



**ENGINEERS
WITHOUT
BORDERS · NL**

2022 Annual Report

Engineers Without Borders, The Netherlands

Stichting Ingenieurs zonder Grenzen

CIC Rotterdam, Stationsplein 45, 4th floor

3013 AK Rotterdam, the Netherlands

Chamber of Commerce no. 65174275, ANBI: RSIN 856007638



A message from the ex-chairman



Dear EWB Community,

I hope this message finds you all in good health and high spirits. 2022 has been a year of resurgence and transformation for our organization, filled with challenges, achievements, and most importantly, the continued dedication of our incredible volunteers.

First and foremost, I would like to express my gratitude to Antonio Menezes, who guided EWB with exceptional leadership until the end of 2021. Building upon his legacy, I assumed the role of Chairman with a sense of great responsibility and enthusiasm.

In 2022, we overcame the clutches of the pandemic, as we witnessed the revival of project work and travel to target communities abroad, going back to our core mission of affecting change through engineering interventions. Additionally, we joyfully resumed face-to-face meetings, rekindling the spirit of collaboration that defines our community.

Early in 2022, we convened for a strategic brainstorming session with our dedicated volunteers. The insights gained from this exercise were invaluable, leading us to recognize the importance of streamlining our organizational structure. Embracing a flatter hierarchy, we reduced the frequency of virtual meetings and opened up existing meetings to a broader range of volunteers. This shift fostered inclusivity as the monthly Operational meetings became open to all volunteers.

One notable development was the establishment of the Structures portfolio, aimed at providing engineering and architectural support for social and community buildings. This expansion broadened our scope of impact and enhanced our ability to address the needs of diverse communities. Our Partnership team continued their tireless efforts in cultivating new relationships and nurturing existing ones, resulting in the addition of eleven new partners and an influx of 5000 euros in funding. For more detailed information, please refer to the Finance report.

It is also with immense gratitude that we bid farewell to our former Advisory Board members, Tjeerd Dierckxsens, Roel Tersteeg, and Maurits Ertsen. Their wisdom and guidance were invaluable assets to our organization. We warmly welcomed Petra Beris, Claire Hallewas, and Jelena Popovic as our new Advisory Board members, and we are excited about the fresh perspectives they bring.

In 2022, we successfully carried out two impactful project travels, namely the Nachali Girls Secondary School Project in Malawi and the Water4Kasese project in Uganda. You can find more information about these projects on our website at <https://www.ewbnl.org>. Furthermore, I am thrilled to witness the emergence of many new projects in the making, building collaborations between multiple portfolios that promise to deliver holistic impact on the ground, addressing the interconnected challenges faced by communities. We have also conceptualized an organizational Theory of Change for EWB-NL, which we hope to develop further in 2023. Looking ahead, we also have the Circular Summit to anticipate in February 2023.

I would like to extend my heartfelt appreciation to every single volunteer who has contributed to our mission. From those working directly on projects across various portfolios to the individuals who toil behind the scenes in communications, HR, project requests, and SEG, your dedication and unwavering commitment continue to fuel the progress of our organization. Special gratitude goes to our esteemed members of the Strategic and Advisory Boards, whose guidance has been instrumental in our success.

As we enter 2023, I will be passing the torch of chairmanship into the capable hands of Sven Spierings, who has admirably led the Partnerships portfolio and the newly established Structures portfolio in 2022. I wish him the best in this journey.

My time at EWB-NL has been a truly transformative experience. I extend my heartfelt wishes to all the volunteers of Engineers Without Borders for continued success in creating sustainable engineering interventions that make a lasting impact globally.

Together, we are making a difference.



Nishant Narayan

Ex-Chairman

A message from the new chairman



Dear EWB Community,

2022 has been a strong but challenging year for us all. Our volunteers have worked hard to reignite pre-COVID projects, start new ones and build upon partnerships, new and old.

I would like to take this opportunity to thank our ex-chairman, Nishant Narayan, for steering our organisation through this process and reinvigorating our motivation to create impact throughout the world with our engineering expertise.

As the new chairman, I aim to continue the work that Nishant has done and further grow and professionalize our organisation. To this end, I have sat down with the other strategic board members to formulate several key strategic focus areas that we will be giving attention to in the coming year.

These focus areas can be found at the end of this document where we look forward to 2023.

