



PVC REDESIGNED

Designing in a
Circular Economy
with PVC



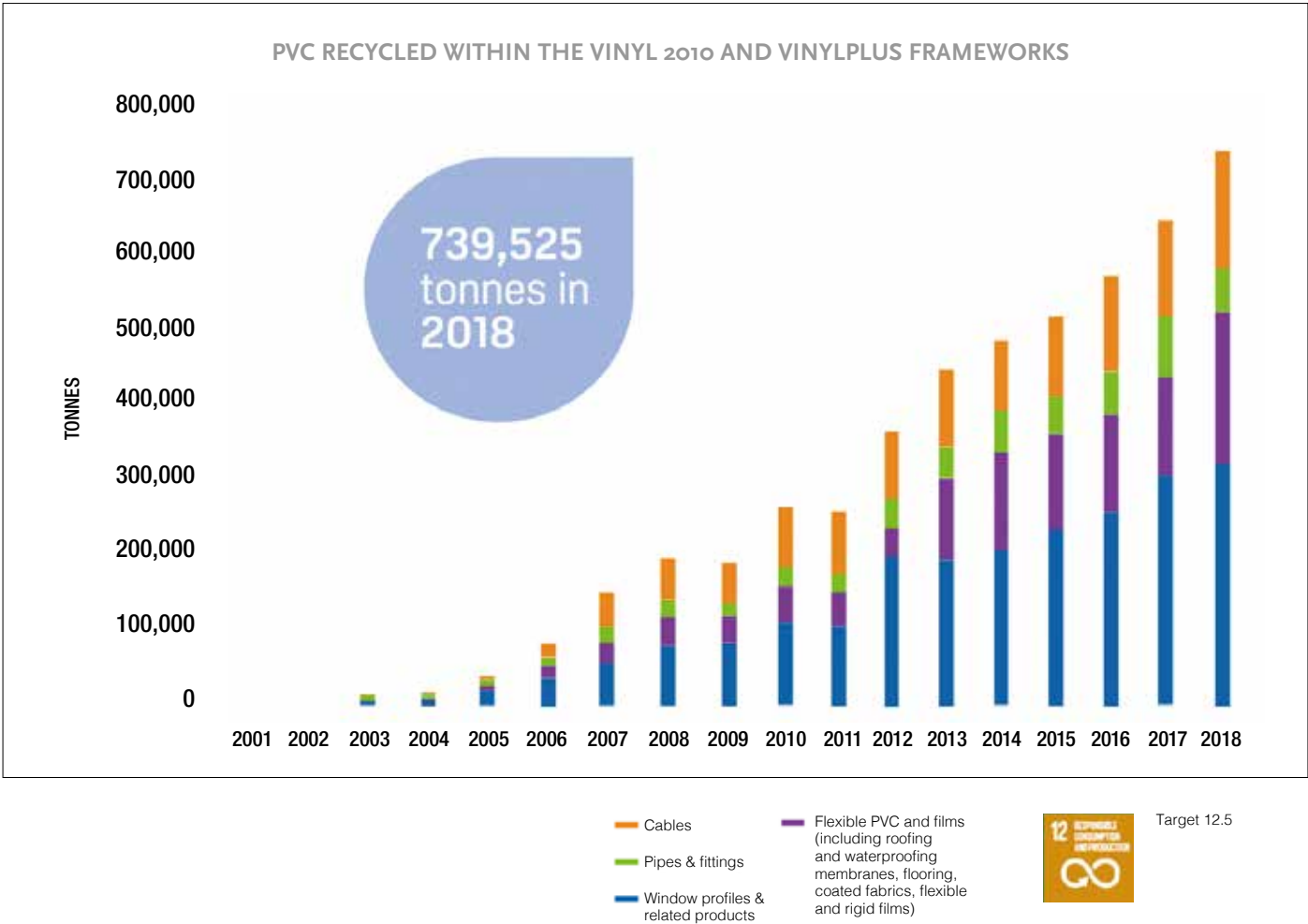


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RECYCLING ACHIEVEMENT

The volume of PVC waste recycled within the VinylPlus framework reached 739,525 tonnes in 2018, a 15.6% rise from the previous year. That was achieved in spite of increasing constraints at the regulatory level.



1. INTRODUCTION TO VINYLPLUS



VinylPlus is the renewed ten-year Voluntary Commitment of the European PVC industry. The programme establishes a long-term framework for the sustainable development of the industry by tackling a number of critical challenges, in the EU-28, Norway and Switzerland.

