton/polyester, is commonly found in fast fashion; uniforms and sportswear are considered a lower grade of textiles that are difficult to process in the UK and also reduce the bulk sales value of post-consumer textiles. Textile recycling companies manage collection systems in the UK and buy textiles from charities that have been sorted and the highest value clothing that the charities can retail affects the price paid per kilo of clothing by recyclers. The current market prices for a tonne of used clothing from a supermarket car park collection point is £200 – £400.⁹

JEPLAN, as part of a promotional exercise in partnership with NBC Universal Entertainment, devised an interesting and media grabbing marketing plan that centered on the film Back to the Future II. In the film, made in 1985, there is a DeLorean car which is fueled by bioethanol from food waste and the date on the electronic dashboard is 21.10.2015. The car toured around Japan to raise awareness of the process and to encourage consumers to return their old clothes to retail stations (see appendix for press release).

JEPLAN wanted to create a system that would enable consumers to recycle unwanted clothing and so created the FUKU-FUKU project. Customers return used clothing where there is a branded FUKU-FUKU collection box which can be found in participating department stores and offices. The clothes are then processed and made into bioethanol, coke, hydrocarbon oil and other products which could, in theory, fuel textile production plants, therefore technically ‘closing-the-loop’.

The direct translation of FUKU-FUKU is CLOTHES-CLOTHES. JEPLAN developed the FUKU- FUKU project in 2010. The owner of JEPLAN, Mr Aiko Okita created the bee logo as he felt that the bee symbolised the number 8 which is the Japanese number most closely linked to natural harmony and balance.



Mr Takao, Lynn Wilson and Mr Patil holding a Fuku - Fuku in-store clothing collection box and Back to the Future poster in the background.

Ryohin Keikaku MUJI – ‘no label quality goods’ – FUKU-FUKU Project

Mujirushi (no-brand) Ryohin (quality goods) is better known in the UK as MUJI. The company philosophy is based on good functional design, no waste and goods that can be recycled. MUJI has been involved since the beginning of the FUKU-FUKU pilots by JEPLAN in 2010. All of the MUJI stores in Japan put collection boxes in their stores to collect only MUJI clothing. In Japan, MUJI has 284 stores and supplies 117 outlets¹⁰. Up until 2013, customers received a 10% discount for returning clothing. MUJI realised this was counter-productive to what they were trying to achieve by incentivising people to buy more products. By the end of October, 7,825 kilos had been recycled = 1% of MUJI production. MUJI has now developed an App called Passport which enables customers to return clothes and gather points for doing so through their membership. The customers who have points gathered can receive a reduction on new clothing.



MUJI – ‘no label quality goods’ Philosophy

MUJI – ‘no label quality goods’ Philosophy

MUJI began as a product brand of the supermarket chain The Seiyu, Ltd., in December 1980. In 1991, the 1st international store opened in London. In 1999, they started using the brand ‘Muji’. MUJI has stores throughout Europe and twelve stores in England, three are in London. MUJI has previously set a design brief with Central Saint Martins’ students to design products for MUJI in Japan – from their London headquarters.

⁹ www.wrap.org.uk

¹⁰ Source -Wikipedia, correct as of January 2016.



MUJI, indigo dyed garment rail from consumer returns, MUJI Department Store, Ginza. These garments sell out as quickly as they are presented in the store.

A meeting was organised with Ms Mariko Oguri, Public Relations Department. The meeting was conducted through a Japanese interpreter, Mrs Naruki.

The average age of MUJI customers is 30-40. MUJI is considered a cool, middle-class brand in Japan for intelligent, environmentally aware consumers. MUJI's philosophy is to help the customer use their clothes for a long time. They are conscious of waste and try not to generate waste from textile products; they also use excess pieces from the cutting to make other products. MUJI work with a company who are based in Hiroshima who dye returned clothing that is then resold. All of the re-dyed products are sold at 2,900 Yen in four stores. They have sold very well and can't keep up with demand. Every year, MUJI sales are increasing and MUJI believe the success of their company means that customers are committed to the brand philosophy.

All products are designed in Japan and manufacturing is undertaken across 30 different countries. They used to produce furniture in Europe for the European market but this was not viable for the company. MUJI are currently working with a chemical company, similar to Teijin, on the recycling of garments - these garments will be available in 2017. MUJI has been developing household products from recycled materials for some time. MUJI want to roll out the programme to Europe and the UK but the model needs to be profitable. They hope to start it in Europe in 2017. They have 60 stores in Europe. UK stores are doing well but Europe is not - they are going to restructure in 2016. MUJI wants to create a recycled clothing process throughout the brand and stop them being sold to developing countries; however, they also want to ensure they don't increase their price point.

Onward Kashiwama

Onward Kashiwama is a major Japanese company within the fashion manufacturing and retail industry and are the Japanese licensing partner for UK brands, such as Paul Smith and Joseph. At the moment, the recycle percentages of textiles and clothing is low compared to other products in Japan. Only 20% is being recycled compared to 98% of Japanese steel. Based on that situation, Onward have tried to find a way to recycle.

Onward Kashiwama started a campaign in 2009: the Onward Green Campaign. They asked consumers to send back clothes by returning them to department stores which are then reprocessed into fibre and made into blankets for the Red Cross. So far they have donated to seven countries which amounts to 20,000 blankets. Next year, they will send 4000 blankets to Nepal and Vietnam. Gloves are donated to local community projects in Japan. The main consumer collection system happens twice a year in department stores. They ask the consumers to return unwanted clothing which is then reprocessed and made into gloves, blankets and energy. For reuse, there is a reuse park: Kichijogi, Tokyo. There is also a rental corner in Onward stores. The rental programme is popular and accessed within the reuse store or a set of clothing is sent to you. For people who bring in clothing, they can contribute to environmental sustainability and receive a voucher for 1000 Yen (approximately £5). The main outlet is the department store but they also have an internet site so people can post clothing in collecting boxes.

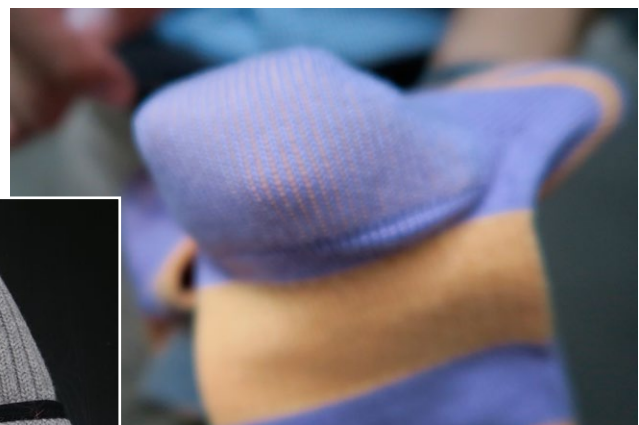
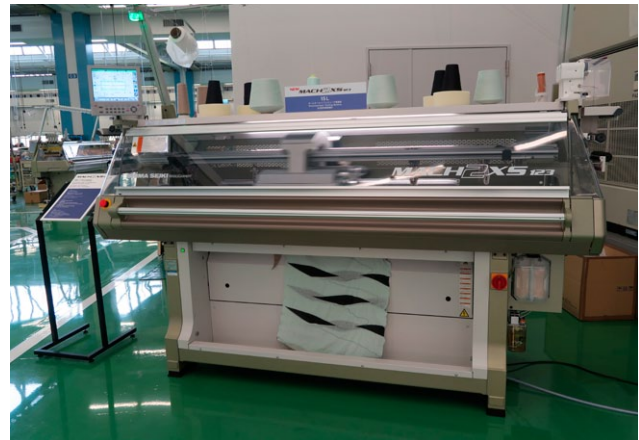
Onward Kashiwama has addressed the concept of sustainability throughout the Onward stores. Shop fittings and furniture are made from wood from Japanese forests in the Kochi Prefecture where most of the land is covered by forest and needs to be thinned out and so is a necessary process. This is called Green Keeper. After the clothing is collected, it is processed into a cotton thread. The technology was already available in Japan and they were able to make the thread into gloves. Polyester is added to the cotton thread to make it stronger. So far, the project has collected 400,000 items, some in really excellent condition and so Onward decided to clean them and sell on. In order to provide a reuse and recycle service, as a company one of the issues is cost and so the profits of the shop go to fund the processing activities. Whilst the prices are kept to the equivalent of charity shop prices in the UK, it makes just about enough to sustain itself. However, an issue is collecting 400,000 garments which equals just 4% of sales in Japan so there is still a lot of work to be done.

According to Mr Yoshigaya, Leader of the Corporate Communications Department, there are no municipal textile recycling systems in Japan and so textiles are still disposed of in the household bin. He said that since the earthquake in 2011 attitudes and awareness of the Japanese consumer has changed but in his opinion the young fashion community in Japan are still not interested.

Shima Seiki

There is a need for new textile manufacturing hubs in Scotland as there is a demand for small production run by young design companies not yet fully established but looking for a foothold in the market and want to ensure Made in the UK is part of their brand story. Larger manufacturers are often unable to take on new orders due to small run production not being financially viable. Shima Seiki is one of the leading global brands in industrial electronic knitting machines.

Shima Seiki has developed a digital knitting machine that can knit a garment in full using a single yarn without creating any waste - Wholegarment© Technology. This technology celebrated its 20th year in 2015 and they recorded that they had sold 100,000 machines in that time. This technology is an excellent solution to the challenge of up to 20% waste per garment in cut and sew technology. Traditional manufacturers in Scotland are wary of this technology as it is perceived to require less staff and there is a challenge that it has the potential to threaten traditional manufacturing jobs. However, it could work well in startup companies with few staff overheads or with established companies that want to provide a different production service.



Top to bottom: Shima Seiki Wholegarment machine MACH2X 15L, Total Garment System Whole Garment© system, Wholegarment© socks, Wholegarment© hat

つながるプロジェクト

- POWER OF FASHION -

お客さまの大切な服や靴をお預かりし、リユースしていくことで、人と人、想いをつなぎながら、社会の課題を解決してゆきます。

みんなを笑顔にするリユースサイクル



“We believe that the concept of fashion does not only refer to clothing but also encompasses a comprehensive set of values that form our overall lifestyle culture including such aspects as food, housing and services.”¹¹

¹¹ <http://www.japanfashion.or.jp/english/>

マルイのリユースマーケットで販売
2013年度は6万点を販売。次に使っていただけのお客さまへとつなぎました。

東北の復興商店街で販売
宮城県女川町・南三陸町の衣料品店で販売。ファッションのお買い物を楽しんでいただいています。

途上国へ寄贈
認定NPO法人日本救援衣料センターを通じて途上国への寄贈を行っています。

CO₂の排出削減に貢献
2010年からの4年間でリユースした360万点は、ブナ5000本の植林に相当するCO₂削減効果があります。

Research Question 2

What retail trends are happening in Japan that contribute towards a circular economy?

Scotland/UK Context

There is an estimated £30 billion of unworn clothing in the UK wardrobe. Zero Waste Scotland is exploring new business models to support a circular economy, including ways to access clothing. Traditional dress hire, such as kilts and special occasion wear, is a common service in Scotland. It would be beneficial to develop this system for other modes of attire.

Street Fashion

"...the background of each age and society, the people's interests, way of thinking and feeling, their tastes, dressing well, this is "street fashion".¹²

Japan imports \$100billion of textiles annually, including clothing and vintage salvage from the USA and Europe. It excels at presentation and detail in everything fashion-related - whether they are presenting couture or vintage. Street fashion originates from the UK and is associated with youth culture originating alongside popular music movements beginning with Rock n' Roll 'Teddy Boys' in the 1950's being considered the first street style to Punk, Goths, New Romantics and Mods. The Tokyo area of Harajuku has been the centre of Japan street style fashion since the 1980s. It is most famous for the 'Harajuku Girls' a teen street fashion originating from the Hello Kitty brand of 'cuteness' and innocence. It is considered to be heavily influenced by UK literature, street style and fashion movements, such as Punk and Glam Rock and associated with fashion designers such as Alexander McQueen and Vivienne Westwood.

'Eco Village' – Harajuku, Tokyo

The latest trend is 'eco fashion' which manifests as vintage retail and 'used fashion' stores. Japan, unlike the UK, does not have a culture of charity retail. Retailers selling mainly apparel and goods - technically called 'salvage' from the USA - are presented as another retail choice selling high value well-laundersed garments and products rather than a cheaper apparel alternative. The main difference from the UK is in merchandising and store designs.



Top: Harajuku Girls, Harajuku, Tokyo.
Above: Entrance to the main Harajuku fashion area

¹² The definition of 'Street Style'
<http://www.style-arena.jp/en/aboutus/>



Pass the Baton - Vintage

Pass the Baton is a retail store which is a fusion of vintage and retro clothing, accessories and vintage object d'art as well as new designer products made from discarded materials. They use the term 'New Cycle' in the promotion of the stores which has a positive descriptive message around the renewal of discarded items.



