LPA
LIGHTING AND ENERGY SOLUTIONS

Sustainability Pathway
PRODUCT & SERVICES

Overview

There are many opinions and approaches to sustainability in the lighting industry. LPA believes that for the lighting to be sustainable - the entire life cycle of a product must be considered from product concept through production, project design, operation and end of life.

The purpose of this document is to provide an overview of the key sustainability aspects and initiatives of LPA Lighting & Energy Solutions (part of LPA Energy Group) products that were incorporated into the products and lighting design and services.

Our Framework and Approach

PLANET

Be a leader for decarbonisation by helping our clients through their sustainability, climate, and energy transformations.

Key Objectives

- Reduce environmental impact of our products, services and operations
- Enable our customers to reduce costs and their carbon footprint

PEOPLE

Build a positive future for our employees and across the supply chain by promoting inclusive workplace, ethical supply chain and people's development.

Key Objectives

- Enhance organisational performance through a more diverse, equitable and inclusive culture
- Give preference to suppliers who demonstrate high ethical standards
- Invest in improving health and safety and wellbeing

PERFORMANCE

Set standards and processes that make a measurable difference to our business, customers and across the supply chain.

Key Objectives

- Optimise our operations and drive positive outcomes
- Continue evolve our services by making data-driven decisions
- Continue invest in business sustainability performance, systems, policies and training

Long-term Business Sustainability

We are focused on sustainability in our own operations just as much as on providing our customers with products that increase sustainability in their business.

Our Carbon Emissions

We have commenced our sustainable journey by initiating the implementation of our GHG Scope 1 and 3 (downstream) emission calculation and reduction strategies, while simultaneously taking a significant step toward environmental responsibility by offsetting our GHG Scope 2 emissions through the adoption of green energy in our Australian offices in Melbourne and Sydney and Oxford, United Kingdom office.

CARBON TRUST

VERIFIED CO₂e FOOTPRINT

The carbon footprint of this product is reducing in line with COMPANY NAME'S Net Zero target by YYYY.

Learn more at clientwebsite.com carbontrust.com/label

Our Sustainability Pathways

Drive sustainable business growth and expand global business Scope 1, 2 and 3 greenhouse gas monitoring, measurement and reduction strategies.

Continue to innovate and see growth in our products' sustainability pathway.

See more in product section.

Expand our services profile to support sustainability for both our business and clients.

See more in service section.

Achievements

Over the past 18 months, we have been driving our market-leading position with credentials from leading organisations within the sustainability reporting space.

ISO 14001 Environment Management Certification

In 2022, LPA Energy Group achieved ISO 14001 certification and has developed a standardised approach to managing an organisation with a sustainable focus.

COMPASS ASSURANCE SERVICES · ISO 14001
ISO 14001 ENVIRONMENT ✓

EcoVadis Sustainability Rating

In 2023, LPA Lighting achieved a silver medal in the recent evaluation conducted by EcoVadis, the leading provider of corporate sustainability ratings worldwide. This internationally recognised award signifies our achievement of a score within the top 5% among all companies assessed in our category.

SILVER
2023
ecovadis
Sustainability Rating

ISO 45001 Occupational Health & Safety Management Certification

In 2022, LPA Energy Group achieved ISO 45001 certification and uses the standard to manage and improve workplace Health & Safety.

COMPASS ASSURANCE SERVICES · ISO 45001
ISO 45001 SAFETY ✓

Environmental Product Declarations (EPD)

We are expanding our portfolio of EPD's to cover 8 product families. EPD provides environmental information about the lifecycle environmental impact of a product.

EPD
ENVIRONMENTAL PRODUCT DECLARATION

Our Products & Services

We provide services that drive innovative, functional, adaptable and efficient solutions, assisting our clients in building energy optimisation.

LPA Energy Group leads R&D and practical implementation in both lighting and resource optimisation technology domains. We offer systems that use data, automation and intelligence to assist in managing energy consumption from smart lighting and multiple other consumers enabling data-driven decisions using task and project-appropriate multi-layered, coordinated systems such as local automated controls and cloud-based software such as our WideSky platform.

