



CIRC4LIFE

CIRCULAR BUSINESS MODEL -
CO-CREATION OF PRODUCTS

Presented by [...]
[Date]



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 776503

Basic information about CIRC4Life



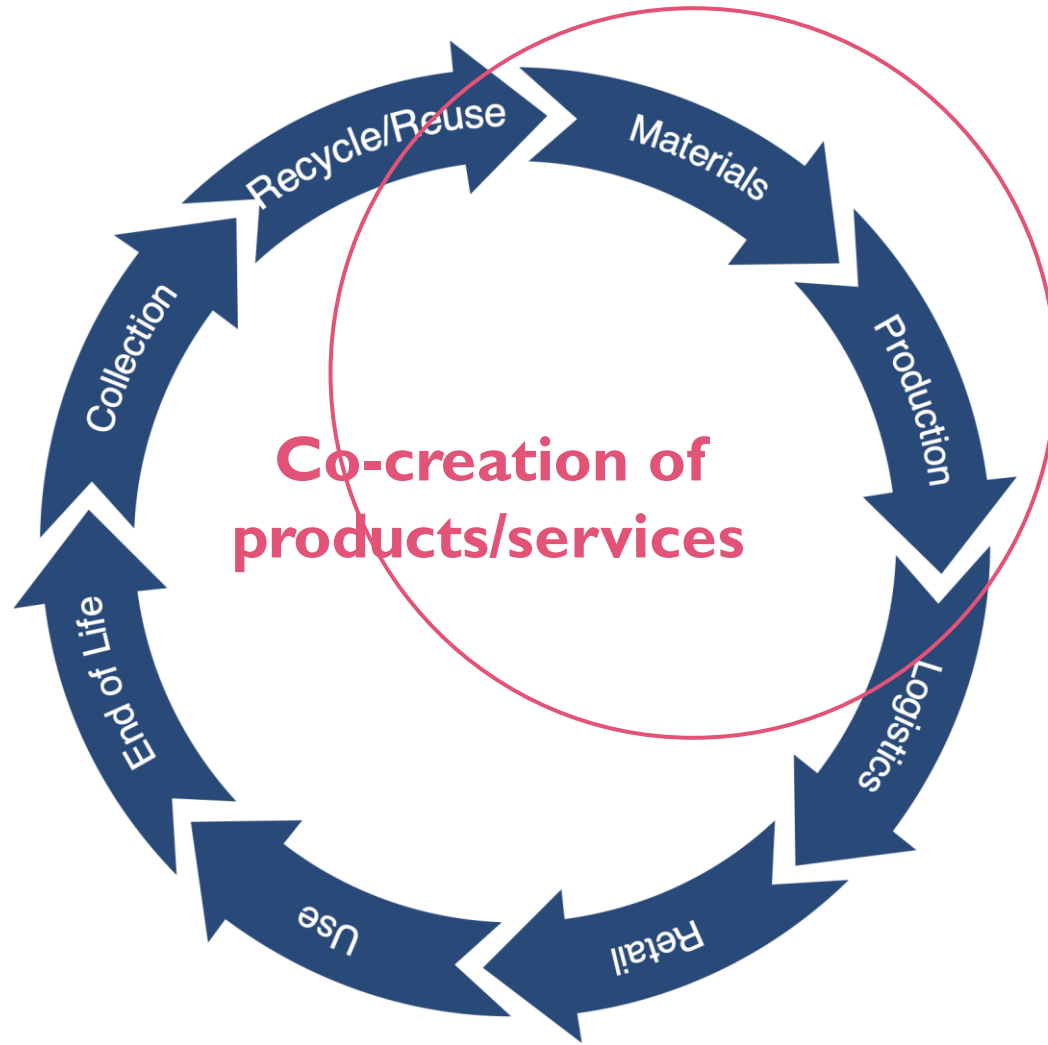
- CIRC4Life is an international collaborative innovation project (May 2018 until April 2021) with the aim to develop and implement a circular economy approach for sustainable products and services through their value and supply chains.
- Coordinator Nottingham Trent University
- Partner organisations

