Holistic and Sustainable Prosthetic Care
CIRCLEG is a Swiss-East African social enterprise, developing a holistic, planet-centred solution for the provision of appropriate lower-limb prosthetics. The Circleg prosthetic system is designed and engineered specifically for the needs of amputees and prosthetic and orthotic (P&O) technicians in low- to middle-income countries (LMICs). It will be manufactured close to the beneficiaries, in East Africa, from locally and readily available plastic resources, through innovative circular manufacturing processes. The vision of Circleg is to enable freedom of mobility for everyone.

Circleg improves accessibility and sustainability of quality prosthetics by designing and producing them based on principles of the circular economy. Circleg prosthetics are made of locally recycled post-consumer plastic, mixed with glass fibres for strength and durability. Their parts are injection molded and distributed to local hospitals and P&O centres, where they will be individually adjusted for each amputee. Broken parts can be exchanged and returned to the materials cycle, to be transformed into new prosthetics. Thus, Circleg produces quality prostheses and ensures their availability, while also promoting sustainable resource use.

42 million
amputees reside in low- to middle-income countries (LMICs).

~90%
of LMIC amputees either lack prostheses or have low-functionality devices which do not improve work and life prospects and are soon discarded, contributing to the plastic waste crisis.

Related UN Sustainable Development Goal
More information: un.org
The Julius Baer Foundation supports Circleg in bringing this circular model to East Africa, through co-funding the prosthetic’s final design and initial production stages, as well as the establishment of the Circleg East African Hub. The Hub, located in Kenya, will be the first of its kind, responsible for on-site manufacture, assembly, and training to manage quality and regional distribution of the Circleg prosthetic system.

**Freedom of Mobility and a Cleaner Environment for All**

Access to a functional prosthetic has a dramatic effect on an amputee’s life. Regaining mobility enables reintegration into society and community, improves amputees’ well-being, chances of employment productivity, health, intimacy, self-esteem and safety. Access to prosthetics also increases life expectancy and decreases likelihood of hospitalisation. Moreover, Circleg’s circular production design promotes sustainable resource use and reduces the negative impact of prosthetics on the environment.

The Circleg Hub model is designed to be replicable in other regions, including Western and Southern Africa, Latin America and Southeast Asia. By 2050, the already large global need for prosthetics is expected to double, alongside global plastic waste.

Circleg aims to tackle this issue by establishing sustainable production and distribution Hubs across the world that provide high quality prosthetic solutions to LMIC amputees.

**Facts and figures**

- 65% of the world’s 65 million amputees reside in LMICs, yet only 5–15% of them have access to prosthetics, due to the devices' unaffordability and an overall supply shortage.
- The African continent is home to 3.7 million lower-limb amputees, 20% of whom live in East Africa. More than 15,000 additional amputations are performed in East Africa annually.
- Locally provided prosthetics are functionally limited and seldom reliable. Because they do not satisfy user needs, they are often abandoned, contributing to the region’s mounting plastic waste problem.
- Existing prosthetic solutions are not fully recyclable and therefore do not follow principles of circular economy.
- In Nairobi alone, an estimated 2,400 tons of solid waste is generated every day; 20% of this waste is plastic.
- In Mombasa, a coastal city of over 1.2 million, 3.7 kg of plastic waste per capita enters the waterways annually.

By 2030, approximately 344,000 tonnes of polymers and plastics are expected to be consumed on the African continent, creating an urgent need to develop intelligent solutions for upcycling these materials.

For more information about Circleg, please visit: www.circleg.world

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1. AT2030, 2020, Prostheses Product Narrative
2. Ibid.
3. AT2030, 2020, Prostheses Product Narrative

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“The Circleg Prosthesis can revolutionise prosthetic care in Africa.”

Emmanuel Mayaka, Secretary General of the Kenyan National Association of Orthopedic Technologists