LIGHTING PRODUCTS

LPA has provided lighting solutions across the globe for over 30 years. Our team have the knowledge and experience to deliver projects at any scale, in any location around the world

LIGHTING DESIGN

Our globally distributed teams of expert designers provide customised and impactful solutions compliant with local codes that consider zones, layers and fixtures to achieve the best possible lighting outcome whilst minimizing maintenance and energy consumption.

SMART LIGHTING CONTROLS

We partner with 3rd parties to offer full end-to-end Smart Lighting Systems providing our clients with convenient ways of automating operations for optimal lighting results technologies such as Casambi, DALI, KNX provide freedom of choice, legacy compatibility and future-proof cyber security along with easy commissioning and operation.

DATA MONITORING & MANAGEMENT SYSTEMS

Merging smart lighting systems with our WideSky software management platform brings a new approach to the integration of all aspects of smart building data.

WideSky monitors, analyses and reports on energy usage, the indoor environment, and space utilisation in real-time giving you visibility, insight, and control over the performance of your working environment.

Product

The linear economy is a thing of the past, we are reimagining the life cycle of our products.

LPA products are designed and manufactured to meet the needs of each project, but no less attention is paid to product sustainability. We consider every aspect of our products from materials to use, use and maintenance to end-of-life disposal.

In addition, we uphold our commitment to environmental responsibility through the following measures:

1: Utilisation of CIBSE TM65 methodology for calculating embodied carbon emissions.

2: Provision of Environmental Product Declarations (EPDs) based on Product Life Cycle Assessments (LCAs).

* It's important to note that the agreement for EPDs as part of project requirements must be mutually established between LPA and the client.

Product design:
- Focus on durability, longevity and repairability

Material circularity:
- Reduction of virgin materials
- Reduction of plastic in product packaging

LED technology:
- Energy efficiency optimisation
- Energy quality

Product R&D Manufacturing

Materials Acquisition

Product Distribution

End-of-Life

Installation Use Maintenance

Final Disposal: Recycle

Repair & Reuse

Lighting Design

Smart Lighting Controls & WideSky

End-of-life treatment:
- Responsible disposal of lighting product
- Compliance with WEEE regulation

Re-Light Program:
- Re-purposing of used lighting products
- Redirecting from landfill