Thank you for believing in our work!



Sven Spierings

Chairman of the board

Changes to the board from 2023 onwards



Nishant Narayan
Chairman 2021 Q4-2023 Q1



Irina Sleikina
Projects and Portfolios



Wessel Wikkerink
Treasurer



Sven Spierings
Chairman 2023 Q2+



Agata Malinowska
Project Impact Officer



Wacera Mwangi
Human Resources Officer



Hammond Sarpong
Community engagement officer

Table of contents

1.	Our organization	6
2.	Our mission	8
3.	Our vision	9
4.	Implementation	10
5.	Our organization in numbers	11
6.	Our impact	13
7.	Our partners – we thank you!	14
8.	Overview of projects in 2022	15
9.	Circular portfolio	17
10.	Water portfolio	21
11.	Education portfolio	24
12.	Energy portfolio	27
13.	Structures portfolio	30
14.	Financials	34
15.	EWB in 2023	36



Our organization



We believe in the power of those who want to make a change: local entrepreneurs and leaders with passion, dreams and ideas on how to improve their life and the life of their communities. Therefore, our goal is to **promote, teach and implement sustainable technical solutions** in developing countries which can be successfully adopted by local companies, entrepreneurs and initiative takers.

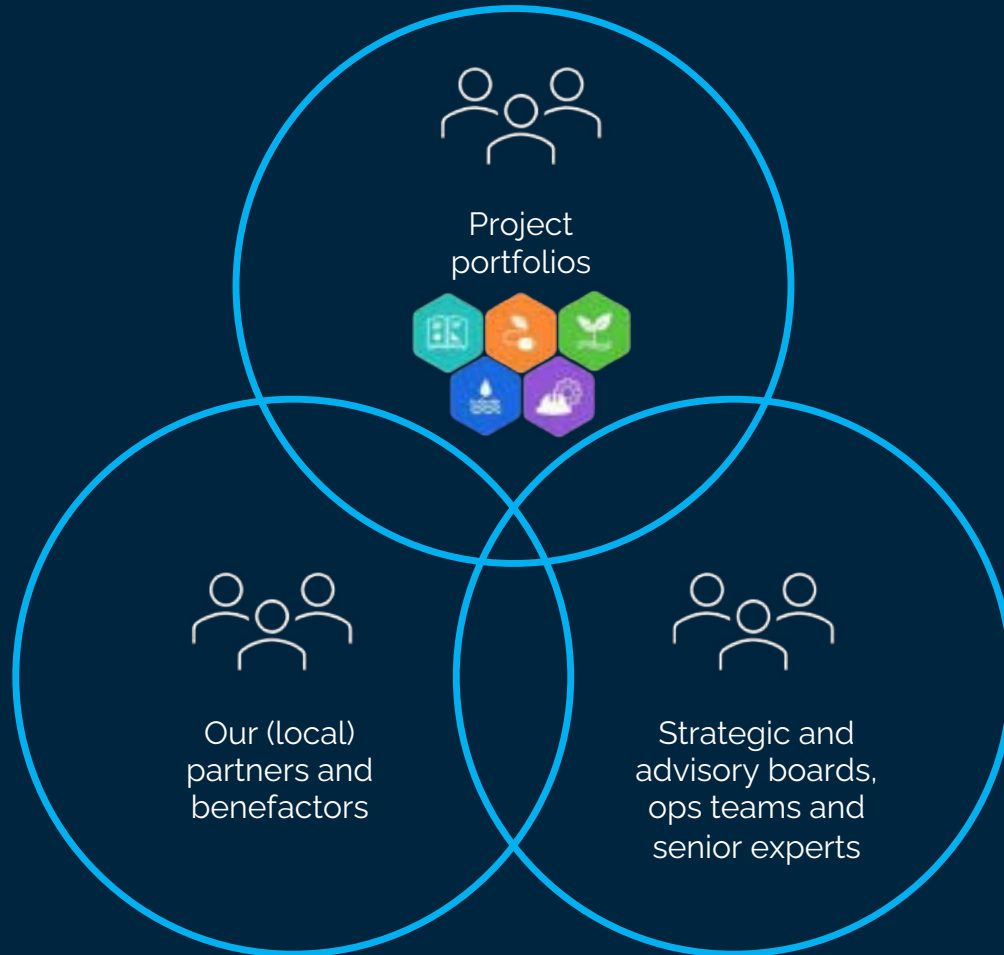
To attain our goals, our volunteers provide their knowledge and experience to local organizations, NGO's and entrepreneurs, ensuring that their ideas get the necessary technical support they need.