Enviro Data (ENV), Jonathan Michael Smith (JS), Kosnic Lighting Limited (KOS), Centre of Research for Energy Resources and Consumption (CIR), European EPC Competence Center GmbH (EECC), The Institute for Ecology of Industrial Areas (IETU), RISE IVF AB (SWE), Make Mothers Matter (MMM), ONA PRODUCT (ONA), INDUMETAL Recycling (IND), GSI Germany GMBH (GSI G), Laurea University of Applied Science (LAU), Center for European Policy Studies (CEPS), Institute of Communication and Computer Systems (ICCS), Recyclia (REC), S.A.T. Alia (ALIA)

- Content specific for this module tool produced by



CO-CREATION OF PRODUCTS/SERVICES



Key tools and service

- Eco-cost approach
- Data mining technology for online consumer review
- *Example: Leasing service for industrial lighting; Taking back scheme for End of life domestic lightings.*

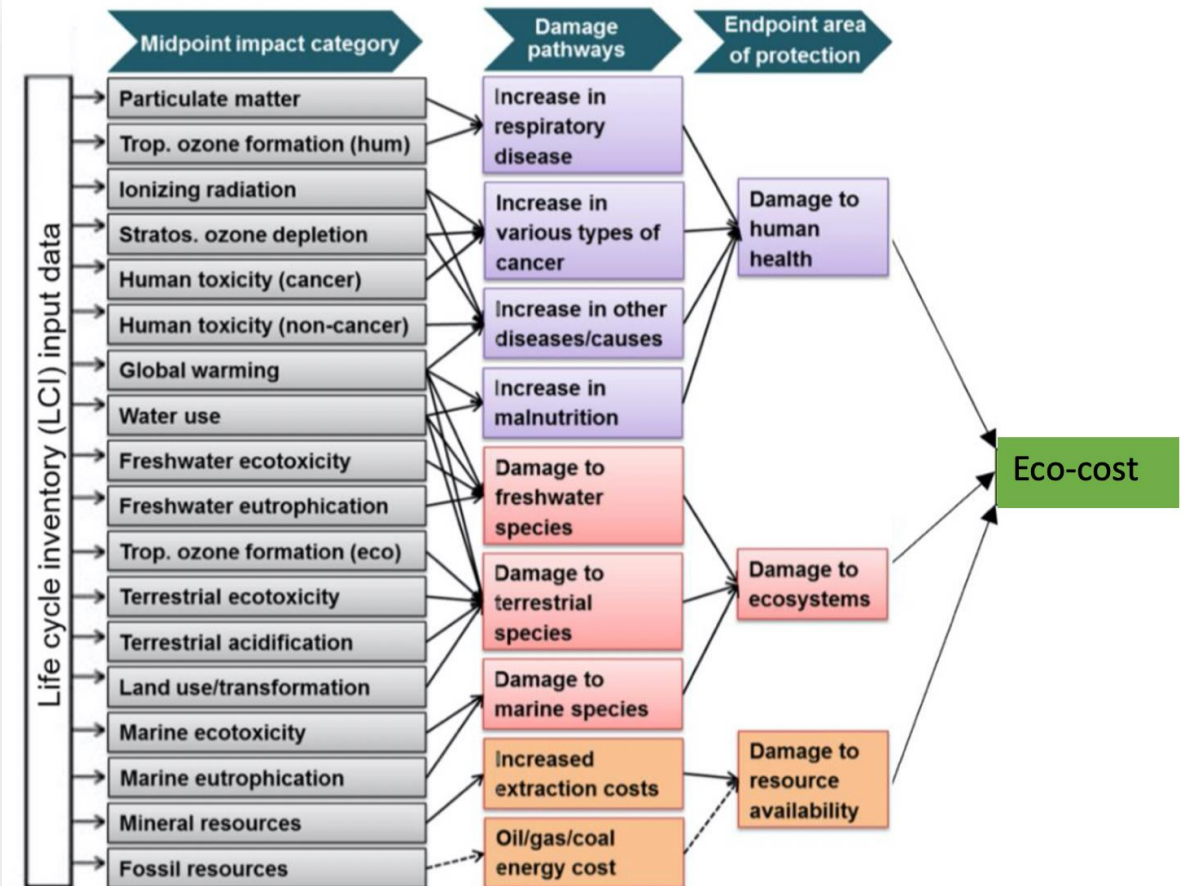
Key benefits

- Measure and record the eco-impacts of the product life cycle
- Identify consumer preferences and apply into product design specification
- Prolong product life span, and easy to recycle/reuse

ECO-COST APPROACH - VALUE



- The eco-cost is a cumulative value, which accounts for an aggregate of the ecological impacts throughout the product life cycle.
- Eco-cost value is obtained via utilising the method of life cycle impact assessment (LCIA).
- One of the most commonly used LCIA methods is ReCiPe, which applies seventeen midpoints and three endpoints to assess the impact of product.