VinylPlus is committed to the following working principles:

- Voluntary action –tackling the sustainability challenges of PVC in a proactive way.
- Measurable targets and deadlines – shared publically and reported on annually.
- Continuous improvement –accepting that the journey to sustainability requires constant evaluation and learning.
- Collaboration – working together within the industry to find solutions that no single player can implement, and reaching out to much broader stakeholder groups.
- Transparency – opening up, sharing and recognising the gap between where we are now and where we aim to be.
- Scientific rigour and research – making sure technologies, processes and materials are assessed according to strong and scientifically-based

sustainability principles.

- Dialogue – creating more debate with those who have something to say about PVC, in a positive, receptive frame of mind.
- Responsibility – no one is going to secure a place for PVC in the sustainable future other than the industry itself.
- Seeking business prosperity – we need successful businesses along the value chain – that means making an acceptable return on investment, being competitive while pursuing a sustainable development.
- Priority to sustainability innovation – research, design and innovation should have no goal other than improving the sustainability potential of PVC, including its market competitiveness, and openly challenging components, materials and practices which do not make sense in terms of sustainable development.

Over the last 20 years, VinylPlus has met key sustainability goals for the PVC industry, including:

- Establishing a large-scale PVC recycling stream (target 12 of the UN SDGs – responsible production & consumption) – 739,525 Tonnes recycled in 2018
- Phasing out use of cadmium in stabiliser systems
- Replacing the use of lead additives
- Phasing out mercury catalyst in the production of PVC
- Working towards energy efficient in production.



2. A VIEW VIEW FROM THE BPF



Sustainability is an important aspect to the BPF and its VinylPlus UK group. Having seen the vinyl sector grow its environmental credentials tremendously over the last couple of decades, looking beyond recycling was an exciting challenge. The concept of reuse is a valuable aspect of a circular economy due to the lack of mechanical processing required to utilise products at their end of life. By collaborating with IOM3 and MaDE, the

BPF was able to tap into the creative minds of design students to produce innovative results on how vinyl products could be reused in the future. Continuing the efforts of the industry sector to support a circular economy will always be a key task for the BPF and this competition has opened up exciting avenues for PVC products.

Matt Davies,
British Plastics Federation

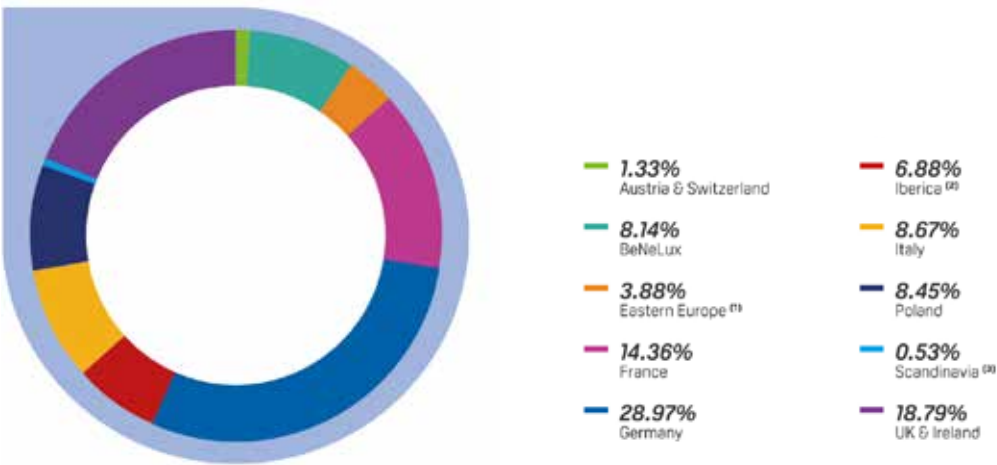
3. DESIGNING IN A CIRCULAR ECONOMY WITH PVC

RECYCLING ACHIEVEMENT

Recovinyl® remained the main contributor, with a registered volume of 734,568 tonnes of PVC entirely recycled in Europe.

During the year, Recovinyl further sharpened its certification and audit schemes to ensure maximum reliability of collected data and recyclates, both from recyclers and converters.