That's why all our projects are based on local requests and include a business/social model, so that a long-term, sustainable impact is achieved, and local ownership is ensured.

Example projects are drinking water systems, sustainable off-grid energy systems, smart apps or low-tech tools, and the build and operation of schools, factories and enterprises.

By participating in these projects, our volunteers (mainly engineers) develop non-technical skills that they can also apply in their professional work, such as the bridging of cultural differences during projects, understanding local stakeholders and

managing expectations, creating social impact, understanding institutional models, and the challenges of entrepreneurship in low resource settings.



Our organisation is built around three teams that work together intensively to successfully undertake and complete our projects.

The project portfolios organise the projects and form project teams to carry them out. They are supported by our (local) partners and benefactors who provide engineering and/or financial support. Our strategic and advisory boards, senior experts and ops teams provide the project teams with structure and guidance.

Our mission



To increase
quality of life for communities
in low-resource settings
through **sustainable technical**
interventions.

Our vision



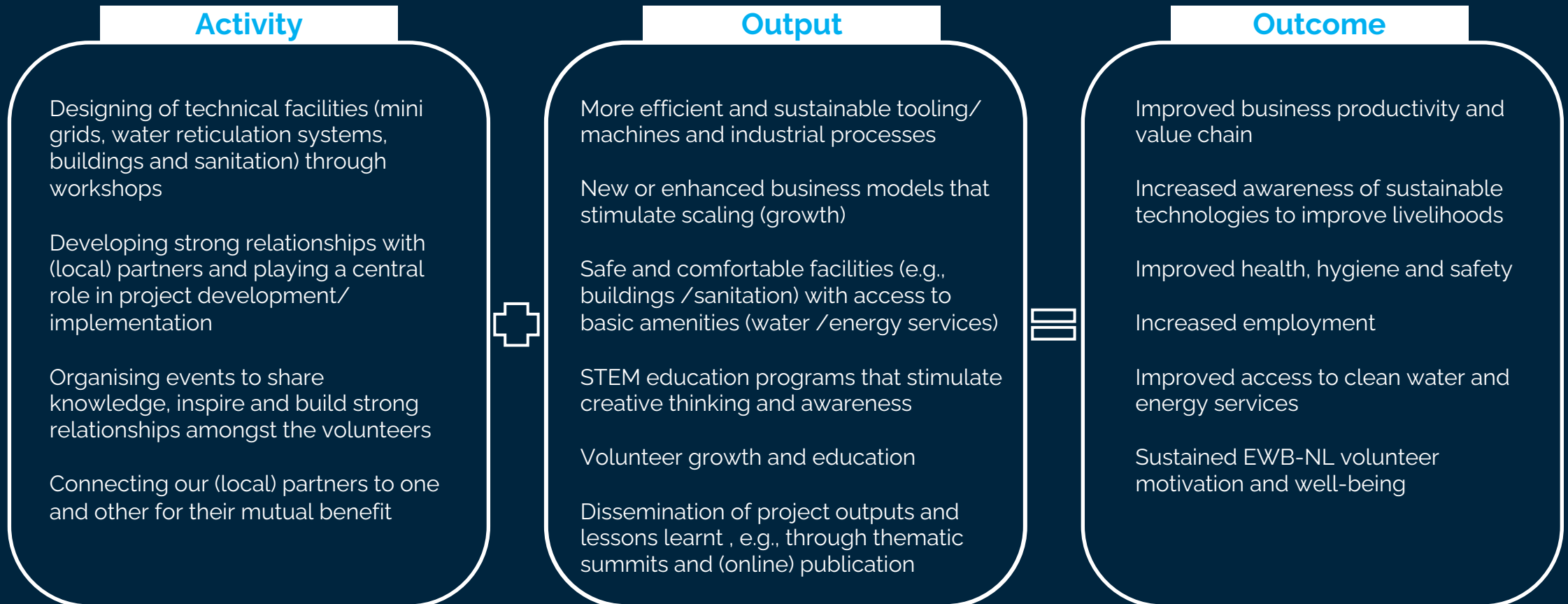
Empowered social organisations
through (technical) knowledge
that improve wellbeing in
alignment with SDGs.