ECO-COST APPROACH – APPLICATION

Eco-account



Eco-shopping

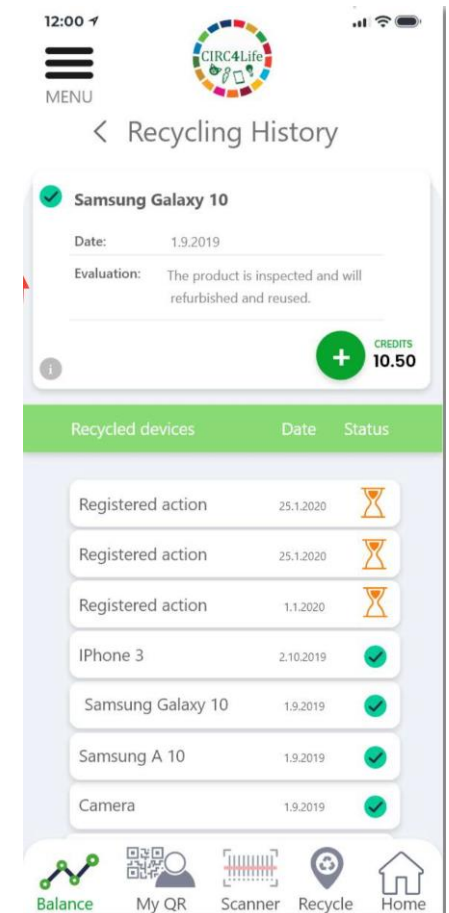


Eco-shopping



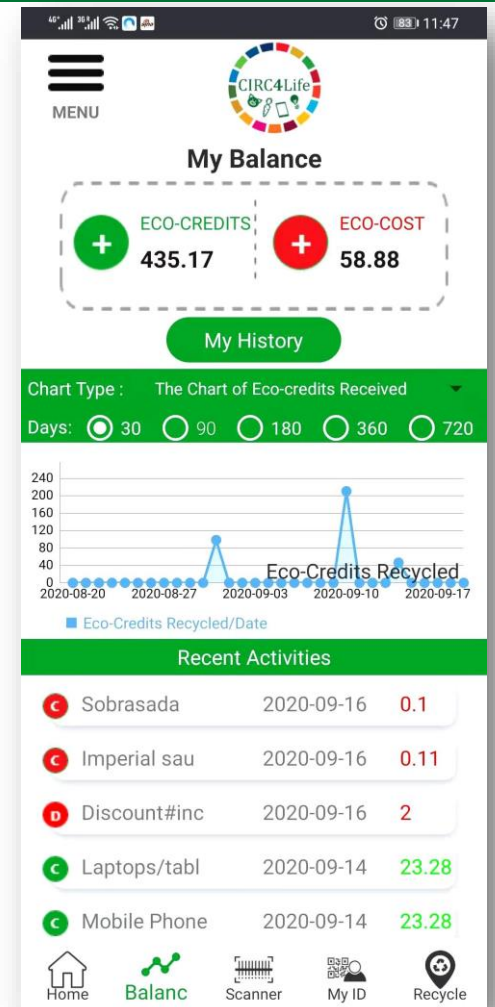
ECO-CREDIT

- Eco-credit, which is used to credit the customer's positive behaviour for their longer-time use, and their sorting process for later recycling or reuse of the products.
- Eco-credit value could be higher than Eco-point value due to longer use time, and hence. The eco-credits are calculated based on the eco-points).