Product performance optimisation:
- Sustainable lighting design
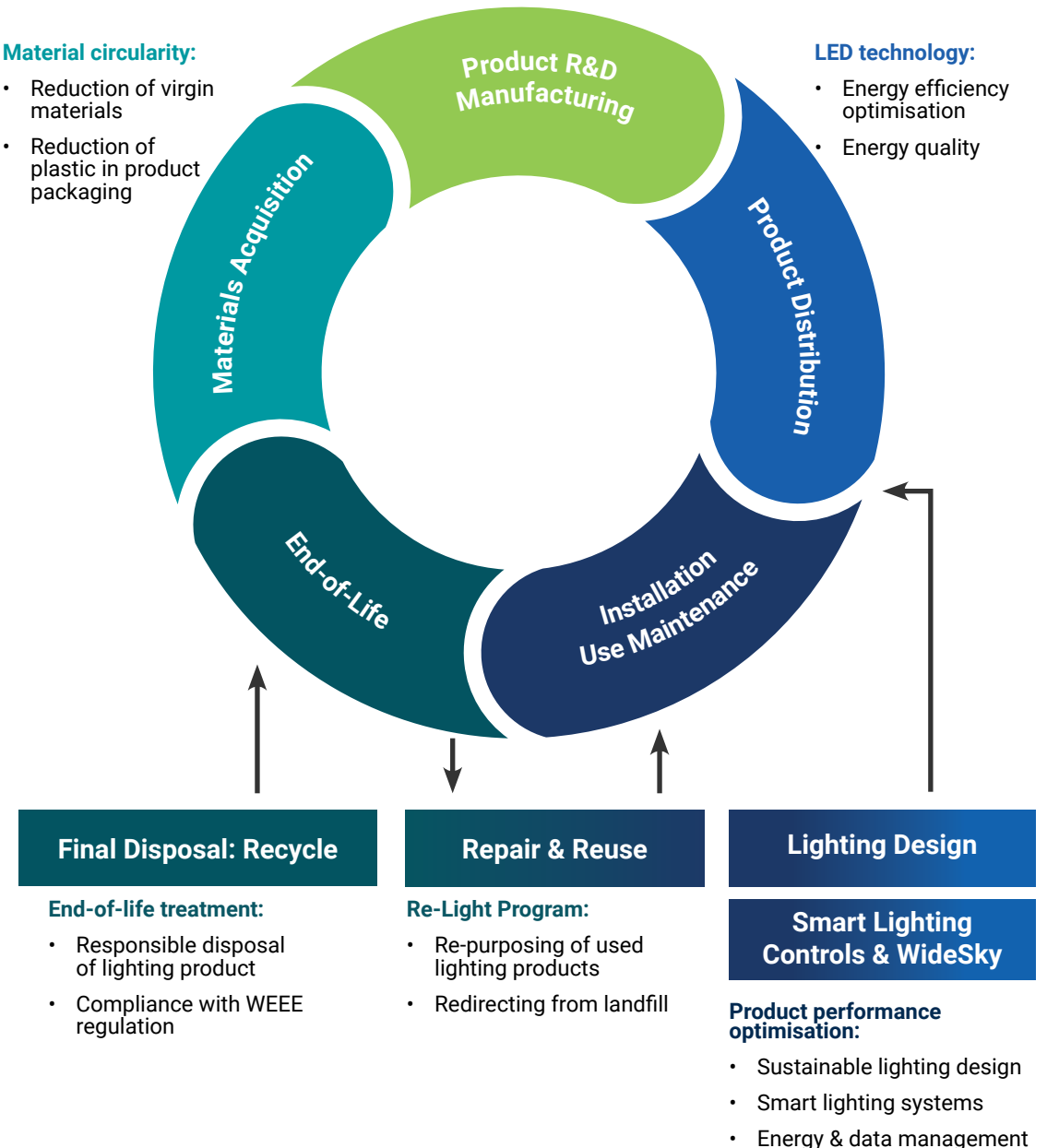- Smart lighting systems
- Energy & data management

Figure 1 LPA Circular Product & Service Diagram

Product

The linear economy is a thing of the past, we are reimagining the life cycle of our products.

We have been collaborating with our suppliers to incorporate every aspect of the circular economy into our product designs:

Up to 90% of recyclable materials

90% reduction of carbon in packaging

On target to improve product circularity for core range by 2025

Up to 50% LED efficacy increase

MATERIAL

We prioritise materials from renewable sources with a high recyclability rate to ensure that nothing goes to waste at the end of a product's life.

90% is the highest rating for recyclable materials in some of the main downlights and track lights, with the remainder made up of electronic components that can be recycled through the e-waste scheme.
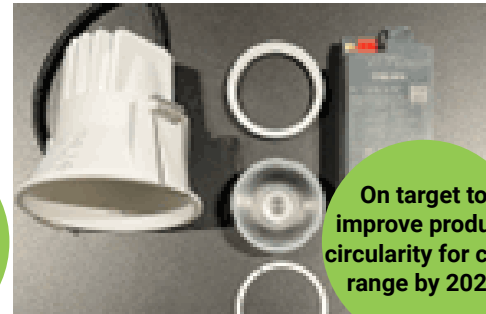
PACKAGING

100% of the core LPA product range comes in plastic-free packaging.

We have reduced the packaging carbon footprint by 90% by switching to paper packaging. What's more, all packaging is made of recycled paper and cardboard.

PRODUCT DESIGN

Standard LPA downlights and track lights are now designed to allow for easy upgrades or modifications. For instance, products are serviceable so it can be easily disassembled, have internal components replaced, changed accessories and eventually parts recycled.

We use CIBSE TM66: Circular Economy Assessment Methods to evaluate our product design and identify areas of improvement.

ENERGY EFFICIENCY

Today, we continue to focus on improved product design, with a particular emphasis on optimizing energy consumption and LED technology.

Reduction of energy consumption by reducing power (W) and improving LED efficacy (lm/W) contributes to reducing the carbon footprint of the product during the service phase.