Implementation (Theory of Change)



Our vision: Empowered social organisations through (technical) knowledge that improve wellbeing in alignment with SDGs.

Our mission: To increase quality of life for communities in low-resource settings through sustainable technical interventions.



Our organization in numbers

Our organisation works in portfolios, each of which advances a Sustainable Development Goal.



100+
ACTIVE VOLUNTEERS

18+
PARTNERS

100+
**FRIENDS/
BENEFACTORS**

4.000+
SOCIAL MEDIA FOLLOWERS

“If change isn’t **systemic**, it isn’t change at all.”
George Roter

Our impact

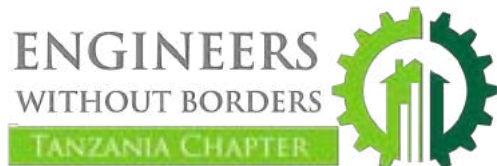
- Projects: In 2022 we worked on 4 circular economy projects, 2 water projects, 2 education projects, 1 energy project, and 3 structures projects.
- Overall revenue from donations: €38.416
- Overall project costs: €36.981
- Overall operational costs: €6.622



Our partners – we thank you!

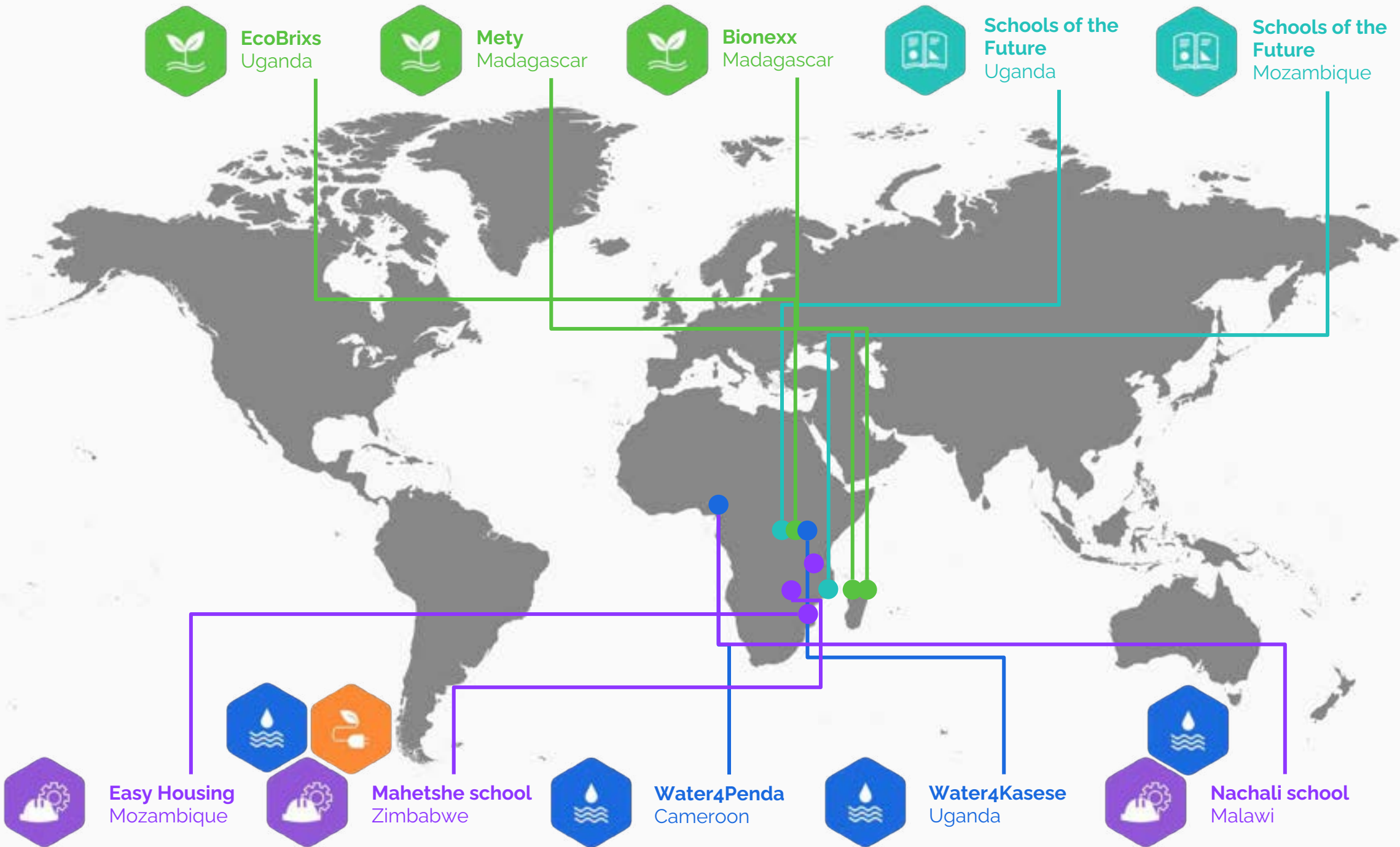


ARUP



Overview of projects in 2022

For more information on our projects, please visit: www.ewbnl.org/projects



EcoBrixx
Uganda

Mety
Madagascar

Bionexx
Madagascar

Schools of the Future
Uganda

Schools of the Future
Mozambique

Easy Housing
Mozambique

Mahetshe school
Zimbabwe

Water4Penda
Cameroon

Water4Kasese
Uganda

Nachali school
Malawi



Circular portfolio



Circular portfolio



- **Project:** Mety
- **Location:** Madagascar
- **Objectives:**
 - Support Mety in their work on establishing a waste management enterprise in Madagascar.
 - Support in conducting a 170 surveys of households and restaurants in Tanjombato, Andoharanofotsy, and Iavoloha. The aim was to get a better overview about the potential amount of waste, the types of waste and whether it is mixed or separated. Also, regarding the current energy demand for cooking.
 - Next steps: sampling and analyzing the waste produced.
- **Background information:**