Top: Exterior of Pass The Baton
Above: Interior of Pass The Baton



Merchandise on display in the D&Design shop



Comme Des Garçon and D&Design

The Japanese couture label Comme Des Garçon set up a store in partnership with D&Design Project in 2013 in the Omotesando area of Tokyo which is the wider area around Harajuku. D&Design Project has various stores throughout Japan, the purpose of which is to promote design that is sustainable or made of long lasting reclaimed or sustainable materials. Their collaboration with Comme Des Garçon include quality household utilitarian items that they consider to be well- designed household staples made to last. Comme Des Garçon is a Japanese couture label founded by Rei Kawakuba in the 1970's. Ms Kawakuba has always retained a strong commitment to using her fashion collections to highlight global challenges and encourage the fashion industry to consider the relevance of fashion in society. The store in Omotesando is designed in terms of price and products to appeal to the MUJI consumer. It is therefore a design-led concept that could be replicated by charities in the UK selling furniture and used products through training in-store design and merchandising skills.

Fashion Rental

Licie - Fashion Rental (www.licie.jp) is a leasing system that operates as a membership scheme where a customer could trial renting one item for an introductory price of ¥4500 (£3.50 approx.) or enter into a monthly agreement of ¥2500 (£15 per month approx.) to rent up to five garments per month. Members have access up to 1,000 pieces of clothing, shoes, accessories and bags, all of which can be freely borrowed for up to a week.

Dress Code is a rental boutique for the luxury end of the market offering premium couture that offers a monthly membership service (¥30,000 per month) (£120 per month). One-off customers are also able to access one piece starting at ¥15,000 (£60) for a dress and matching accessories. Both stores are set up as boutiques and the presentation of the clothing ensures it is difficult to differentiate between a traditional retail store and a rental store.

BASIC PLAN	TRIAL PLAN
	
2点	1点
¥5,500	¥500
/month	/month
レンタル期限 14至15日間	レンタル期限 1至2日間

Rental costs at Lucie



Shop selling vintage clothing by the kilo in Harajuku



Interior of Licie Fashion Rental Store



“The kimono has long since been considered a zero fabric waste garment due to its construction methods. Traditionally constructed from woven silk strips, a traditional kimono uses 12-13 metres of fabric with an overall outfit using up to 21 metres.”

Research Question 3

80% of a product's environmental impact can be determined at the design stage¹³. What can we learn from Japanese traditional design methods?

Scotland/UK Context

Circular economy solutions benefit from reflection and analysis of traditional making where in periods of austerity such as during the two world wars materials needed to be kept in circulation out of necessity. Even items such as parcel string from parcels received was kept after use however small for reuse. Garments such as kilts and kimono, design, material and construction characteristics have been enduring for centuries – why is this and what solutions can it offer a circular economy?

Kimono

The kimono has long since been considered a zero fabric waste garment due to its construction methods. Traditionally constructed from woven silk strips, a traditional kimono uses 12-13 metres of fabric with an overall outfit using up to 21 metres. Every day 253 tonnes of textiles are landfilled in Hong Kong from the production of apparel mainly for the fashion market. It is essential that designers and pattern technicians develop pattern cutting systems that reduce waste and identify technologies that enable 'closed loop' systems that keep materials in use for longer.

Pattern cutting methods traditionally place garment shapes on top of material and cut into it creating excess. When this happens in mass production, it is currently more cost effective to landfill the excess material than to capture it and reprocess it. The pattern cutting and construction of traditional Japanese kimono is considered a zero waste pattern design. From a heritage and design perspective, I wanted to explore if this was true and what we can learn from kimono construction to support the reduction of waste in the global apparel industry.

In Kyoto, I visited two key tourist areas, the Bamboo Forest and the Old Town of Kyoto where there is a current trend for young Japanese people to hire traditional dress and wear it at the weekend. I also observed that, on the second Sunday of the month in Tokyo, kimono club members wear their traditional kimonos as a cultural social activity. These activities have meant an increase in companies offering kimono hire for both men and women. In Scotland, there is a strong tradition of kilt hire and the Scottish



Far left: Lynn with girls in rented kimonos visiting the Bamboo Forest, Kyoto on a Sunday. A popular Sunday past-time with you people. Above: Bamboo Forest, Kyoto. Left: Young women visiting Bamboo Forest, Kyoto with rented kimonos

Tartan Authority is an organisation that champions the wearing of traditional Scottish dress throughout the world. It is currently developing a plan to build a national tartan centre, the purpose of which will be to celebrate and educate people about tartan and traditional dress. This parallel of commitment to preserve the wearing of traditional dress from both Japan and Scotland highlights similarities in cultures in terms of the importance of preserving and maintaining traditional aesthetics.

¹³ <https://www.ellenmacarthurfoundation.org>



Vocational Training – Tokyo Fashion Institute

Tokyo Fashion Institute was established in 1913 and is Tokyo's oldest technical garment college. It was founded by the Matsuyo Department store¹⁴. Matsuyo has a full kimono department which sells a vast range of kimonos for different occasions. Every year in February, a fashion show is held in the Matsuya Department Store of the graduating students' work.

There are three courses which last one, two or three years. 70% of the students are currently Japanese. Other students come from neighbouring countries to study other courses in the college, such as art, design and fashion. The purpose of my visit was to observe a typical day of teaching technical kimono skills and discuss with the lecturers whether the kimono is truly zero waste design and construction. Throughout the day, I observed the teaching process and discussed with teaching staff and students the merits of the kimono in terms of zero waste design. Mrs Sakuma, the course tutor, pointed out a pattern for a kimono on the teaching board and confirmed that there is less than 2% waste.

The students began with a sewing test - 30 lines in 15 minutes. Mrs Sakuma accompanied the test with the music of Jacques Offenbach's Infernal Galop better known as the music of the French dance the can-can. The courses are accredited by the Japan Chamber of Commerce. Sewing by hand well and quickly is still considered the most important skill in kimono construction. This is particularly related to the kimono and very important in the construction; therefore, the students are regularly tested on the speed and quality. A first grade exam will last 5 hours and 45 minutes; a 2nd grade 6 hours and 30 minutes. They have to make an 'awase'¹⁵ for their exam. In the exam situation, it is half made and so they have to finish it. A professional kimono tailor needs to be able to sew quickly to handle as many commissions as possible, efficiently and beautifully.



Above: Students preparing for an exam.

Left: Wedding kimono for sale, Matsuyo Department Store. Below: Ladies shopping in the Matsuyo Department Store, Kimono Department



The students were using a cotton wool 'mawatu' (silk/cotton wool). Currently, wool is more expensive for making kimonos than silk because less and less places are producing it in Japan. During my observations, the students were making a Haori (a traditional Japanese hip or thigh-length jacket) and a kimono. The students work with 21 metres of fabric. A Kimono uses 11.4 metres - 12 metres, sometimes 13 metres (for both men and women).

¹⁴ <http://www.matsuya.com>

¹⁵ Awase – lined kimono traditionally worn from October to May



Student Lecture

Part of my visit involved giving a presentation about the work of Zero Waste Scotland and our involvement in the UK's Sustainable Clothing Action Plan to all of the students in the college. One of the similarities I observed was the lack of awareness by both students from Japan and Scotland in terms of the environmental impact of the fashion industry.

The Director Mr Tashiro Takeshi explained that there is a rapid decline in the amount of students interested in learning kimono. This is another parallel with Scotland and the wider UK where it is difficult to find potential technical students and experienced garment construction specialists.

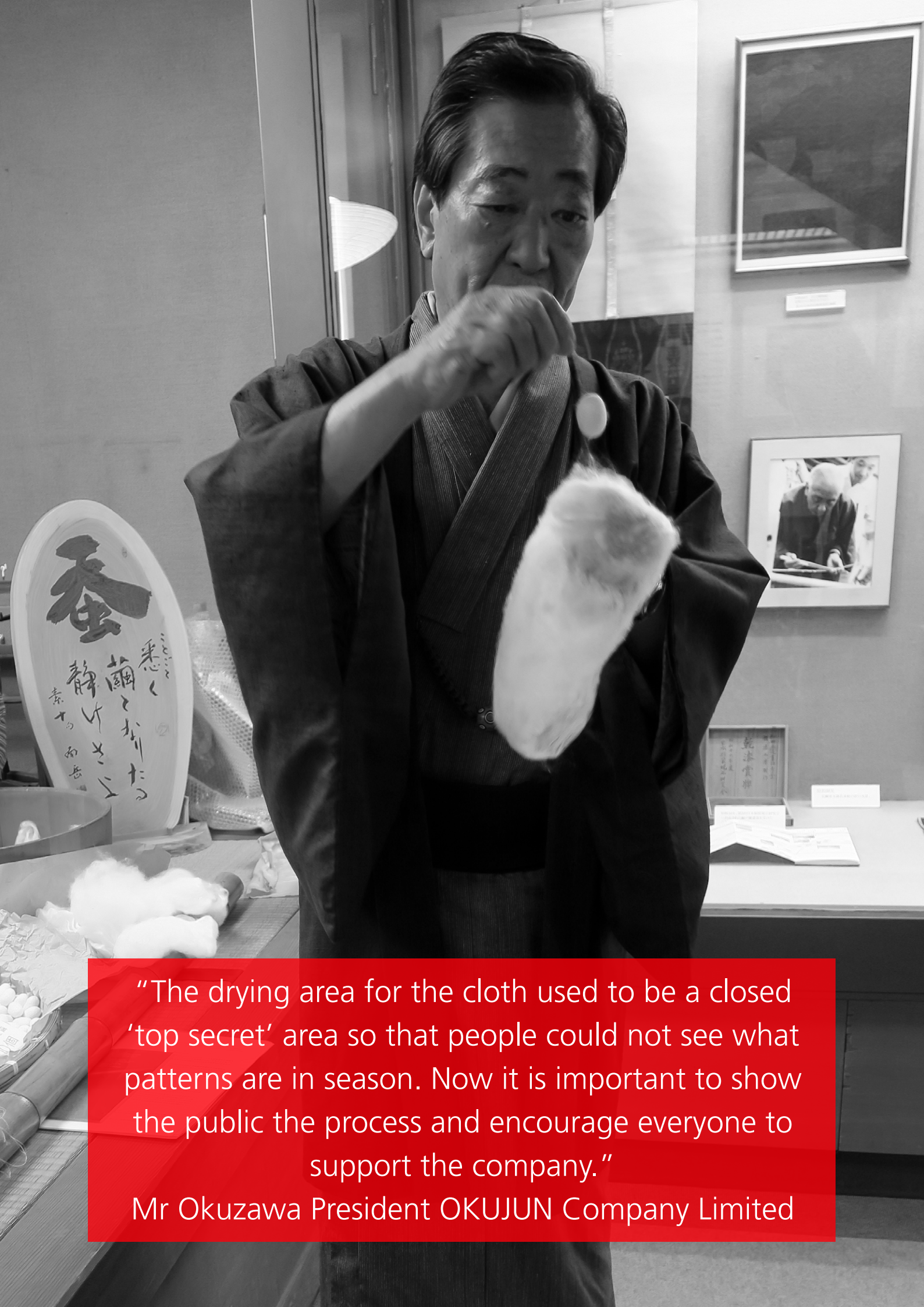
Students and lecturers attending lecture by Lynn Wilson at Tokyo Fashion Institute

Findings

- Kimono is a zero waste pattern design with qualities that are applicable in all seasons
- Opportunity for fashion designers and technical pattern cutters to develop zero waste pattern designs applicable to industry
- Provide training to explore how new principles of zero waste pattern design can be built into curriculum in Scotland
- Promote the kimono and its value through an exhibition in Scotland

Geisha models in the old town, Kyoto





“The drying area for the cloth used to be a closed ‘top secret’ area so that people could not see what patterns are in season. Now it is important to show the public the process and encourage everyone to support the company.”

Mr Okuzawa President OKUJUN Company Limited

Research Question 4

How can traditional and industrial manufacturing models contribute to a circular economy?

Scotland/UK Context

Made in Scotland/Made in the UK traditionally represents quality design and sustainable and ethical manufacturing and production but, whilst Made in Scotland/UK is still a very important globally recognised label, companies need to have environmental systems in place to demonstrate lifecycle analysis and due diligence in the supply chain to back up the quality of manufacturing that 'Made in...' still means. Quality manufacturing should also mean enduring products that require less consumption but still contribute to the economy.

Traditional Manufacturing

OKUJUN Company Limited

The Japanese fabric Yuuki-Tsumugi is a woven length of silk cloth which is the preferred fabric of choice for the finest kimono producers. Kimonos have been made from this cloth for 2,000 years in Japan. Making the clothing requires more than 40 procedures, each needing the handiwork of a skilled craftsman. These skills have been passed down through the years and, in 2010, the Yuki- Tsumugi production technique was inscribed on UNESCO'S Representative List of the Intangible Cultural Heritage of Humanity.

A day trip to OKUJUN Company Limited was organised by JETRO Japan in cooperation with Mr Takeji Okuzawa, President, and Mr Sotaro Nishikawa, Chief Director, JETRO Ibaraki.