Environmental Product Declaration

EPD®

EPDs (Environmental Product Declarations) tell the environmental story of a product throughout its life cycle in a clear, science-based, and transparent format, often compared to nutrition labels on food products.

At LPA, we utilise EPDs to shape our product sustainability strategy. For our clients, EPDs can help them obtain LCA credits in certification schemes such as LEED, BREEAM, Green Star, and others.

Starting in 2022, in collaboration with our suppliers, we initiated the process of collecting EPD data and analyzing each stage of our product life cycle, from material selection to recycling. To guide our efforts in reducing the environmental impact, we developed a Product Sustainability Heatmap, focusing on strategies for each life cycle stage.

We learned that the most impact happens after the products have left our hands. How the customer uses the product is the main contributor to the total energy consumption associated with a product when seen over its entire lifetime.

By providing EPDs and informing our customers about the energy consumption of our products, we aim to guide them in choosing not only our products but also services that promote efficient use, the longevity of our LPA luminaires, and the prevention of unnecessary energy wastage.

We have carefully selected eight product models for EPD assessment and are working towards ob-taining third-party verified EPDs by November 2023.
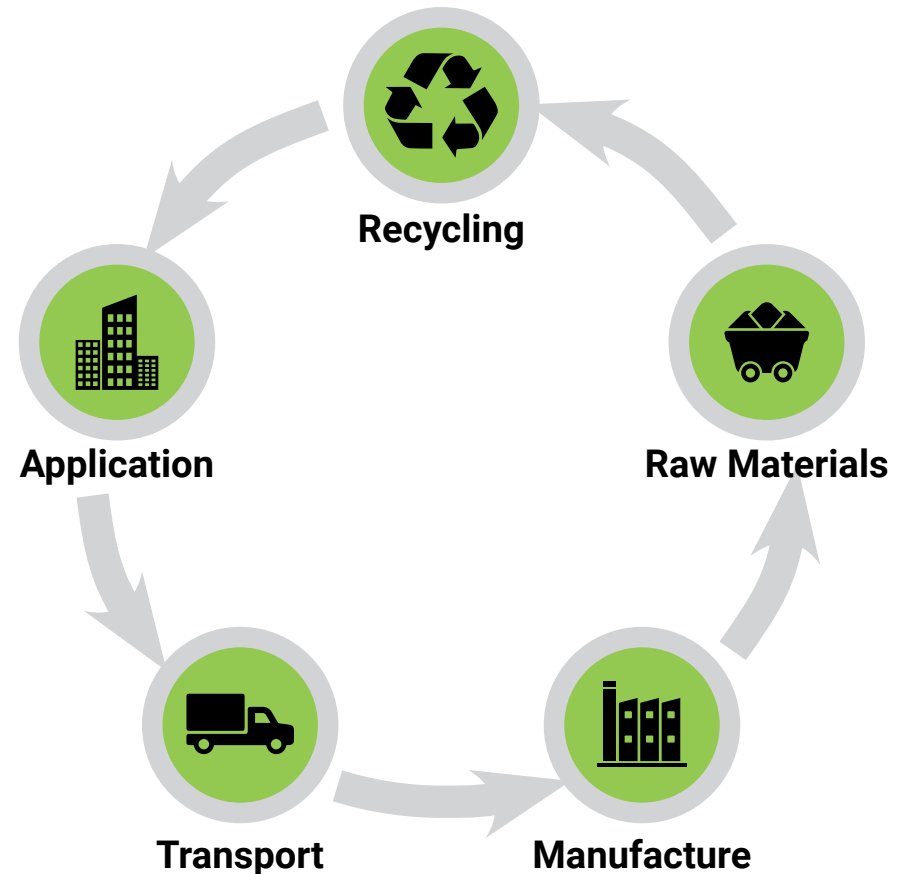
2022	2023 - Present	2023 – November
Data collection	Analysis of energy used in materials processing and manufacture processes, raw materials, logistics, application and end-of-life recycling	Verification of EPDs by third party accredited body, publish on International EPD® System

Recycling

Raw Materials

Manufacture

Transport

Application

RELIGHT

The circular economy does not end at the product supplier, it continues through the use phase of the product until the end of its life.