RECOVINYL REGISTERED RECYCLED VOLUMES 2018 PER REGION



⁽¹⁾ Eastern Europe includes Bulgaria, Czech Republic, Estonia, Greece, Hungary, Latvia, Romania and Slovakia
⁽²⁾ Iberica includes Spain and Portugal
⁽³⁾ Scandinavia includes Denmark, Finland, Norway and Sweden

Designing in a Circular Economy was a project run by the BPF's VinylPlus UK Group. The aims of the project were to raise the awareness of the PVC sector within the design community as well as showcase vinyl's sustainability and cost effective credentials. Through collaboration with the design community, VinylPlus UK also wanted to identify the design opportunities of PVC products at their end of life.

Working with the Institute of Materials, Minerals & Mining (IOM3) and the Materials and Design Exchange (MaDE), VinylPlus UK sought to engage designers, manufacturers and materials experts to learn about the properties, applications & sustainability credentials of PVC material. This was done through a 'whitewater' workshop facilitated by MaDE, which involves bringing together different industries to identify possibilities through learning and 'playing' with design.

RECYCLING ACHIEVEMENTS SINCE 2000



**5 million tonnes
of PVC recycled**



**10 million tonnes
of CO₂ saved**

4. PVC

REVISITED

PVC: Reused, Recycled, Revisited

Whitewater Innovation Workshop

24 January 2018 | 9.30am
IOM3 Boilerhouse, Grantham

A workshop combining the expertise of the materials and product design communities to revise the understanding and opportunities for PVC product reuse.





The PVC: Reused, Recycled, Revisited event was a 'whitewater' workshop combining the expertise of the materials and product design communities to revise the understanding and opportunities for PVC product reuse.

The 'Whitewater Workshop', a product developed by the Materials and Design Exchange, provides the vehicle to fully understand a chosen material and develop novel thinking toward innovative future use.

Providing a balanced mix of materials professionals, users, developers and product designers the event set out to topple myths, remove misconceptions and identify the targets through which the value of PVC can be retained as a product for reuse.

5. PVC

REDESIGNED

The Circular Economy aims to redefine the conventional 'make, sell and discard' model through innovation and careful design to reuse materials for a second life. Such a model goes well beyond conventional recycling but requires novel thinking and careful design to minimise material waste and maximise circularity. The competition aimed to engage the design community to encourage development of new product ideas from PVC products that have reached their end of life. Recycling is well established within the PVC industry (e.g. RecoVinyl), therefore the competition wanted to seek new ideas in the reuse space, taking items and innovating new products without the need for mechanical and/or chemical recycling.

PVC REDESIGNED

**A Circular Economy
Design Competition
for Design Students**

DEAR STUDENT,

We are delighted to invite you to participate (as an individual or team) in our PVC ReDesigned Competition, aimed at showcasing innovative design concepts for the reuse of PVC material in the Circular Economy. The competition will be open until **31 January 2019** with a **First place prize of £3,000, second place prize of £1,500 and 3rd place prize of £500.**

Background

The Circular Economy aims to redefine the conventional make, sell and discard model and by innovation and careful design to reuse materials for a second life. Such a model goes well beyond conventional recycling but requires novel thinking and careful design to minimise material waste. This competition aims to engage the design community and to encourage the development of new product ideas from PVC products that have reached the end of their original design life. A range of products made from PVC are shown in the gallery attached. Some of these may surprise you, however, all would benefit from consideration for re-use at end of life in a different way.

The Competition Brief

Acting as an individual or team, we are interested in seeing your re-use ideas for the PVC products you can see in the photo gallery.

Re-imagine the function of the original product, or with different combinations of product shapes create something entirely new. Develop your own concepts as a series of drawings, perhaps with notes regarding the function of the new design, how it works and how it would be put together. You can enter up to three separate ideas, but your entries must be complete and uploaded to **www.made.partners** by midnight on **31 January 2019**.

To enter

Your new ideas set out in drawings and notes should be entered at **www.made.partners** where we will also need your name, university or college address, your email and your postal address. Your postal address is important for the competition support package (see across) which we will send to the first 100 entrants to the competition.

Support for ideas

To help visualise the potential re-use of PVC, we have created a box of material samples which will assist in shape, texture and properties of the original material. This pack can be retained by you as a useful future resource if you upload a design entry into the competition. We would however request that you return this at your cost if you fail to submit an entry in time.

Judging

We have assembled a panel of product designers, materials technologists and product makers to judge all the entries after the competition has closed.

The winning entries will be notified by 28 February 2019.