OKUJUN is the textile brand of Okujun Co. Ltd. OKUJUN offers supreme comfort when worn and has a beautiful luster, exceptional lightness and rich texture. OKUJUN is made up of two collections: SUPREME YUKI SILK, a fabric of highest quality that is produced by a method descended from the traditional technique inscribed in UNESCO'S Representative List of the Intangible Cultural Heritage of Humanity, and YUKI SILK, a new fabric that preserves the fine texture but is made by using a more efficient production process.¹⁶

Silk – Production and Spinning

The spinning of the silk is done by the studio of Mr Akiro Sudo, owner of the weaving studio. Mr Sudo was decorated by the current Emperor for his services to textile tradition. His son is the 4th generation and



Above: Mr Yutaka Kurosawa, Production Manager, Mr Okuzawa, President, Okujun, Lynn Wilson and Mr Sotaro Nishikawa, Chief Director, Jetro Ibarara. Visit to OKUJUN
Below: Mr Takezawa with dye bucket



¹⁶ <http://www.okujun.co.jp/english/>

does not want to continue the business and succeed his father when he retires.

The cloth is dyed at 40 degrees using chemical dyes. It is a hand wash process to remove the starch. The amount of starch varies with the season, depending on the amount of time and humidity. The experienced person can tell the right amount to use purely by touching it. This is the only place that this process can be completed. There are only two Yuki – Tsumugi cloths from the local area. The current head dyer, Mr Takezawa, studied Business Management at university and then decided on a complete career change - considered unusual to choose a career in a manual skill rather than in commerce.

The drying area for the cloth used to be a closed, 'top secret' area so that people could not see what patterns were in season. Now it is important to show the public the process and encourage everyone to support the company.

Similar to Scotland, less people are interested in learning the skills involved in the textile process and the average age of a worker was 45 – 80. As in Scotland, there is a challenge with succession planning and Okujun are overcoming this by out-sourcing and training new workers in Laos where there is a history of silk weaving. They also recognise, like Harris Tweed, the importance of diversifying the brand and attracting the international premium fashion market - Louis Vuitton commissioned cloth for suiting for menswear in 2012.

Traceability and Provenance

Japan remains the world's second largest consumer of luxury goods. The Harris Tweed Authority and other Scottish companies supplying the Japanese market have commented that when Japanese retail buyers come to Scotland they expect to see the actual sheep or at least the flock that the wool has come from. This is currently not possible and is key to developing business with traditional customers such as Japan and emerging markets such as China and the Far East. Therefore, traceability in the supply chain and the provenance of a Made in Scotland/UK is key to business sustainability.

The Scottish company Mackintosh Limited, founded in 1822 by Charles Macintosh, still produces its handmade coats in Cumbernauld. Japanese company Yagi Tsucho now own Mackintosh and have moved away from their traditional functional market to focus on the premium fashion market, collaborating with Japanese fashion houses such as Comme Des Garçon.



Example of a label from a garment by the Scottish company Mackintosh found in Isetan, one of Japan's premium department stores.

Handmade coats are still traditionally manufactured in Cumbernauld, near Glasgow but there was evidence of misguided labelling on a Mackintosh sweater for sale in Isetan which demonstrates the complexity of international brand provenance.

Scotland symbolises a mark of quality in Japan with significant luxury textile history but the UK flag is easier to recognise than the St Andrew's flag of Scotland. However, Cumbernauld, Glasgow gives more provenance to Scotland. The small tag says 'Made in China'. Traceability in the supply chain adds value to a brand and offers customers assurance regarding the provenance, durability and longevity of apparel which helps keep it in circulation for longer. Leading fashion companies, such as the Kering group who own brands including Gucci, Alexander McQueen and Stella McCartney, have made traceability in the supply chain a priority and have created their own tool called an EP&L (Environmental Profit and Loss) tool which they want to share with their suppliers and the wider fashion industry. There is a Japan Government commitment across manufacturing to promote Made in Japan, promoting onshore manufacturing across all industries including cottage style industries in the textile and apparel sector. The annual Tokyo Fashion Expo (1st - 3rd October) had a dedicated stand to new designer/manufacturers similar to the support Scottish Enterprise or Scottish Development International would offer. The annual Tokyo Fashion Expo had a Made in Japan showcase stand for young designers and artisan cooperatives. Tokyo Design Week (24th – 31st October) is held every year and has some of the country's leading design companies and universities represented. Traditional manufacturing had a good presence throughout the regional group shows.

Industrial Manufacturing

Sustainable Apparel Coalition Global Meeting - Solution Forum, Osaka

Zero Waste Scotland supported attendance at the Sustainable Apparel Coalition Global Meeting and saw an opportunity to engage with the global apparel retail and manufacturing industry to:

- network with senior industry representatives at an evening reception
- listen to other presentations from speakers at the Solutions Forum
- Present information about Zero Waste Scotland at our own information stand in the main registration and networking hall
- Present a workshop about Zero Waste Scotland

Global brands, such as Nike, were early investors in tools to trace and demonstrate the environmental impact of their production. Nike has developed an environmental assessment tool called the Higg Index which has been gifted to the Sustainable Apparel Coalition to be used by the global industry. The Sustainable Apparel Coalition is an international non-governmental organisation. Forty nine of the global leading apparel brands are members and they meet annually in different key member countries. I was able to gather a wider global perspective by attending the Sustainable Apparel Coalition's global meeting in Osaka representing Zero Waste Scotland as a participant sponsor. This involved hosting a workshop at the Solutions Forum attended by representatives from brands, such as Adidas, Patagonia and New Balance. It was also valuable to engage with trade and industry representatives from the UK and Japan and share knowledge and understanding about circular economy principles.

The Solutions Forum was a series of presentations from global companies with new solutions for sustainable textiles and the supply chain. This was an excellent opportunity to learn and network with global companies.



Sustainable Apparel Coalition

I attended the following sessions by other Solution Forum participants:

Kevin C. McMullan

TORAY INDUSTRY

Your Smart Choice, TORAY'S Plant Based Polyester Toray Industries – Innovation by Chemistry

This presentation introduced Toray's Plant Based Polyester - Ecodear™ is a biomass based polymer certified by the Japan Environmental Association (JEA) made from recycled ECODEARTM is based on polylactic acid (PLA) derived from plants, rather than petroleum and other fossil resources. This means that it can readily be returned to the natural environment after use. ECODEARTM is an environment-friendly product that helps to conserve fossil resources and reduce carbon dioxide emissions. It also has people-friendly characteristics, including mild acidity. This material is perfectly suited to the century of www.toray.com

Shingo Hayashi

iCare Benefits

Drive Productivity through Employee Satisfaction: For Free iCARE Benefits is an employee benefits package that targets workers earning between 100-300 US dollars per month. It enables employees within the largest footwear and apparel production companies that have worked for one year or more to have access to essential home products, such as mattresses and cell phones. The scheme works through a 0% interest loan scheme paid over 6 months. Factories need to join the scheme to enable their employees' access to it but registration is free for employees.

Reet Aus

MARKO KIISA

UPMADE certificate: preventing waste in mass production Aus Design (Estonia)

Estonian designer and researcher Reet Aus (PhD) has developed an up-cycling method suitable for large-scale production. The UPMADE certification programme strives for a smaller environmental footprint and maximised resource efficiency in the textile industry through up-cycling production waste.

The certification programme has been developed in partnership with the Stockholm Environmental Institute Tallin centre.

¹⁷ Fashion industry accreditation organisation developed from the Cradle to Cradle Institute (Braumgardt and McDonough) in San Francisco.

I delivered a workshop in the afternoon session which included a presentation about the Zero Waste Scotland Circular Economy Programme attended by senior sustainability managers from various global companies, such as Patagonia, Nike and Adidas. Annika Washburn, Product Quality Engineer from Patagonia discussed the success of their Worn Wear programme which tours America helping people learn how to repair their oldest and most loved Patagonia items (<http://www.patagonia.com/us/worn-wear>). Patagonia is considered a pioneering apparel brand in helping consumers keep clothing in use for longer.

Zero Waste Scotland also had an information stand which presented Love Your Clothes material and a copy of the Zero Waste Plan as well as examples from Scottish companies Catherine Aitken and Eribe Knitwear.

Following on from the workshop, I was invited to join a breakfast meeting of the Circular Innovations Working Group by Claire Bergkamp, Sustainability Manager at Stella McCartney. I met Annie Gullinsrud from Fashion Positive¹⁷ (this meeting resulted in an invitation for me to represent Zero Waste Scotland as part of the Apparel Circular Innovations Working Group which is administered by Fashion Positive and has representatives from the global industry and funding initiatives, such as the Closed Loop Fund <http://www.closedloopfund.com/apply-for-funding> which is a \$100million funding for 'closed loop' solutions in the US, funded by companies such as Walmart, Coca-Cola and Unilever.

Goals of Working Group

- 1 Collaborate, identify and pilot circular innovation projects starting in 2016 that focus on the chemical processing of fibres into virgin-quality fibres for use in apparel or other products (which have next-generation use capabilities):
 - Goal 2016: 100% composition fiber input
 - Goal 2017+: Blended fibers input
- 2 Identify a number of Innovative Fibre Recycler companies to receive investment starting in 2016.

Actions

- Follow on meeting with Annie Gullinsrud and introductory meeting with Roy Vercoulon, Vice President, Head of European Operations, Fashion Positive in Tokyo on 19th October.

- Invitation to meet with Toray Industries, potential Skype meeting or factory tour for return visit to Japan
- Joined the Circular Innovations Working Group and attended one meeting via Skype on 18th December and two more scheduled 14th January and 19th January. These meetings focus on the distribution of funding for international companies in the UK and Europe who are trialing solutions to fibre processing.

Japanese obi, lady shopping in Tokyo



Conclusion

A truly circular economy model enables materials and products to be kept in circulation for longer and have endless lives. However, it is important not to dismiss systems that are not truly circular but offer a temporary solution. I found a lot of evidence of this but very limited evidence of truly circular solutions. Japan remains at the forefront of developing technologies, leading trends and embracing new concepts. It is able and needs to do this because of the critical mass of consumers that continue to embrace fashion as Japan remains the 5th richest global economy.

Technology

Teijin Eco Circle® was the main evidence of circular technology but, as the chemical engineers of the process, they need companies to buy into the technology to make a system of apparel manufacturing and collection systems work in order to achieve the feedstock for a circular process. JEPLAN, Bioethanol processing is not a truly circular process but is another temporary solution to low grade fibre processing that captures the value of materials and gives them another life, avoiding landfill. However, as a fuel it is non recoverable; therefore is not 'closed loop'. Onward Kashiyama, whilst having a worthy and important solution to the processing of fibres that are currently being landfilled, is also non circular as the blankets are non-recoverable but again an important system for diverting materials from landfill and repurposing. Shima Seiki Wholegarment® technology remains a zero waste solution that could be part of a circular model if applied to the manufacturing of mass produced products aligned to a returns system such as surgical gloves using a Teijin Eco Circle® processing solution.

Retail

MUJI provide consumer collection systems and have explored multiple solutions to repurposing apparel that ranged from reselling up-cycled, over-dyed garments giving them a second life to partnering the FUKU-FUKU project. Onward Kashiyama collection system and processing into blankets for the Red Cross is a good recycling and Corporate Social Responsibility solution. However, fashion cycles require a turnover of style in line with fashion trends and so a truly circular model would require reprocessing and production systems that enable this to happen. The MUJI model could be replicated by members of the Sustainable Clothing Action Plan through engagement and learning from the MUJI model. Fashion leasing models aid a circular economy by reducing consumption and keeping goods in circulation for longer. Trial pop-up leasing model

shops in Scotland could be a good opportunity for young designers.

Manufacturing

Traceability in the supply chain and storytelling is key to the provenance of products and should be seen by manufacturers in Scotland and the UK as a way of strengthening and securing the 'Made in...' label which is so important; globally respected and sought after.

Good design is key to a circular economy but relies on efficient, circular production systems. Traditional design and production techniques use quality materials, craftsmanship and functional design to ensure products remain in circulation for longer. Traditional apparel that endures such as the kimono do so because of the functionality of design, material choice and meticulous attention to detail. The construction of the kimono is also suitable for disassembly which offers possibilities for modular design and circular systems of disassembly and material repurposing or processing. Future work will involve developing practical skills based relationships between Japan and the UK in the field of zero waste pattern design and manufacturing models.

Recommendations based on the key research questions

1. What technologies has Japan developed to support post-consumer and post-industrial textile processing and enabled 'closed loop' systems?

Based on the companies that I visited, Teijin and JEPLAN have made excellent chemical and technology advances but more research is needed in public procurement to explore 'closed loop' systems where textiles are currently disposed and incinerated (e.g. NHS disposable gowns). School uniforms are widely supplied to the UK that are made from PET but there are no collection systems available to enable the return of used/worn garments to a recycler/collection depot where they can be returned and reprocessed. Teijin Eco-Circle® could work well for public procurement or with large supermarket or retail chains that supply school uniforms.

The JEPLAN technology producing bioethanol from cotton is not a pure closed loop technology but it could be one of a range of solutions to diverting textiles from landfill.