Both the product supplier and the consumer are responsible for closing the loop.

LPA is delighted to be offering a Re-Light program, a simple solution to repair, reuse, and recycle lighting products.

Additionally, we can quantify the carbon reduction impact by using CIBSE's TM65: Embodied Carbon Calculation and comparing products that undergo Re-Light refurbishment with brand new replacements of the same kind.

Learn More

REPAIR

REUSE

RECYCLE

Service

Service that enhances sustainability.

At LPA, we match a superior design with excellent technology to reduce the need for artificial lighting and decrease energy consumption in a building without compromising human experience or safety.

Our designs utilise:

- Natural Light: By considering the natural elements there is a way to deliver more efficient illumination and reduce energy consumption and support the physical and psychological well-being of people in space.

- Lighting Control: By integrating smart technologies, our design team can utilise lighting controls in individual zones, by implementing motion and occupancy sensors that contribute to reducing energy consumption.

- Visual Light Comfort: The design itself is meant to evoke feelings, interests, and emotions. Lighting is fundamental to showing or enhancing the experience. Our design team ensures compliance with the applicable technical local codes and client specifications regarding illumination levels, glare, obtrusive and spill light as well as energy density as a starting point. The "LPA Standards" always seek new ways to be more efficient and to ensure visual efficiency in delivering the client's ultimate objectives for the space.

1 LUX PLOT
   SCALE: NTS

2 PSEUDO COLOUR RENDER
   SCALE: NTS

3 RENDER
   SCALE: NTS

4 ISOMETRIC RENDER
   SCALE: NTS

1 RENDER
   SCALE: NTS

2 PSEUDO COLOUR RENDER
   SCALE: NTS

3 RENDER
   SCALE: NTS

4 PSEUDO COLOUR RENDER
   SCALE: NTS

Smart Lighting Controls

Smart lighting systems are a powerful tool for reducing energy demand and minimizing the environmental impact of buildings compared to traditional static systems.

There are two types of smart lighting systems:

- Traditional smart lighting systems: These systems utilize a network of cables that are hardwired to a centralized control unit. The central control unit manages the operation and control of the lights.

- Wireless mesh network smart lighting systems: In this type of system, each light has its own operating rules and instructions, without the need for a central control unit. The lights communicate with each other through a wireless mesh network.

Both types of systems can be connected to an independent data layer, such as the WideSky cloud. This integration allows for centralized data management and analysis, enhancing the functionality and efficiency of smart lighting systems.

At LPA, we collaborate with integration partners to carefully select the most suitable lighting control and management technology for each project, considering the budget and specific requirements. This allows us to seamlessly deliver outstanding lighting solutions, ranging from simple automation to highly complex dynamic lighting management.

Wide**Sky**

Proudly owned by LPA Energy Group, WideSky offers a wide range of solutions to customers in the commercial, industrial and energy sectors.

WideSky can unlock the value of energy, environmental and building data. Our team has decades of operational and information technology experience, coupled with our partner network, we can implement future-proofed, well-supported solutions tailored to your business on a global scale.

To understand the full concept of the benefits of the WideSky solution, LPA offers a workshop specifically tailored to your business