Other information

If you need any additional help or clarification contact Matt Davies at: **mdavies@bpl.co.uk**

MATERIALS AND DESIGN EXCHANGE

IOM³
The Institute of Materials, Minerals and Mining

BPF vinyl

6. INNOVATIVE DESIGNS FOR REUSE

The award ceremony saw presentations from the three finalists on their designs, covering their inception, design and plans to bring the ideas to market. Bernie Rickinson of the Materials and Design Exchange (MaDE) detailed the benefits and aims of the project in collaboration with the BPF & IOM3, whilst Matt Davies detailed the environmental efforts of the PVC industry and how this competition brought new ideas to the table. Associate Professor Robin Jones of London South Bank University, at which two of the finalists studied, noted the quality of the designs.



“ *The designs showed both creative flair and an attention to detail, and in tackling real-world issues demonstrated a great depth of thought into the product’s lifecycle and practical use.*

Associate Professor Robin Jones, London South Bank University





WINNER

Karen Silva

YUNA

Karen is an Industrial Product Designer studying Product Design at London South Bank University. Karen is currently on placement in Spain designing car interiors for a Tier 1 automotive manufacturing company. Passionate about improving people's lives through smart and ergonomic design, Karen's projects have included a filtering water container for third world countries, multi-functional interactive

children's toys and a sustainable modular bed frame for all ages.

Before going into Product Design, Karen studied Art & Design at Enrico de Nicola College in Milan, Italy. There she developed skills in rapid sketching and rendering and architectural drawings. Today, Karen offers skills in problem solving, sketching & rendering, 3D design, and prototyping.

Bio and Q&A

Q. CAN YOU BRIEFLY TELL US ABOUT YOUR DESIGN ENTRY?

The name of my design is Yuna. It is a portable water purifier for the poorest communities in third world countries. Yuna allows for the ergonomic transportation of 3.5L of water with a centralized filter purifying the water during transit. It features a strap for ergonomic transportation, as well as a lid that can be used to collect water or as a drinking utensil. Its integrated valve pipe helps to dispense the water in a controlled way. Yuna can be also suitable for hikers, disaster relief and military personnel.





millions of women and girls spend hours every day traveling to water sources, waiting in line and carrying heavy loads



Dirty water kills 5,000 children a day and 2M people over the world



Contaminated water can cause diarrhea, Cholera, Guinea worm disease, Typhoid, and Dysentery.

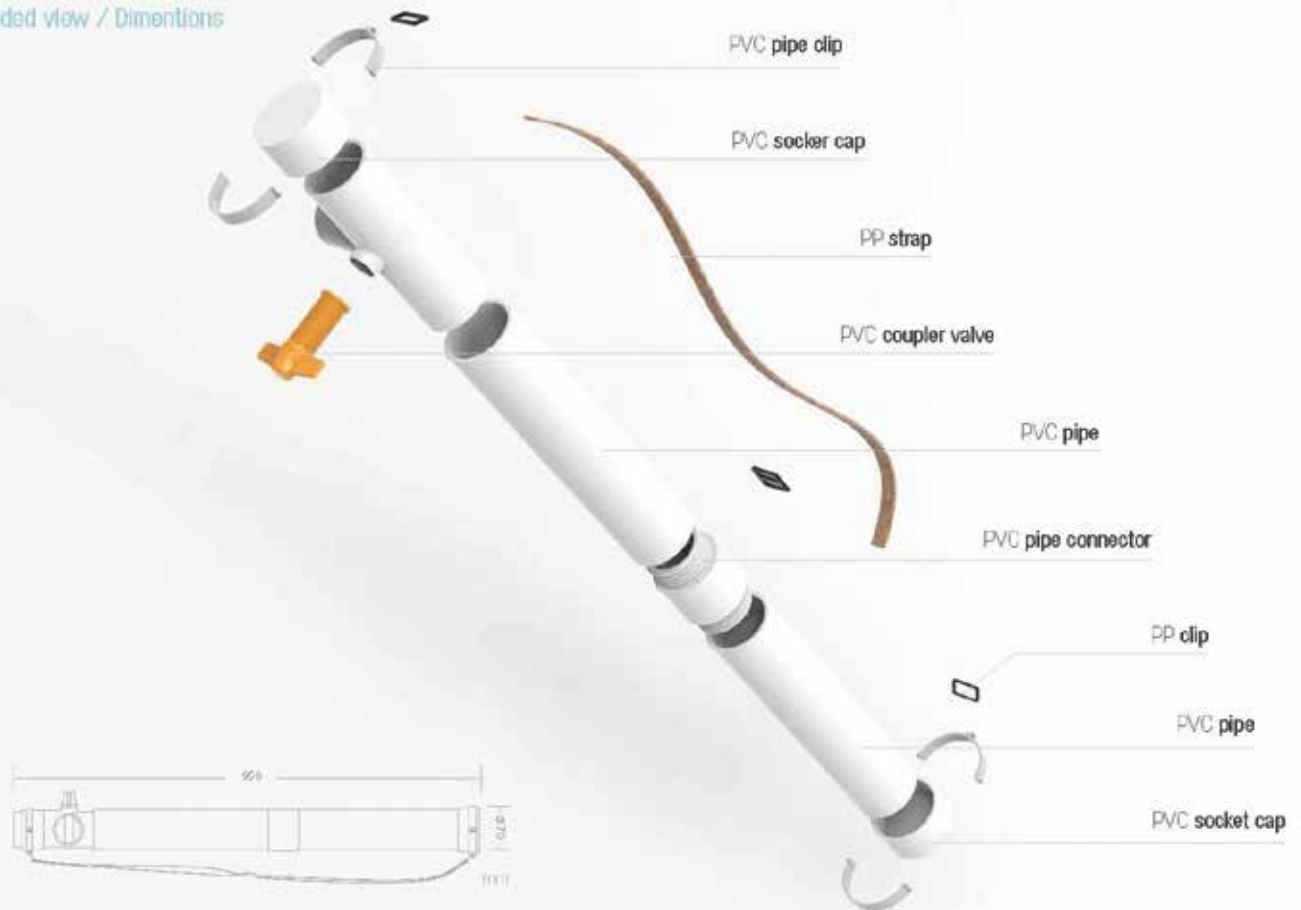
<https://www.who.int/news-room/fact-sheets/detail/drink-water>