Steps for taking this forward will include:

discussing global trends and technologies in medical equipment and material recycling with Zero Waste Scotland colleagues working with NHS procurement and wider public procurement departments;

presenting the case studies within presentations and lectures given to industry and academic audiences;

2. What retail trends are happening in Japan that contribute towards a circular economy?

Onward Kashiyama has made excellent progress developing systems of collecting post-consumer clothing and reprocessing it into blankets in partnership with the Red Cross Japan. MUJI has developed consumer return schemes where clothing is then re-dyed in indigo and presented in stores as a limited collection. The Scottish/UK Government in partnership with large retailers and consumer retail organisations need to invest in consumer trials and collection schemes in partnership with waste management companies that can reprocess end of life and post-industrial textiles. Large retailers recommend that in order for closed loop systems to work they need to participate in trials at a scale that is workable for the industry. The Scottish/UK Government need to identify what that scale is and announce national/UK competitions that invite recyclers/processors/ entrepreneurs to develop onshore technologies.

I will support this through:

- sharing my Japan research and relevant report sections with the Textile Recycling Association;
- presenting at the Textile Recycling Association Annual General Meeting, April 2016;
- helping shape Zero Waste Scotland funding calls;
- sharing my report with the WRAP administered, industry led Sustainable Clothing Action Plan;
- introducing JEPLAN to various companies and academic researchers both in the UK and

internationally including Fashion Positive, the sustainable fashion initiative of the Cradle to Cradle Institute, San Francisco

The Harajuku area of Tokyo where there were clusters of retail shops under the brand of sustainable fashion was a great example of making used clothing fashionable and integrating rental and fashion leasing businesses into mainstream retail districts.

Fashion pop-up shop pilots that offer alternative retail models such as rental and leasing of clothing needs to be explored further in the UK. Consumer awareness of how clothing is manufactured and the environmental impact of clothing needs to be discussed with consumers with a particular emphasis on millennial shoppers. Further, and significant improvement in this area over the last few years through the campaigning of Mary Portas, there is still a long way to go to ensure our high street charity shops have a strong attractive retail presence. Significant levels of fashion merchandising training is needed for nonprofit organisations/businesses in Scotland/UK selling used clothing

To support this approach I will:

share information and ideas with the Revolve staff in the third sector certification team within Zero Waste Scotland;

present my report to the Scottish Skills Partnership (Textiles) to help them explore ways of developing education packs for schools;

Include examples of fashion leasing and rental models in lectures and presentations

3. 80% of a product's environmental impact can be determined at the design stage. What can we learn from Japanese traditional design methods?

Through observing the pedagogy of kimono design and construction at the Tokyo Fashion Institute, I learned that the kimono is a true zero waste design. At Shima Seiki in Wakayama I observed the latest Whole Garment knitting technology which is truly zero waste production process. This technology could be used to manufacture garments that could be easily deconstructed and reprocessed or yarn re-made to complete a closed loop process, thereby ensuring zero waste. The benefits of zero waste manufacturing technology need to be presented to the Scottish/UK Textile sector and will work best in new emerging manufacturing hubs where young companies are more likely to be open to new manufacturing models. In order to promote and influence the development of technology and raise awareness of the change needed I will:

disseminate my report to the Scottish Textiles Industry Leadership Group, Scottish Manufacturing Advisory Service and Scottish Enterprise;

participate in seminar discussions and debates with the fashion industry during Edinburgh International Fashion Festival 2016;

deliver various lectures to students, researchers and staff throughout the UK from February 2016 onwards sharing the knowledge and insight I have gathered in Japan and the published evidence from UK agencies such as WRAP and Zero Waste Scotland;

publish articles in relevant textile journals in the UK and Japan;

identify further funding and opportunities to develop zero waste garment construction workshops with Tokyo Fashion Institute and other institutes in Scotland and the UK;

deliver a public lecture at the Scottish National Gallery during October 2016 to introduce a wide audience of designers, consumers, artists and researchers to the importance and influence of the kimono as a zero waste garment

4. How can traditional and industrial manufacturing models contribute to a circular economy?

The Japanese Government's commitment to promoting manufacturing in Japan through a concentrated Made in Japan campaign and the provenance and sustainability of traditional industries such as Okujun,

Yuki -Tsumugi silk weaving is parallel to the UK's current Made in the UK promotional activities to encourage re-shoring of manufacturing and the popularity of enduring traditional Scottish 'craft' manufacturing such as Harris Tweed. However, without quality standards, environmental assessment tools and transparency in the supply chain the origin of where a product is made is not enough to support sustainable manufacturing that enables closed loops. This was discussed more widely at the Sustainable Apparel Coalition global meeting in Osaka, which included contributions from some of the leading global brands, such as Patagonia, who are at the forefront of making products that last longer and are so well made that consumers look after them, make repairing a part of the culture of owning the product. These garments can then be passed on when one owner no longer requires it.

Environmental Impact assessment tools need to be introduced and used widely across micro, small to medium enterprises and large textile businesses in the UK to ensure traceability in the supply chain and to satisfy customer demand. The Scottish/UK Textile industry needs to identify an environmental impact tool to strengthen the 'Made in Scotland/UK' narrative of provenance, quality and sustainability by being able to demonstrate how this is monitored, measured and quality checked.

I will promote this through:

- facilitating a meeting with the International Wool Textile Organisation and Textiles team at Scottish Enterprise to talk about the importance of life cycle analysis tools and how wool is measured in terms of environmental impact;
- participating in a meeting with the Sustainable Fibre Alliance and Head of Textiles, Scottish Enterprise, January 2016 to discuss sustainable cashmere production
- facilitating a Textile industry workshop delivered by Zero Waste Scotland, Sustainable Clothing Action Plan funded work in partnership with the Scottish Textile and Leather Association, Stirling, April 2016
- chairing a seminar at the Edinburgh Centre for Carbon Innovation led by Claire Bergkamp, Head of Sustainability at Stella McCartney to introduce Scottish textile and fashion industry professionals to environmental impact assessment tools used by the global fashion and apparel industry such as the Higg Index and the Kering Environmental Profit and Loss tool (EP&L), July 2016.

Appendices

1. List of contacts, companies and places visited
2. Outputs and Outcomes from the Fellowship
3. Press Release from JEPLAN
4. Kimono Diagram
5. Okujun Weaving Process
6. Shinjuku Sanitation Department – Public Information
7. Onward Green Campaign
8. Contacts, Resources and Further Reading

Diary of Events

Date	Organisation	Activity
02/10	Tokyo Fashion	
03/10	Shinjuku Waste Department	Attended a local community workshop for repair and recycling
05/10	British Embassy	
07/10	Shima Seiki	Report included
09/10	Visit to Teijin	Report included
12/10	SAC – Evening Reception	Report included
13/10	SAC – Solutions Forum	Report included
14/10	SAC – morning forum	Report included
15/10	OKUJUN	Report included
16/10	Onward Kashiwama	Report included
16/10	SDI	Presentation to the team in the Tokyo office about Zero Waste Scotland and circular economy priorities.
17/10	JEPLAN	Report included
18/10		
20/10	Fashion Positive	Report included
21/10	Retail research - Tokyo	Dakanyaima is a developing area of Tokyo where there is a surge of vintage and designer stores
22/10	Retail research - Tokyo	Harajuku is the centre of Tokyo Street Style and is comparative to Carnaby Street in London. It has an international influence since the 1970's
23/10	BCCJ	Met with Lori Henderson, CEO - Invited to nominate Shima Seiki for the BCCJ Awards 2015
24/10		
25/10	Kyoto – Heritage Research	Visited the Bamboo Forest in Kyoto and observed the modern tradition of hiring kimono as a weekend cultural activity.
26/10	Tokyo Fashion Institute	Report included
27/10	Bunka College of Fashion	Lecture to post graduate students and a group of visiting students from Nottingham Trent University awarded Paul Smith scholarships.
28/10	Tokyo Design Week	Held every year as a Japan trade show and exhibition of all things new and developing in product design in Japan and the region.
29/10	MUJI	Report in main document

Date	Organisation	Activity
29/10	Deloittes – Sustainability Team.	<p>This meeting was a sharing of information and Deloittes had prepared a list of questions that they wanted to focus on:</p> <ol style="list-style-type: none"> <li data-bbox="683 495 1444 551">1 Why is the Scottish Government collaborating with the apparel industry for environmental activities <li data-bbox="683 577 1444 633">2 What is the concept of Zero Waste Scotland and how do you engage with commercial companies and their supply chain? <li data-bbox="683 660 1444 716">3 What is the Love Your Clothes Campaign (www.loveyourclothes.org.uk) <li data-bbox="683 743 1444 840">4 Can we discuss the environmental impact of the global apparel industry? We understand it has the second largest environmental impact behind the oil industry <li data-bbox="683 866 1444 987">5 What is the mechanism for the Sustainable Clothing Action Plan? What about the financial resource – how is it funded? In Japan, the consciousness of consumers is very low. That is the weakest point to change our industry. <li data-bbox="683 1014 1444 1106">6 If you know some officials in the UK Government (DEFRA) in charge of SCAP, please introduce us. We're planning to visit London on 19 -21 Novemberss

Outputs and Outcomes from the Fellowship

Date **Event/Media**

Three months after Fellowship

01/12/15 Interview as part of STV interview about Christmas jumpers and waste

07/12/15 Joined the Fashion Positive Circular Innovation Working Group meeting

18/12/15 Internal presentation, Zero Waste Scotland, Circular Economy Team

25/01/16 Following on from meeting Beverley Henry, Chair of the International Wool Trading Organisation (IWTO) at the Sustainable Apparel Coalition visited Scotland in January. We had a meeting with Scottish Enterprise Textiles Project Manager and the Chief Executive Officer of the Scottish Textile and Leather Association and discussed the importance of traceability in the supply chain in terms of wool production.

07/02/16 Lecture to 3rd and 4th year Fashion students at Glasgow Caledonian University
Heriot Watt University

Six months after Fellowship

Further activity/funding applied for to develop kimono workshops in Japan

One year on from Fellowship and beyond

25/10/2016 Art of Kimono – Past, Present and Future
Evening Lecture – Friends of the Scottish National Galleries, Hawthornden Lecture Theatre

07/02/2017 Kimono – The Ultimate Zero Waste Garment Design, Costume Society, Edinburgh

JEPLAN Press Release

26th. August. 2015

“Back to the Future” 30th Anniversary “FUKU-FUKU Project x Back to the Future GO De Lorean

Driving Project” JEPLAN, INC. make Time machine De Lorean runs with the bioethanol fuel made from your waste(old clothes)!

In order to commemorate the 30th year of birth of car that run on fuel produced from recycled garbage, JEPLAN, INC. (Location: Chiyoda City, Tokyo Kasumigaseki under the Chief Executive Officer: I WAMOTO Michihiko, JEPLAN, INC.) along with the NBC Universal Entertainment Japan LLC (Location: Tokyo, Minato-ku, Atago under the Managing Director / Chief Executive Officer and President: Takagi gym) “FUKU-FUKU x BTTF GO! De Lorean driving project” will be carried out.

This project is based on stage of movie “Back to the Future part 2” and corresponds to the Memorial Day October 21, 2015 when time-machine De Lorean went to the future world. The first of its kind in the world, JEPLAN's recycling technology to make the fuel from clothing that are no longer used were collected from consumers. This is an attempt to run De Lorean on waste which is similar to the concept in the movie.

Finally come! The future day of the “BTTF”, when we will try to convert the clothing that is no longer used to resources which will run the De Lorean.

Coming towards October 21, 2015, the clothes which are no longer used are collected from consumers by our project partner companies in the shopfront in September will be recycled into fuel. We will run De Lorean somewhere in Tokyo by using this recycled fuel on Memorial Day October 21, 2015.

In order to run De Lorean fuel produced from recycled technology, Japan Environmental Planning's “Technology of converting clothes into Bioethanol” will be used.

In order to make fuel to run De Lorean, JEPLAN will collect clothes under waste clothes management, textile recycling project “FUKU-FUKU” and undertake recycling of the clothes which are no longer use from 1 September

In order to run De Lorean on 21 October, collection campaign calling for the collection of clothes to be conducted all over japan. *schedule will be announced later

In addition, individuals and companies, we also recruiting supporters to take any clothing and textile product collection. Details will be described later.

JEPLAN, C.E.O. I WAMOTO, Michihiko, “the things which are of no use are turned into resources and this energy will be used to run De Lorean is the future Technology”. This system is established to make that movie scene a reality on same date October 21, 2015 as shown in the movie. In response to behaviour of consumers we also want to recycle in the future. We will continue to promote the collection and recycling project in conjunction with various companies.