 - Our partner, Mety, is working on establishing a waste management enterprise in Madagascar with a focus on the low-income area (Ambalavao Isotry) in Antananarivo, the capital of Madagascar. There are about 12.000 households there and a lot of street food, markets, and small restaurants. At the moment, there is only a public waste bin to collect all household and business waste in the area and there is no possibility to sort the waste.
 - A successful design challenge in March 2021 has resulted in ideas for turning food waste into compost (by windrow composting) and a sustainable energy source for cooking (biochar).
 - EWB is supporting Mety with conducting surveys for local households and restaurants to get an overview of the waste produced before a business model can be made.
 - Progress with this project has been a bit slow due to the local partner being quite small and also busy.

Circular portfolio



- **Project:** Bionexx
- **Location:** Madagascar
- **Objectives:**
 - Conducting a feasibility study for adding a combined heat and power plant on site, to improve the valorization of waste biomass and reduce utility costs for Bionexx.
 - The study compares different technology options for steam and power generation. The team contacted multiple equipment vendors to collect the required input for the technical and economic comparison.
 - Producing power on site could also benefit communities in the region by freeing up capacity on the local power grid.
 - Supporting the YEP volunteer on site
- **Background information:**
 - Bionexx is a producer of Artemisinin, the most important molecule used in Malaria medication. They aspire to become a leader in circular economy in Madagascar and Africa for the decades to come and add value for its community. Engineers Without Borders collaborates with Bionexx in order to make them realize their ambition by helping them finding ways to become a more environmentally friendly company.
 - For 2022, EWB has had a volunteer living in Madagascar and working for Bionexx, as part of the Young Experts Program (YEP).
 - The focus of EWBs collaboration with Bionexx has been on working with the YEPper for conducting an energy study for the site.