Learn More

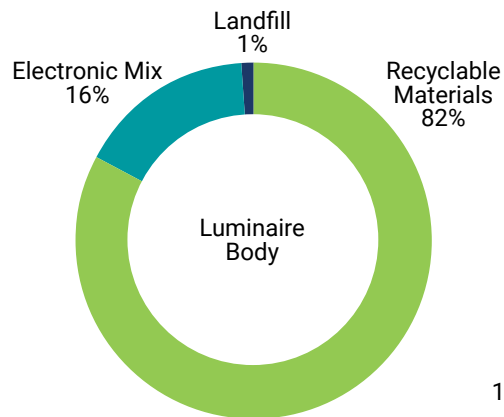# Product Sustainability Analysis

We will use the selected track light product range to identify improvements in product circularity and sustainability. We will provide a product comparison to a typical 3D-printed light fixture, followed by a discussion on biomaterials.
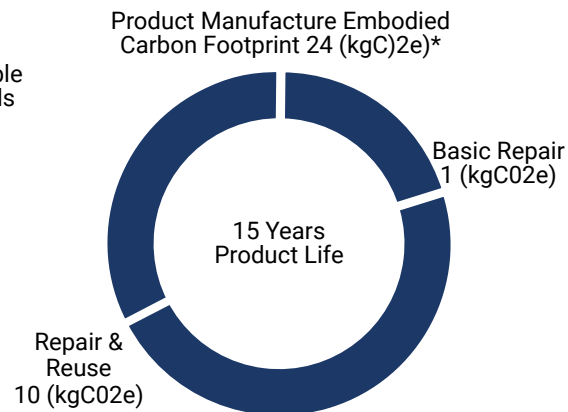
Product: ST-A536

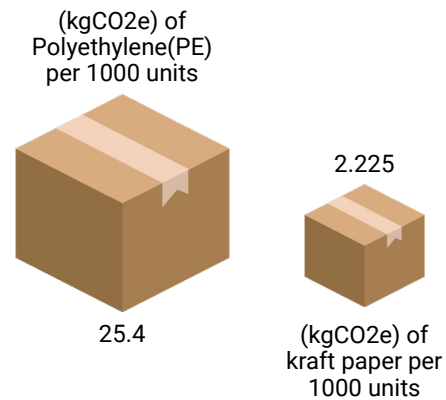**Product Description:** a typical track light made of aluminium and PC parts.
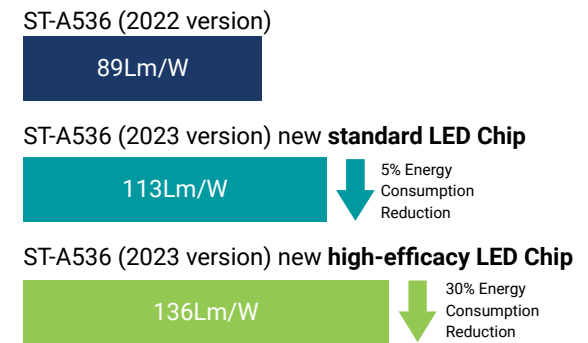
Material Analysis

Landfill 1%

Electronic Mix 16%

Recyclable Materials 82%

Luminaire Body

Carbon Footprint

Product Manufacture Embodied Carbon Footprint 24 (kgC)2e)*

Basic Repair 1 (kgC02e)

15 Years Product Life

Repair & Reuse 10 (kgC02e)

Packaging

(kgCO2e) of Polyethylene(PE) per 1000 units

2.225

25.4

(kgCO2e) of kraft paper per 1000 units

Energy Efficiency

ST-A536 (2022 version)

89Lm/W

ST-A536 (2023 version) new **standard LED Chip**

113Lm/W

5% Energy Consumption Reduction

ST-A536 (2023 version) new **high-efficacy LED Chip**
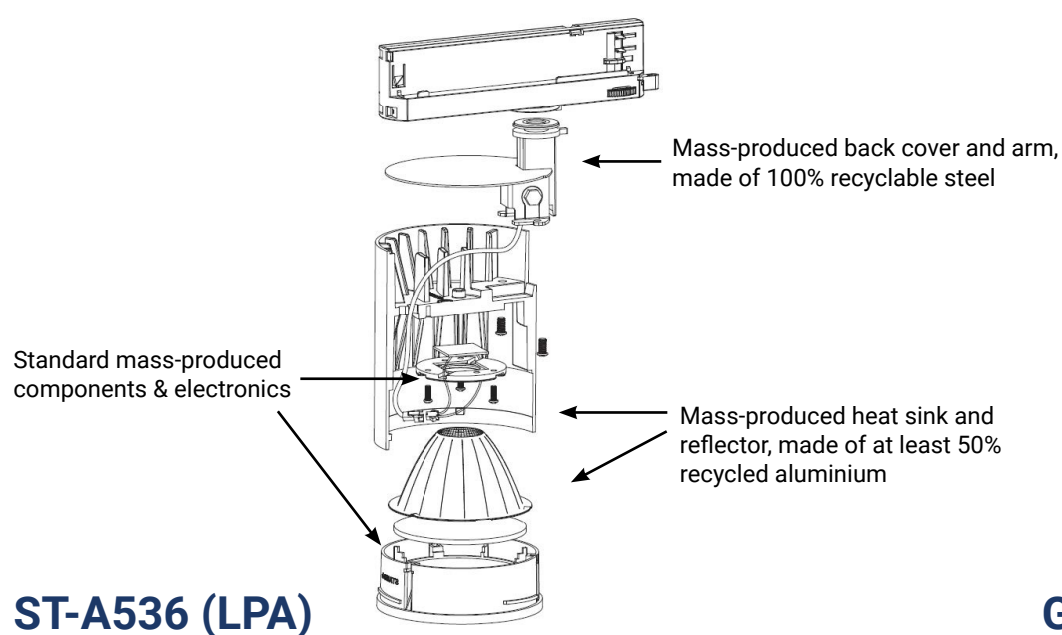
136Lm/W