YUNA

Designed by Karen Silva

Exploded view / Dimensions



Q. WHAT MADE YOU ENTER THE COMPETITION?

I was motivated by my University tutor. What attracts me the most was the idea of giving to pvc parts a new use in a world where it is very important to reuse products and not waste them.

Q. WHAT INSPIRED YOUR DESIGN?

What inspired me was the variety in parts that PVC tubes have – pipes, coupler valve, pipe connector and socket pipes etc. I have been using it like Lego parts to create a full product.

Q. WHAT ARE YOUR NEXT STEPS?

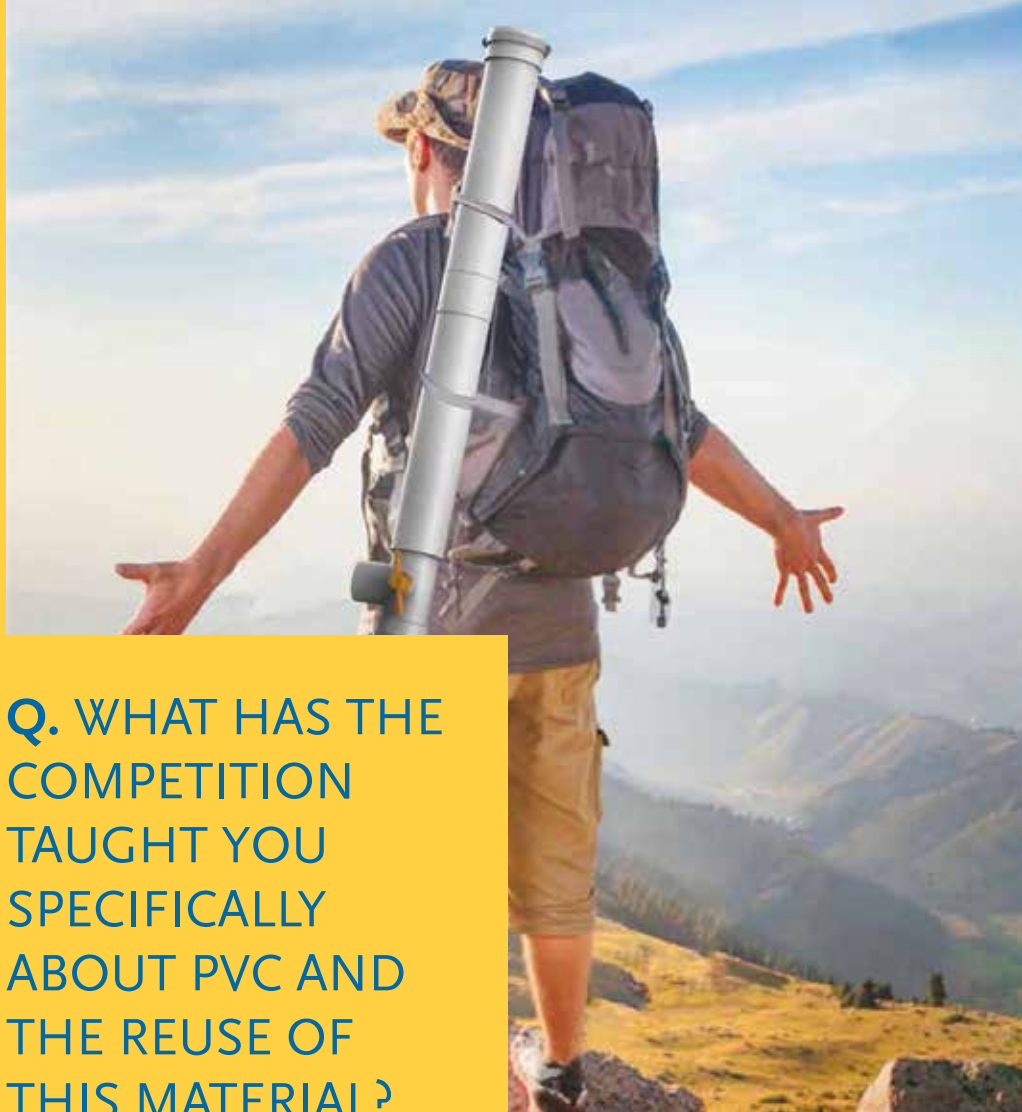
I would try to create a fully working prototype to see if my idea can work and be manufactured.