Circular portfolio



- **Project:** Jos Green Centre
- **Location:** Jos, Nigeria
- **Objectives:**
 - Designing a pilot plastic recycling facility for JGC with a 1000 kg/week plastic processing capacity
 - Phase 1 (Completed): August 2021 to August 2022 - Perform a feasibility study of the plastic recycling process
 - Phase 2 (Ongoing): October 2022 to October 2023 - Detailed design of the plastic recycling facility
 - Support JGC in preparing a concrete business plan and logistics support for purchasing a new shredder
 - Preparing a financial model for the plastic recycling facility
 - Impact - reduce plastic pollution, create 100 new jobs in Jos area, sustainable facility design and engage the local community in waste management
- **Background information:**
 - The Jos Green Centre (JGC) is a NGO based in the Jos Plateau area. JGC is a youth organization pioneering innovations for large scale systemic change in Nigeria. JGC has always promoted projects to speed up the sustainable transition of Jos city through conferences, collaborations and projects with local communities, institutions and organizations, gaining public acceptance and financial support. Inspired by the “Closed-loop plastics system” challenge in collaboration with EcoBrixx (a startup in Uganda) JGC wants to reduce the plastic pollution and the unemployment among youth in the Jos area. This will be achieved through an optimization of the current plastic waste recycling system, starting from the waste collection until the production of the product(s) and education and engagement of the local communities.
 - Thanks to the funds obtained from a previous project, JGC started work on the plastic recycling system by creating 6 waste collection points, buying a collection cart, buying land area to build the facility, setting up a manual process to separate and clean the plastic and also buying a shredder supplied by a local manufacturer and a diesel generator to power it.
 - The task of EWBNL is to provide expert support to help design and implement an improved waste management facility.

Circular portfolio



- **Project:** Waste to Infrastructure
- **Location:** Ghana
- **Objectives:**
 - Reduction of the Bionexx factory carbon footprint (producer of Artemisinin, the most important molecule used in Malaria medication)
 - Reduction of the waste streams and/or revalorization of waste.
 - Creation of new jobs and business opportunities in the region in case of spin-off projects for the revalorization of waste streams or the introduction of locally available raw materials.
 - Factory workers and neighbours exposed to less (toxic/harmful) emission and educated in the highest safety standard
- **Background information:**
 - Bionexx aspires to become a leader in circular economy in Madagascar and Africa for the decades to come and add value for its community. Engineers Without Borders collaborates with Bionexx in order to make them realize their ambition by helping them finding ways to become a more environmentally friendly company.
 - EWB is analysing the Bionexx production process from the farmer to the client. The objective is to identify improvement opportunities to make the process more sustainable, safer and circular.



Water portfolio



Water portfolio



- **Project:** Water4Kasese
- **Location:** Uganda
- **Objectives:**
 - Rehabilitate the existing water supply system (new tank, pipelines, and tabs)
 - Develop appropriate operation and maintenance plan for the system at hand
 - Raise awareness of good hygiene practices and their role in reducing the spread of disease
- **Background information:**
 - Kitabu Parish, in the Kasese District in Uganda, has approx. 25,000 residents. The community is struggling due to lack of access to safe drinking water especially in the short dry seasons - for domestic use and institutions use (e.g. schools). The current water wells are in valleys on hills but, since they were constructed 40 years ago, many are damaged, or they were not designed for the community which grew within the last 20 years.

Water portfolio



- **Project:** Water4PendaMboko
- **Location:** Cameroon
- **Objectives:**
 - Rehabilitate the existing water supply system (new tank and pipeline)
 - Develop a monitoring structure for the good management of the water system and the regular maintenance
- **Background information:**
 - The PendaMboko area is on the border of the British and French speaking border in Cameroon. Due to ongoing crisis in the region the water system in the PendaMboko area, which consists of different camps, is poor. Due to the consumption of untreated water, waterborn diseases spread among the camps. Together with our local partner, Rudec, we look for the right steps to take to install a proper working drinking water system. This includes, technical consulting regarding installation, maintenance of water infrastructure, implementing a sustainable economic system so the community is self-reliant in its drinking water production and can improve and expand its infrastructure.

Water portfolio



- **Project:** Water4Dumila
- **Location:** Tanzania
- **Objectives:**
 - Provide access to safe drinking water in peri urban areas of Dodoma, Arusha, Dar es Salem.
 - Introduce water kiosk as a financially feasible blueprint model for surrounding communities and EWB Tanzania
 - Develop a suitable social business model based on the needs and values of the community.
 - Provide WASH training as needed
- **Background information:**
 - The residents of Dumila Township (approximately 2500 people) currently access water through shallow wells and stagnant water next to the river Mkundi. This poses health and livelihood concerns due to the quality of the water leading to water borne diseases (cholera, botulism, diarrhea and dysentery, typhoid) and therefore barriers to children's education. In collaboration with EWB Tanzania, a water kiosk along the main road and at the school is proposed with the aim of providing clean and safe water from one collection point which is locally owned and operated. The objectives of EWB-Tanzania are to solve the major problems related to access to clean and safe drinking water to communities in Tanzania. This project has the potential to be a blueprint for surrounding communities and EWB Tanzania which accelerates the creation of other water collection points.