30% Energy Consumption Reduction

The saving of choosing LPA Re-Light is 1500 kgCO22 per 100 products, this equates to carbon sequestered by 24.8 tree seedlings grown for 10 years**

Based on TM65: Basic Carbon Calculation
*** EPA Greenhouse Gas Equivalencies Calculator*

Product Anaylsis

Mass-produced back cover and arm, made of 100% recyclable steel

Standard mass-produced components & electronics

Mass-produced heat sink and reflector, made of at least 50% recycled aluminium

3D Printed Nonoilen components

3D Printed Greentec components

Standard mass-produced components & electronics

ST-A536 (LPA)

A standard ST-A536 is mass-manufactured and assembled using standard injection moulding, die-casting and assembly methods in-house. Fitting is made of 50% recycled materials, mainly aluminium components, 32% virgin materials such as plastic components and wiring, while the rest 18% is electronic mix.

At the end of the product's life, the product can be removed from general landfills by recycling under the WEEE waste scheme.

Key outtakes:

- Recyclable materials >82%
- Landfill only 1%
- Electronics require specialised recycling (WEEE)
- Can not be disposed of with general waste
- Lower cost

Generic 3D Printed Luminaire

The presented product uses biodegradable plastic materials commonly used for 3D printing. 3D printing can reduce inventory and logistics resources, and eliminate tooling for the same items, however, the process is substantially more energy-intensive per kg of finished product than mass-produced items using processes such as injection moulding, high-pressure die casting, and extrusion.

At the end of life, biodegradable materials must be recycled at dedicated facilities; otherwise, they will end up in landfills just like standard plastics.

Key outtakes:

- Recyclable materials >40%
- Biodegradable materials >30%
- Potential landfill approx. 20%
- Requires specialised recycling (bioplastics). Limited services
- Can not be disposed of with general waste
- Higher cost

Discussion

LPA Energy Group is excited about renewable resources and manufacturing technologies, and our WideSky team supports multiple clients operating in these industries. Our R&D team across all business sectors, from lighting to IoT, continuously tests and evaluates the potential environmental benefits of additive manufacturing coupled with decentralized production and biodegradable materials.

Renewable Materials vs Biodegradable

LPA recognizes the benefits of biodegradable materials but would like to emphasize the advantages of using recycled and easily recyclable materials too. We are confident that delivering significant and sustainable lifecycle benefits right now is best achieved through maximizing the use of recycled materials and selecting easily recyclable materials wherever technically feasible.

Delivering true circularity requires early-stage design decisions regarding materials, mechanical design, production methodology and location enabling both maximizing the useful product life and closing the loop at the end of that life. These decisions must not compromise product efficiency and thereby increase overall resource consumption.

3D Printing

The LPA team has been continuously using 3D printing in the design and production of prototypes. Our in-house resources design and produce FDM prototypes, custom tooling, assembly jigs, QA tools and even office fit-out components across the group.

LPA is offering a Re-Light program (repair and reuse) as part of the product design and development. We utilize specialized Additive Manufacturing service bureaus to manufacture special components for permanent installation using appropriate materials and 3D printing technologies.