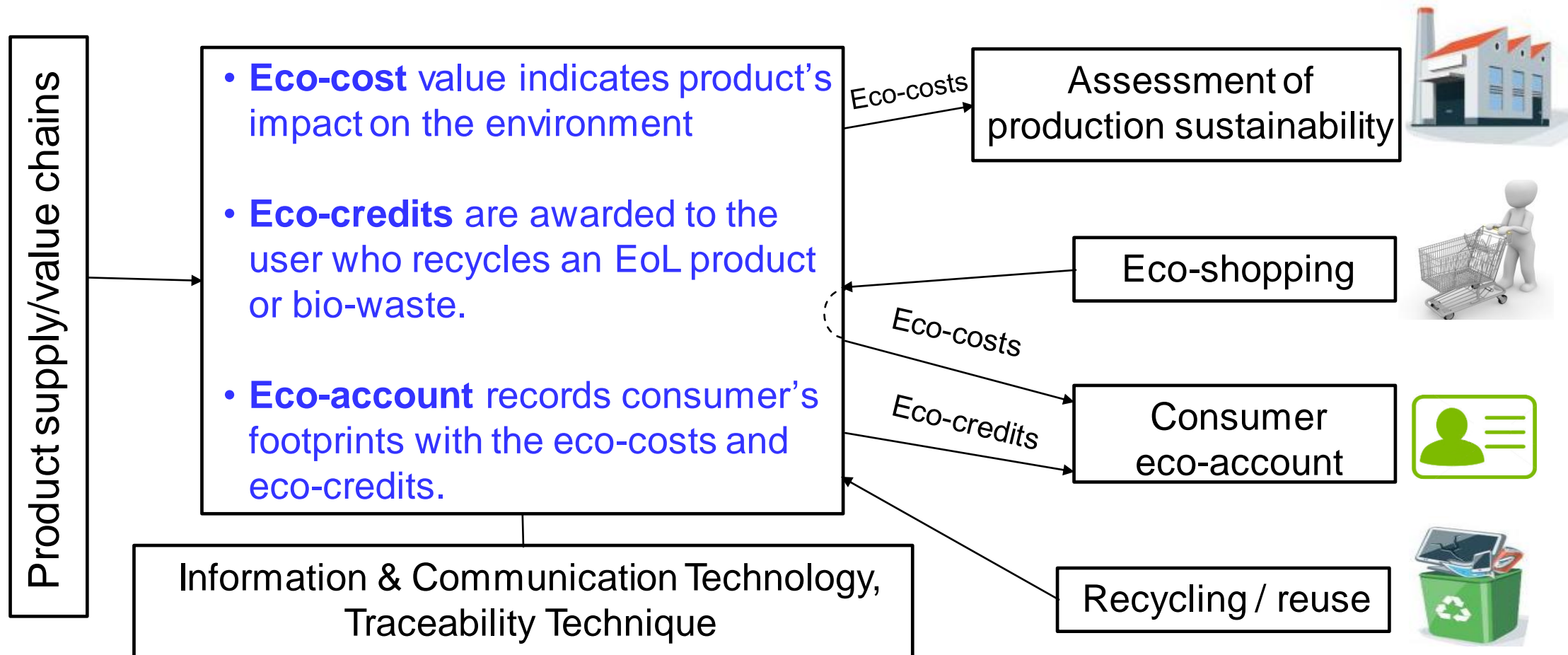


ECO-COST AND ECO-CREDITVALUE

Products	eco-costs (via purchasing)	eco-credits earned (via use and recycling/reuse)	eco-balance (use eco-credits minus eco-costs)
book	9	11	2
computer	18	13	-5
Total	27	24	-3



ECO-ACCOUNTING PLATFORM





DATA MINING FOR ONLINE CUSTOMER REVIEW

Select Target Product

Establish Analysis Objectives

Mining Online Reviews

Select Online Reviews

Texture Processing

Compose PDS

Customer Requirement Mining System

Welcome! admin

Task List Create Task

Title:

Creator: Type:

starttime: : finishtime: :

Theme:

Target:

Subject: Scheme:

reserved wordlib:

stoped wordlib:

ambiguity wordlib:

tools ☐ Gephi ☐ Cormap

Task Manage Wordlib Manag Subject Manage

Classic Mortadella Customer Requirement Mining

Theme: Classic Mortadella Customer Requirement Mining

Target: Classic Mortadella Customer Requirement Mining

State: UNDERWAY

Subject: Classic Mortadella

- sodium nitrite contains. Very taste but unfortunately contains sodium nitrate. Nitrite can damage cells and also morph into molecules that cause cancer(2stars[Subject],14:46:57)
- way too fatty. I understand where people are coming from about the saltiness...but they are mortadella after all...so I'd thought I would still try them. being a celiac I struggle to find gluten free mortadella. these ones are way too fatty(2stars[Subject],14:47:05)
- Tasteless. This is a very bland type of cooked sausage, similar to German extrawurst but containing much more fat.(2stars[Subject],14:47:15)
- Don't like it. Won't buy it again. Awful smell. The organic mortadella is far better taste and smell(2stars[Subject],14:47:21)
- Too much plastic in our society. I think it is great to have reusable bags in order to reduce waste as some people said before. However, I think that it is necessary to go deeper and try to reduce the plastic use for packaging these products.(3stars[Subject],14:47:59)
- Too greasy. I find this product too greasy. I would recommend to do a variety of mortadella less greasy for people like me.(3stars[Subject],14:48:12)
- seem to be a bit too greasy. Very tasty, had them on three separate occasions separated by ten days. On the day after eating these tasty things, I did not feel well. I tried, as I said, three times but no.(2stars[Subject],14:48:22)
- Contains Sodium Nitrite. Sodium nitrite is linked with increased cancer risk. Delicious but not that good(3stars[Subject],14:48:38)
- highly spiced sausage. I personally found it too highly spiced - tasted to us more like a black version of a haggis, rather than a black pudding.(3stars[Subject],14:48:44)
- This is a really nice sausage but it didn't last that long in my fridge.. This is a really nice sausage but it didn't last that long in my fridge.

submit

Subjects

- 3stars
- 2stars
- 4 stars
- 5 stars
- 1stars

Network Analysis

20180826 14:59:10

Cormap

20180826 15:06:17

DATA MINING FOR ONLINE CUSTOMER REVIEW – LIGHTING EXAMPLE

Word cloud of consumer preferences extracted from reviews and workshops:

- Eye spare
- instruction
- some
- port
- colour
- discount
- selection
- part
- USB
- broken
- buy
- recycle
- lamp
- trade
- charging
- old
- change
- energy
- video
- protection
- information
- temperature
- saving
- sustainable

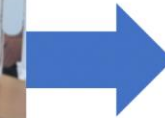
Consumer preferences
through
mining their reviews
and workshops



Prototype



Consumers feedback via
Workshop and focus group



ona[®]



Improved version

NEW CIRCULAR BUSINESS OPPORTUNITY - LEASING SERVICE FOR INDUSTRIAL LIGHTING



■ Survey results - Leasing service for industrial lighting



More than **57%** responses think this service is important

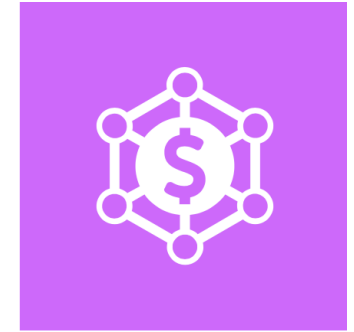


90% responses show that their own company is doing the replacement work when the lighting product goes faulty