Q. WHAT HAS THE COMPETITION TAUGHT YOU SPECIFICALLY ABOUT PVC AND THE REUSE OF THIS MATERIAL?

What I learnt from the PVC competition was the importance of creating new opportunities for other people through reusable products. Reusing simple materials and giving them a second use can be extremely important for others in need. Products at the end of life in developed countries that would otherwise be waste can become valuable for third world countries.

CONTACT

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2nd PLACE

Kristen Tapping TECTUM

Kristen is a Design Engineer passionate about making sustainability profitable through innovative materials, renewable energy and effective thermal management systems. Currently enrolled at London South Bank University studying Product Design, Kristen took a

year away designing automotive interiors at Grupo Antolin, a Spanish Tier 1 automotive interior manufacturer. Highly involved in design competitions, Kristen has entered concepts ranging from design for disabilities to better planet packaging.

Bio and Q&A

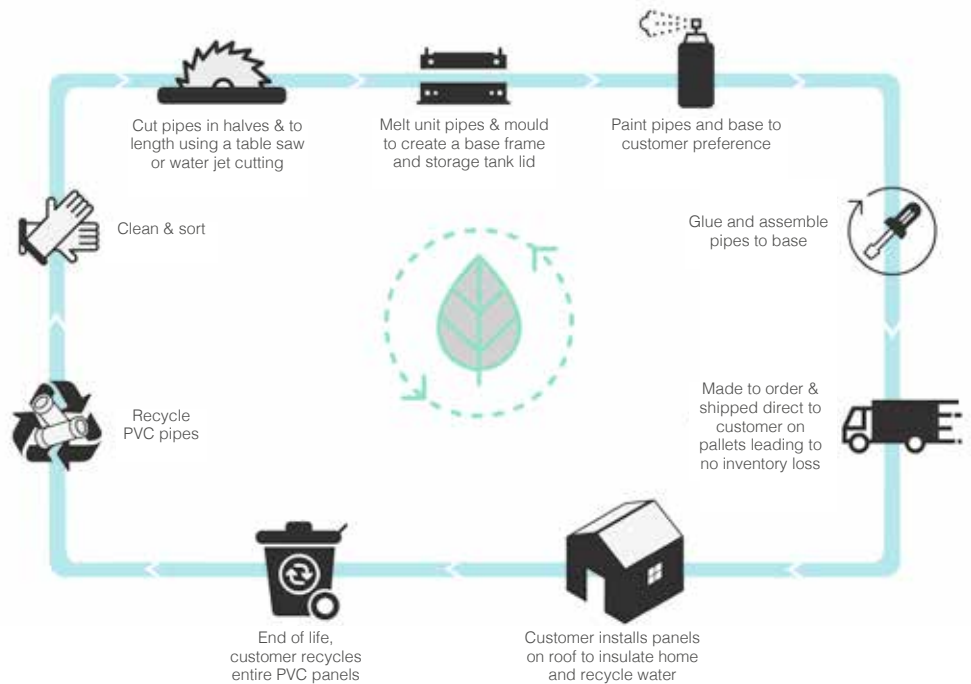
Q. CAN YOU BRIEFLY TELL US ABOUT YOUR DESIGN ENTRY?