Kimono Diagram

着物の寸法と割出方法について | 和裁教室・着物の販売「...」 2/6 ページ

ENGLISH

こちらもお見下さい
おまかせコーディネート
おまかせコーディネート
おまかせコーディネート

ツイート

着物の寸法と割出方法について | 和裁教室・着物の販売「...」

身長 158 cm ヒップ 86 cm バスト 83 cm

Rear

袖付 Sode tsuke
身八つ口 Miyayatsu-guchi
袖掛り Sode tsukari
後身頃 Uchiro-miigo
裾下 Tsurite shita
裾 Suro
上前 Uwa-mae
下前 Uwa-mae
前巾 Kata-huba
脇巾 Waki-huba
袖山 Katsuyama
袖口 Sode-guchi
共衿 Tomeri-eri
前袖 Mae-sode
袖丈 Sode-ate
裾下 Tsurite shita
裾 Suro
上前 Uwa-mae
下前 Uwa-mae

Front

袖口 Sode-guchi
共衿 Tomeri-eri
前袖 Mae-sode
袖丈 Sode-ate
裾下 Tsurite shita
裾 Suro
上前 Uwa-mae
下前 Uwa-mae

身長 158 cm ヒップ 86 cm バスト 83 cm

<http://iwasa-wasai.com/shakusunbun.html> 2015/10/26

着物の寸法と割出方法について | 和裁教室・着物の販売「...」 3/6 ページ

衿 Oumi
前身頃 Mae-miigo
前巾 Mae-huba
合袖巾 Aisume-huba
裾 Suro
下前 Shita-mae
上前 Uwa-mae
脇巾 Waki-huba

名称	長	幅	寸法	コート
衿	±29 (0.8cm)	±29 (0.4cm)	±29 (0.8cm)	
袖幅	±29 (0.8cm)	±29 (0.4cm)	±29 (0.8cm)	
袖丈	±29 (0.8cm)	±29 (0.4cm)	±29 (0.8cm)	
袖掛り	±29 (0.8cm)	±29 (0.4cm)	±29 (0.8cm)	
裾幅	±52 (1.8cm)	両寸		
前幅	±27 (1.78cm)	長巻の巻幅: 2.3 (11.34cm)		5.3 (18.8cm) (長巻の巻幅: 2.1, 6.2 ± 2.8cm)

身長 170 cm ヒップ 88 cm バスト 81 cm

<http://iwasa-wasai.com/shakusunbun.html> 2015/10/26

着物の寸法と割出方法について | 和裁教室・着物の販売「...」 4/6 ページ

袖口 Sode-guchi
共衿 Tomeri-eri
前袖 Mae-sode
袖丈 Sode-ate
裾下 Tsurite shita
裾 Suro
上前 Uwa-mae
下前 Uwa-mae

袖口 Sode-guchi
共衿 Tomeri-eri
前袖 Mae-sode
袖丈 Sode-ate
裾下 Tsurite shita
裾 Suro
上前 Uwa-mae
下前 Uwa-mae

<http://iwasa-wasai.com/shakusunbun.html> 2015/10/26

着物の寸法と割出方法について | 和裁教室・着物の販売「...」 5/6 ページ

袖口 Sode-guchi
共衿 Tomeri-eri
前袖 Mae-sode
袖丈 Sode-ate
裾下 Tsurite shita
裾 Suro
上前 Uwa-mae
下前 Uwa-mae

袖口 Sode-guchi
共衿 Tomeri-eri
前袖 Mae-sode
袖丈 Sode-ate
裾下 Tsurite shita
裾 Suro
上前 Uwa-mae
下前 Uwa-mae

名称	長	幅	寸法
衿	±29 (0.8cm)	±29 (0.4cm)	±29 (0.8cm)
袖幅	±29 (0.8cm)	±29 (0.4cm)	両寸
袖丈	±29 (0.8cm)	±29 (0.4cm)	±29 (0.8cm)
袖掛り	±29 (0.8cm)	±29 (0.4cm)	±29 (0.8cm)
裾幅	±52 (1.8cm)	両寸	
前幅	±27 (1.78cm)	長巻の巻幅: 2.3 (11.34cm)	

<http://iwasa-wasai.com/shakusunbun.html> 2015/10/26

Okujun Weaving Process



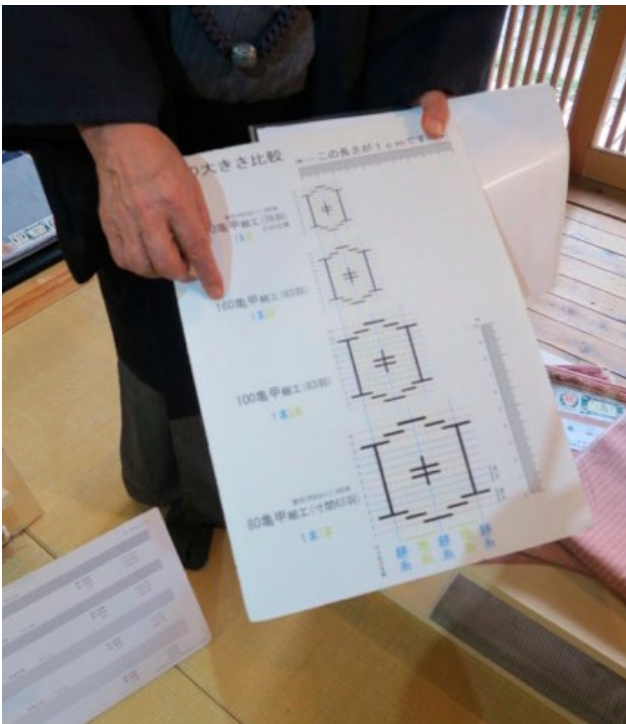
1. Silk is spun into a thread



3. The threads are knotted to resist the dye



4. The knots are then untied and the thread is ready to be attached to the loom



2. The minute ancient pattern is drawn out



5. The looms are warped for weaving



7. The white cloth is then dyed and dried in the dying area



6. One inch of cloth can take up to one week to weave



8. It is then gathered in an accordion style



9. Each obi is completely unique

Shinjuku Sanitation Department – Public Information

Shinjuku city Issued March 2019

The correct way to dispose of recyclables/waste

Please place recyclables/waste at the collection point by 8:00 am.

Recyclables old newspapers, plastic packaging containers, bottles, cans, PET bottles, spray cans, gas cartridges, batteries, etc.	Once per week	1 day	Pages 1 to 4
Combustible waste	Twice per week	1 day and 1 day	Pages 5
Metal, Ceramic, Glass Waste	Twice per month	On the 1st and 15th of each month	Pages 6

Please inquire with the waste collection office **Page 6** Items that the city will not collect **Page 9**

How to put out large waste items/group collection **Page 7**

Business recyclables/waste **Page 10**

Items collected at city facilities, etc. **Page 8** Let's build a resource recycling-oriented society together, shifting of waste **Page 11-12**

Your town's 'Recyclable/waste' collection days **Page 13-14**

Recyclables

Please take recyclables out to the **recyclable/waste collection point** on the weekly collection day.

Recyclable Paper

(Newspaper, Magazines, Books, Paper, Cardboard, Paper cartons, etc.)

Will also be collected on rainy days. Please separate by type and tie with string/twine.

Magazines/miscellaneous paper
Notebooks, boxes for items such as food, wrapping paper, envelopes, copying paper, etc. are also resources.

Newspapers/flyers
Fold flyers into four and stuff between newspapers.

Cardboard boxes
That which is from a cross-sectional view.

Paper carton
Dispose of these in collection crates provided at Shinjuku city facilities and other regional centers, or at supermarkets in Shinjuku city. *See page 8.

Items that cannot be collected:
Please dispose of as combustible waste.

Please
Recyclable paper may also be collected through group collections. Please make an effort to dispose of it through group collections. (Please follow each group's rules when disposing in group collections) *See page 7.

Plastic Containers and Wrapping

Please take recyclables out to the **recyclable/waste collection point** on the weekly collection day.

These refer to plastic items that are used to hold or wrap goods, and are not needed anymore when the products inside have been used up. They have a plastic mark. (Some items may not have the mark due to shape.)

How to Dispose
Rinse with water and dry with paper, cloth or old clothing that you don't need anymore. *It is not necessary to remove stickers such as price tags.

Containers with lids
See-through plastic bags
Put out

Bottles
Tubes
Cartons
Cups
Containers
Trays
Caps, nozzles, fasteners
Packing polystyrene, fruit netting, bubble wrap
Plastic bags/film

Items that cannot be collected:
Please dispose of as combustible waste.

Please
PET bottles are not classified as plastic containers and wrapping. *See page 4.

Recyclables

Glass Bottles, Cans, Plastic Bottles, Spray Cans,

Bottles Bottles for beverages, food, cosmetics, and medicine

Take off the caps
Rinse lightly with water
Put in a see-through plastic bags

Please put plastic caps in collection containers for plastic wrapping at the waste collection location. *See page 2.

Cans Aluminum cans and steel cans for beverage or food

Rinse lightly with water
Please completely remove all the contents of cans, especially cans for pet food.
Put in a see-through plastic bags

Items that cannot be collected:
Please dispose of these items with metal, ceramics and glass waste

Bottles
● Bottles that cannot be cleaned
● Medication (besides oral medication) bottles
● Light bulbs, fluorescent lights, etc.

Cans
● Cans that can't be cleaned out
● Cans used for purposes other than food/drink
● Large drums/kegs ● Paint cans

Please
Returnable bottles (that can be used multiple times) and aluminum cans are also collected in group collections. Please make an effort to dispose of it through group collections. (Dispose of it in accordance with the rules of your group.) *See page 7.

How to Dispose
Please dispose of at the collection point

Containers and nets (rental system) may be loaned out when they can be supervised at apartment buildings and condominiums. For more information, please contact your local Waste Collection Office or Waste Collection Center.

Please take recyclables out to the **recyclable/waste collection point** on the weekly collection day.

Gas Cartridges, Dry-Cell Batteries

PET bottles PET bottles with the mark for beverages, alcoholic, cooking rice wine, soy sauce, soy sauce-processed foods, cooking rice wine-based seasonings, vinegar, non-oiled dressing-type seasonings

Remove the caps and labels
Rinse and flatten
Put in a see-through plastic bags

Items that cannot be collected:
Please dispose of as combustible waste.
● PET bottles with oil in them
● Items with content that can't be cleaned out simply by rinsing

Items that cannot be collected:
Specialists will be referred to you
● Cassette-type gas cartridges (See page 9)

Spray cans and cassette gas cylinders
Caps and nozzles go to recycling
Please put plastic caps and nozzles in collection containers for plastic at the recyclables and waste collection location. (See page 2)

Put in a see-through plastic bags

Be sure that they are all used up

Items that cannot be collected:
● Button batteries
● Small rechargeable batteries
● For button batteries, please bring them to a store that accepts them for collection.
● For small rechargeable batteries (nickel-cadmium batteries, nickel-hydroxide batteries, lithium-ion batteries, etc.), by law the manufacturers must collect and recycle them. If the small rechargeable batteries have a recycle mark on them, take them to a store that accepts them and put them in the box marked "rechargeable batteries recycling box."

Dry-Cell Batteries Used dry-cell batteries (magnesium, alkaline, lithium)

These items are collected in the box located in local community centers and at some local supermarkets. (See page 8)

Please take combustible waste out to the **recyclable/waste collection point** on the semi-weekly collection day.

Combustible waste

How to Dispose Containers with lids Or See-through plastic bags

Plastic products other than plastic containers and wrapping

Plastic containers and wrapping with contents remaining or those that cannot be cleaned

Rubber products Please cut long hoses down to lengths of 50 cm or less.

Leather products

PET bottles covered in oil or those where the contents cannot be removed with simple washing

Kitchen waste Please leave garden stumps

Cooking oil Soak into paper or cloth, or harden using a coagulant.

Paper scraps Paper that cannot be recycled (See page 1).

Clothing, disposable diapers, sanitary goods Remove filth before disposal.

Small amounts of branches Please leave garden stumps
● Cut into lengths of 50 cm or less.
● See Page 6 for information on what to do for large amounts.

Reduce raw kitchen waste!!! Raw waste from the kitchen accounts for 35% of all combustible waste and is the most abundant form of combustible waste. Kitchen waste can be reduced with just a little effort.

- Plan your shopping well
- Be careful not to prepare too much food
- Do not waste ingredients or leave food unseasoned.
- Drain to remove excess water before putting the waste out.

These are all things that you can do right away. Make sure you start as soon as possible.

Recycling old clothing>>>What do you do with clothing you don't need anymore?
Try recycling old cloth (clothes) before you throw them away next time!
● Submit at a flea market or bazaar
● Use the Recycling Activity Center
● See page 8.

Please take metals, ceramic and glass waste out to the **recyclable/waste collection point** on the semi-monthly collection day.

Metal, Ceramic, Glass waste

How to Dispose Containers with lids Or See-through plastic bags

Metals Disposable body warmers

Ceramics, Glass, Broken Bottles Wrap broken glass, ceramics, sharp-edged tools, etc. in thick paper and mark "危険" (DANGEROUS).

Small appliances Please tie up cords neatly.

Cutting tools / needles / razor blades, etc. Wrap in thick paper and mark "危険" (DANGEROUS).

Fluorescent light tubes / light bulbs Put them in paper cases.

Disposable Lighters Make sure to always use them up completely and put them in a separate clear bag marked "Lighters".

Mercury Thermometers, Mercury Blood Pressure Devices Make sure to put them in a see-through bag.

Please apply at the waste collection office-waste collection center that administers waste in your area

※ For info on what area applies to you, see pages 13 and 14.
Shinjuku Waste Collection Office ☎ 03-3350-2923 Shinjuku East Waste Collection Center ☎ 03-3353-9471 Kabukicho Waste Collection Center ☎ 03-3200-5339

Lending bird nets
Bird nets for preventing damage to recyclables/waste from crows, cats, etc. at collection points are lent out for free.