Education portfolio



Education portfolio (Schools of the Future)



- **Project:** Schools of the Future
- **Location:** Mozambique
- **Objectives:**
 - To facilitate the undertaking of a higher education path for those students who lack the appropriate resources;
 - To inspire and to put to practice the knowledge obtained in improving wellbeing of the student and surrounding community.
 - Deliver of workshops to students and teachers
 - Development of long term sustainable vision where the project can be transferred to the local community (NGOs, government, industry)
- **Background information:**
 - Despite years of progress in Mozambique's schooling system (no. of children signed to the primary schools has increased to 93% since 2011), there are still significant structural deficits like:
 - Low teaching-quality due to lack of qualified teachers, textbooks and infrastructures
 - Illiteracy school drop-out and delay (due to family fragility and connected with food shortage)
 - Lack of stimuli and interest in study among teens
 - Inadequate impact of educational activities in the districts
 - Technological development can not only bring societal development and help improve general human well-being, it can provide an outlet for creativity, critical and analytic thinking and can boost community spirit, empathy and self-confidence.

Education portfolio (Schools of the Future)



- **Project:** Schools of the Future
- **Location:** Uganda
- **Objectives:**
 - Inspiring children to discover the world of Science & Technology by themselves
 - Give workshops and teach at 4 local primary schools every year
 - With the support of Local NGO Knowledge for Children
 - Workshops and lessons given by qualified personnel
 - 7 EWB volunteers to organize and assist
 - reach 500-1000 children in the Masaka Region:
 - 20 schools in 5 years
- **Background information:**
 - Upon completing their primary education, only 53% of children in the Masaka region continue to their secondary education. Furthermore, only 0,34% of Ugandans get a technical degree. Systemic change begins with a good education, creating capable and well-schooled individuals.



Energy portfolio



Energy portfolio



- **Project:** Jos Green Centre
- **Location:** Nigeria
- **Objectives:**
 - Build a source of energy for a plastic recycling facility
 - reduce the plastic pollution in Jos area
 - create around new 100 job positions
 - increase the engagement of the local community and awareness about waste valorization and sustainable process
- **Background information:**
 - Considering that the waste generated in Nigeria is estimated between 0.49 and 0.95 kg/capita/day , Nigeria generates 42 million ton/year of waste, of which only less than the 30% is correctly collected and disposed of. It is estimated that 20% of the waste is plastic. According to those values, it is expected that in the only area of Jos around 47 kton/a of plastic waste is generated.
 - EWB NL has therefore teamed up with Jos Green Centre (JGC), an NGO based in the Jos Plateau area, to engineer a system to increase the efficiency of the current waste management system and increase jobs among the younger generation.

Energy portfolio



- **Project:** KCDO - Kyamaganda Community Development Organization
- **Location:** Uganda
- **Objectives:**
 - build 3 biodigesters to provide renewable energy to schools and communities
 - 1 small scale biodigester providing sufficient biogas for cooking meals once every week for ~100 children at KCDO.
 - 1 medium scale biodigester for the local primary school (~600 students + 30 staff) + water supply
 - 1 medium scale biodigester for the local secondary school (~900 students + 80 Staff) + water supply
- **Background information:**
 - Uganda is facing severe impacts of climate change, including long droughts and floods, due to deforestation caused by the increasing use of firewood and charcoal. This trend is widespread throughout the country, leading to a significant decrease in tree coverage. With the population expected to reach 76 million people by 2040, it is essential to consider alternative energy sources to meet basic cooking and water heating demands.
 - EWB NL has therefore teamed up with a local partner, Kyamaganda Community Development Organization (KCDO), to engineer a biodigester that will provide fuel for the local community, using the surrounding bio-resources



Structures portfolio



Structures portfolio



- **Project:** Nachali Girls' Secondary School
- **Location:** Karonga, Malawi
- **Objectives:**
 - Build a school campus for secondary school girls
 - Design a comprehensive master plan for the campus
 - Provide the school with a water reticulation system plan and design for a sanitation facility
 - Design the structures of the school buildings and additional facilities
 - Assist the local partner with fundraising
- **Background information:**
 - The project is in Malawi, in the northern region of the Karonga district approx. 650 kms from Lilongwe, the capital. There is an acute shortage of (secondary) schools for children in Malawi, especially for female children.
 - Our local partner has acquired a large plot of land from the community where he aims to develop a secondary school for girls. The first three school buildings containing 7 classrooms have been built already by local artisans. The school buildings still require a roof structure, however. In addition to engineering of the roof structure, our partner requires engineering/architectural assistance with the teacher's hostels, the multipurpose hall, girls' hostels and water reticulation system.