My design entry, Tectum, creates insulating roofs using recycled PVC pipes. The pipes are cut in half and staggered in opposite directions to deflect water into a gutter and water storage container, both made of recycled PVC pipes and joinery. The pipes are pre-assembled onto panels to make installation faster and more cost effective. Tectum is an ideal solution for low income housing, farms, and industrial complexes.

Q. WHAT MADE YOU ENTER THE COMPETITION?

Our professor Robin Jones, Head of EPD at LSBU, sent it to us and I thought it was a great challenge for a functional concept.





Q. WHAT INSPIRED YOUR DESIGN?

Well I started off thinking of using the pipes as roof solar pipes to heat water in 3rd world countries, but the technicalities of how to move the hot vs cold water around without electricity worried me. Instead I simplified my idea to make insulating roofs that collect water for grey applications. With roofs being so expensive to make and needing replacement every decade, a cost effective solution would fit many sectors well.

Q. WHAT ARE YOUR NEXT STEPS?

I am currently on placement designing car interiors in Spain. From winning a previous competition, I have pending a placement at Cerebra In Wales to design prototype equipment for disabled people. Next I have to finish school and then I would love to work on functional products that help sectors and populations in need.

Q. WHAT HAS THE COMPETITION TAUGHT YOU SPECIFICALLY ABOUT PVC AND THE REUSE OF THIS MATERIAL?

Since PVC is extremely durable and versatile in function, when designing a product using it one should plan out a second life scenario for when it is going to be discarded. Reusing simple materials and given them to second use can become extremely important for others in need. Products that for developed countries are waste for third world countries become valuable.

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3rd PLACE

Helen Benz

**MENSTRUAL
CUP SANITISER**

Helene is currently doing her Master's in Service Design at the Royal College of Art in London. After graduating from Stanford in 2015 with a BA in Science, Technology & Society, she worked as a financial associate at Silicon Bank and then pursued UX design for two years in Austin, Texas. She designs to positively impact the lives of others, by democratizing resources, facilitating trust, and constantly considering ethical implications. She has worked in diverse sectors through projects with Facebook, Telefonica, the City of Bradford, and InHouse Records, to name a few.

Bio and Q&A

Q. CAN YOU BRIEFLY TELL US ABOUT YOUR DESIGN ENTRY?

Nari is a menstrual cup sanitiser for women in the developing world -- helping reduce infections from cleaning with contaminated water and making zero-waste sanitation available to a new market of women.





Q. WHAT MADE YOU ENTER THE COMPETITION?

After reading about the competition in an RCA newsletter, we felt the PVC Redesigned competition was the perfect opportunity to highlight Nari's circular and accessible design -- using standard size PVC piping for the body of the device.

Q. WHAT INSPIRED YOUR DESIGN?

Our project brief was initially created through RCA's Grand Challenge and we designed to solve issues related to social and economic equality.

Q. WHAT ARE YOUR NEXT STEPS?

Helene and her teammate, Malvika, are currently developing and taking Nari to market.

FILTER ALTERNATIVES

CLAY



30,000 litres

ACTIVATED CHARCOAL



100 litres

HOLLOW FIBRES



10,000 litres

Q. WHAT HAS THE COMPETITION TAUGHT YOU SPECIFICALLY ABOUT PVC AND THE REUSE OF THIS MATERIAL?

For Nari, we were so focused on the sterilisation of the material. Since PVC can't be boiled, we had to come up with a creative way to sanitise it as a product.

CONTACT

www.helenebenz.com/



FURTHER INFORMATION

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visit: [https://www.bpf.co.uk/
Sustainability/designing-in-a-
circular-economy-with-pvc.aspx](https://www.bpf.co.uk/Sustainability/designing-in-a-circular-economy-with-pvc.aspx)