Collection of dead animals
Dead animals such as dogs and cats (under 25 kg) are disposed of for 2,600 yen each.
● If there is a dead animal whose owner is unknown on one's own property, driveway, empty lot, etc., the owner or manager of the land is responsible for paying the fee in disposing of the dead animal as a general rule.
● For more information, please contact the appropriate road administrator as they will handle dead animals on the street.
● For National Roads: Tokyo National Highway Work Office, Toyoko Branch ☎ 03-3374-9451
● For Prefectural Roads: Local Waste Collection Office Center
● For city Roads: Tobu Construction Office (East of Meiji-dori) ☎ 03-5361-2454
Seibu Construction Office (West of Meiji-dori) ☎ 03-3364-2422

Visits for collections are available for the following people
Visits for collections will be made as needed upon field surveys.
Applicable Persons:
● Households made up only of persons 65 years or older requiring nursing care or disabled persons who have difficulty making it to the recyclables/waste collection points
● Households with only one person aged 85 years or older who does not get regular visits from relatives or acquaintances

There is a fee for disposing of waste in large amounts
There is a fee for disposing of a large amount of waste all at once arising from general households when moving, cleaning out rooms, cutting garden tree branches, etc. (When having garden trees trimmed/clipped by a specialist, have them take the branches away with them.)

You must make a reservation with the Large Sized Waste Reception Center for collections. **Prior reservation required, fee**

Large Waste (households)

Large-sized waste is waste from households with a length longer than 30 cm on one side, including furniture, bedding, electric appliances (excluding recyclable electronic home appliances), and bicycles. It shall be submitted as large waste even when disassembled. Some items may not be collected due to their size, weight, etc.

- Please apply upon confirming the size, materials, etc. of the waste.**
Application
Large Sized Waste Reception Center ☎ Phone: 03-5296-7000 (Mon.-Sat. 8:00am - 7:00 pm)
☎ Internete (24h) http://sodai.tokyo.kanryo.or.jp/
They will tell you the fee/collection date and confirm the disposal location with you.
- Purchasing a "Large-Sized Waste Disposal Ticket" in Shinjuku**
Shinjuku city has an A Ticket (200 yen) and a B Ticket (300 yen) for paid large-sized waste disposal, so purchase them in combination to match the disposal fee. Shinjuku city's disposal tickets for paid large-sized waste disposal services are available at shops with the "Paid Waste Disposal Ticket" mark, convenience stores, supermarkets, waste collection offices, local special district offices, and the Consumer and Environmental Protection Division (within the City Office).
- Please take it out before 8:00am on the collection day.**
Please dispose of waste at locations where they can be collected (the entrance area of single-family homes, the 1F entrance area of apartment buildings and condominiums) by 8 am on pick-up days. Write the collection date, reception number or year name on the paid large-sized waste disposal service ticket(s) and attach it to the item so it can be seen easily.

Items not applicable as large-sized waste
● See Page 9 for information on how to dispose of air conditioners, TV sets, refrigerators, freezers, washing machines, clothes driers, personal computers, and motorcycles.
● See Page 9 for information on how to dispose of tires, pianos, fire-resistant safes, fire extinguishers, etc.

Businesses have a responsibility to dispose of their own waste privately, so they should request services directly to the applicable waste disposal company. For inquiries of authorized businesses, please contact the Tokyo Waste Collection Services Cooperative Business Association (03-3232-9248) for general waste, and the Tokyo Industrial Waste Association (03-5283-9459) for industrial waste.

Please participate in group collections

How to Start One

- Participate in group collection activities near you.
- Create a new Group
Please inquire with the Shinjuku waste collection office operations division (Direct line: 03-3950-2962)

The city supports registered groups.

- Payment of Incentives**
Payments of rewards according to amounts collected are made twice a year.
- Provision of Support Items**
Cotton work gloves, aprons, brooms, etc. are supplied once a year upon request and examination. Items such as collection site flags and notice flyers are also supplied as needed.
- Provision of Operation Support Tools**
A flat car may be supplied upon annual request and examination.

Group collection activities are voluntary recycling activities where residents from ten households or more gather to specify collectible items (newspapers, magazines, cardboard, old cloth, aluminum cans, returnable bottles, etc.), collection sites, and collection dates for handing waste over to waste collectors. About 490 town councils, residents' associations, apartment association boards, etc. are currently registered as active groups in Shinjuku city.

Items that the city will not collect

● Household air conditioners, TV sets, refrigerators, freezers, washing machines, and clothes driers

They are not classified as large-sized waste. The Home Appliance Recycling Act requires them to be recycled.

You must make a reservation with a retail outlet or the Home Appliance Reception Center for collections.

There are recycling and transportation fees.

(The fees may vary according to the manufacturer. The fees below are standard fees.)

Standard Recycling Fees

A/C Unit	1,620 to 2,689 yen
Braun tube TV	1,836 to 3,688 yen
Liquid crystal TV	1,836 to 3,688 yen
Plasma TV	1,836 to 3,688 yen
Refrigerator/freezer	3,888 to 5,902 yen
Washing machine/clothes drier	2,592 to 3,418 yen

(as of January 2015)



- When purchasing a replacement, ask the retail outlet where you bought the new item for details.
- When only disposing of an item
 1. Please apply with the retail location you purchased the item at.
 2. If you are unable to drop off your items at the retailer the items were purchased at because it has gone out of business, etc., please contact the Home Electric Appliance Reception Center (☎ 03-5298-7200).
 3. When transporting the item yourself directly to the designated collection location, purchase an "electronic recycling ticket" at the post office (recycling fee and wire transfer service charge are required) and after contacting the designated collection location in advance, take it in. Please inquire at the designated collection locations, waste collection office or waste collection, or check on the city's website.

Home computers

They are collected/recycled by the manufacturers

Ask the manufacturer, etc. of the item to be disposed of for details.

※ For contact information of the manufacturer, please visit the PC3R Promoting Association

(Website <http://www.pc3r.jp/> ☎ 03-5282-7685)

For PC with no collecting manufacturer (home-made PC, manufacturers no longer in business, etc.) please apply with the PC3R Promoting Association.

※ Collecting and recycling fees required.

(Excluding products purchased after October 1, 2003 with a "PC recycle mark")
The collection/recycling fee for PCs made by major manufacturers is 4,320 yen for the base unit and an additional 4,320 to 5,400 for external displays.

Motorcycles

There are recycling systems operated by the manufacturers, etc.

Bicycle Recycling Call Center
Please inquire: ☎ 03-3589-8075



Automobile

The Automobile Recycling Law requires recycling.

There is a charge, contact the ELV Recycling System Contact Center
Please inquire: ☎ 03-3786-7755 for collection methods, recycling fees, etc.



Other items to be collected by specialists

Specialists will be referred to you. For more information, please contact the waste collection office/waste collection center in your area.

※ Items that are harmful, dangerous or have offensive odors
Cassette-type gas cylinders, oils (gasoline, diesel, kerosene, thinner, etc.), paint, medicines, printer ink, batteries, fireworks, matches, fire extinguishers, etc.

※ Things difficult to dispose of
Tires, pianos, fireproof safes, dirt, sand, rocks, blocks, sludge, etc.

Business recyclables/waste Fee

Businesses must dispose of resources/waste privately.

(Waste Disposal and Public Cleansing Act, Article 3: Businesses shall appropriately manage of the waste left as a result of their business activities.)

If they are unable to do so on their own, they shall appropriately dispose of the waste by ways such as commissioning the disposals to specialists such as general waste disposers or resource collectors.

Also, resources, waste, etc. from businesses can be collected only if does not interfere with the city's general household waste collection and a Shinjuku City Business-Related Paid Waste Disposal Ticket is attached.

Business-Related Paid Waste Disposal Ticket (sticker)

Business-Related Paid Waste Disposal Ticket Price Table

Extra-Large Bottles Equal to 70 Liters (セマーク専用)	1 set of 5	2,415 yen
Large / Equal to 45 liters	1 set of 10	3,100 yen
Medium / Equal to 20 liters	1 set of 10	1,380 yen
Small / Equal to 10 liters	1 set of 10	690 yen

Paid Waste Disposal Ticket Office

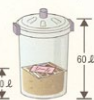
Shops which have the "Paid waste disposal ticket location" mark (convenience store, supermarket, etc.) and waste collection offices, local waste collection centers, the waste reduction recycling dept. (inside city office) and all special branches
※ Some of these locations may also offer paid waste disposal tickets for other cities.

Please be sure to purchase a "Shinjuku City Business-Related Paid Waste Disposal Ticket"

How to attach stickers

When disposing of combustible waste, metal, ceramic, glass, and plastic containers and wrapping

◆ When disposing in a container, attach the ticket that is in accordance with the actual amount of waste in the container.

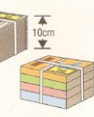


◆ When disposing in a bag, please place a sticker that suits the size of the bag. Use small bags for small amounts of waste.



When disposing of recyclable paper

◆ For newspapers and magazines: Attach a 10 liter sticker to each bundle 10 centimeters high.



◆ For cardboard: Attach one 10 liter sticker to every two cardboard boxes about the size of tangerine boxes.



When disposing of bottles, cans, PET bottles, spray cans, cassette gas cylinders, and dry-cell battery

Please place bottles, cans, PET bottles, spray cans cassette gas cylinders and dry-cell batteries in separate bags, attach the sticker according to the sizes of the bags, and place the bags at the recyclables/waste collection point.



Let's build a resource recycling-oriented society

A "resource recycling-oriented society" is a society that minimizes burdens on the global environment and recycles waste products by minimizing generation of waste, reusing, and disposing properly. We must reexamine our daily habits and try to reduce waste while effectively utilizing our resources. Let us citizens, businesses, and Shinjuku city face this waste problem and work together to build a resource recycling-oriented society for the sake of the earth and our future.

The Roles of City's Residents, Businesses, and Shinjuku City

Role of citizens

- Reduce waste and recycle
- Use items with care
- Cooperate with group collections and administrative collections

Role of businesses

- Produce and sell products that are easy to recycle
- Collect used items promote recycling
- Proper disposal based on taking responsibility for your company's own waste

City's role

- Spread promotion of reducing waste and recycling
- Offer support and guidance for smooth recycling operations
- Proper and effective processing of waste

Reducing Waste with the Three Rs

The "three Rs" are the key in reducing waste. Check your daily habits once again with "The three Rs" in order to reduce waste. Waste reduction and the recycling of resources can be realized with just a little effort by each and every person.

The first R stands for REDUCE
meaning to decrease the amount of waste

- Don't buy disposable items
- Refuse excessive packaging
- Bring your own shopping bags
- Don't buy things in trays and only purchase when necessary
- Utilize rentals

The second R stands for REUSE
meaning to make adjustments so that you can use items again instead of immediately throwing them away

- Fix broken items for use
- Use refillable packaging
- Use flea markets and recycle shops

The third R stands for RECYCLE
meaning to reuse as resources

- Properly separate recyclables and waste
- Buy and used recycled items

The Earth's resources are limited. It is important for us not to buy unnecessary goods and to recycle what can be recycled so that natural resources that have taken billions of years to produce are not used up by our generation. Let us lead a lifestyle where we properly separate resources and waste every day so that we can reuse unwanted things as resources.

together

Transitions in Waste Collected by Shinjuku City and Volume of Waste Recycled

According to statistical data from previous years, more waste was produced in 1989 than in any other previous year, and the collecting of resources was done only through group collections. Later, collections began with bottles and cans in 1992, the collection of business-related waste became no longer free in 1996, in 1997 the collection of plastic bottles began, and in October of 1999 weekly collection of used paper began. The collecting of plastic containers and wrappings as resources started in April 2008 and other plastic, leather, and rubber products, which had been handled as non-combustible waste, were changed to combustible waste. In April 2009 spray cans and cassette gas cylinders were added, to the bottle, can and PET bottle collections and dry-cell batteries were added as well in April 2011. From April 2015, bottles, cans, PET bottles, spray cans, cassette gas cylinders and dry-cell batteries will be collected at recyclable/waste collection points.

Amount of Waste in Shinjuku City

Classification/Year	1989	2003	2008	2013
Combustible waste	152,676	77,105	74,242	68,161
Metal, Ceramic, Glass waste	48,322	22,682	6,854	3,136
Large-Sized Waste	3,492	1,720	2,127	2,559
Total	204,490	101,507	83,223	74,856

Units: tons

Volume of Waste Recycled in Shinjuku City

Classification/Year	2003	2008	2013
Group Collections	6,648	7,037	6,415
Bottles, cans*	3,328	3,011	4,718
Dry-cell batteries, white food trays	23	25	54
Used paper, paper books	11,105	8,220	6,095
PET bottles	366	1,214	1,444
Plastic Containers and Wrapping	-	2,047	1,643
Total	21,470	22,454	20,367

Units: tons

*Including spray cans and cassette-type gas cylinders as of 2013.
(Some items may not add up to the totals because some separate pieces may have been cut off.)

Amount of Waste and Disposal Costs in Shinjuku City

Waste Volume and Population

Waste per person every day = waste volume ÷ population = 365 days

● 2003 (population as of Jan. 1, 2004) 1 Population: 290,995 ppl. (including 29,143 registered foreign nationals) Amount of Waste: 101,507t Amount of waste per person: 925g	● 2013 (population as of January 1, 2014) 1 Population: 324,083 ppl. (including 34,121 registered foreign nationals) Amount of Waste: 74,856t Amount of waste per person: 633g
---	---

Disposal Costs

Fiscal Year 2013

● Waste (combustible waste, metal/ceramics/glass, large-sized waste) processing fees
The costs from collection/transport to processing/disposal covered by the city.