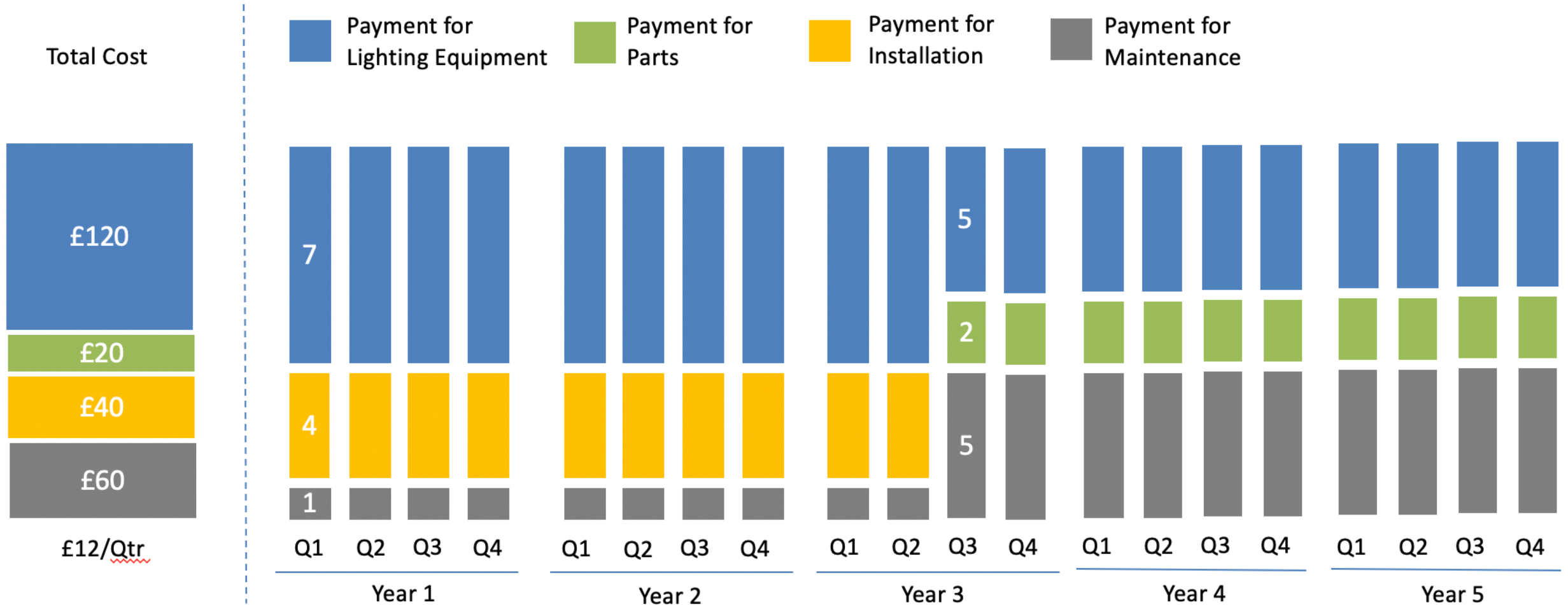
Interested services (**42%**):

- Intelligent usage and energy analytics via IoT solutions
- One service provider provides holistic solution



A flat rate payment plan is preferred (**71.43%**).

LEASING SERVICE FOR INDUSTRIAL LIGHTING - PAYBACK PLAN



LEASING SERVICE FOR INDUSTRIAL LIGHTING

- COMPARISON OF COSTS (UK TARIFF)

	Fluorescent (existing installation)	LED (new installation)
Energy Consumption:	1,350,000 kWh	485,000 kWh
Energy Cost (7.9p per kWh):	£106,650	£38,315
Maintenance Costs:	£5,500	£0
Fittings and Installation: (repaid through lease)	£0	£53,000
Total Costs:	£112,150	£91,315
Total Savings:		£20,835



WORKSHOP

USE ECO-POINT APPROACH TO
IMPROVE COMPANY
SUSTAINABILITY

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WORKSHOP AIM

- Understand what eco-cost value mean to companies/consumers.
- Knowledge about the main environmental impact contributors.

EXAMPLES FOR ECO-COST VALUES

Product	Unit	eco-cost value (Points)	Note
domestic LED lighting	per luminaire	17 Pts	6.7w per luminaire, 40,000 hours life span
industrial LED lighting	per luminaire	120 Pts	100w per luminaire, 40,000 hours life span
organic potato	1 kg	0.33 Pts	0.05 Pts, per potato (approx. 0.15kg)
pork sausage	1 kg	0.43 Pts	0.1075 Pts per 0.25kg (the weight of the product)
pork loin	1 kg	0.57 Pts	0.5130 Pts per 0.9kg (the weight of the product)



WORKSHOP STRUCTURE

Individual/group work :

- Pick one product manufactured from your company, to estimate its eco-point value based on previous slide.
- Draw a simplified flowchart describing the manufacturing process/flow.
- Highlight the main manufacturing procedures/materials that contribute environmental burden.
- Mark the possible impact contribution percentage associated with those procedures/materials.

WORKSHOP ASSIGNMENT

Open questions:

- Apart from the energy consumption, what is the major impact contributor for the product eco-cost value?
- Discuss the alternative materials or manufacturing technologies that can mitigate the overall eco-cost value.
- Does the mitigating solution cause additional environmental burden that may be neglected?

WORKSHOP CONCLUSIONS



- [To add during or after the workshop]



You can find CIRC4Life app from Google Play, please feel free to share your feedback with us.

THANKS





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References



■ TEXT