Structures portfolio



- **Project:** Mahetshe Secondary School
- **Location:** Matobo, Zimbabwe
- **Objectives:**
 - Build a school campus for secondary school children
 - Design a comprehensive master plan for the campus
 - Provide the school with a water reticulation system plan and design for a sanitation facility
 - Provide the school with an energy plan
 - Design the structures of the school buildings and additional facilities
 - Assist the local partner with fundraising
- **Background information:**
 - The project is requested by the Masakhaneni Projects Trust, a non-profit organization based in Bulawayo Zimbabwe that aims to facilitate democratic, peaceful, and inclusive spaces for structurally marginalized communities through dialogues held over conflict, governance, human rights, and development issues.
 - From 2020 Masakhaneni has embarked on a mission to improve the quality of education in marginalized schools in Zimbabwe. These are schools where pupils have a zero percent pass rate at grade seven level. Masakhaneni has been intervening in these schools by providing learning materials and incentives for teachers while enhancing the capacity of school development committees and learner's parents to be more effective.
 - Additionally, Masakhaneni is now focusing on improving the infrastructure in schools in general and helping to provide proper facilities to the remote resettlement areas in Zimbabwe, where the school facilities are generally in an extremely poor state.

Structures portfolio



- **Project:** EasyHousing.org
- **Location:** Various locations in Africa
- **Objectives:**
 - Provide structural calculations for 1 to 2 story modular wooden dwellings
 - Develop standardised building details that are feasible for our local partner
- **Background information:**
 - Easy Housing has developed a scalable, climate resilient, circular and carbon negative building concept based on sustainable timber. They have built two semi-detached starter homes for low-income families. The houses include a solar home system and passive house design principles are applied for maximum energy efficiency. The building concept reduces resource extraction and waste. It: i) eliminates the use of concrete and steel and uses sustainably sourced timber instead; ii) stores carbon and uses regenerative resources that substitute the intensive resource extraction and carbon footprint from mainstream cement and steel constructions; iii) eliminates waste during the construction process by working with exact specified lengths of timber and by using only circular construction principles. Hence, the building technology provides a holistic, integrated sustainable solution focusing on circularity and waste reduction.

Financials 2022

For more detailed information on our financials, please see the Financial Report for 2022

Conclusion profit & loss

Overall, the financial position of the foundation is positive. It can facilitate growth, but for substantial growth, extra financial resources will be needed.

The organisational costs of the foundation are approximately €5.000 per year. In 2022, general donations were enough to cover the organisational costs and the amount received from regular donations grew.

The general (unearmarked) reserve is now about 70% of the budget of our current projects, which is sufficient. The general reserve should be at least €10.000 for continuity of the foundation and as a contingency. This means approximately €15.000 can be used by the foundation on projects annually.

If EWB-NL executes more projects and in a more efficient manner, the general reserve will be sufficient to get more projects of the same size as we have up and running. We have the added financial capacity to kick start high impact projects when needed.

	2022	2021	2020
Total Revenue	€ 38.416	€2.987	€34.268
Total Costs	€ 43.603	€3.358	€8.207
Net profit/loss	€ -5.187	€ -371	€23.654

EWB in 2023

Three strategic focus areas

1.



Increase our impact by promoting multidisciplinary projects

(Prioritize knowledge exchange within projects and use our resources more efficiently and effectively)

2.

Prioritize volunteer well-being, motivation, and time management

(Decrease overall volunteer rate of attrition and support project longevity and success)

3.

Empower our project teams through strong leadership

(Bring together and coordinate key individuals that can support the teams and partners, increase our visibility and accessibility, strengthen our fundraising expertise)



**ENGINEERS
WITHOUT
BORDERS • *NL***

Contact us: board@ewbnl.org

www.ewbnl.org