● Costs to recycle resources (for 1 kg) Costs=amount collected
The costs covered by the city from collection to recycling. (Gains on disposals are subtracted.)

Products subject to the Containers/Packaging Recycling Act include recycling expenses (covered by Shinjuku city).

Recyclable Paper	Bottles	Aluminum	Steel Cans	PET bottles	Plastic Containers and Wrapping
22 yen	79 yen	15 yen	77 yen	108 yen	172 yen
● Group collections: about 13 yen/kg expenses ÷ volume collected					



Group collecting is an excellent system. Please see Page 7 if you are not participating yet.

How to Separate and Dispose of Recyclable Resources / Garbage

*For more details, please see the pamphlet version. Please confirm and fill in your specific collection days.

From April 2015

- In Shinjuku City, bottles, cans, PET bottles, spray cans, cassette gas cylinders, and batteries are collected at the recyclable and waste collection point.
- In some areas, the collection date of metal, ceramics, and glass items has changed.

Recyclable resources

Once a week on

(day of the week)

✓ **Dispose of bottles, cans, PET bottles, spray cans, cassette gas cylinders, and batteries in a transparent plastic bag.**
*In apartment and condominium buildings that have been lent containers or nets, please continue disposing of these items loosely into the containers as before.
*Collection times for each category are different.

Bottles

- Food / drink
- Cosmetics
- Oral medicines

Lightly rinse bottles with water.

Cans

- Drink
- Aluminum & steel food cans

Lightly rinse bottles with water.

PET bottles

Dispose of caps and labels separately from bottles, together with plastic containers and packaging materials.

Lightly rinse bottles with water.

Spray cans, cassette gas cylinders, batteries

- Manganese batteries
- Alkaline batteries
- Lithium batteries

Plastic caps are to be included with plastic container and packaging materials recycling.

Make sure spray cans and cassette gas cylinders are empty before disposal.

Recyclable paper

Newspapers / flyers (folded into four / A4 size)

Magazines / books / miscellaneous paper (magazines, books, notebooks, confectionery boxes, wrapping paper, envelopes, toilet roll cores, etc.)

Milk / drink cartons

Cardboards

Plastic containers and packaging materials

*Plastic that has been used to hold or wrap goods.

Plastic bags / plastic wrap / plastic film

Cups

Tubes

Lids / stoppers

Bottles

Trays / packs

Styrofoam trays, fruit

Dispose of these items all together in a container with a lid or a transparent plastic bag.

Items that are difficult to clean should be disposed of as combustible garbage. Please rinse items clean with water before disposal.

Combustible garbage

Twice a week on

(day of the week)

(day of the week)

Plastic items except for plastic containers and packaging materials (Plastic containers and packaging materials that cannot be cleaned)

Kitchen waste (Drain to remove excess water before disposal.)

Cooking oil (Soak into paper or cloth, or harden using a coagulant.)

Clothes, disposable diapers, etc. (Remove soiling before disposal.)

Paper scraps

Small amounts of branches from garden plants (Cut into lengths of 50 cm or less.)

Rubber / leather items

Dispose of these items all together in a container with a lid or a transparent plastic bag.

A fee will be charged for collection of large amounts of recyclable resources or garbage disposed of by ordinary households. Please consult in advance with the waste collection office or waste collection centers listed on the reverse side.

Metal, Ceramic, Glass

Twice a month on

(day of the week)

Metal, ceramic, glass, small home appliances, etc. Disposable lighters

Wrap broken glass, ceramics, sharp-edged tools and so forth in thick paper and mark "キケン" (DANGEROUS).

Return fluorescent light tubes / light bulbs to their cardboard cases.

Make sure these are empty and place them in a separate bag marked "ライター" (LIGHTERS).

Mercury thermometers and blood pressure meters

Dispose of these items in a transparent plastic bag.

Dispose of these items all together in a container with a lid or a transparent plastic bag.

Lighters

Thermometers and blood pressure meters

As of April 1, 2015, collection days will change in some areas. Please check the Shinjuku City website (from April) or the pamphlet version.

Recyclable resources and waste should be disposed of at the recyclable and waste collection point by 8 a.m. on the designated day.

Collection of other items

Milk and other drink cartons, white food trays, dry-cell batteries, ink cartridges

Dispose of these in collection crates provided at regional centers and other city facilities, or at supermarkets in the city (where available).

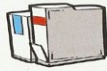
Milk and other drink cartons



White food trays



Ink cartridges



Ink cartridges for home-use printers
Genuine Brother, Canon,
Dell, Epson, Hewlett-Packard, and
Lexmark brand ink cartridges only.

Manganese, alkaline and lithium batteries



*To dispose of button cell batteries, take them directly to a shop that accepts such batteries for collection.

Small Rechargeable Batteries

Nickel-cadmium, nickel-hydrogen, lithium-cell, and other rechargeable batteries should be taken to recycle boxes at retail outlets.

Collection at collection sites

Used small-size electronic devices, etc.

Mobile phones, digital cameras, portable video cameras, portable music players, hand-held video game units, portable car navigation units, electronic dictionaries, calculators, and accessories such as remote controllers, AC adapters, and cables are collected as recyclable resources at the collection sites below.

Collection sites

- Shinjuku City Office Garbage Reduction and Recycling Division (main office building 7F)
- Shinjuku Recycling Center •Nishiwaseda Recycling-related Activities Center
- Shinjuku Waste Collection Office •Shinjuku-Higashi Waste Collection Center
- Kabukicho Waste Collection Center •Shinjuku Waste Station



Important points •Electronics devices other than those listed above are classified as "metal / ceramics / glass garbage" or "large-size waste". Remove all removable batteries or similar items before bringing the device to the collection site.
•Other remove or erase any recorded media which contains personal information. Small-size electronic devices and so forth cannot be returned once collected.

Collection fees apply for large-sized waste

You must make a reservation with the Large-Sized Waste Reception Center for collection of household furniture, bedding, bicycles, and other waste with dimensions of 30 cm or more. (Collection may not be possible if the size or weight exceeds a certain limit.)

Application:

Large-Sized Waste Reception Center

Or via Internet (24 hr) <http://sodai.tokyokankyo.or.jp>

Large-Sized Waste Reception Center Search
☎ 03-5296-7000 (Mon. to Sat. from 8 a.m. to 7 p.m.)



Companies are responsible for the disposal of their own large-sized waste and therefore cannot apply through the Large-Sized Waste Reception Center. Companies should apply directly to waste disposal agencies. For referrals of licensed disposal agencies, for ordinary waste contact the Tokyo Waste Cooperative Business Association (☎: 03-3232-6249), and for industrial waste contact the Tokyo Industrial Waste Association (☎: 03-5283-5455).

Items that the city will not collect

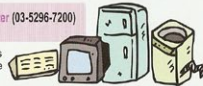
Household-use air conditioners, TV sets, refrigerators, freezers, washing machines, clothes driers

Removal / recycling fees are required

- When buying a new appliance, request collection at the same retail outlet.
- Contact the retail outlet you originally purchased the product from for disposal only.
- If you are not able to secure pick-up with the above retailers:

Call the Home Electric Appliance Reception Center (03-5296-7200) to request collection.

- Please contact the numbers at the bottom of this page if you are going to haul your own appliance to a designated point (outside of the city).



Home computers

Removal / recycling fees are required

(This does not apply to computers sold after October 2003 with "PC Recycle Marks" displayed on them)

Inquire directly to the manufacturer for disposal.

Check the manufacturer's contact details

by contacting the PC3R Promotion Association at 03-5282-7685, or online at <http://www.pc3r.jp>



Hazardous and hard-to-dispose-of materials

- Oils (gasoline, diesel, kerosene, paint thinner), paint, chemicals, ink for printers
- Firecrackers, large quantities of matches or lighters, and similar materials
- Soil, sand, cement blocks, sludge, and similar materials
- Fire extinguishers, batteries, tires, motorcycles, pianos, fireproof items such as safes

Contact the following number to find the appropriate collection service.



All business and industries will be charged to have their waste materials and recyclable resources collected.

Disposal may be carried out by commissioning the services of general-waste management businesses or private resource recovery contractors that have obtained permission to operate from Shinjuku City.

If it is difficult for a business to dispose of its waste privately and the amount of waste to be collected is not large, the city's collection services can be used with purchase of a Business-Related Paid Waste Disposal Ticket in advance, which is to be attached to the recyclable resources / garbage to be collected for disposal.

All business and industries will be charged to have their waste materials and recyclable resources collected.

Disposal may be carried out by commissioning the services of general-waste management businesses or private resource recovery contractors that have obtained permission to operate from Shinjuku City.

If it is difficult for a business to dispose of its waste privately and the amount of waste to be collected is not large, the city's collection services can be used with purchase of a Business-Related Paid Waste Disposal Ticket in advance, which is to be attached to the recyclable resources / garbage to be collected for disposal. However, collection will be made such that it does not interfere with general household collection, and there are restrictions on the types of items accepted for disposal.

Combustible garbage, metal / ceramic / glass items, recyclable resources (plastic containers and packaging materials)

If using a container:

Attach a ticket that corresponds with the actual amount of waste in a container.



If using a bag:

Attach a ticket that corresponds to the capacity of the bag.



Use small bags for small amounts of waste.

Recyclable Resources (recyclable paper)

Newspapers and magazines:

Attach a 10-liter ticket for each bundle 10 cm high (newspapers folded into four / A4 size).



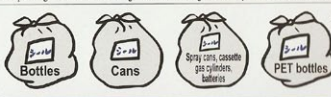
Cardboards:

Attach one 10-liter ticket for every two cardboard box about the size of a mandarin orange box.



Recyclable Resources (bottles, cans, PET bottles, spray cans, cassette gas cylinders, and batteries)

Put bottles, cans, PET bottles, spray cans, cassette gas cylinders, and batteries into separate bags, attach tickets corresponding to the size of each bag, and leave the bags at the recyclable and waste collection point.



Make sure spray cans and cassette gas cylinders are empty before disposal. Put out used manganese, alkaline and lithium batteries.

Business-related paid waste disposal ticket price table

Extra-large, equal to 70 liters (only those market with)
Set of 5 ¥2,415

Large, equal to 45 liters
Set of 10 ¥3,100

Medium, equal to 20 liters
Set of 10 ¥1,380

Small, equal to 10 liters
Set of 10 ¥690

2015 collection days for metal / ceramic / glass items Collection will be twice a month on a specified day.



- Area 1 and 3 collection days are the 1st and 3rd and specified day of the month (Ex.: 1st and 15th, 6th and 20th)
- Area 2 and 4 collection days are the 2nd and 4th and specified day of the month (Ex.: 8th and 22nd, 13th and 27th)
- There are no collections on the 5th specified day of the month (29th, 30th)

	April	May	June	July	August	September	October	November	December	January	February	March
Date	Date	Date	Date	Date	Date	Date	Date	Date	Date	Date	Date	Date
1st & 3rd Mon.	6 20 4 18 1 15 6 20 3 17 7 21 5 19 2 16 7 21 4 18 1 15 7 21	13 27 11 25 8 22 13 27 10 24 14 28 12 26 9 23 14 28 11 25 8 22 14 28	7 21 5 19 2 16 7 21 4 18 1 15 6 20 3 17 1 15 5 19 2 16 1 15	14 28 12 26 9 23 14 28 11 25 8 22 13 27 10 24 8 22 12 26 9 23 8 22	1 15 6 20 3 17 1 15 5 19 2 16 7 21 4 18 2 16 7 21 4 18 2 16	8 22 13 27 10 24 8 22 12 26 9 23 14 28 11 25 9 23 13 27 10 24 9 23	2 16 7 21 4 18 2 16 6 20 3 17 1 15 5 19 3 17 7 21 4 18 3 17	9 23 14 28 11 25 9 23 13 27 10 24 8 22 12 26 10 24 14 28 11 25 10 24	3 17 1 15 5 19 3 17 7 21 4 18 2 16 6 20 4 18 1 15 5 19 4 18	10 24 8 22 12 26 10 24 14 28 11 25 9 23 13 27 11 25 8 22 12 26 11 25	4 18 2 16 6 20 4 18 1 15 5 19 3 17 7 21 5 19 1 15 6 20 5 19	11 25 9 23 13 27 11 25 8 22 12 26 10 24 14 28 12 26 9 23 13 27 12 26

For further information, contact the waste collection office or waste collection center. (Inquiries in Japanese only, please.)

☐ Shinjuku Waste Collection Office ☎ 03-3950-2923 (2-1-1 Shinjuchoshi)

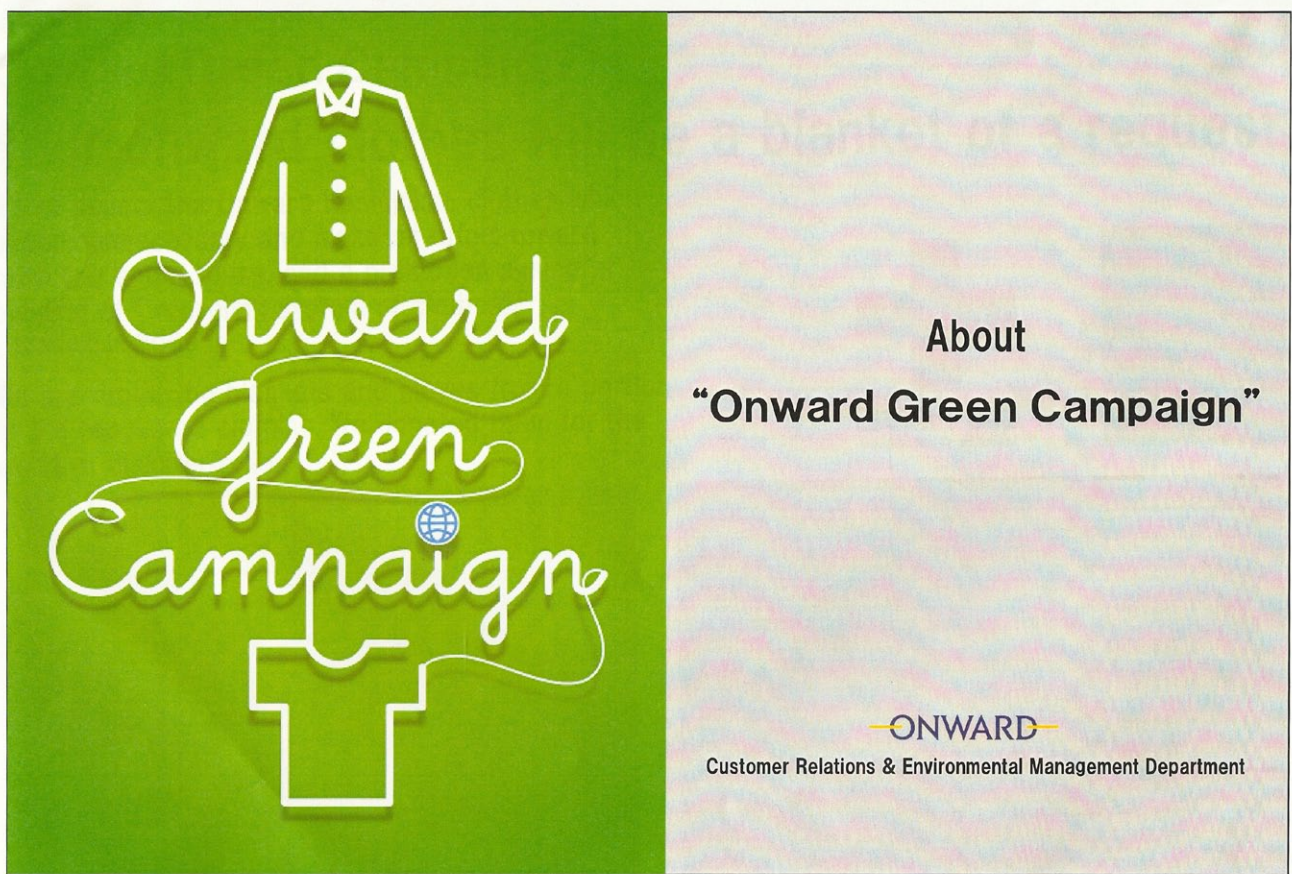
☐ Shinjuku Higashi Waste Collection Center ☎ 03-3353-9471 (28 Bansei-chu)

☐ Kabukicho Waste Collection Center ☎ 03-3200-5339 (2-42-7 Kabukicho)

<http://www.city.shinjuku.lg.jp/foreign/english/>



Onward Green Campaign



■ About “Onward Green Campaign”

Onward Green Campaign

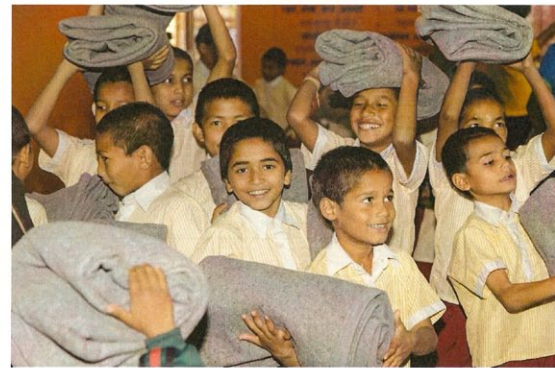
Your onward clothes will be a blanket of a request

It's to collect the Onward Kashiwama clothes which became unnecessary and make an effort toward recycling and a reuse, and a promotion aiming at building of "recycling system of clothes".
(Starting in 2009)

We are producing blankets and gloves from a portion of the recovered clothing. We donated them for the world of disaster relief.

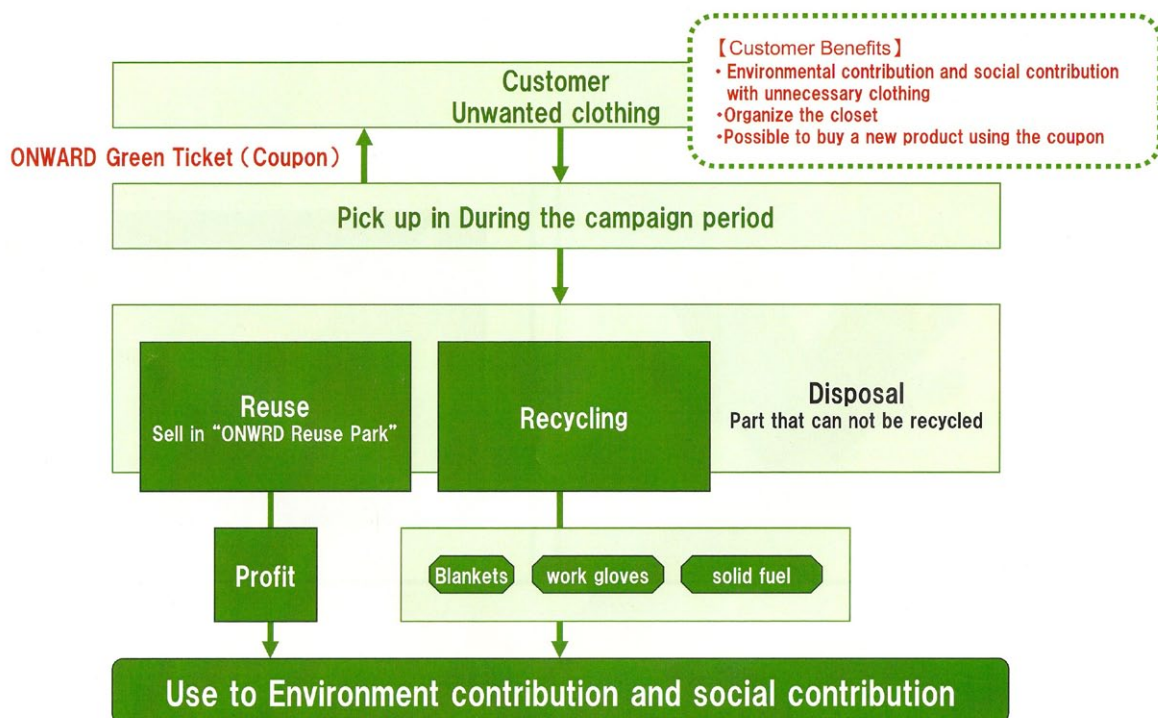


日本赤十字社
Japanese Red Cross Society



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■ Flow of Onward Green Campaign



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■ Recycled products

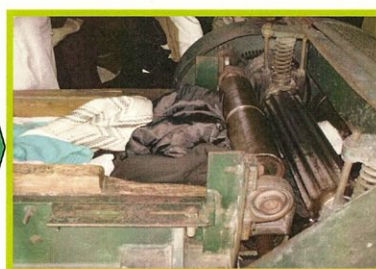


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■ Blanket manufacturing process



1.sort clothing in Domestic factory



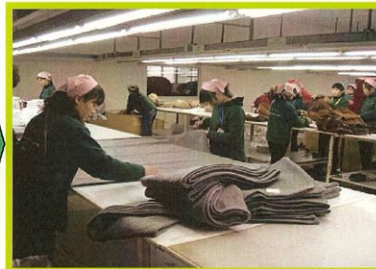
2.The cut in the machine after removing the accessories in Philippines factory



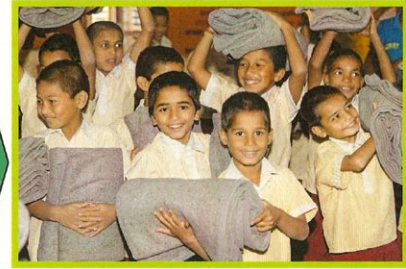
3.reclaimed wool



4.Knitting blankets in reclaimed wool that was to thread in China factory



5.Inspection



6.Donation

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■ Campaign performance

Cumulative total of participants = About 305,000 people
 Recovery clothing : About 1.65 million = About 413 tons



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■ About Support activity



1st Support activity / Bangladesh
 May 2010 : 3,000 blankets



4th Support activity / China
 March 2012 : 2,200 blankets



7th Support activity / Myanmar
 October 2014 : 4,000 blankets



2nd Support activity / Kazakhstan
 February 2011 : 3,300 blankets



5th Support activity / Mongolia
 September 2012 : 2,000 blankets



3rd Support activity / Japan
 September 2011 : 1,000 blankets



6th Support activity / Nepal
 October 2013 : 4,000 blankets

The total number of
 donated country

7 countries

The total number of
 donated blanket

19,500 blankets

4,000 blankets to Nepal and Vietnam in October of this year.

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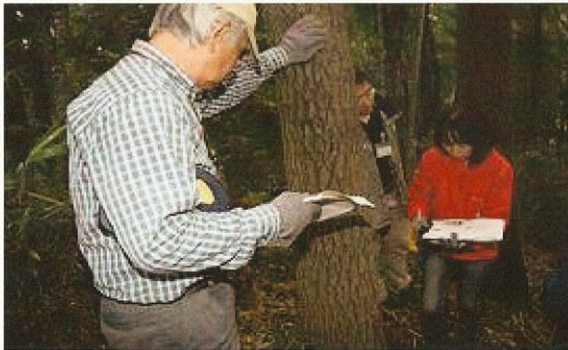
■ About the use of work gloves



Customers who participate in the campaign



Volunteers involved in forest conservation activities



People of Green Saber



Disaster stricken area

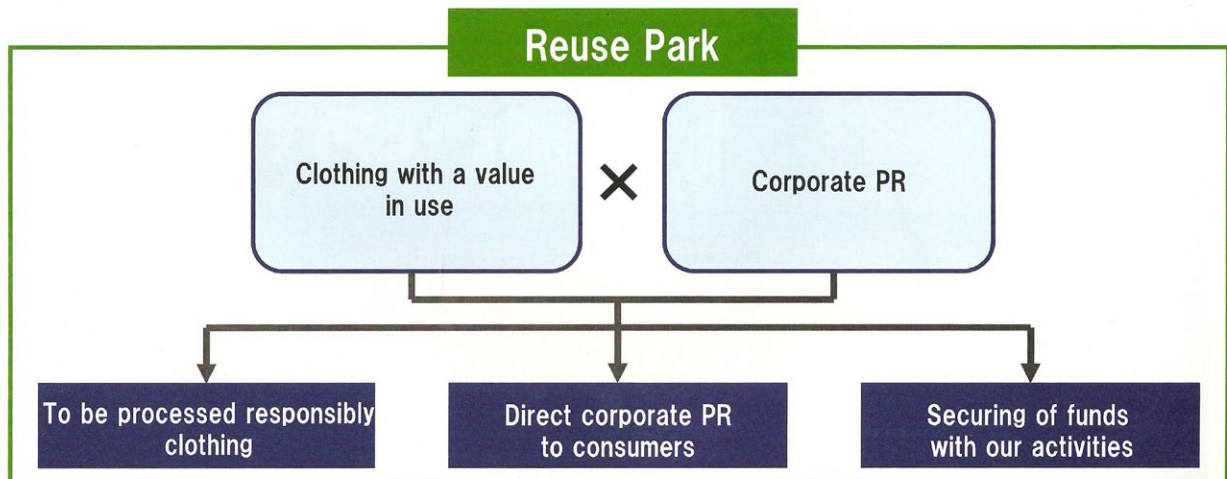
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■ About “Onward Reuse Park”

Reuse shop for the purpose of continuity and PR of CSR activities

Sell used valuable clothing from the recovered clothing.
Take advantage of revenue for Environment contribution and social contribution activities of ONWARD.

Also used as a place to transmit the company's Corporate Social Responsibility activities.



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Contacts, Resources and Further Reading

The sustainable future of the Scottish textiles sector:
challenges and opportunities of introducing a circular
economy model

Wilson Textiles and Clothing Sustainability (2015)
1:5 DOI 10.1186/s40689-015-0005-y

[https://textclothsustain.springeropen.com/
articles/10.1186/s40689-015-0005-y](https://textclothsustain.springeropen.com/articles/10.1186/s40689-015-0005-y)

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<http://www.lynnwilson.co.uk>

Tokyo from the Tokyo Tower

